FIRESTONE FLATS FIRE SALVAGE

ENVIRONMENTAL ASSESSMENT

PREPARED BY THE KALISPELL UNIT,
NORTHWESTERN LAND OFFICE

MONTANA DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

OCTOBER 2013

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CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	Firestone Flats Fire Salvage
Proposed:	
Implementation Date:	November 2013
Proponent:	DNRC
Location:	Section 36, T17N, R19W;
County:	Lake

I. TYPE AND PURPOSE OF ACTION

DNRC, Kalispell Unit, is proposing to salvage harvest approximately 4.5 MMBF of timber from approximately 435 acres of Trust lands burned during the Firestone Flats fire of July/August 2013.

The purpose of the timber sale is:

1) To generate revenue for the common school trust (C.S.) by salvaging burned timber before it loses economic value as directed in MCA 77-5-207.
2) Try to mitigate any adverse affects to resources caused by the fire, by implementing site specific measures.

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 15, 2013. Legal ads were placed in the Sunday edition of the Missoulian on August 18 and August 25, 2013.

Three letters were received from adjacent landowners, 1 letter from the Confederated Salish and Kootenai Cultural Preservation Office, and 1 letter from Stoltze Lumber. The main issues from the public were that harvest activities could cause erosion, spread noxious weeds, and increase traffic on the County Road. DNRC staff met one adjacent landowner on site to discuss site specific concerns raised by the landowner. As a result of the meeting, project mitigations were developed to address some these concerns. The letter from the Tribal Cultural Preservation Office stated that the project area had been reviewed for cultural resources and they knew of no cultural resources that would be impacted by this project. The Stoltze letter offered support for our project. All comments and concerns were considered when developing the action alternative.

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.

DNRC will need to acquire road use authorization from the Confederated Salish & Kootenai Tribe to access the project area. An ALCO permit will be required from the Confederated Salish and Kootenai Shoreline Protection Office for crossing of class 3 streams.

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 harvesting would occur. Sale specific mitigation measures would not be implemented. Specifically, retention of coarse, woody debris, tree planting, and treatment of noxious weeds would not happen with the no-action alternative.

2. Action- Salvage burned timber on approximately 350 acres. Approximately 2 miles of new road would need to be constructed. Site specific mitigation measures would include the retention of woody debris for soil stabilization, tree planting, and treatment of noxious weeds. The action alternative would meet the intent of MCA 77-5-207 and capture the value of fire killed trees.

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.

Soils information for the project area is from the Soil Survey of Lake County Area, Montana and was obtained using the Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/). Ten mapped soils were identified in the project area and harvesting is proposed on all but one of these soil types. While some of the project area within the fire perimeter still has live, green trees, most of the *fire burn severity* (Scott, J. H. and E.D. Reinhardt, compilers. 2007) in the project area was high; indicating that all of the litter, duff and small woody debris were consumed and the large woody debris was consumed or deeply charred. The soil temperature likely reached levels that created varying degrees of *fire induced water repellency* and increased the erosion potential.

Erosion on the high burn severity portions of the state land with steep slopes would have a high risk of erosion due to (1) loss of surface cover in the form of vegetation, duff or litter, (2) lack of tree canopy to intercept precipitation, (3) loss of woody debris of all sizes to store sediment and desynchronize runoff, and (4) the presence of water repellent characteristics in the surface soils.

- ***Direct, Indirect, and Cumulative Effects of the No-Action Alternative***

  No timber harvesting or associated activities would occur under this alternative. Because harvesting would not be implemented, compaction, displacement and erosion rates due to management activities would not occur. The high erosion risk on steep slopes with high burn severity would remain until down woody debris levels are increase through natural recruitment and vegetation is re-established. Rain-on-snow events or intense thunderstorms may result in substantial erosion. Fire restoration and erosion control plans for contour felling of trees on up to five acres is expected to have slightly lower the risk of sheet erosion.

- ***Direct, Indirect, and Cumulative Effects of the Action Alternative***

Using these percentages of expected impacts, moderate or higher impacts would cover approximately 38 acres in harvest units. Additionally, the proposed 1.5 miles of new permanent road construction and 0.2 miles of temporary road construction would remove approximately 5.2 acres from forest production. Fire restoration and erosion control plans for contour felling of trees on up to five acres is expected to have slightly lower the risk of sheet erosion. Cumulative effects associated from timber harvest operations would be minimized 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, managing cable corridor widths and limiting operations to dry or frozen conditions. Due to these mitigation measures and the limited existing impacts, the cumulative effects attributed to timber harvest from compaction, erosion and displacement would be low.

Attachment II: *SOILS ANALYSIS* contains a detailed analysis of soil related issues.

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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.

This parcel is entirely included in the Middle Jocko River 6th code HUC which is a 37,491 acre watershed. Precipitation in the watershed averages 26 inches per year with a range of 14 to 60 inches per year. The Jocko River is a perennial fish-bearing stream that flows in a general northeast-to-southwest direction through the Jocko canyon before turning north towards its confluence with the Flathead River. While the state-managed parcel is within the Middle Jocko River 6th code watershed, the river channel is not closer than 1,350 feet of any portion of the project area. Stream channels are generally less than three feet wide and have a rocky bottom where scour has occurred. These channels only flow during or immediately after precipitation events and thus have an ephemeral flow regime. All streams are considered to be Class 3 channels because they flow less than 6 months during the year and do not contribute surface flow to downstream waterbodies. Due to the intermittent and disconnected characteristic of the streams in the project area, fish are not present in these streams on the state parcel.

- ***Direct, Indirect and Cumulative Effects of the No-Action Alternative to Water Resources***

Because no timber harvesting or associated activities would occur under this alternative, direct, indirect and cumulative effects would be limited to the existing conditions. Fire restoration and erosion control plans for contour felling of trees on up to five acres would be expected to slightly lower the risk of sheet erosion. As vegetation re-establishes on the state parcel, the risk of erosion would decline as would the risk to the downstream private water source. Newly formed stream channels would reach equilibrium over time and sediment transport would be reduced.

- ***Direct, Indirect and Cumulative Effects of the Action Alternative to Water Resources***

Skyline yarding across class 3 streams may result in some erosion in channels, but this is not expected to affect downstream bodies of water due to the ephemeral flow regime and discontinuous scour. Due to mitigation measures listed in the *SOILS ANALYSIS (ATTACHMENT II)*, the risk of substantial sediment delivery to streams from the timber harvest would be reduced. Leaving the majority of slash in the harvest units would serve to desynchronize runoff (by slowing runoff in some areas and allowing for infiltration) and also store sediment on the hillside. Additionally, installing surface drainage in the existing skid road network would be expected to reduce erosion on the skid roads and depositions in low areas.

Existing roads would have minor drainage improvements during road maintenance to maintain a reduced risk of sediment delivery to streams. Minor drainage improvements include reshaping drain dips and cleaning ditches, as well as, placing energy dissipaters at as necessary to reduce the risk of erosion. New road construction would have three stream crossings—drive through fords—installed with rock armoring to reduce the risk of sediment delivery. During construction minimal amounts of sediment may enter the stream channel, however due to the ephemeral flow regime and discontinuous channel scour, the risk of sediment delivery to downstream waterbodies would be very low.

Because all timber-harvesting activities would follow BMPs as required by *ARM 36.11.422* and the direct and indirect effects would have a low risk of impacts, a low risk of additional cumulative effects with adverse impacts to water quality and beneficial uses would be expected under this alternative.

Attachment II: *WATER RESOURCES ANALYSIS* contains a detailed analysis of water quality issues.

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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. The CSKT Reservation is classified as a Class 1 Airshed.

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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.

The majority of the project area experienced a stand replacement fire with over 95% of the standing trees being killed by fire. Approximately 40 acres did not burn in the fire. This area is not included in the proposed harvest area. Approximately 350 acres of the 435 that were burned will be harvested. Several small areas within the burn area experienced a less severe fire and many of the trees still have green foliage. The majority of these 'green' acres will not be harvested and be left for hiding cover for wildlife species. The green area deferral is approximately 10 acres.

Since almost 100% of the trees proposed for harvest were killed by the fire, there is little change in vegetative cover, quantity, age class, and stocking between the action and no-action alternatives. **The full, detailed vegetation analysis is contained at the end of this document (ATTACHMENT II - VEGETATION ANALYSIS). It provides an in-depth evaluation of the No-Action and Action Alternatives.**

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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.

The full, detailed wildlife analysis is contained at the end of this document (ATTACHMENT II - WILDLIFE ANALYSIS). It provides an in-depth coarse filter evaluation of the No-Action and Action Alternatives and notes pertaining to species potentially present in the project area. The following text provides a brief summary of that document. No fish habitat was identified in the parcel.

A coarse filter analysis was conducted to address potential adverse effects to wildlife associated with habitat connectivity and removal of mature forest cover, changes in the abundance of snags and coarse woody debris, and old-growth forest habitat availability and fragmentation. The proposed activities are not anticipated to adversely affect mature forested habitat or old-growth forests due to the absence of these habitats in the project area. Moderate adverse direct and indirect effects and minor adverse cumulative effects associated the availability of snags and coarse woody debris and would be anticipated under the Action Alternative.

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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 full, detailed wildlife analysis is contained at the end of this document (ATTACHMENT II - WILDLIFE ANALYSIS). It provides an in-depth evaluation of the No-Action and Action Alternatives and notes pertaining to threatened, endangered and sensitive species potentially present in the project area. The following text provides a brief summary of that document. Wetlands and streams are protected under the Streamside Management Zone law. This is discussed in ATTACHEMENT II – WATER RESOURCES ANALYSIS.

Habitat assessments were conducted for federally listed species in northwest Montana, including Canada lynx and grizzly bears. The project contains potential grizzly bear habitat and in grizzly bear non-recovery occupied habitat associated with the Northern Continental Divide Ecosystem (USFWS 1993, Wittinger 2002). Given the level of disturbance and extent of habitat alteration associated with the proposed action, minor adverse direct, indirect, and cumulative effects to grizzly bears would be expected under the Action Alternative.

Habitat assessments were also conducted for the following sensitive species: bald eagle, black-backed woodpecker, Coeur d'Alene salamander, Columbian sharp-tailed grouse, common loon, fisher, flammulated owl, gray wolf, harlequin duck, northern bog lemming, peregrine falcon, pileated woodpecker, Townsend's big-eared bat, wolverine, and big game. From this list of species, it was determined that black-backed woodpeckers warranted detailed study due to the presence of habitat in the project area. Moderate adverse direct and indirect effects and minor adverse cumulative effects to black-backed woodpeckers are anticipated under the Action Alternative.

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10. HISTORICAL AND ARCHAEOLOGICAL SITES:

Identify and determine direct, indirect, and cumulative effects to historical, archaeological or paleontological resources.

Scoping letters were sent to those Tribes that requested to be notified of DNRC timber sales. No response was returned that identified a specific cultural resource issue. A Class I (literature review) level review was conducted by the DNRC staff archaeologist for the area of potential effect (APE). This entailed inspection of project maps, DNRC's sites/site leads database, land use records, General Land Office Survey Plats, and control cards. The Class I search results revealed that no cultural or paleontological resources have been identified in the APE, but it should be noted that Class III level inventory work has not been conducted there to date.

Because the topographic setting and geology suggest a low to moderate likelihood of the presence of cultural or paleontologic resources, proposed timber harvest activities are expected to have *No Effect* to *Antiquities*. No additional archaeological investigative work will be conducted in response to this proposed development. However, if previously unknown cultural or paleontological materials are identified during project related activities, all work will cease until a professional assessment of such resources can be made.

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 Firestone Flats fire. Silvicultural prescriptions would harvest trees killed in the fire and would have little change from the existing appearance. The State parcel is not visible from the County Road.

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.

No other DNRC projects are planned in this area. The Confederated Salish and Kootenai Tribe is planning a fire salvage on Tribal lands burned in the Firestone Flats fire (s. 2 & 3, T16N, R19W; S. 25, 35, 36, T17N, R19W; s. 31, T17N, R18W).

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 45 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.

The project area lies within the boundaries of the Confederated Salish and Kootenai Tribe. DNRC referenced Tribal resource standards (Streamside Management Zone rules and Best Management Practices). The CSK Tribal Preservation Office reviewed the project area for cultural resources.

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 $450,000 for the Common Schools (CS) Trust and an additional $80,000 in Forest Improvement fees. The no-action alternative would not produce revenue for the Common Schools (CS) Trust or collect any Forest Improvement fees.

A Checklist Prepared By:	**Name:**	Pete Seigmund	**Date:**
	Title:	Forester	

V. FINDING

25. ALTERNATIVE SELECTED:

The Montana Department of Natural Resources and Conservation has completed the environmental assessment (EA) for the proposed Firestone Flats Fire Salvage Project on State School Trust Lands described on page 3 of this document. After a thorough review of the EA, public comments, the project file, Department policies, standards, and guidelines, I have made the following decision 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 4.5 million board feet of timber from 435 acres, and include approximately 2 miles of new road construction. The purpose of this project was twofold:

1) To generate revenue for the common school trust (C.S.) by salvaging burned timber before it loses economic value as directed in MCA 77-5-207.
2) Try to mitigate any adverse affects to resources caused by the fire, by implementing site specific measures.

Issues identified through Scoping were, harvest activities could cause erosion, spread noxious weeds, and increase traffic on the County Road. Information contained in the EA indicates that these issues have

been resolved or mitigated by the design of the project, or those mitigations would be specific contractual requirements of the project. Therefore I select the Action Alternative as described in this document.

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.

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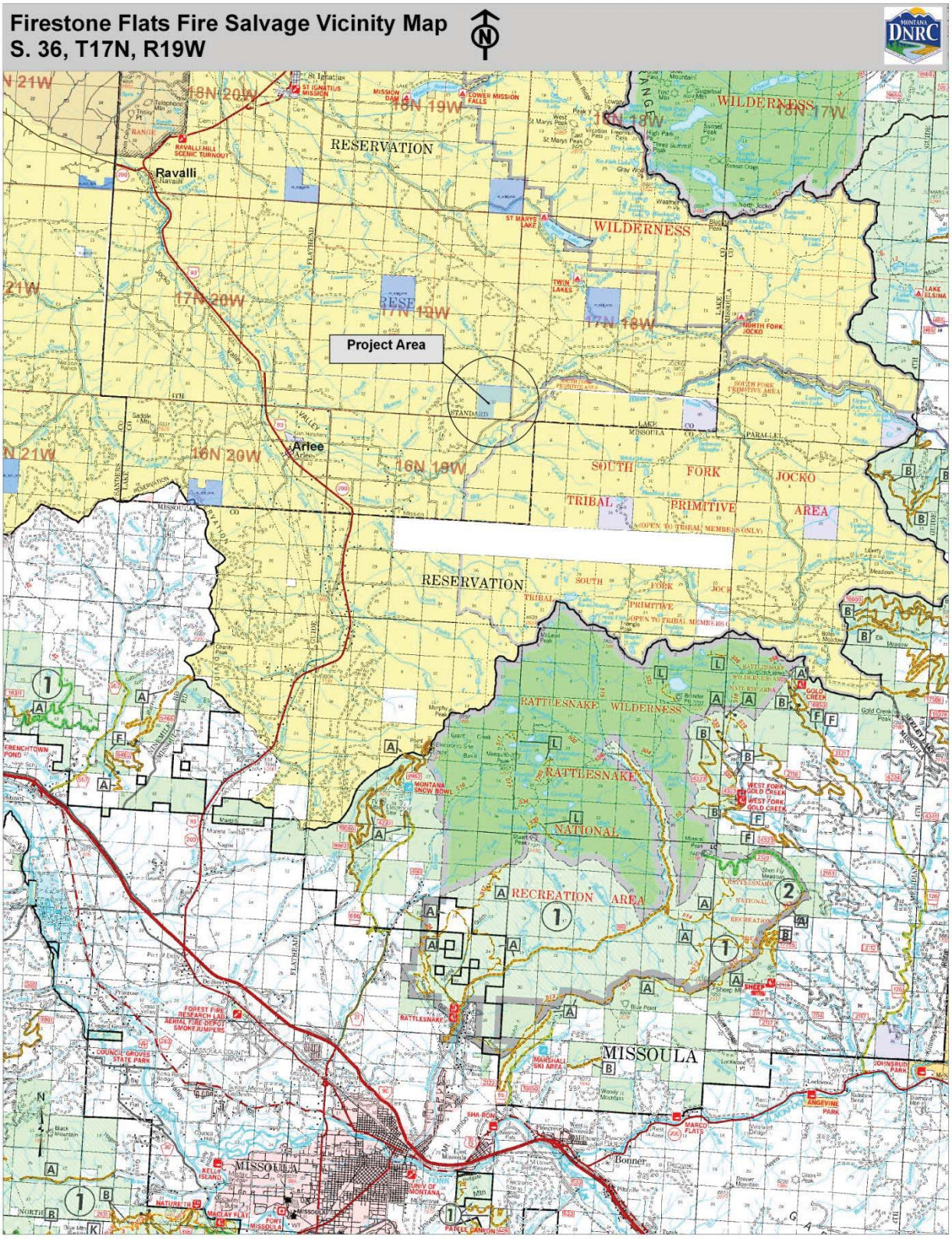
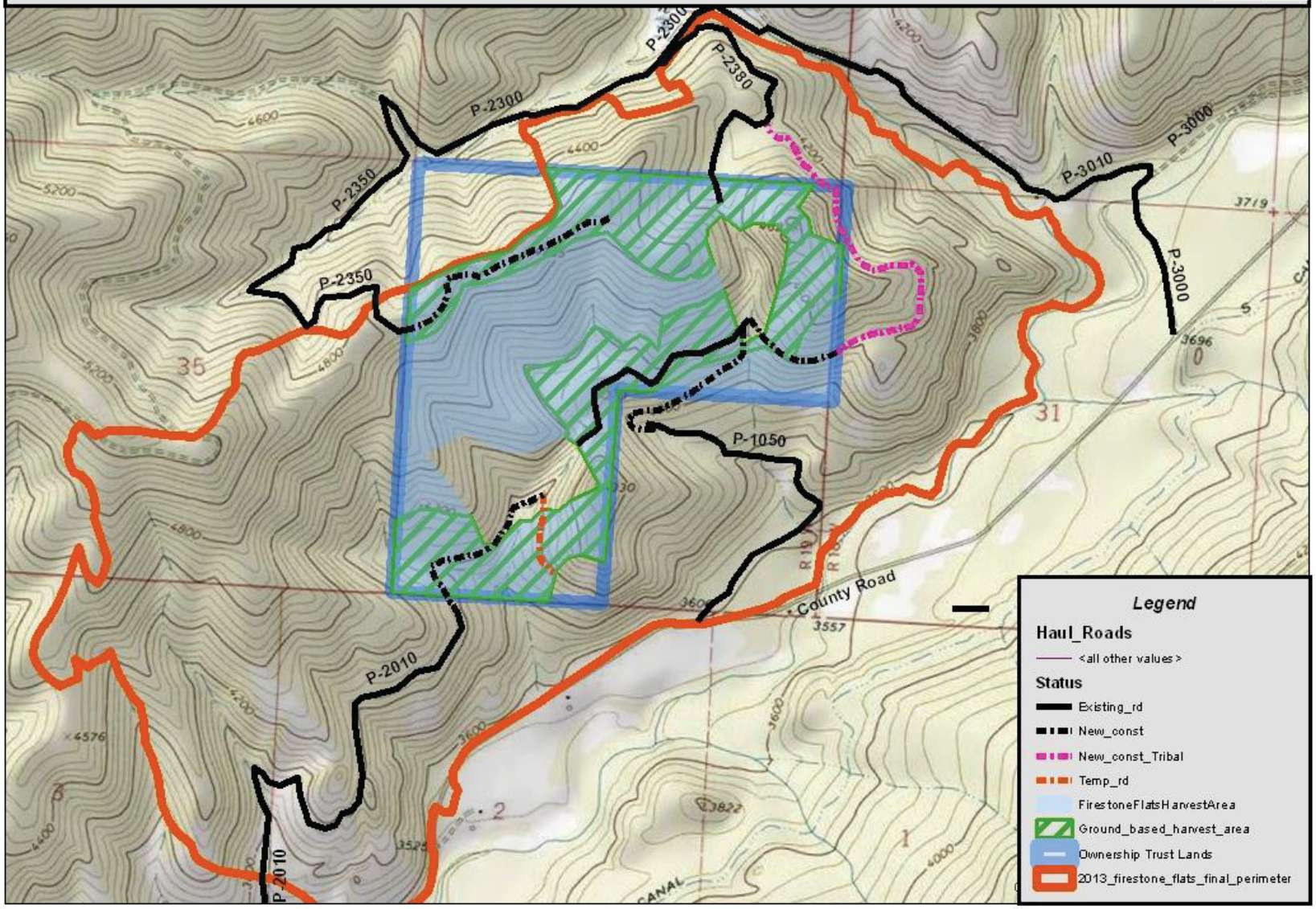
27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

	EIS		More Detailed EA	X	No Further Analysis

EA Checklist Approved By:	**Name: David M. Poukish** **Title: Kalispell Unit Manager**
Signature:/s/ David M. Poukish	**Date**: 10/23/13


Firestone Flats Fire Salvage Vicinity Map
S. 36, T17N, R19W
Project Area
Ravalli
Arlee
RESERVATION
WILDERNESS
SOUTH FORK JOCKO TRIBAL PRIMITIVE AREA
RATTLESNAKE WILDERNESS
RATTLESNAKE NATIONAL RECREATION AREA
MISSOULA
18N 20W
18N 19W
18N 17W
17N 20W
17N 19W
17N 18W
16N 20W
16N 19W

Firestone Flats Fire Salvage - Proposed Salvage Map
S. 36, T17N, R19W



ATTACHMENT II – RESOURCE ANALYSES

- **Vegetation Analysis**
- **Wildlife Analysis**
- **Water Resources Analysis**
- **Soils Analysis**

ATTACHMENT II: FIRESTONE FIRE SALVAGE VEGETATION ANALYSIS

The vegetation section describes present conditions and components of the forest as well as the anticipated effects of both the No Action and the Action Alternatives. Issues expressed during initial scoping by the public and internally were:

- Bark beetle populations could increase by infesting fire killed trees and then infesting green trees located within the project area.
- Timber harvesting and associated activities may increase noxious weeds in the project area.

These issues can be evaluated by analyzing the anticipated changes in current forest conditions in the project area, in conjunction with the extent and location of silvicultural treatments.

Analysis Methods

Administrative Rules of Montana (ARM 36.11.404) direct DNRC to take a coarse filter approach to favor an appropriate mix of stand structures and compositions on state lands, referred to as a desired future condition. The following characteristics: forest composition, age class distribution, cover type and structure, are used to describe current forest and stand conditions in comparison to the estimated natural forest characteristics for Montana prior to extensive influences from fire suppression, logging, and development. This analysis will compare the desired stand conditions that DNRC believes to be appropriate for the site with current stand conditions.

***Forest/Timber Analysis Methods* –**

The DNRC site–specific model (ARM 36.11.405), was used to determine the characteristics of the desired future condition and to evaluate the potential direct, indirect, and cumulative effects. This model compares the 1930's forest inventory data used in *Losensky's* 1993 analysis and subsequent 1997 report of estimated proportions of forest stand structural stages by cover type historically represented throughout Montana, to the 2006 DNRC Stand Level Inventory database that estimates current forest conditions. More recent field observations and tree data were gathered to further refine specific forest stand characteristics within the project area. This data is available at the Kalispell Unit. The method used to analyze current and appropriate (desired future conditions; DFC) stand conditions, old-growth timber stands, and stand development follows:

- *Current & Appropriate Conditions:* Two filters were developed for the Kalispell Unit Landscape and applied to 2006 Stand Level Inventory (SLI). The filters were assigned cover types similar to those used in the 1930's inventory. The

first filter followed the 1930's criteria exactly, or as closely as possible, representing current conditions. The second filter represents the department's DFC as defined in ARM 36.11.404 and 405. The second filter for appropriate conditions assigns cover types using criteria primarily designed to help address the situation where succession from one cover type to another is occurring. This successional filter was developed to indicate that those areas in the absence of fire suppression, introduced pathogens, and timber harvesting would likely have been assigned to a different cover type than the current cover type filter would suggest. The appropriate filter estimates, from the current stand conditions, what cover type representation might have looked like in 1900.

- *Old Growth Timber Stands:* the methods to identify old growth timber stands, as defined by ARM 36.11.403 (48), are based on the Kalispell SLI data. The process uses the SLI to identify stands that may meet the minimum criteria (number of trees per acre that have a minimum dbh and minimum age) for a given habitat type group as described in Green et al (1992), *Old Growth Forest Types of the Northern Region*. Field surveys were used to verify that the definition is met in the identified stands and to determine if additional stands meet the definition.
- *Stand Structure/Development:* the analysis on stand structure and development is qualitative, and discusses the conditions of timber stands, including how various natural and man-caused disturbances and site factors have affected and may continue to affect timber stand development.

***Sensitive Plant Analysis Methods* –**

The Montana Natural Heritage Program (MNHP) database was consulted by DNRC for information regarding occurrence of plant species of special concern and the potential for sensitive plants and their habitats within the project area

***Noxious Weed Analysis Methods* –**

During field reconnaissance, DNRC personnel assessed road conditions, road locations, various susceptible timber stands, stream conditions, and generally evaluated noxious weed occurrence, extent and location.

***Forest/Timber Analysis Area* –**

This analysis area includes 3 geographic scales for assessing potential direct, indirect and cumulative effects on forest cover type, species composition, the distribution of age classes, structural stages, and fragmentation.

- Climatic Section M333B - **Lower Flathead Valley (Losensky 1997) Scale** was used in this analysis for comparing historic conditions related to the distribution of forest cover types and age classes, to current conditions within the project area. The Lower Flathead Valley geographic area includes Flathead Lake west to the Montana border, from the Canadian border south to Missoula, MT (Losensky 1997).

- The **DNRC Kalispell Landscape Scale** includes all scattered forested trust land 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. Current and appropriate conditions related to forest cover types and age class distribution were analyzed on this scale.

- The **Firestone Fire Salvage Project Area Level Scale** includes all trust lands located within s. 36, T17N, R19W (approximately 476 acres). Approximately 435 acres were burned in the fire. This scale was used to analyze expected changes in current forest conditions of the project area.

***Sensitive Plants/Noxious Weeds Analysis Area* –**

The analysis area for noxious weeds and sensitive plants species, are trust lands within the project area. Surveys identifying sensitive plant occurrences were compared to proposed harvest sites and road construction locations for assessing direct, indirect, and cumulative effects, and developing mitigation measures, if needed.

Existing Conditions

General Forest Vegetation Information –

The existing vegetative types, more specifically forest habitat types and cover types within the Kalispell Landscape and the Firestone Flats project area, reflect the varied influences of site factors, fire regimes or disturbance patterns, and past management activities.

Site conditions vary depending upon the physiographic and climatic factors associated with geographic locations. Soil types, slope aspect and position, length of growing season, and moisture availability influence the type, growth and development of forest vegetation. These site factors are considered in the forest habitat classifications (Pfister et al. 1977), used to generally describe forest vegetation, forest stand development, and relative forest productivity associated with the given site and climatic factors.

***Stand History/Past Management* –**

There is no record of this parcel of State land being harvested. Field reconnaissance indicates that scattered firewood cutting has probably occurred over the last 25 years. Approximately 435 acres were burned in late July of 2013. Fire severity was high in most of the area burned on State land. About 12 acres experienced a mixed to low severity fire. These areas are located in draw bottoms.

Forest Habitat Types –

Stands in the project area are dominated by forest habitat types in the Douglas-fir series (*pseudotsuga menziesee)* with most types being Douglas-fir/ninebark (psme/phma).

Douglas-fir, ponderosa pine, and western larch, are the most prevalent trees species. There are some scattered grand fir, Engelmann spruce, and lodgepole pine. Timber productivity is considered moderate to high.

***Fire Regimes* –**

Fire regimes for the Kalispell Landscape are variable, given the broad and scattered nature of trust lands, but are predominantly within the moderate severity fire regime. As a whole, the forest exists as a mosaic of differing age and size classes that have developed from different human activities, fire frequencies and intensities in relation to other site factors such as aspect, elevation, weather, stand structure, and fuel loadings. Areas of frequent fire have produced WL/DF, PP, and DF cover types. In low severity fire regimes, fires occur frequently and create relatively smaller patches of open-grown forest. Historically, these low severity regimes maintained stand conditions that were resistant to stand replacement fires, by regularly consuming forest fuels, killing small trees, and pruning boles of small trees. As fire intervals become longer and management activities occur less frequently, more shade tolerant tree species begin to develop in the understory and stands tend to be multi-storied, with varied patch sizes. These characteristics reflect a moderate to low severity fire regime. High severity fire regimes are characterized by large patch sizes and stand replacement fires, but often include low severity fires that act as a thinning agent, or create small openings where clumps of trees die where small crown fires erupt.

Approximately 435 acres of State land burned in late July of 2013. Almost all of the acreage burned experienced a high intensity, stand replacement fire. There is approximately 15 acres that experienced a low to moderately intense fire with low tree mortality.

Forest Age Class & Cover Type Distribution –

Table 3–1 compares the DNRC Kalispell Landscape (current cover types) with historical data (appropriate cover types) as an assessment of desired future conditions regarding cover types.

Table 3–1. Current and appropriate cover types for the Kalispell Unit.

Cover Type	Current Cover Type (Acres	Appropriate Cover Type (Acres)	Current Type Minus (-) Appropriate Type (Acres)
SAF	2249.9	254.8	1995.1
DF	1646.5	1029.4	617.1
HW	449	207	242
LP	2269.2	1376.8	892.4
MC	10265.8	2282.3	7983.3
PP	10636.9	11936.2	-1299.3
OTHER	3635.4	3576.2	59.2
WL/DF	25494.6	32974.5	-7479.9
WWP	567.6	3577.7	-3010.1
TOTAL	57214.9	57214.9	--

SAF = subalpine fir. DF = Douglas-fir. LP = lodgepole pine. MC = mixed conifer. PP = ponderosa pine. WL/DF = western larch/ Douglas-fir. WWP = western white pine. Other = non stocked lands, nonforest, or water. The Current Type minus Appropriate Type column above lists the excess and deficit (-) acres for each Cover Type.

The longer intervals between disturbances and commodity extraction generally explain the decrease in the WL/DF and PP cover types. The PP, WL/DF, and WWP cover types are not as well represented within the Kalispell Landscape as estimated for the early 1900's. Most notable, is the conversion of over 11,000 acres in the WL/DF, PP, and WWP cover types, over the last 100 years, to the present over abundance of the MC and SAF cover types by approximately 10,000 acres.

Active fire suppression initiated in the early 1900's has interrupted wildfire frequencies and intensities in conjunction with 50 years or more of logging practices that favored the removal of commercially valuable western larch (*Larix occidentalis)*, ponderosa pine (*Pinus ponderosa)*, western white pine (*Pinus monticola)* and Douglas-fir (*Pseudotsuga menziesii)* for railroad ties, mining timbers, and construction lumber. Many open, mature stands dominated by western larch and other seral species with even-aged patches of immature seral trees in the understory have been replaced with more densely stocked stands in both the overstory and understory. These stands often include a higher percentage of more shade tolerant trees such as, Douglas-fir, grand fir (*Abies grandis*), sub-alpine fir (*Abies lasiocarpa*), or spruce (*Picea spp*.), as a result of longer intervals between disturbances.

Since most of the project area (over 95%) experienced a stand replacement fire, there would be no change in age class or cover type distribution from the existing condition. Most of the stands located within the burned area are classified as ponderosa pine cover types and it is likely these stands would continue to be ponderosa pine stands in the future regardless if the area has a salvage harvest.

Age class distributions in conjunction with other forest stand conditions or characteristics are useful in determining general historic conditions for inferring desired future conditions. Table 3– 3 displays historic age class distribution and current age class distribution on the Kalispell Unit. Stands in the seedling-sapling age class (0-39 years) are under-represented compared to the historical condition for the Kalispell landscape. The 150+ age class is over represented for the Kalispell Unit. This deviation from historical conditions can partially be explained by successful fire suppression increasing the interval between large, stand replacement fires and logging practices that did not necessarily create a similar disturbance to a wildfire.

Table 3–3. Historic and current age class distribution.

Percent of Analysis Areas by Age Class Groups (years):				
Analysis Area	00 - 39	40- 99	100 - 149	150+
M33B (historic)	36	13	15	36
Kalispell (current)	10	21	30	39

Distribution of Old-Growth Stands –

As per the Land Board's decision in February, 2001, the DNRC adopted definitions for old growth by forest habitat type groups, based on minimum number and size of large trees per acre and age of those trees as noted in *Old-Growth Forest Types of the Northern Region (Green et al. 1992).* There is no old growth present in the project area.

Stand Structure and Development –

Stand structure and patch size indicates a characteristic of stand development and disturbance and how a stand may continue to develop. Stand structure is classified as single-storied, two-storied, or multi-storied.

Single-storied stands are most often associated with stand replacement events, such as severe fires or regeneration harvests including clearcutting or seedtree cutting. Stands are fairly simple in vertical structure and are often even aged. Regeneration harvests, such as a seedtree or shelterwood, that retain 10% or more of the upper crown canopy and has a seedling/sapling understory are considered 2-storied stands. Two-storied stands have simple vertical structure and are frequently even aged, although at least two age classes are generally present. The multi-storied condition arises when a stand has progressed through time and succession to the point that shade-tolerant species are encroaching into a shade-intolerant overstory. Three or more age classes may be present in these stands and vertical structure can be complex. These stands often experience a long interval between disturbances. Stand size refers to openings created by disturbances and provides insight regarding the severity of a disturbance event regarding tree mortality. Larger patch sizes are generally associated with moderate and high severity fire regimes or regeneration harvests. Smaller sizes are attributed to low or moderate severity fire regimes, and harvest treatments that retain larger proportions of the overstory.

Single storied stands cover approximately 90% of the project area. About 40 acres of State land did not burn in the Firestone Flats fire and about 12 acres experienced low to moderate severity fire. The un-burned area would be classified as multi-storied.

Timber Productivity and Value –

Fire Burned Trees: Trees killed by the fire need to be salvaged as soon as possible to limit value loss. Fire killed trees will eventually begin to dry and check causing scale defects to the wood. Eventually the defect will become high enough that the fire killed trees will no longer be able to be sold as sawlogs. Ponderosa pine will likely be infested by bark beetles and as a consequence blue stain fungus. Blue stain is a grade defect and greatly de-values ponderosa pine.

Insects: Bark beetle activity has already been noticed in fire killed trees (both ponderosa pine and Douglas-fir). It is possible that populations will build up in the fire killed trees and then infest live trees in the surrounding area. This will have a detrimental effect on timber productivity and value.

Sensitive Plants –

A review of the records from the MNHP for the project indicated no plant species of special concern identified within the project area. Field reconnaissance also indicated no unique or sensitive plants within the project area.

Noxious Weeds –

Spot infestations of spotted knapweed and Hound's tongue were noted in the project area. Several factors increase the likelihood of continued weed encroachment in the project area. They are: proposed timber harvest and associated log hauling, persistent and increasing usage of the area for recreation.

Environmental Effects

Forest Age Class & Cover Type Distribution –

No Action Alternative – Direct and Indirect Effects
Under the No Action Alternative, no salvage harvesting would occur and natural processes would continue to have a direct influence on these forest characteristics. The stands burned in the fire would be left to naturally regenerate and it is unknown how quickly regeneration would occur and what species would be established. Assuming that natural regeneration does occur over a short period of time, the stands would be all even-aged and single storied. All stands would be in the 0 to 39 year age class.

No Action Alternative – Cumulative Effects
Under the No Action Alternative, there would likely be an increase in the acreage of even-aged stands on the Kalispell Unit. Cover types would likely be the same as they were pre-fire

(ponderosa pine) but this would be difficult to quantify because there is no way of knowing which species will regenerate successfully.

Action Alternative – Direct and Indirect Effects
This alternative would harvest approximately 350 acres (or 75% of the project area) and would remove the majority of fire killed trees. The harvested stands would be even-aged and single-storied. Proposed planting of ponderosa pine would help establish appropriate cover types. All stands would be in the 0 to 39 year age class. There would be no change in current cover type distribution since the proposed action would mostly only remove dead trees.

Action Alternative – Cumulative Effects
The Action Alternative would result in an increase in the 0 to 39 year age class of approximately 5% on the Kalispell Unit. There would be no change in cover type distribution from the existing condition. Across the landscape, fire suppression, insect and disease occurrence, and increasing human use may influence cover type and age class distribution to an unknown degree.

Distribution of Old-Growth Stands –

No Action Alternative – Direct, Indirect, and Cumulative Effects
There are no stands meeting DNRC's definition of old growth in the project area. It is possible that unburned areas and several small 'green' patches of trees within the fire perimeter could develop old growth characteristics over time.

Action Alternative – Direct, Indirect, and Cumulative Effects
No old growth is present within the project area so no timber harvesting would occur in old growth stands. Approximately 4 large trees (20 inch DBH or greater) would be left per acre. If 20 inch DBH (diameter at breast height) are not present, the largest trees available would be left. Most leave trees would be fire killed and serve as snags. Large live trees would be left were available.

Stand Structure and Development –

No Action Alternative – Direct and Indirect Effects
Fire killed stands would be left to naturally regenerate. Stocking levels and species composition would be unknown. Many of the surrounding lands were burned as well so the availability of a seed source for tree regeneration is unknown. If regeneration occurs over a short period of time, the stands would be even-aged and single-storied. Over time, these stands could develop into multi-storied and multi-aged stands. The stands within the project area were classified as multi-storied and uneven-aged before the fire.

No Action Alternative – Cumulative Effects
Forest succession would continue over time and stands would develop naturally. Stand structure would become more complex and multi-storied over time. The development of stand structure would be cumulative to adjacent burned areas on other ownerships.

Action Alternative – Direct and Indirect Effects
Under the Action Alternative, the majority of merchantable (about 8 inch DBH and greater) trees would be removed. Approximately 4 large, dead standing trees would be left per acre. Sub-merchantable trees would be retained to the extent practical. Stand structure would be similar to the existing condition except that some planting of ponderosa pine may happen after harvest operations are complete. Planting of ponderosa pine would help establish appropriate cover types within the project area. Stand structure would likely be single storied. The un-burned part of the project area would continue to be multi-storied as would un-harvest 'green' patches located with the burned area. These green patches comprise about 5% of the total burned area. Over time, the harvested burned area could develop into multi-storied stands.

Action Alternative – Cumulative Effects
The area covered by single storied stand structures across the Kalispell Landscape would increase by approximately 350 acres or by .06%.

Timber Productivity and Value –

No Action Alternative – Direct and Indirect Effects
The value of fire killed trees will decline rapidly due to the effects of drying and insect infestations. As dead trees dry and crack, scalable defects increase to the point where the tree no longer meets the DNRC contract specification for a sawlog. At this point, the tree would be classified as non-sawlog or pulp. Non-sawlog values are less than that received for sawlogs, and the value of this timber trust asset would continue to decline. Loss of dead and dying trees along both open and closed roads would continue to occur from activities associated with firewood gathering.

Bark beetle populations would likely increase by infesting fire killed trees. The risk of infestation into green trees would increase and lead to more mortality and loss of productivity outside the burned area. Timber productivity would likely increase if the stands within the burned area regenerate to full stocking levels.

No Action Alternative – Cumulative Effects
If fire killed trees are not salvaged, this would represent a large loss in value of the timber asset and would be cumulative to other parcels of State land that have dead standing trees that are not salvaged.

Action Alternative – Direct and Indirect Effects
The action alternative would salvage fire killed timber and meet the intent of MCA 77-5-207. To realize the greatest economic return and capture the value of dead trees, it is important the fire killed trees be salvaged as soon as feasible. Snags would be left to meet DNRC requirements. Approximately 25% of the burned area would be deferred from salvage operations to meet black-backed woodpecker requirements, grizzly bear requirements, and due to steep, inaccessible ground.

Woody debris would be retained to help stabilize the soil and reduce erosion in burned areas. Retention of woody debris would improve site productivity. The potential planting of ponderosa pine would establish a new stand. The risk of bark beetle infestations to green, unburned trees would be reduced by removing fire killed trees. Productivity would improve on all acres that have regeneration established.

Action Alternative – Cumulative Effects
If regeneration is established, site productivity and potential would increase on the Kalispell by Unit by approximately 0.5% (proposed harvest acres divided by total forested acres in KU). The value of salvaged timber would be maximized and meet the intent of MCA 77-5-207.

Sensitive Plants –

No Action Alternative – Direct and Indirect Effects

A review of the records from the MNHP for the project indicated no plant species of special concern identified within the project area. Field reconnaissance also indicated no unique or sensitive plants within the project area.

No Action Alternative – Cumulative Effects
Cumulative effects to the distribution or viability of sensitive plants populations are not expected under No Action Alternative.

Action Alternative – Direct and Indirect Effects
Since no sensitive plants are present within the project area, the Action Alternative would not have any direct or indirect effects to sensitive plants.

Action Alternative – Cumulative Effects
Since no sensitive plants are present within the project area, the Action Alternative would not have any cumulative effects to sensitive plants.

Noxious Weeds –

No Action Alternative – Direct and Indirect Effects
Weed seed would continue to be spread or be introduced throughout the project area from recreational use and use adjacent to state land. Herbicide treatment along open, public roads and enhancement of road closures would continue as funding and unit priorities allow. Containment of weed infestation areas or a reduction of weed infested acres may be realized.

No Action Alternative – Cumulative Effects
Cumulatively the potential spread of weed seeds and increases in areas where weed populations could start is possible under the No Action Alternative, across the Kalispell Landscape, as well. With adoption of ARM 36.11.445 and implementation of Cooperative

Noxious Weed Agreements with Flathead, Lake, and Lincoln counties, a more aggressive approach to identification and treatment of noxious weeds 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

Logging disturbance would increase the potential for further establishment of noxious weeds with the exposure of mineral soil in skid trails, landings, existing roads, new road construction, and road improvement sites. Applying integrated weed management techniques within the sale design would reduce the occurrences and spread of weeds. Grass seeding new and disturbed roads and 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 slash in skid trails and closing additional roads would limit the potential for soil disturbance within these routes during or after logging, reducing the potential for weed establishment. Treating existing weed populations along or within roads with herbicide spray would reduce current weed populations, or contain the area of infestation. This project would also likely be winter logged which would limit the exposure of mineral soil and deter new weed infestations.

Under the Action Alternative, harvesting would occur approximately 350 acres, and involve road work on approximately 2.5 miles of state roads. Acreage within harvest units are at higher risk of incurring weed establishment within the units due to soil disturbances that may occur from skidding, landing, and heavy equipment use for scarifying or fuels reduction treatments. This risk would be limited by mitigation measures described above. Installation of road closures, trampling slash in road prisms, grass seeding sites disturbed during road construction or work, and additional road closures in combination with spot herbicide treatments would reduce current coverage of weed populations and limit the potential risk of further establishment.

Action Alternative – Cumulative Effects

In combination with other management activities and recreational use of the Kalispell Landscape, the action alterative would increase the risk of further encroachment of forested sites by noxious weeds. The potential risk would be limited with the use of prevention measures implemented under County Weed plans in addition to the site-specific mitigation measures. Actual 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 Landscape.

References

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ATTACHMENT II: FIRESTONE FIRE SALVAGE WILDLIFE ANALYSIS

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.
- **Grizzly bears.** The proposed activities could alter grizzly bear cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats and/or increasing risk of human-caused bear mortality.
- **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 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

Direct and Indirect Effects

The direct and indirect effects of the proposed activities on all species/issues were analyzed within the project area (TABLE W-1 –ANALYSIS AREAS and FIGURE W-1 –ANALYSIS AREAS).

Cumulative Effects

The cumulative effects of the proposed activities on all species/issues were analyzed at a surrounding landscape scale that varies according to the issue or wildlife species being discussed. Cumulative effects analysis areas (CEAAs) are named according to their relative size and are summarized in TABLE W-1 – ANALYSIS AREAS and FIGURE W-1 –ANALYSIS AREAS. CEAAs 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 evaluated.

TABLE W-1. ANALYSIS AREAS. Descriptions of the direct and indirect effects analysis area and CEAAs for the Firestone Salvage Project.

ANALYSIS AREA NAME	DESCRIPTION	TOTAL ACRES	ISSUE(S)/SPECIES ANALYZED
Project Area	T17N R19W Section 36	476	direct & indirect effects for all issues/species
Medium CEAA	The Firestone Flats Fire Perimeter buffered by 1 km	5,244	black-backed woodpeckers, snags and coarse woody debris
Large CEAA	Portions of the Jocko River, Middle Jocko River, and Middle Fork Jocko River Subwatersheds considered NCDE grizzly bear non-recovery occupied habitat in the vicinity of the project area	27,464	grizzly bears

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 effects of the proposed alternatives on old growth forest, connectivity of mature forest habitat, 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 analyses account for known past and current activities, as well as planned future agency actions. Additional salvage of the timber burned in the Firestone Flats Fire is proposed for CSKT lands located east of the project area; however, proposed units are not available at this time (*Hartwell, Ecosystem Research Group, pers. comm., Sept. 20 2013*). No timber harvest has occurred on DNRC lands in the CEAAs and timber harvest on other ownerships has been accounted for in aerial photograph analysis.

COARSE-FILTER ANALYSIS

TABLE W-2 –COARSE-FILTER. Analysis of the anticipated effects of the DNRC Firestone Salvage on coarse-filter resource topics.

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 unburned patches totaling approximately 2-acres. The proposed harvest would focus on removing dead and dying timber, but would also remove some green timber, primarily Douglas-fir affected by mistletoe or trees with burned root collars that are not likely to survive (see VEGETATION ANALYSIS for additional

	details). However, considering the small patch size of green timber within the matrix of burned forest, the project area does not provide connected 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*). Coarse woody debris, snags, and defective trees (i.e., partially dead, spike top, broken top) are used by a wide variety of wildlife species for foraging, 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. 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 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 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 476-acre project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the 5,244-acre medium CEAA described in TABLE W-1 –ANALYSIS AREAS and depicted in FIGURE W-1 –ANALYSIS AREAS. The medium CEAA represents an area large enough to support a diversity of species that use coarse woody debris and snags.

Analysis Methods

The abundance of snags and coarse woody debris was estimated in the project area during visits to the project area. 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 consists of approximately 435 acres (91.4% of project area) of timber stands burned by the Firestone Flats Fire of 2013. The remaining acres consist of unburned Douglas-fir, ponderosa pine,

and larch stands. During field visits, 60-80 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. Many woodpecker species were observed foraging on these snags during field visits. Coarse woody debris levels varied across the project area, but on average were 0-10 tons/acre due to the high severity of the fire. Coarse woody debris will likely increase in this area over time as snags fall. Firewood harvesting risk is low due to the absence of open roads in the project area.

The 5,244-acre medium CEAA consists of approximately 1,570 acres (29.9% of medium CEAA) of timber stands burned in the Firestone Flats Fire of 2013. Coarse woody debris and snag abundance varies across the medium CEAA and is influenced by whether or not the area was burned in the Firestone Flats Fire, burn severity, land management practices, and open road density. Open road density is approximately 3.7 miles per square mile providing a high level of access for firewood cutting.

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 355 acres (74.5%) of the project area due to timber felling operations. Given operability and human safety constraints, existing non-merchantable snags would be left standing or on the ground. 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*). However, recruitment trees are largely absent across the project area due to the high severity of the burn. In areas where recruitment trees are absent, 4 large snags (>21 inches dbh) would be retained. If such large snags are absent, the largest available snags and/or recruitment trees would be retained. Approximately 76 acres of burned forest patches would retained unharvested (see black-backed woodpecker analysis for additional details). Additionally, most submerchantable snags would be retained for feeding substrate, and coarse woody debris would be retained according to DNRC Forest Management Rules (*ARM 26.11.414*), which would likely increase post-harvest as snags blow down. Approximately 1.4 miles of road are proposed for construction; however, these roads would be closed or reclaimed post-harvest and accessibility of 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 355 acres (74.5% 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*), moderate 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 on DNRC lands. No changes in the availability of snags and coarse woody debris would be expected. Existing snags would continue to provide habitat attributes, 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

The majority of merchantable burned trees and snags would be removed from the 355 acres (6.8%) proposed for harvest on DNRC lands within the 5,244-acre medium CEAA, but retention measures would apply (*ARM 36.11.411, ARM 26.11.414*). Reductions in the availability of coarse woody debris and snags would be additive to any proposed or ongoing actions in the CEAA, including the proposed CSKT harvest of the burn west of the project area. Firewood cutting risk in the medium CEAA would not change due to DNRC activities under the Action Alternative because no additional permanent roads are proposed for construction. Thus, since: 1) proposed actions would be additive to the proposed CSKT harvest that would remove some snags, snag recruits, and coarse woody debris; 2) accessibility for firewood harvesting would not change; and 3) snags and coarse woody debris would be reduced, but would be retained in amounts required to meet DNRC Forest Management Rules (*ARM 36.11.411, ARM 36.11.414, ARM 36.11.438*); minor adverse 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. 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.

TABLE W-2 –FINE-FILTER. Analysis of the anticipated effects for fine-filter species on the DNRC Firestone Salvage Project.

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	***Detailed Analysis Provided Below*** – The project area is considered Northern Continental Divide Ecosystem (NCDE) non-recovery occupied habitat (*USFWS 1993, Wittinger 2002*).
SENSITIVE SPECIES	
Bald eagles (*Haliaeetus leucocephalus*) Habitat: Late-successional forest less than 1 mile from open water	The Jocko River is located approximately 0.5 miles from the project area; however, the closest nest to the project area is 7 miles away and bald eagles have not been documented nesting on the section of the Jocko River adjacent to the project area. Thus, negligible direct, indirect, or cumulative effects to bald eagles would be anticipated.

Black-backed woodpeckers (*Picoides arcticus*) Habitat: Mature burned or beetle-infested forest	***Detailed Analysis Provided Below*** – Approximately 435 acres of forest burned in the Firestone Flats Fire of 2013 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 anticipated.
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 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 anticipated.
Fishers (*Martes pennanti*) Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian	The project area does not contain 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 contains preferred flammulated owl cover types; however these stands were burned 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	The Pistol Creek Pack 2012 home range is located 1 mile from the project area (*DFWP 2012*); however, no known den or rendezvous sites exist within 1 mile of the project area (*S.Courville, CSKT Wildlife Management Program, wildlife biologist, pers. comm., September 30, 2013*). Additionally, the proposed activities would focus on removing dead trees affected by the Firestone Flats Fire and are not likely to adversely affect wolf prey. Thus, negligible direct, indirect or cumulative effects to gray wolves would be anticipated.
Harlequin ducks (*Histrionicus histrionicus*) Habitat: White-water streams, boulder and cobble substrates	The Jocko River occurs within 0.4 miles of the project area; however, the stream is fairly low-gradient and thus is not likely to provide suitable harlequin duck habitat. Additionally, there are not any recent (≤25 years) records of harlequin ducks using the Jocko River in the vicinity of the project area (*MNHP data, September 10, 2013*). Thus, negligible 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 anticipated.
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. Additionally, peregrine eyries have not been documented within 0.5 miles of the project area (*MNHP data, September 10, 2013*). Thus, no direct, indirect, or cumulative effects to peregrine falcons would be anticipated.
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 Firestone Flats Fire. Thus, no direct, indirect, or cumulative effects to pileated woodpeckers would be anticipated.
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 anticipated.
Wolverine (*Gulo gulo*) Habitat: Alpine tundra and high-elevation boreal and coniferous forests that maintain deep persistent snow into late spring	No high-elevation habitat with persistent spring snow pack occurs in the project area. Thus, no direct, indirect or cumulative effects to wolverines would be anticipated.
BIG GAME	
Elk (*Cervus canadensis*)	The project area contains southerly slopes that receive some use by wintering elk and deer. However, the majority of the project area is not currently providing thermal cover that would ameliorate severe winter conditions due to the Firestone Flats Fire of 2013. The proposed harvest would focus primarily on removing dead and dying trees that do not provide thermal cover for big game, thus, negligible adverse direct, indirect or cumulative effects to big game are anticipated.
Mule Deer (*Odocoileus hemionus*)	
White-tailed Deer (*Odocoileus virginianus*)	

THREATENED AND ENDANGERED SPECIES

GRIZZLY BEAR

***Issue**: The proposed activities could alter grizzly bear cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats, and/or by increasing risk of human-caused bear mortality.*

Introduction

Grizzly bears are opportunistic omnivores that inhabit a variety of habitats in Montana. Preferred grizzly bear habitat includes avalanche chutes, fire-mediated shrub fields, and riparian areas, all of which provide seasonal food sources (*Servheen 1983, McLellan and Hovey 2001*). Grizzly bears are federally listed as a threatened species and primary threats are related to human-bear conflicts and long-term habitat loss associated with human development (*Mace and Waller 1997*). Forest management

considerations for grizzly bears include minimizing potential for conflicts with humans, minimizing adverse effects to vegetation and hiding cover, minimizing access and the construction of new roads, and reducing disturbance levels during the non-denning season, especially in the spring and fall periods when grizzly bears have important nutritional demands.

Analysis Area

The analysis area for direct and indirect effects is the 476-acre project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the 27,464-acre large CEAA, which is defined by ridgelines and other topographic features and coincides with NCDE non-recovery occupied habitat (*Wittinger 2002*) (TABLE W-1 –ANALYSIS AREAS, FIGURE W-1 –ANALYSIS AREAS). This area is approximately the size of a female grizzly bear home range (*Mace and Roberts 2011*) and provides a reasonable analysis unit for cumulative effects to local grizzly bears.

Analysis Methods

Analysis methods included field evaluations, GIS analysis of SLI data, and aerial photograph interpretation. These methods were used to identify potential visual screening cover, and to estimate open and restricted road densities. Visual screening was estimated by evaluating forest stand size class and the total crown density of all trees in the stand using GIS and SLI data. Grizzly bear visual screening is defined as vegetation that could hide 90% of a grizzly bear at a distance of 200 feet. Factors considered in the analysis included: 1) the degree of harvesting, 2) the availability of visual screening cover, 3) risk of displacement from important grizzly bear habitat including spring habitat and riparian habitat, and 4) open and restricted road densities.

Existing Conditions

Grizzly Bears

The project area is considered NCDE grizzly bear non-recovery occupied habitat (*USFWS 1993*, *Wittinger 2002*) and is located 3.1 miles from recovery zone habitat associated with the Mission Mountains east of the project area. The project area does not occur in an important linkage zone for grizzly bears (*Servheen et al. 2003*), however, bears may occasionally use the Jocko River corridor for foraging and travel. Approximately 435 acres (91.4% of project area) was burned in the Firestone Flats Fire of 2013 removing the majority of cover capable of providing screening for grizzly bears. However, two small patches of unburned green shrubs and trees exist in the burned portion of the project area and approximately 41 acres of hiding cover occur in the northern portion of the project area, which was not affected by the fire. Riparian habitat can provide important foraging areas for bears, especially in the spring (*Servheen 1983*). Such riparian habitat associated with 1.3 miles of Class 3 streams is available in the project area (*ARM 36.11.403(16)(17)*). The project area is located below 4,900 feet elevation and is considered grizzly bear spring habitat. The project area is located near residences on the Jocko River, which may increase the risk of human-bear conflicts, reducing the capacity of the area to support grizzly bears. The density of open roads in the project area is 0 miles/square mile and total road density is 0.8 miles/square mile.

The large CEAA is managed primarily by CSKT (87.4% of large CEAA), with the remaining habitat managed by private land owners (7.5% of large CEAA) and Montana DNRC (5.1% of large CEAA). The area contains preferred grizzly bear habitat including riparian habitat associated with the Jocko River, South Lamoose Creek, Pistol Creek, and additional small streams and wetlands. Due to the high severity of the fire, hiding cover was removed throughout the 1,570-acre area affected by the Firestone Flats Fire of 2013 (5.7% of large CEAA); although some small patches of green trees and shrubs remain in areas

that were not burned as severely. Spring habitat exists in portions of the project area located below 4,900 feet. The town of Arlee is located west of the analysis area and is an important source of disturbance, but overall, the area likely provides high quality habitat where there are low levels of human access and development. The density of open roads in the large CEAA is 2.9 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. Hiding cover, existing secure areas, and open and restricted road density would remain the same. Thus, since: 1) no timber harvesting would alter existing hiding cover, 2) no existing important bear habitat would be affected, and 3) 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

Harvesting associated with the action alternative would slightly increase sight distances within the 355 acres proposed for harvest. Trees affected by mistletoe and trees with a burned root collar would be removed from the edges of the small patches of green trees located within the burned area. However, the 41-acre stand in the northwest portion of the project area that was not affected by the fire would not be harvested. Commercial forest management activities would be restricted from April 1- June 15th to provide security for grizzly bears during the spring period when bears are nutritionally stressed. Approximately 1.4 miles of restricted road and 0.2 miles of temporary road would be constructed within the project area. Traffic would temporarily increase 2.7 miles of road in the project area, increasing disturbance to bears. However, post-harvest the 0.2 miles of temporary road would be reclaimed and the 1.4 miles of new restricted road would be closed with berms and slash. Open road density would not change post-harvest. Thus, since: 1) the quality of hiding cover would be slightly reduced in <1 acre; 2) grizzly bears could be temporarily displaced from riparian habitat associated with class 3 streams for approximately 8 months; 3) commercial forest management activities would be restricted from April 1 – June 15th to reduce disturbance to bears during the spring period; and 4) no new open road construction would occur and restricted roads would be closed with berms and slash; 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. Ongoing and proposed forest management projects within the large CEAA could affect hiding cover, secure areas, important habitats and open road density. No additional cumulative effects to visual screening, secure areas, important habitats and open road density are expected to result from the No-Action Alternative. Thus, since: 1) no timber harvesting would alter present visual screening, 2) no existing important bear habitat would be affected, and 3) 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 slightly increase sight distances around the perimeter of the patches of unburned vegetation currently providing hiding cover. However, these patches would continue to provide hiding cover post-harvest and the 41-acre stand in the northwest portion of the project area that was not affected by the fire would not be harvested. Approximately 1.4 miles of restricted road and 0.2 miles of temporary road would be constructed within the project area and an additional 1.1 miles of road would be constructed on CSKT lands. All roads on DNRC lands would be closed or reclaimed post-harvest. Traffic would temporarily increase on approximately 12 miles of road along the

haul route in the large CEAA. Adverse effects to hiding cover and displacement of grizzly bears due to increased traffic and harvesting activities would be additive to the proposed CSKT salvage of timber burned in the Firestone Flats Fire, which is located west of the project area. However, specific information on harvest units and prescriptions are currently unavailable. Commercial forest management activities would be restricted from April 1- June 15th to reduce disturbance to grizzly bears during the spring period when they are nutritionally stressed. Thus, since: 1) hiding cover would be reduced in <1 acre of DNRC lands; 2) grizzly bears could be displaced from riparian habitat associated class 3 streams in the project area for approximately 8 months; 3) commercial forest management activities would be restricted from April 1 – June 15th on DNRC lands to reduce disturbance to bears during the spring period; 4) no new open road construction would occur and restricted roads would be closed with berms and slash following use; and 5) the proposed activities would be additive to the proposed CSKT salvage of the Firestone Flats Fire, which would occur on lands adjacent to DNRC project area; 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

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 medium-sized woodpeckers that are habitat specialists that use forests affected by recent disturbances, such as wildfires or extensive insect outbreaks. 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 and feed almost exclusively on wood-boring insects and bark beetles. Snags species preferred for nesting are western larch, ponderosa pine, Douglas-fir, and lodgepole pine, usually 9 to 16 inches dbh (*Harris 1982*) and nests are typically active from late April through early July. 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*). Forest management considerations for black-backed woodpeckers include retaining high quality snags for nesting and foraging and reducing disturbance to nesting birds.

Analysis Area

The analysis area for direct and indirect effects is the 476-acre project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the 5,244 acre medium CEAA area described in TABLE W-I –ANALYSIS AREAS and depicted in FIGURE W-1 –ANALYSIS AREAS. The CEAA includes the area burned in the Firestone Flats Fire of 2013 and is buffered by 1 km to incorporate areas most likely to be used by local black-backed woodpeckers. This scale includes sufficient area to support multiple pairs of black-backed woodpeckers (*Dudley and Saab 2007*).

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 435 acres (91.4%) of forested stands burned in the Firestone Flats Fire, which occurred in the summer of 2013. The species composition of the burned timber stands consists primarily of ponderosa pine and Douglas-fir and the burn severity is high with a total of two pockets of unburned timber totaling 2 acres located in the southwest portion of the project area. The intensity of the fire and the species composition are suitable for black-backed woodpecker use. Approximately 60-80 snags >9 inches dbh occur in this area, providing suitable foraging and nesting habitat. Additionally, multiple black-backed woodpeckers were observed in the project area during a field visits in September 2013.

The 5,244-acre medium CEAA contains approximately 1,570 acres of mixed conifers burned in the Firestone Flats Fire, which occurred in the summer of 2013. Ownership of the burned timber consists of 1,029 acres of CSKT lands (68.3% of burn), 435 acres of DNRC lands (27.7% of burn), and 43 acres (2.7% of burn) of private ownership. The species composition, snag density, and burn severity varies throughout the burn, but overall the burn severity is high and snag density is high at 60-80 snags/acre >9 inches dbh. The remaining 3,674 acres in the analysis area consist of unburned forested habitat adjacent to the burn (within 1 km) that may also be used by black-backed woodpeckers for nesting or foraging.

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 355 acres (81.6%) of the 435 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. Across the project area, at least 2 large snags and 2 large recruitment trees (>21 inches dbh) per acre would be retained in the harvest unit (*ARM 36.11.411*). However, recruitment trees are largely absent across the project area due to the high severity of the burn. In areas where recruitment trees are absent, 4 large snags (>21 inches dbh) would be retained. If such large snags are absent, the largest available snags and/or recruitment trees would be retained. Additionally, all sub-merchantable trees would be left standing where safety concerns allow. Approximately 76 acres of DNRC-managed burned timber stands would not be harvested, and would continue to provide high density snags for black-backed woodpeckers (*ARM 36.11.438(1)(b)*). These unharvested patches would occur in 4 patches approximately 38, 23, 8, and 7 acres in size. All patches except for the 23-acre patch would be contiguous with burned habitat on adjacent ownerships. 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 355 acres (81.6%) 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) 76 acres of DNRC-managed burned timber stands would not be harvested; moderate 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 of the No-Action Alternative on black-backed woodpeckers

None of the proposed forest management activities would occur on DNRC lands. Ongoing and proposed forest management projects within the medium CEAA could reduce black-backed woodpecker habitat suitability and could disturb black-backed woodpeckers. Thus, since: 1) no changes to black-backed woodpecker habitat availability or suitability would occur, and 2) no disturbance during the nesting season would occur, no cumulative effects to black-backed woodpeckers associated with habitat suitability or disturbance during the nesting season be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on black-backed woodpeckers

The proposed activities would affect 355 acres (22.6%) of the 1,570 acres of burned habitat present in the medium CEAA. The proposed harvest would reduce snag density and the suitability of the area for black-backed woodpeckers, although all sub-merchantable trees that do not pose a safety risk and 4 snags or recruitment trees >21 inches dbh per acre would be retained. Additionally, 76-acres of burned timber stands on DNRC lands would be left unharvested to provide habitat for black-backed woodpeckers. Reductions in black-backed woodpecker habitat suitability would be additive to harvest activities that are proposed or ongoing in the medium CEAA including CSKT's proposed salvage of the burn which would occur in the area west of the project area. However, specific information on harvest units and treatments are currently unavailable. Mechanized forest management activities would be prohibited from April 15- July 1 to reduce disturbance to nesting black-backed woodpeckers. Black-backed woodpeckers could be temporarily displaced by forest management activities associated with the proposed activities for approximately 8 months in addition to any displacement from CSKT's proposed salvage. Thus, since: 1) snag density would be reduced on 355 acres (22.6%) 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 time period; and 4) the proposed activities would be additive to CSKT's proposed salvage of the burn; minor adverse cumulative 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.

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 from April 15- July 1st to reduce disturbance to black-backed woodpeckers.
- Prohibit mechanized activity from April 1-June15 to reduce disturbance to and grizzly bears.
- Retain sub-merchantable burned trees where soil, slope stability, and human safety concerns allow.
- Retain patches of hiding cover where they occur.
- Close any roads or skid trails opened with the proposed activities to minimize the potential for unauthorized motor vehicle use.
- Manage for snags, snag recruits, and coarse woody debris, particularly favoring ponderosa pine, western larch, and Douglas-fir (*ARM 36.11.411, ARM 26.11.414)*.

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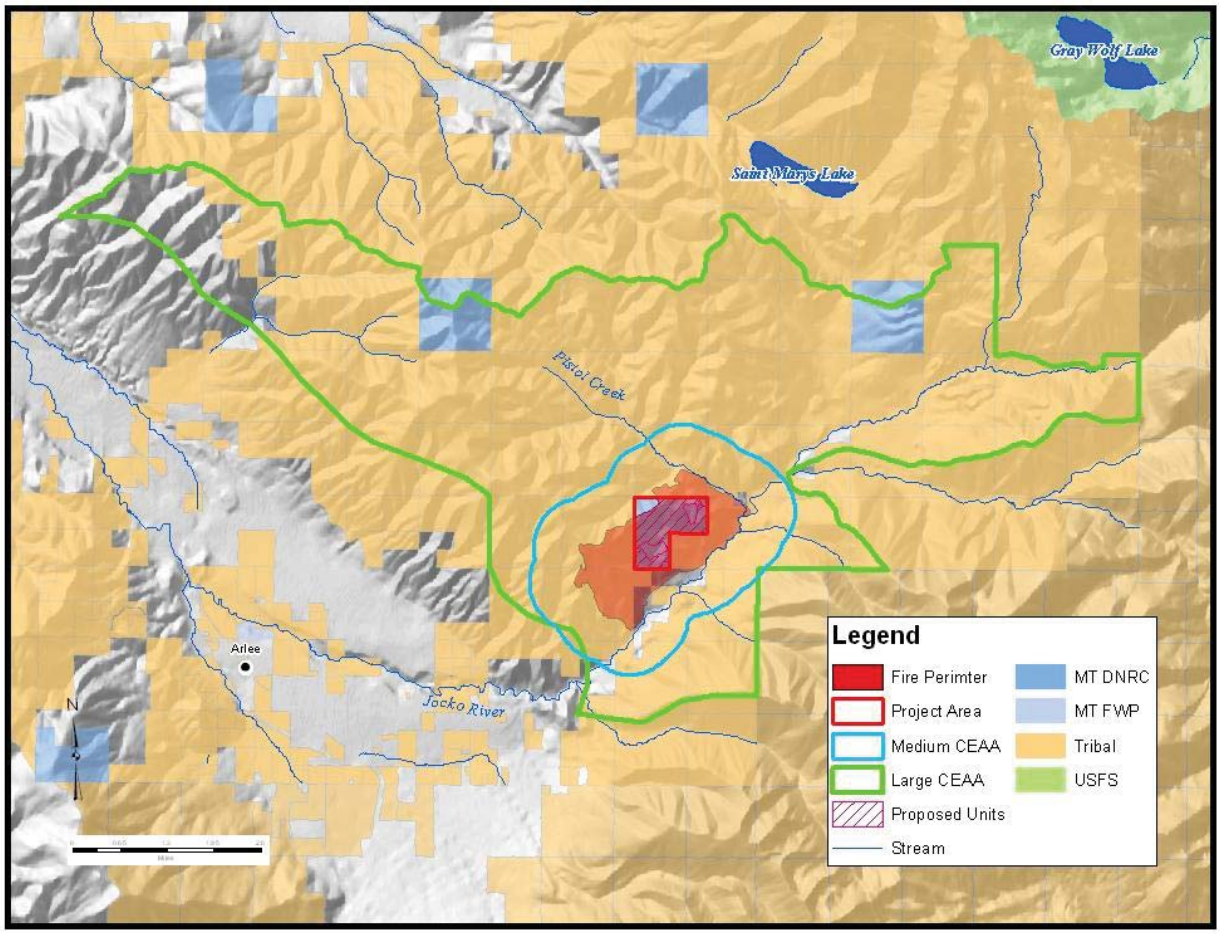
FIGURE W-1 –ANALYSIS AREAS. Wildlife analysis areas for the proposed DNRC Firestone Timber Salvage.



FIRESTONE FLATS SALVAGE PROPOSAL
SOILS ANALYSIS
October 1, 2013

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, specific issues regarding soil impacts were identified by the public. The following issue statement was developed from public comments and interdisciplinary team discussions regarding the effects of the proposed timber harvesting:

- *Timber harvesting activities in the fire area may increase compaction, displacement and erosion of the soil which may affect the long-term productivity of the site.*

ANALYSIS METHODS and ANALYSIS AREAS

The project area for this proposal includes approximately 476 acres. Because the Firestone Flats Fire and proposed harvesting would only affect a portion of the project area, the analysis area is smaller. The direct, indirect and cumulative effects analysis area will cover approximately 435 acres of the DNRC-managed parcel.

Compaction, Displacement and Erosion

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 post-harvest monitoring projects (DNRC, 2011) and the soils monitoring reports from the Sula State Forest Fire Mitigation, Salvage and Recovery Project (DNRC 2002) and Moose Fire Salvage and Reforestation Project (DNRC 2003).

Risk Assessment Description

In terms of the risk that an impact may occur, a low risk of an impact means that the impact is unlikely to occur. A moderate risk of an impact means that the impact may or may not (50/50) occur. A high risk of an impact means that the impact is likely to occur.

REGULATORY DOCUMENTS

The Administrative Rules for Forest Management (ARM 36.11.401 to 456) include several rules that guide conservation of soils resources. The Administrative Rules were generally adopted from recommendations in the State Forest Land Management Plan (SFLMP) (DNRC 1996). Part of the project area is also covered by the Montana DNRC Forested Trust Lands Habitat Conservation Plan (2012). The project was developed to be incompliance with both the Administrative Rules and the HCP.

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.

EXISTING CONDITIONS

Soils information for the project area is from the Soil Survey of Lake County Area, Montana and was obtained using the Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/). Ten mapped soils were identified in the project area and harvesting is proposed on all but one of these soil types. Soil characteristics including erosion factors and particle size content (clay, silt, sand) can be found in the project file at the Northwestern Land Office in Kalispell, Montana.

The whole soil erosion factor K—which indicate the susceptibility of sheet or rill erosion by water--for these nine soils ranges from 0.1 to 0.24. Values of K_w 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). This suggests the erosion risk is moderate for these soils. However, when combined with slopes in the project area, the potential for erosion would increase to severe indicating that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised.

Approximately 435 acres of the DNRC-managed parcel was burned on July 27, 2013 in the Firestone Flats Fire. While some of the project area within the fire perimeter still has live, green trees, most of the *fire burn severity* (Scott, J. H. and E.D. Reinhardt, compilers. 2007) in the project area was high; indicating that all of the litter, duff and small woody debris were consumed and the large woody debris was consumed or deeply charred. The soil temperature likely reached levels that created varying degrees of *fire induced water repellency* and increased the erosion potential.

On August 2nd and 3rd, approximately 0.6 inches of rain fell on the fire area over a 37 hour period. While the intensity of the rainstorm was not high, the lack of vegetation combined with steep slopes and hydrophobic characteristics in the surface soil resulted in a debris flow and caused considerable channel scour of ephemeral draws and deposition at the base of draws. Rain events in September 2013 of 0.86 inches and 1.13 inches moved fine sediment in the draws, but no large debris flows occurred after these events, suggesting a reduction in hydrophobicity of the soils.

Erosion on the high burn severity portions of the state land with steep slopes would have a high risk of erosion due to (1) loss of surface cover in the form of vegetation, duff or litter, (2) lack of tree canopy to intercept precipitation, (3) loss of woody debris of all sizes to store sediment and desynchronize runoff, and (4) the presence of water repellent characteristics in the surface soils.

Compaction, Displacement and Erosion from Management

Records of the state managed parcel do not indicate any commercial harvests or authorized road construction. During field reconnaissance, excavated skid roads were found across the state parcel—some of the roads were located in the draw bottoms and most did not have any surface drainage. Very few stumps were found throughout the state parcel.

An estimate of less than 1 percent of project area exhibits moderate or higher impacts due to compaction on the skid roads from past timber removal.

Coarse and Fine Woody Debris

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. Woody debris, both large and small is very limited throughout the portion of the state parcel that burned. While recruitable large woody material is present in the fire-killed trees, recruitable fine woody material is limited to small branches because leaves and needles were consumed by the fire.

Recommendation for large woody debris can be found in *Managing Coarse Woody Debris in Forests of the Rocky Mountains* (Graham et al, 1994). Douglas-fir habitat types are recommended to have a level of coarse woody debris in the range of 5 to 24 tons per acre. while the present grand fir habitat types are recommended to have 7 to 24 tons per acre.

DESCRIPTION OF ALTERNATIVES

- *No-Action Alternative*

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

- *Action Alternative*

  Approximately 355 acres would be commercially harvested under this alternative. All of the proposed harvest would remove all merchantable saw timber and leave behind sub-merchantable trees and cull trees. Approximately 196 acres would be completed using ground based equipment and 159 acres would be harvested using skyline cable systems. Harvesting would remove merchantable trees in all Class 3 SMZs although equipment would be restricted within 150 feet of streams to mitigate for erosion potential. Approximate miles of road activities include:

  - 1.5miles of new permanent road construction
  - 0.2 miles of new temporary road construction
  - 4.6 miles of existing road would be maintained or have drainage improvements installed as necessary to protect water quality.

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 and recommendations are considered appropriate and, would be implemented during harvesting operations:

1) Harvest Schedule: The majority of ground-based harvest would be prioritized to be complete during winter months on all harvest areas with slopes greater than 30%, and harvests in Streamside Management Zones and Riparian Management Zones established

for sites with high erosion risks.

2) Limit equipment operations to periods when soils are relatively dry, (less than 20 percent oven-dry weight harvest units), 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. In order to prevent soil resource impacts, logging activities would be restricted to periods when one or more of the following conditions occurs, unless otherwise approved in writing by the Forest Officer.

   a. Soil-moisture content at 4-inch depth is less than 20% of oven-dry weight
   b. Minimum frost depth of 3 inches
   c. Minimum of 16 inches loose snow or 8 inches packed snow adequate to avoid soil displacement

3) 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. Additional requirements include:

   a. Skid trails would be located at least 75 feet apart unless on snow.
   b. Skid trails would have erosion control installed where needed as directed by the forest officer.

4) Tractor skidding should be limited to slopes of less than 40 percent. 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. Ground-based logging systems (tractor, skidders, and mechanical harvesters) would be limited to slopes less than 40% on ridges, convex slopes, and concave slopes when winter conditions exist; and less than 35% on concave slopes without winter conditions. Riparian management zones along stream should be extended depending upon slope. No equipment operations within RMZs over 35% slope per ARM 36.11.425 (4)(b)(i). Winter conditions may allow equipment operations if conditions exist that mitigate erosion risk.

5) Skyline corridors shall be spaced not less than 75 feet apart. In the case of ridges where fan-shaped settings are required, the minimum distance at the widest divergence will be 150 feet. Clearing width for corridors to accommodate yarding should not exceed 12 feet. Where skyline is required, harvest would be by log-length skidding. Leading end of the logs would be carried free of the ground at all times except during lateral yarding. Erosion control, such as slashing or retaining tops, would be required within cable skidding corridors where excessive soil disturbance may be of an extent to cause erosion. ARM 36.11.425 (4)(c) restricts cable yarding within the RMZ if it causes excessive ground disturbance. The contract administrator would monitor conditions and recommend erosion control as needed.

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

7) 95% of all slash should be return skidded or left within the harvest unit. Slash should be returned at the landing to the unit and distributed evenly throughout the unit. Slash would be returned to the unit as it is created and worked onto the skid trails. Large amounts of slash shall not be allowed to accumulate at the landings before it is returned in the unit. Slash shall be scattered on skid trails as skidding progresses on each trail. Within the harvest units operations should retain at least ten tons per acre of downed woody material larger than 3 inches diameter to be left scattered throughout the sale units. Material will be aligned predominately perpendicular to the slope. While most sub-merchantable trees will be retained, all sub-merchantable trees felled, must be left predominately perpendicular to the slope to reduce surface runoff and erosion.

8) Install and maintain adequate road drainage to control erosion and comply with forestry Best Management Practices and maintain concurrent with hauling operations. To maintain drainage features and avoid rutting, the department would limit the season of road use to dry, frozen or adequately snow covered conditions.

ENVIRONMENTAL EFFECTS

- *Direct, Indirect, and Cumulative Effects of the No-Action Alternative*

No timber harvesting or associated activities would occur under this alternative. Because harvesting would not be implemented, compaction, displacement and erosion rates due to management activities would not occur. The high erosion risk on steep slopes with high burn severity would remain until down woody debris levels are increase through natural recruitment and vegetation is re-established. Rain-on-snow events or intense thunderstorms may result in substantial erosion. Fire restoration and erosion control plans for contour felling of trees on up to five acres is expected to have slightly lower the risk of sheet erosion.

- *Direct, Indirect, and Cumulative Effects of the Action Alternative*

The comparison of 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 approximately 202 acres of the proposed units. However, part of this ground would require using winchline from a skidder to access small areas that exceed the 40% slope recommendation. Monitoring of winter ground-based skidding on the Coal Creek State Forest after the Moose Fire showed that on average 2.6% of the transects exhibited erosion compared to 9.3% of the unharvested sites. Soil displacement and rutting associated with winter harvesting on the same area averaged 1.3% with a maximum area of 5.4% (DNRC 2003). Monitoring on the Sula State Forest showed no observable displacement on winter harvest units, but summer harvesting had disturbance levels up to 20% on ground-based harvest (DNRC 2002)

Sheet erosion on the Sula State Forest project covered approximately 60% of the winter harvested sites, 43% of the unlogged sites and 27% of the summer ground-based harvested sites although summer sites showed higher compaction (DNRC 2002).

Past monitoring on DNRC timber sales from 1988 to 2011 has shown an average of 12.2 percent soil impacts due to compaction, displacement or severe erosion across all parent materials (*DNRC*

2011). Impacts associated with fire salvage in the report average 13.6% impacts from winter ground-based harvesting after the Jocko Lakes Fire in 2007.

While sheet erosion has occurred and will continue in the project area until ground cover is re-established, some additional disturbance would be expected from timber harvesting. After reviewing the monitoring reports from fire salvages, it is reasonable to expect up to 13.6% impacts from compaction and displacement due to winter ground-based timber harvesting. Actual impacts may be less, as was the case with the Moose Fire Salvage and Sula Fire Salvages.

DNRC has conducted soil monitoring on seven harvest units that were completed using cable yarding system and found that the average ground disturbance was 7.0 percent of the unit.

Using these percentages of expected impacts, moderate or higher impacts would cover approximately 38 acres in harvest units. Additionally, the proposed 1.5 miles of new permanent road construction and 0.2 feet of temporary road construction would remove approximately 5.2 acres from forest production. Table ST-2 below exhibits the expected level of impacts from the proposed activities.

TABLE ST-2: EXPECTED AREA OF IMPACTS

Description	Acres of harvest	Expected percentage of area impacted	Acres of reduced productivity	Acres removed from forest production
Ground base	202	13.6%	~27	-
Cable yarding	157	7.0%	~11	-
Road Construction	-	-	-	5.2
TOTAL	**359**	**10.5% weighted average**	**~38**	

Coarse woody debris would be left on-site in volumes recommended to help reduce hillslope erosion and to maintain soil moisture and forest productivity, generally in the 10 to 20 tons per acre range for habitat types found in the harvest locations (Graham et al. 1994). Because coarse woody debris would be left on site in amounts recommended by scientific literature, and 95% of fine debris (branches and available foliage) would be left in the woods the risk of erosion due to lack of down woody material would be reduced.

Fire restoration and erosion control plans for contour felling of trees on up to five acres is expected to have slightly lower the risk of sheet erosion. Cumulative effects associated from timber harvest operations would be minimized 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, managing cable corridor widths and limiting operations to dry or frozen conditions. Future harvesting opportunities would likely use the same road system and landing sites to reduce additional cumulative impacts. Due to these mitigation measures and the limited existing impacts, the cumulative effects attributed to timber harvest from compaction, erosion and displacement would be low.

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FIRESTONE FLATS SALVAGE PROPOSAL
WATER RESOURCES ANALYSIS
October 1, 2013

INTRODUCTION

This analysis is designed to disclose the existing condition of the hydrologic and fisheries resources and describe the anticipated effects that may result from each alternative of this proposal. During the initial scoping, one issue was identified regarding water-quality, water-quantity, or fisheries resources from the public. The following issue statements were compiled from public comments and interdisciplinary team discussions regarding the effects of the proposed timber harvesting:

- *Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.*

This issue will be addressed by addressing by assessing the risk of sediment delivery to water bodies from roads and harvest units.

The *ENVIRONMENTAL EFFECTS* sections disclose the anticipated direct, indirect, and cumulative effects to water resources in the analysis area from the proposed actions. Past, current, and future planned activities on all ownerships in each analysis area have been taken into account for the cumulative effects analysis.

ANALYSIS METHOD

The methods applied to the project area to evaluate potential direct, indirect, and cumulative effects include a field review of potential sediment sources from DNRC-managed lands (including roads) within the fire perimeter.

Potential sediment delivery from harvest units will be evaluated from a risk assessment. This risk assessment will use the soil information provided in the *SOILS ANALYSIS* and the results from soil monitoring on past DNRC timber sales.

ANALYSIS AREA

The analysis area for sediment delivery is the proposed harvest units and roads used for hauling. This includes upland sources of sediment that could result from this project. In addition, in-channel sources of sediment such as mass-wasting locations or excessive scour/deposition will be disclosed if found in project area streams.

WATER USES AND REGULATORY FRAMEWORK

WATER QUALITY STANDARDS

This portion of the Flathead River basin, including the Jocko River, is classified as B-1 by the Confederated Salish and Kootenai Tribal Council, as stated in the Water Quality Standards and

Antidegradation Policy. Water classified as B-1 must be maintained suitable for drinking and culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; wildlife (birds, mammals, amphibians and reptiles); the growth and propagation of salmonid fishes and associated aquatic life; and agricultural and industrial water supply purposes.

STREAMSIDE MANAGEMENT ZONE LAW (SMZ)

All rules and regulations pertaining to the Montana SMZ Law are to be followed as well as the Forestry Best Management Practices of the Confederated Salish and Kootenai Tribes. An SMZ width of 50 feet is required on Class 3 and may be extended for riparian vegetation, braided channels and/or adjacent wetlands.

FOREST MANAGEMENT RULES AND HABITAT CONSERVATION PLAN (HCP)

In 2003, DNRC drafted Administrative Rules for Forest Management. The portion of those rules applicable to watershed and hydrology resources include ARM 36.11.422 through 426 and 470 through 471. The HCP was adopted in December 2011 and all conservation commitments covered by the HCP are also to be applied to this project. All applicable rules will be implemented if they are relevant to activities proposed with this project.

EXISTING CONDITION

The project area includes approximate 476 acres of DNRC managed lands in Section 36, T17N, R19W. This parcel is entirely included in the Middle Jocko River 6th code HUC which is a 37,491 acre watershed. Precipitation in the watershed averages 26 inches per year with a range of 14 to 60 inches per year. The Jocko River is a perennial fish-bearing stream that flows in a general northeast-to-southwest direction through the Jocko canyon before turning north towards its confluence with the Flathead River. While the state-managed parcel is within the Middle Jocko River 6th code watershed, the river channel is not closer than 1,350 feet of any portion of the project area.

Approximately 435 acres of the DNRC-managed parcel was burned on July 27, 2013 in the Firestone Flats Fire. While some of the project area within the fire perimeter still has live, green trees, most of the *fire burn severity* (Scott, J. H. and E.D. Reinhardt, compilers. 2007) in the project area was high; indicating that all of the litter, duff and small woody debris were consumed and the large woody debris was consumed or deeply charred. The soil temperature likely reached levels that created varying degrees of *fire induced water repellency* and increased the erosion potential.

Photo 1

On August 2nd and 3rd, approximately 0.6 inches of rain fell on the fire area over a 37 hour period. While the intensity of the rainstorm was not high, the lack of vegetation combined with steep slopes and hydrophobic characteristics in the surface soil resulted in a debris flow and caused considerable channel scour of ephemeral draws (***Photo 1***) and deposition at the base of draws. Rain events in

September 2013 of 0.86 inches and 1.13 inches moved fine sediment in the draws, but no large debris flows occurred after these events, suggesting a reduction in hydrophobicity of the soils.

Photo 2

A private spring, used as a domestic water source, is located below state parcel. During the debris flow, the delivery pipe was destroyed and sediment was introduced in to the water supply. Since that time, the water has cleared up and the spring is useable.

The scoured channels are protected by the Streamside Management Zone Law (ARM 36.11.301 through ARM 36.11.312). Stream channels are generally less than three feet wide and have a rocky bottom where scour has occurred. These channels only flow during or immediately after precipitation events and thus have an ephemeral flow regime. All streams are considered to be Class 3 channels because they flow less than 6 months during the year and do not contribute surface flow to downstream waterbodies. Even during the debris flow in early August, surface flow did not connect to the Jocko River.

While the soils information shows no unstable soils in the project area, the debris flow created several scour holes (***Photo 2***) and substrate deposits (***Photo 3***) that are more prone to movement and erosion than undisturbed soils.

Photo 3

Due to the intermittent and disconnected characteristic of the streams in the project area, fish are not present in these streams on the state parcel.

A field review of the state parcel during September 2013 identified a skid road network on the state parcel that concentrates water and increases the potential for erosion. Due to the lack of ground cover as a result of the wildfire, sediment was routed along this skid road network to low, flat locations where collected sediment was deposited. Rilling on skid roads occurred in many locations because no waterbars, drain dips or other surface drainage features were installed.

Existing roads that are proposed for timber hauling are owned by the Confederated Salish & Kootenai Tribes or Lake County. During field reconnaissance, no substantial sediment delivery locations were observed.

ENVIRONMENTAL EFFECTS

DESCRIPTION OF ALTERNATIVES

- *No-Action Alternative*

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

- *Action Alternative*

  Approximately 355 acres would be commercially harvested under this alternative. All of the proposed harvest would remove all merchantable saw timber and leave behind sub-merchantable trees and cull trees. Approximately 196 acres would be completed using ground based equipment and 157 acres would be harvested using skyline cable systems. Harvesting would remove merchantable trees in all Class 3 SMZs. Approximate miles of road activities include:

  - 1.5miles of new permanent road construction including one stream crossing
  - 0.2 miles of new temporary road construction including two stream crossings
  - 4.6 miles of existing road would be maintained or have drainage improvements installed as necessary to protect water quality.

DIRECT AND INDIRECT EFFECTS

- ***Direct and Indirect Effects of the No-Action Alternative to Water Resources***

  Under this alternative, no timber harvesting or related activities would occur. Sediment from all sources would continue as described in the existing condition until vegetation is established and erosion risk decreases. Also, as vegetation reestablishes, the risk of debris flows (that could again compromise the private spring) would be reduced. Newly formed stream channels would continue to adjust as vegetation establishes and precipitation events form the channels. Fire restoration and erosion control plans for contour felling of trees on up to five acres is expected to have slightly lower the risk of sheet erosion.

- ***Direct and Indirect Effects of the Action Alternative to Water Resources***

  Post-fire salvage harvest would be expected to have moderate or high impacts on approximately 13.6% of the proposed harvest units from compaction, displacement and erosion. Skyline yarding across class 3 streams may result in some erosion in channels, but this is not expected to affect downstream bodies of water due to the ephemeral flow regime and discontinuous scour. Riparian management zones along streams would be extended depending upon slope. No equipment operations within RMZs over 35% slope per ARM 36.11.425 (4)(b)(i). Winter conditions may allow equipment operations if conditions exist that mitigate erosion risk.

  Due to mitigation measures listed in the *SOILS ANALYSIS*, the risk of substantial sediment delivery to streams from the timber harvest would be reduced. Leaving the majority of slash in the harvest units would serve to desynchronize runoff and also store sediment on the hillside. Additionally, installing surface drainage in the existing skid road network would be expected to reduce erosion on the skid roads and depositions in low areas.

  Existing roads would have minor drainage improvements during road maintenance to maintain a reduced risk of sediment delivery to streams. Minor drainage improvements include reshaping drain dips and cleaning ditches, as well as, placing energy dissipaters at as necessary to reduce the risk of erosion. New road construction would have three stream crossings—drive through fords—installed with rock armoring to reduce the risk of sediment delivery. During construction minimal amounts of sediment may enter the stream channel, however due to the ephemeral flow regime and discontinuous channel scour, the risk of sediment delivery to downstream waterbodies would be very low.

Because DNRC would incorporate BMPs into the project design as required by *ARM 36.11.422 (2),* RMZs would be extended for high erosion risk per ARM 36.11.425, and all laws pertaining to SMZs would be followed, a reduced risk of sediment from timber-harvesting activities would result from the implementation of this alternative and a very low risk of sediment delivery to perennial surface water would result. Therefore, the risk of long-term adverse direct or indirect effects to water quality or beneficial uses due to increased sediment would be low.

CUMULATIVE EFFECTS

Cumulative Effects Summary - No-Action Alternative

Because no timber harvesting or associated activities would occur under this alternative, cumulative effects would be limited to the existing conditions. Fire restoration and erosion control plans for contour felling of trees on up to five acres would be expected to slightly lower the risk of sheet erosion. As vegetation re-establishes on the state parcel, the risk of erosion would decline as would the risk to the downstream private water source. Newly formed stream channels would reach equilibrium over time and sediment transport would be reduced.

Cumulative Effects of the Action Alternative to Water Resources

Under this alternative, the proposed timber-harvesting and road-construction activities would occur. A cumulative increase in sediment delivery as a result of timber harvesting and roadwork would have a low risk of occurring because of the existing road improvements, BMP application and recommended mitigation measures. Fire restoration and erosion control plans for contour felling of trees on up to five acres would be expected to slightly lower the risk of sheet erosion. As vegetation re-establishes on the state parcel, the risk of erosion would decline as would the risk to the downstream private water source. Newly formed stream channels would reach equilibrium over time and sediment transport would be reduced.

Because all timber-harvesting activities would follow BMPs as required by *ARM 36.11.422* and the direct and indirect effects would have a low risk of impacts, a low risk of additional cumulative effects with adverse impacts to water quality and beneficial uses would be expected under this alternative.

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ATTACHMENT IV – MITIGATIONS

Mitigation measures for the Action Alternative:

Vegetation

- 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.
- Riparian management zones along streams would be extend where high erosion risk exists. No equipment may be operated within 150 feet of streams (depending upon slope) when non-winter site conditions are present and no closer than 100 feet of streams when winter conditions exist.
- 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.
- Keep skid trails to 20 percent or less of the harvest unit acreage. Provide for drainage in skid trails and roads concurrently with operations.

- Retain at least10 tons per acre of large woody debris (depending on habitat type) and at least 95 percent 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

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