Environmental Analysis

For the

Lion Mountain Fuels Reduction Project

Prepared By

Kalispell Unit, Northwestern Land Office

Montana Department of Natural Resources and Conservation

June 2008

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Environmental Assessment

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CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	Lion Mountain Fuels Reduction Project
Proposed Implementation Date:	July 2008
Proponent:	Department of Natural Resources and Conservation, Northwestern Land Office, Kalispell Unit
Location:	Section 34, Township 31N, Range 22W
County:	Flathead

I. TYPE AND PURPOSE OF ACTION

The Kalispell Unit, Montana Department of Natural Resources and Conservation (DNRC) is proposing the Lion Mountain Fuels Reduction Project. The project area is located approximately 2 miles west of downtown Whitefish, Montana within Section 34, T31N, R22W (see Vicinity Map in Attachment I). The acreage of state land involved in the project is held by the State in trust for the support of specific beneficiary institutions (*Enabling Act, 1889: 1972 Montana Constitution, Article X, Section 11).* s. 34 – Montana State University, Morrill grant.

Under the proposed action, approximately 750 thousand board feet would be harvested from approximately 240 acres in Section 34. Approximately 1,000 feet of new road may be constructed. An estimated revenue of $120,000 would be generated for the beneficiary. Specific objectives of this project are to maintain and improve forest health, reduce fuel loading, and increase forest productivity beneficial to future trust actions. If the Action Alternative is selected, activities could begin in July 2008.

Project Purpose and Need:

1) Reduce the potential for wildland crown fires by treating forest fuels.

2) Implement silvicultural treatments to improve forest health and vigor.

3) Sell forest products from trust lands within the project area to generate revenue for various trusts to produce the largest measure of reasonable and legitimate return over the long run for specific beneficiary institutions (*Section 77-1-202, Montana Codes Annotated (MCA)).*

Evaluations for road management and silvicultural treatments would also consider and incorporate: 1) aesthetics; 2) non-motorized recreational uses; and 3) control/containment of present weed infestations.

II. PROJECT DEVELOPMENT

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

On 4/29/08, the DNRC sent scoping letters to adjacent landowners and other known interested parties and organizations. A public notice was posted in *The Daily Interlake* on 5/04/08 and 5/11/08. One letter was received and offered support of the project as proposed. Hydrological, soils, wildlife and vegetative issues were identified by DNRC specialists and field foresters for both the No Action and the Action Alternative.

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

No other governmental agencies have jurisdiction and no permits are needed.

3. ALTERNATIVES CONSIDERED:

No Action Alternative: Under the No Action Alternative, no activity would be undertaken. No timber would be harvested and fuels reduction work would not occur. The No Action alternative would likely result in decreased growth rates and increased fuel loading within the timber stands. This alternative would not produce revenue for the Trust Beneficiary. Effects of the No Action Alternative are further described in the Resource Analyses in Attachment 2.

Action Alternative: Under the Action Alternative, DNRC would harvest up to 750 thousand board feet from approximately 240 acres in Section 34. Timber would be harvested using tractor logging with conventional, mechanical or cut-to-length operations and would be focused on the removal of suppressed and intermediate trees or those trees infected or susceptible to insect and disease mortality. In addition to timber harvest, approximately 1,000 feet of new road may need to be constructed to access a portion of the project area.

Issues surrounding this proposed action have either been resolved or mitigated through project design or would be included as specific contractual requirements of this project. Recommendations to minimize direct, indirect and cumulative effects have been incorporated in the project design (Attachment II, Resource Analyses; Attachment III, Prescriptions: Attachment IV, Mitigations;).

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

The project area is predominantly covered by landtype 23-8. The very, gravelly silt loam soils in this landtype are formed in glacial till. Vegetation can range from a moist, mixed forest to a dry, mixed forest. The potential timber production is moderate to high. Because slopes are generally in the 20-40% range, this landtype is well suited to conventional ground-based logging methods. Roads perform well with standard location, construction and maintenance practices, although some cutslopes may be difficult to revegetate due to moisture stress (Martinson and Basko, 1998). Erosion potential is low to moderate. Sediment delivery efficiency is moderate, although very limited in this parcel due to the lack of surface water features.

Harvest activities would comply with Best Management Practices (BMP's) and would use existing roads and segments of existing skid trails where feasible. Mitigations include: limiting equipment operations to minimize soil compaction and rutting, planning appropriate skid trails, limiting skidding to slopes less than 40% and less than 20% of the harvest unit acreage, limiting disturbance and scarification, and retaining adequate amounts of large woody debris and fine litter following harvest. Thus, direct, indirect, and cumulative effects to the soil resource would be minimal.

Please refer to Attachment 2, Soils Analysis for a more detailed analysis, and Attachment 4, Mitigations for a more detailed description of mitigations.

5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

The project area contains no surface water or drainage features that contain or conduct water. The project area is located on side slopes with broken topography.

Harvest activities would use existing roads and segments of existing skid trails where feasible, would require DNRC approved drainage features on skid trails, and would comply with BMPs and all laws pertaining to Streamside Management Zones (SMZs). Due to the lack of streams within the state parcel, well-drained soil conditions, the project design and compliance with applicable regulations and rules, direct, indirect, and cumulative effects to the water resource would be minimal.

Please refer to Attachment II, Water Resources Analysis for a more detailed analysis, and Attachment IV, Mitigations for a description of mitigations.

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6. AIR QUALITY:

The project is located in Montana State Airshed 2 and within the Kalispell Impact Zone. Under the Action Alternative, potential post-harvest burning of logging slash would produce some particulate matter. Impacts are expected to be minor and temporary with slash burning to be conducted when conditions favor good smoke dispersion. All burning would be conducted during times of adequate ventilation and within the existing rules and regulations. The DNRC will make all attempts to utilize logging slash.

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7. VEGETATIVE COVER, QUANTITY AND QUALITY:

Logging activities have occurred within the project area since the 1920's. Stands in the harvest unit are well stocked with 40 to 150 year old trees. No old growth stands as defined by Green et al. (1992) are present in the project area. The predominant appropriate cover type is western larch / Douglas-fir. Noxious weeds, primarily spotted knapweed, are present along existing roads. No sensitive plants listed by the Montana Natural Heritage Program were identified in the project area.

Under the Action Alternative, timber harvest would occur on approximately 240 acres and would be focused on the removal of shade tolerant species and those infected or susceptible to insect and disease mortality. These changes would move stands in the project area toward desired future conditions. Occurrence of noxious weeds may increase.

Recommendations to minimize direct, indirect and cumulative effects have been incorporated into the project design (Attachment 1; Attachment 2, Vegetation Analysis; Attachment 3, Prescriptions; Attachment 4, Mitigations). Measures to minimize noxious weeds, insects and disease are included in the project design (Attachment 4, Mitigations).

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8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

No surface water is present within the project area. Thus direct, indirect, and cumulative effects to aquatic life and habitats would be minimal.

For all other resources related to this heading, please refer to Attachment 2, Wildlife Analysis for a detailed analysis and Attachment 4, Mitigations for a detailed description of mitigations.

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

Please refer to Attachment 2 Wildlife Analysis for a more detailed analysis and Attachment 4, Mitigations, for a more detailed description of mitigations.

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10. HISTORICAL AND ARCHAEOLOGICAL SITES:

A DNRC archaeologist has reviewed this project. Significant sites or artifacts were not identified during these reviews.

11. AESTHETICS:

Portions of the project area will be visible from the Lion Mountain Loop Road (County Road) and the Wolftail Pines road (private easement on State land). It may also be visible from adjacent landowners. Openings in the canopy from skid trails and changes in tree cover density may be seen. The selective harvest prescriptions and broken topography should minimize any visual impacts. Prescriptions are designed to lessen the risk of crown fires and mimic historical stand conditions. Project implementation should not have an adverse visual impact in the area (Attachment 4, Mitigation).

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

No impacts are likely to occur under either alternative.

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:

Whitefish Neighborhood Plan (September 2006)
EA for Land Use License for Trail Runs Through It construction (early spring 2007)

IV. IMPACTS ON THE HUMAN POPULATION

14. HUMAN HEALTH AND SAFETY:

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

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION:

Timber harvest would provide continuing industrial production in the Flathead Valley.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

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

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

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

18. DEMAND FOR GOVERNMENT SERVICES:

Log trucks hauling to the purchasing mill would result in temporary increased in traffic on the Lion Mountain Loop Road and US Highway 93. This increase is a normal contributor to the activities of the local community and industrial base, and they cannot be considered a new or increased source of demand.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

On June 17, 1996, the Land Board approved the SFLMP. The SFLMP provides the philosophy adopted by DNRC through programmatic review (DNRC, 1996). The DNRC will manage the lands in this project according to this philosophy, which states:

> *Our premise is that the best way to produce long-term income for the trust is to manage intensively for healthy and biological diverse forests. Our understanding is that a diverse forest is a stable forest that will produce the most reliable and highest long-term revenue stream…In the foreseeable future, timber management will continue to be our primary source of revenue and our primary tool for achieving biodiversity objectives.*

On March 13, 2003, the DNRC adopted Rules (Administrative Rules of Montana [ARM] 36.11.401 through 450). These Rules provide DNRC personnel with consistent policy, direction, and guidance for the management of forested trust lands. Together, the SFLMP and Rules define the programmatic framework for this project.

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

The project area receives high use by walkers, joggers, and some mountain bikers. It is close to downtown Whitefish and is easily accessible by a County Road. Implementation of the proposed project will not displace any current uses of the area. Use is expected to remain the same or increase following this project.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

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

22. SOCIAL STRUCTURES AND MORES:

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

23. CULTURAL UNIQUENESS AND DIVERSITY:

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

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Costs, revenues and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return. The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find a market value for stumpage. Theses sales have similar species, quality, average diameter, product mix, terrain, date of sale, distance from mills, road building and logging systems, or anything that could affect to buyer's willingness to pay for. The Action Alternative would generate an estimated return to the school trust of $120,000. The No Action alternative would not generate any return to the trust.

EA Checklist Prepared By:	**Name:** Pete Seigmund	**Date:** June 2008
	Title: Management Forester	

V. FINDING

25. ALTERNATIVE SELECTED:

Upon review of the Checklist EA and attachments I find the Action Alternative as proposed meets the intent of the project objectives as stated in section I, Type and Purpose of Action. It complies with all pertinent environmental laws, DNRC State Forest Land Management Plan, and a consensus of professional opinion on limits of acceptable environmental impact. The No Action Alternative does not meet the project objectives. For these reasons I have selected the Action Alternative for implementation on this project.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

After a review of the scoping documents, Department policies, standards, guidelines, and the State Forest Land Management Plan (SFLMP), I find all the identified resource management concerns have been fully addressed in this Checklist EA and its attachments. Specific mitigation measures for each resource concern are listed in Attachment IV. The action alternative provides for income to the school trust and promotes the development of a healthy, biologically diverse, and productive forest. It also provides the opportunity to improve reduce fuel loading and crown fire potential near homes and private property. I find there will be no significant impacts to the human environment as a result of implementing the action alternative. Specific project design features and various resource management specialist recommendations have been implemented to ensure that this project will fall within the limits of acceptable environmental change and result in no significant impacts.

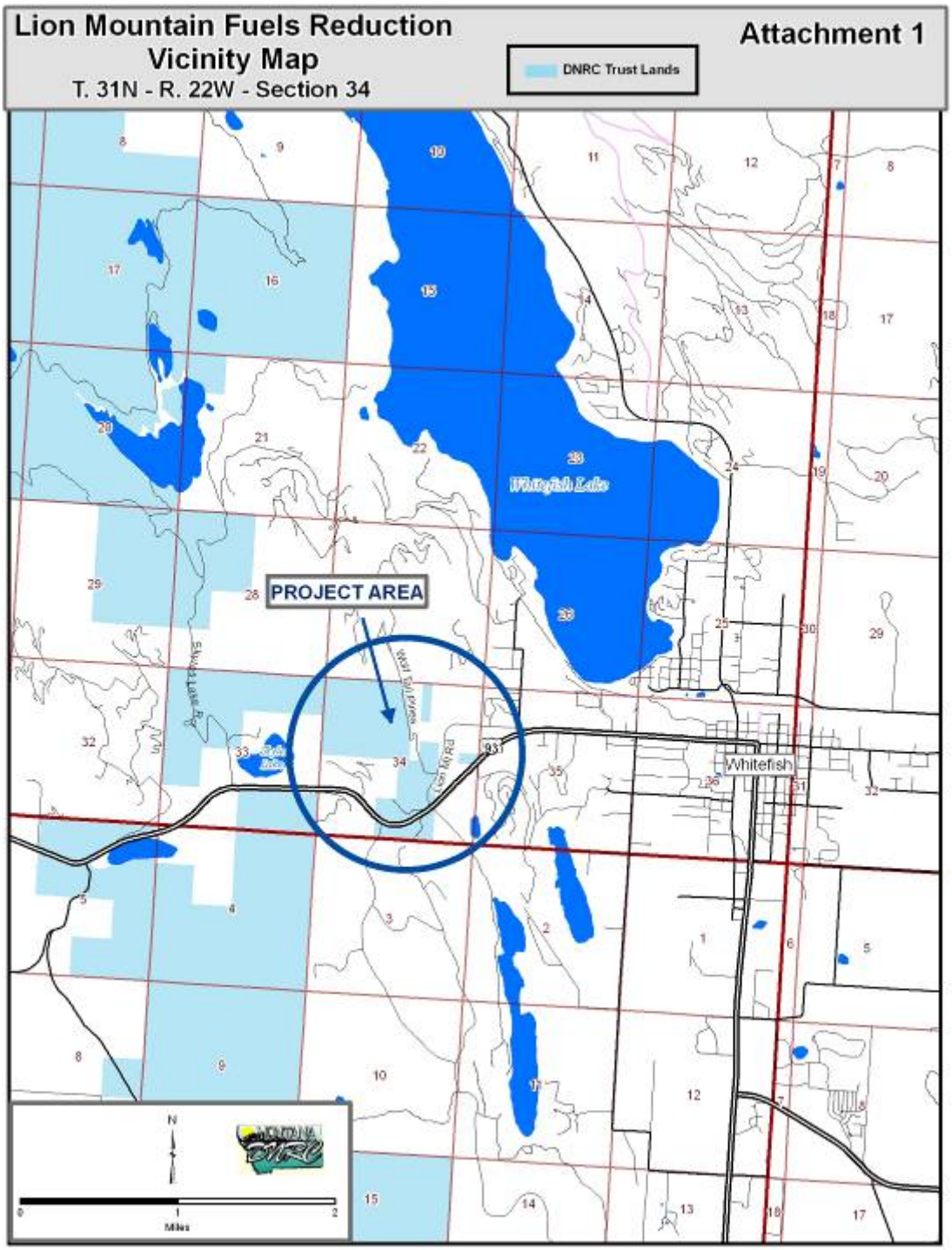
27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

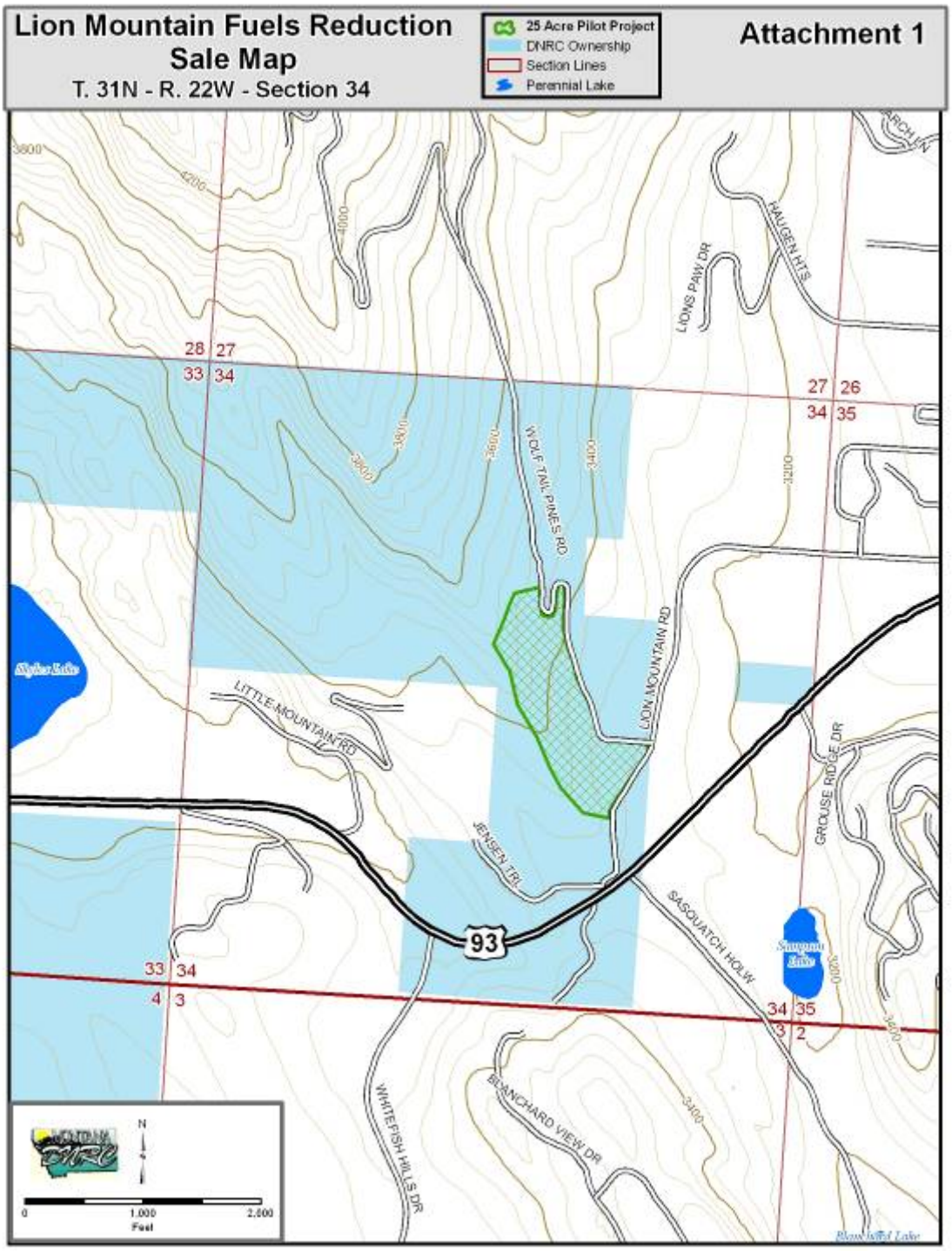
☐ EIS ☐ More Detailed EA ■ No Further Analysis

EA Checklist Approved By:	**Name:** Greg Poncin **Title:** Kalispell Unit Resource Program Manager
Signature: **/s/** Greg Poncin	**Date:** 07/18/2008

Attachment I: MAPS

Vicinity Map
&
Sale Map


Lion Mountain Fuels Reduction
Vicinity Map
T. 31N - R. 22W - Section 34
Attachment 1
DNRC Trust Lands
PROJECT AREA
Whitefish Lake
Whitefish
Silver Lake Rd
West Big Draw
Lion Mtn Rd
93
N
0
1
2
Miles


Lion Mountain Fuels Reduction
Sale Map
T. 31N - R. 22W - Section 34
25 Acre Pilot Project
DNRC Ownership
Section Lines
Perennial Lake
Attachment 1
LIONS PAW DR
HAUGEN HTS
WOLF TAIL PINES RD
LIONS MOUNTAIN RD
LITTLE MOUNTAIN RD
JENSEN TRL
GROUSE RIDGE DR
SASQUATCH HOLW
BLANCHARD VIEW DR
WHITEFISH HILLS DR
93
28 27
33 34
27 26
34 35
33 34
4 3
34 35
3 2
N
0
1,000
2,000
Feet

Attachment II

Resource Analyses: Existing Conditions & Direct, Indirect and Cumulative Effects

Vegetation Analysis

Water Resources Analysis

Soils Analysis

Wildlife Analysis

EXISTING CONDITIONS & ENVIRONMENTAL EFFECTS

Introduction

This section identifies and describes those resources that may be affected by the proposed action and describes the environmental effects of each alternative on the resources. The section is organized by general resource categories and their associated issues. The descriptions of the existing conditions found in this section can be used as a baseline for comparison with the Action Alternative.

Cumulative effects from current management and foreseeable future State actions are discussed. These include other active timber sales, those in the planning stage, ongoing maintenance, and other uses of the areas being analyzed. Direct, indirect and cumulative effects on the resources being analyzed were considered.

General description of the area

The proposed Lion Mountain Fuels Reduction Project area is located approximately 2 miles west of Whitefish, Montana and includes approximately 330 acres of State Trust Lands. It is located within Section 34, T31N, R22W. State Trust Lands within the project share property boundaries with numerous private landowners. Several other analysis areas were delineated to assess direct, indirect and cumulative effects of the alternatives considered. More specific details about these are contained under each corresponding resource heading.

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:

- Current stand conditions are viewed as a fire hazard and at risk of a large, catastrophic fire if ignition occurs.
- Exclusion of fire from the site may continue to change stand compositions and age classes from what would have historically occurred in the area
- Insects and disease may affect timber productivity and value.
- 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.

Analysis Area

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 **Lion Mountain Project Area Level Scale** includes all trust lands within the project area and more specifically those stands proposed for harvesting under each alternative. 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 Lion Mountain 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 –

Lion Mountain Project Area: The majority of the project area was first harvested in the early to mid 1920's for railroad ties and sawtimber. This harvest removed about 500 MBF. Another harvest was done in the mid 1940's and removed about another 500 MBF. These first harvests removed the majority of large diameter western larch and Douglas-fir. Smaller timber and Christmas tree permits occurred in the 1950's and 1960's. One small salvage sale (200 MBF or less) occurred in the area 2005 and a small fuels reduction permit (approx. 100 MBF) is currently

ongoing. Active fire suppression starting in the 1930's has limited the extent of wildfires to small acreages, generally less than ¼ acre in size.

Adjacent Lands to Lion Mountain Area: This project area is immediately adjacent to mostly privately owned lands. Another parcel of State Trust lands borders the project area in the northwest. The private lands consist mostly of smaller (20 acres or less), residential home sites.

Forest Habitat Types –

In the Lion Mountain Project Area, the area is occupied by forest habitat types in the Douglas-fir (*Pseudotsuga menziesii)* and Grand fir (*abies grandis*) series indicating the influence of moderately warm/dry and moderately cool/moist climatic conditions Western larch, grand fir, spruce, and lodgepole pine are the most prevalent trees species along with Douglas-fir. Fire scars were prevalent on older western larch in the project area.

Timber productivity ranges from moderate (Douglas-fir) to very high (grand fir) for these habitat types, with higher productivity generally found in stands dominated by grand fir and spruce. High ridges with shallower soils and less moisture are often dominated by Douglas-fir.

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.

A mosaic of even and multi-aged patches is present in the project area. The majority of the Lion Mountain project area would be classified in a moderate to mixed severity fire regime. Fire intervals are considered to be frequent, 50 years or less. Most of the project area has evidence of past fire activity. Forest stands shaped by frequent to mixed severity fires typically have an abundance of seral species in the overstory.

As a result of fire suppression, stands of the WL/DF cover type that characteristically would have been open-grown now have thick understories of more shade tolerant species throughout both the project area and Kalispell Landscape. In general, fire return intervals have been lengthened and fire intensity has increased due to increased fuel loadings vertically and horizontally. Lower intensity, more frequent fires would have kept a larger composition of seral species and provided for less shade tolerant regeneration.

Forest Age Class & Cover Type Distribution –

Table 3–1 compares the DNRC Kalispell Landscape (current cover types) with historical data (appropriate cover types) from Losensky (1997) for the Lower Flathead Valley section, 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*), or spruce (*Picea spp*.), as a result of longer intervals between disturbances.

Table 3–2 makes the same comparison for determining desired future conditions for the Cliff Lake project area by comparing current stand level inventory data with a 1920's inventory of the area that was completed prior to harvesting the area for the first time.

Table 3–2. Current and appropriate cover types & stand compositions for the Lion Mountain project area.

Cover Type	Current Cover Type (Acres)	Appropriate Cover Type (Acres)	Current Type Minus (-) Appropriate Type (Acres)
SAF	0	0	0
DF	75.5	0	75.5
HW	5.3	5.3	0
LP	0	0	0
MC	6.8	0	6.8
PP	14.6	25	-10.4
Other	0	0	0
WL/DF	228.1	300	-71.9
WWP	0	0	0
TOTAL	330.3	330.3	--

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 or nonforest. The Current Type minus Appropriate Type column above lists the excess and deficit (-) acres for each Cover Type.

The Lion Mountain project area reflects the same trend in forest cover type shifts as the Kalispell landscape, notably that WL/DF, and PP cover types represent a smaller proportion of the cover types, and DF represents a much larger proportion, than likely occurred in the early 1900's.

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 age class distribution on the project area and landscape scales. Stands in the seedling-sapling age class (0-39 years) are under-represented compared to the historical condition for both the Kalispell landscape and the project area, and the 40 to 150 age classes over represented. 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
Cliff Lake (current)	0	18	59	23

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 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)*. The DNRC approach to old-growth management (and forest management in general) is further clarified in (ARM 36.11.401 to 36.11.450). Field verification of older stands modeled in

the coarse filter analysis of SLI data for the project area identified no stands within the project area meeting the DNRC's old growth definition.

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. Patch size for this project is estimated from stand sizes and provides further insight into the severity of a disturbance as it relates to dominant tree canopies. Table 3-4 displays the percent of area in the Lion Mountain Project Area and Kalispell Landscape by stand structure class and estimates of stand size.

Table 3–4. Proportion (%) of analysis area by stand structure and estimated patch size.

Stand Structure	Kalispell Landscape	Kalispell Average Stand Size	Project Area	Project Area Average Stand Size
Single-storied	15%	24 acres	6%	10
Two-storied	3%	28 acres	0%	n/a
Multi-storied	82%	31 acres	94%	18 acres

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.

Over 80 % of both the Lion Mountain project area and Kalispell Landscape consists of stands with multi-storied structures. The various tree canopy levels may be patchy in nature or well distributed and several age classes are usually present. Single or two-storied, even aged structures occur in less than 6% of the Lion Mountain acreage and are largely represented by the younger age classes.

Timber Productivity and Value –

Insects: Since the summer of 2000, various species of bark beetles have been responsible for increased tree mortality in the Flathead Valley. In the Lion Mountain area, fir engraver (*scolytus ventralis*) and Douglas-fir (*dendroctonus pseudotsugae*) bark beetles have been very active. Since 2004, several small salvage sales have occurred within the project area. These salvage sales removed most of the mature grand fir and small pockets of bug infested Douglas-fir. Any other factors that stress trees and cause a reduction in tree vigor will make them more susceptible to attack. Since the year 2000, western Montana has experienced some of the hottest and driest

summers on record. This has lead to an increase in droughty conditions which further weakened and stressed large numbers of trees.

Tree Vigor: Radial growth rates are good to moderate in the younger (less than 150 years). Radial growth is static or declining in the 150 plus age class. Approximately 158 acres or almost 50% of the project area is in the 150 year plus age. Stand age and low vigor is also making many of the stands in the project area more susceptible to bark beetle attacks.

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 –

Invasions of noxious weeds are generally restricted to old logging roads and trails in less recently logged areas. Areas logged in the last few decades, however, have invasions spreading from the well established weed populations in the roads into adjacent openings. Native plant species may not re-colonize these areas. Several factors increase the likelihood of continued weed encroachment in the Lion Moutain area. They are: persistent and increasing usage of the area for recreation, the possibility of a new trail being constructed from the Lion Mountain Loop Road to the Two Bear Road near Skyles Lake.

Environmental Effects

Forest Age Class & Cover Type Distribution –

No Action Alternative – Direct and Indirect Effects

Under the No Action Alternative, natural processes would continue to have a direct influence on these forest characteristics. In the absence of wildfires, the effects of current insect infestation-induced mortality will continue to influence both short and long term age class distribution and cover type representation.

Openings created in the canopy from bark beetle mortality are not expected to resemble natural fire effects. Openings are likely to be smaller and many may continue to be stocked with younger pole-sized trees. Without duff reduction and soil exposure, the regeneration of openings is expected to favor shade tolerant species over seral species. The lack of regeneration under denser canopies or the predominance of Douglas-fir in numerous understories would perpetuate the trend of increasing DF and MC cover types over much of the project area. Without fire, the older age classes from 100 years up would continue to dominate the area and the 0-39 and 40 to 99 age classes would continue to decline, as several 70 to 80 year old stands move into the next age class without replacement.

No Action Alternative – Cumulative Effects

Under the No Action Alternative, there would likely be a decline in acreage in WL/DF cover types. WL composition will continue to decrease leading to a shift from WL/DF to DF or MC cover types. 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. In the absence of stand replacement fires, variability of age class and cover type distribution would decline.

Action Alternative – Direct and Indirect Effects

As a result of harvesting, WL/DF cover types would persist within the harvest units. Dominant tree composition would begin to move toward historic conditions. By removing shade tolerant species (mostly grand fir, spruce, and Douglas-fir) and retaining seral species, WL/DF cover types would persist for a longer time. The average age of some treated stands would decrease, although some stands would remain in the same age class after harvest, depending on the extent of overstory tree removal.

This alternative would harvest 240 acres (this includes the approximate 19 acres that were harvested this past winter under a 612 timber permit). Improvement cutting and commercial thinning would occur in combination on all acres. In the commercial thin areas, harvest prescriptions would favor the retention of western larch and ponderosa pine (trace). Healthy Douglas-fir would also be retained to help achieve desired stocking levels but larch and pine would be favored over Douglas-fir. The reduction in Douglas-fir would increase the proportion of other species in the overstory resulting in a change in composition. The improvement cut areas would remove some of the older, decadent trees as well as trees with insect and disease problems. Tree spacing will be more variable in the improvement cut areas with some small openings possibly being created.

The Action Alternative would treat approximately 70% of the Lion Mountain project area. The MC cover type (stand #6, approx. 7 acres) may be converted to a WL/DF cover type. This project is not expected to have any big change to age class distribution in the project area.

Action Alternative – Cumulative Effects

The Action Alternative would result in a small decrease in the acreage for the MC cover type and small increase in acreage of the WL/DF cover type (about 7 acres). These effects would be cumulative to those of the Bald Hill Timber Sale project which will have an increase of 15 acres in the ponderosa pine cover type, an increase of 127 acres in the WL/DF cover type, and a decrease of 142 acres in the MC cover type. There would be no change in age class distribution on the Bald Hill timber sale. The Cliff Lake project would decrease the 150+ year age class by 0. 25%, without affecting current old growth stands. 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

No old growth stands are present within the project area. Under the No Action Alternative, stands would continue to develop under the influence of suppressed wildfire activity and other natural disturbances such as insect and disease activity. Maintenance of old-growth characteristics and defining criteria will be dependent on the persistence and the rate of mortality. If droughty conditions continue in this area, it is expected that the live trees will continue to die resulting in a younger stand, or an old stand of smaller trees in the near future.

Action Alternative – Direct, Indirect, and Cumulative Effects

Under the Action Alternative, effects to old growth would be similar to the No Action Alternative. Commercial thinning and improvement cutting would improve the growth and vigor of residual trees and help stands to develop old-growth characteristics sooner on 240 acres. The Bald Hill and Cliff Lake timber sales contained no old-growth stands.

Stand Structure and Development –

No Action Alternative – Direct and Indirect Effects

Stand structure and development could continue to change as a result of damaging agents. Older stands (150 years +) comprising almost 50% of the project area are experiencing noticeable reductions in live tree canopy closure due to insect and disease caused mortality. The mosaic pattern of multi-aged and multi-storied or small even-aged patches are likely to persist with this type of disturbance, resembling the unstable conditions and stand development often associated with late successional forests. More shade tolerant species would increase in all canopy levels continuing to replace or inhibit growth of seral species, as dense small diameter trees develop in the understory. Area coverage of forest in early successional stages, especially in larger patch sizes would continue to decrease. Forest fuels, both ground and vertical would continue to build up in stand areas where mortality is occurring, increasing the potential for severe, less controllable fires that may result in large scale stand replacement fires.

No Action Alternative – Cumulative Effects

Forest succession and fire suppression would continue. Conditions favoring the establishment of shade tolerant species in canopy gaps, the slow growth of seedlings and saplings under closed canopies or the hindrance of tree establishment under closed canopies, and increasing fuel loadings would continue.

Action Alternative – Direct and Indirect Effects

Under the Action Alternative, commercial thinning and improvement cutting proposed for 240 acres would maintain current stand ages and structures, although canopy closure and forest fuels would be reduced. Commercial thinning would maintain some of the mid- and lower-canopy, favoring seral species and vigorous trees. These treatments would resemble low severity fires and act as a thinning agent, killing the less fire resistant species and releasing the more fire resistant trees, such as western larch. After slash disposal treatments are completed more fire resistant stand conditions and structures would be maintained for several decades.

Overstory tree canopy closure would be reduced on all harvested acres, temporarily reducing the percentage of closed canopy stands in the Lion Mountain area.

Action Alternative – Cumulative Effects

The area covered by single or two-storied stand structures across the Kalispell Landscape would remain the same.

Timber Productivity and Value –

No Action Alternative – Direct and Indirect Effects

Due to the effects of insects and disease the commercial value of sawlogs would continue to decline. Non-sawlog or pulp values are generally less than that received for sawlogs, and the value of this timber trust asset would continue to decline. Growth rates of individual trees in denser, older stands would remain static or continue to decline and opportunities for establishment of replacement trees would be limited to small openings favoring shade tolerant trees. Development of larger diameter commercially valuable western larch as a persistent component in the overstory of older stands would be hindered. Loss of dead and dying trees along both open and closed roads would continue to occur from activities associated with firewood gathering and maintenance of powerline corridors and public right-of-way easements. The request for small-scale salvage permits would likely increase.

No Action Alternative – Cumulative Effects

Without silvicultural treatments or wildfires to control tree densities, reduce losses to insects or disease, and recover mortality or initiate new stands, the trend towards increasing acreage on the Kalispell Unit covered by older, slower growing stands that are more susceptible to beetle infestations, stem decays, or wildfires would continue.

Action Alternative – Direct and Indirect Effects

Silvicultural treatments to be applied under the Action Alternative would remove both live and dead trees, some of which are affected by insects or diseases. Healthy and vigorous trees of all species would be favored for retention where they occur. Snags and snag recruits in quantities meeting DNRC requirements would be left. Larger diameter snags and cull trees, especially shade intolerant species, if not infected with dwarf mistletoe would be favored for potential snag recruits and snag retention. Due to the removal of low vigor or diseased trees stand health would improve. Between-tree competition would be reduced allowing residual trees to maintain or increase current growth rates. The bark beetle hazard for the treated stands will decrease due to a decrease in stocking, removal of a good number of the larger diameter, decadent trees, and by freeing up more available water, sunlight, and nutrients for residual trees.

Commercial thinning and improvement cutting (intermediate harvests) would remove fewer trees, producing less fuel loadings and regeneration harvests. Slash reduction will mainly include tree length skidding and burning of landing piles the ensuing fall. Some small diameter slash will be placed on skid trails for erosion control and nutrient cycling. Residual trees would adequately stock these units with healthy and vigorous trees.

Silvicultural treatments would be applied to about 240 acres, or 72% of the Cliff Lake project area under the Action Alternative. The effects for the various types of cuts as described above would occur on the treated acres. Timber productivity on the treated acres would increase or be maintained at a level closer to the site potential, improving the future opportunities for generating revenue for the trust with the use of the timber resource.

Action Alternative – Cumulative Effects

The percentage of forested land that is producing timber closer to the site potential would increase by approximately 0.5% on the Kalispell Unit. The acres of forest stands that are less susceptible to beetle infestations, stem decays, or wildfires would increase. Higher potential for greater long-term revenue from the timber resource is expected.

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, residential development and use adjacent to state land or within, and commercial and non-commercial use. 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 204 acres, and involve road work on approximately 0.25 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. Enhancement of existing 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 for the Lion Mountain project. 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.

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WATER RESOURCES ANALYSIS

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

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

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

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

The primary concerns relating to aquatic resources within the analysis area are potential impacts to water quality from sources outside the channel as well as inside the channel. In order to address these issues the following parameters are analyzed by alternative:

-Miles of new road construction and road improvements
-Potential for sediment delivery to streams

Issues/Comments Dismissed from Further Review
-While annual water yield increases for project area streams are typically modeled and disclosed for timber harvest proposals, this analysis does not discuss water yield because of the lack of connected stream network. I have completed a coarse filter screening according to the DNRC Forest Management Rules, 36.11.423(1)(b), but due to the very low potential for impacts, no further analysis was deemed appropriate.

-During field review, no streams were identified within the state parcel. Therefore, no further analysis of fisheries will be conducted.

SEDIMENT DELIVERY
Analysis Method
The methods applied to the project area to evaluate potential direct, indirect and cumulative effects include a field review to look at potential sediment sources from haul routes. Roads were reviewed to determine existing sources of sediment delivery to streams. In addition, soil types in the project area were reviewed to identify areas prone to erosion and sediment delivery.

Analysis Area
The analysis area for sediment delivery is limited to the harvest units and roads used for timber sale access and hauling.

WATER USES AND REGULATORY FRAMEWORK
Water Quality Standards
The majority of the project area is located within the Whitefish Lake watershed. This portion of the Flathead River Drainage basin is classified as A-1 by the State of Montana Department of Environmental Quality (DEQ), as stated in the Administrative Rules of Montana (ARM 17.30.607). The water quality standards for protecting beneficial uses in A-1 classified watersheds are located in ARM 17.30.622. Water in A-1 classified waterways is suitable for drinking, culinary and food processing purposes after conventional treatment, bathing, swimming and recreation, growth and

propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers, and agricultural and industrial water supply. State water quality regulations prohibit any increase in sediment above naturally occurring concentration in water classified A-1. Naturally occurring means condition or materials present from runoff or percolation over which man has no control or from developed land where all reasonable land, soil and water conservation practices have been applied. Reasonable land, soil and water conservation practices include methods, measures or practices that protect present and reasonably anticipated beneficial uses. The State of Montana has adopted Best Management Practices (BMPs) through its non-point source management plan as the principle means of meeting the Water Quality Standards.

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

EXISTING CONDITION

Sediment Delivery

The project area is split between two 6th code hydrologic units: Stillwater River-Tobie Creek and Whitefish Lake. Neither watershed has streams located on or near the state parcel. Furthermore, no surface water exists on the parcel that connects to a downstream waterbody.

Within the project area, only two roads currently exist, although some additional trails can be found . None of the roads or trails is located near a stream or body of water, therefore no direct sediment delivery currently is occuring.

ENVIRONMENTAL EFFECTS

Description of Alternatives

No Action Alternative
No timber harvest or associated activities would occur under this alternative.

Action Alternative
One unit totaling approximately 221 acres would be commercially harvested under the Action Alternative using conventional ground-based equipment. In addition, approximately 0.2 miles of new road would be constructed and approximately 0.3 miles of road would be maintained or have minor drainage improvements installed as necessary to meet BMPs. Harvest may be completed under summer or winter conditions.

Direct and Indirect Effects of Sediment Delivery

No Action Alternative
Under this alternative, no timber harvest or related activities would occur. No direct or indirect impacts to water quality from sediment delivery would be expected.

Action Alternative
Due to the lack of streams and water bodies in the vicinity of the project area and because BMPs would be implemented to reduce the potential for excessive erosion including operating during the appropriate season (dry, frozen or snow-covered) and using appropriate methods (cable vs. ground-based), the risk of sediment delivery to streams would be very low..

Cumulative Watershed Effects of Sediment Delivery

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

Action Alternative

There would be a low risk of additional cumulative effects from the implementation of this alternative beyond those described under the No Action Alternative because of the following reasons:

1) All operations would occur using appropriate forestry BMPs. This would reduce the potential for adverse levels of soil displacement and subsequent sediment transport, and
2) No stream crossings were identified on the haul route that would increase sediment delivery.

SOILS ANALYSIS

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

- Timber harvest activities may result in reduced soil productivity and increased erosion due to compaction and displacement, depending on area and degree of harvest effects.

Analysis Area
The analysis area for soil impacts will be the proposed project area which includes all of the harvest units. This analysis area will adequately allow for disclosure of existing conditions, direct, indirect and cumulative impacts.

Analysis Methods
Methods for disclosing impacts include using general soil descriptions and the management limitations of the landtype and then qualitatively assessing the risk of negative effects to soil productivity from compaction, displacement and erosion from each alternative. In addition, a general description of the past impacts will assist in locating areas sensitive to impacts from erosion, compaction and displacement. Finally, 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 70 post harvest monitoring projects.

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

EXISTING CONDITIONS
General Conditions
Two separate soil surveys have been conducted in the vicinity of the project although boundaries and objectives of each survey resulted in little direct information. The main source used analyze potential impacts in the project area is the inventory by the USDA Forest Service entitled, *Soil Survey of Flathead National Forest Area, Montana* (Martinson and Basko, 1998). While this soil survey did not cover the state parcel, the immediate adjacent lands were not inventoried. Because the project area is adjacent and very similar to a specific landtype, this data will be extrapolated onto the project area. *Landtype* refers to a unit of land with similar designated soil, vegetation, geology, topography, climate and drainage. The landtypes may include several soils within the project area.

In addition, the *Soil Survey of Upper Flathead Valley Area, Montana* (USDA, 1960) was reviewed for management considerations and soil information. In this particular case, three soil types were identified in the project area although the majority of the project area was only described as 'mountainous land'. This publication describes some of the soil features that affect the management of soils in the project area. The information provided in this publication also assists in predicting soil behavior in response to management actions.

The project area is predominantly covered by landtype 23-8. The very, gravelly silt loam soils in this landtype are formed in glacial till. Vegetation can range from a moist, mixed forest to a dry, mixed forest. The potential timber production is moderate to high. Because slopes are generally in the 20-40% range, this landtype is well suited to conventional ground-based logging methods. Roads perform well with standard location, construction and maintenance practices, although some cutslopes may be difficult to revegetate due to moisture stress (Martinson and Basko,

1998). Erosion potential is low to moderate. Sediment delivery efficiency is moderate, although very limited in this parcel due to the lack of surface water features.

Cumulative Effects
DNRC strives to maintain soil productivity by limiting cumulative soil impacts to 15% or less of a harvest area as noted in the State Forest Management Plan (DNRC, 1996). As a recommended goal, if existing detrimental soil effects exceed 15% of an area, proposed harvest should minimize any additional impacts. Harvest proposals on areas with existing soil impacts in excess of 20% should avoid any additional impacts and include restoration treatments as feasible base on site-specific evaluation and plans. Past monitoring on DNRC timber sales from 1988 to 2003 has shown an average of 13.9% soil impacts across all parent materials. Stratifying the results by soil (very gravelly silt loams) similar to the Lion Mountain parcel, shows an average of approximately 12% of the harvest areas impacted (DNRC, 2004). Impacts ranged from 5.3% to 21% on 12 different harvest units. It must be noted that most of these similar sites (9 of 12) were harvested during the winter season, which typically has less impacts than summer harvest operations.

Cumulative effects from past and current uses on this parcel are limited to roads, small timber harvest and recreational uses such as hiking. In addition, it is assumed that firewood gathering has occurred throughout the last 75 years. Because, past timber harvest entries are very limited in this parcel, cumulative impacts to soils from compaction and displacement are estimated to cover less than 5% of the project area.

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

Action Alternative
One unit totaling approximately 221 acres would be commercially harvested under the Action Alternative using conventional ground-based equipment. In addition, approximately 0.2 miles of new road would be constructed and approximately 0.3 miles of road would be maintained or have minor drainage improvements installed as necessary to meet BMPs. Harvest may be completed under summer or winter conditions.

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

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

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

2) On ground skidding units, the contractor and sale administrator would agree to a general skidding plan prior to equipment operations. Skid trail planning would identify which main trails to use, and what additional trails are needed. Trails that do not comply with BMPs (i.e.

draw bottom trails) would not be used and may be closed with additional drainage installed where needed or grass seeded to stabilize the site and control erosion.

3) Tractor skidding should be limited to slopes less than 40% unless the operation can be completed without causing excessive erosion. Short steep slopes above incised draws may require a combination of mitigation measures based on site review, such as adverse skidding to ridge or winch line skidding from more moderate slopes less than 40%.

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

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

6) Retain 10 to 15 tons large woody debris and a majority of all fine litter feasible following harvest. On commercial thin 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 harvest, return skid slash and evenly distribute within the harvest area, or 3) cut off tops from every third bundle of logs so that tops are dispersed as skidding progresses.

Considering data from the DNRC Soil Monitoring Report (DNRC, 2004), the implementation of Forestry Best Management Practices has resulted in less risk of detrimental soil impacts from erosion, displacement and severe compaction. While the report noted that the impacts were more likely on the fine textured soils and steep slopes, reduced soil productivity due to compaction and displacement may occur on coarser parent materials similar to those found in the state parcels. Also, the greatest impacts were noted where harvest implementation departed from BMPs such as limiting ground-based skidding to slopes of 40 percent or less.

Comparing the soil type map, field reconnaissance notes and topographic map features with the proposed harvest unit map indicates that under this alternative ground-based skidding would occur on slopes of up to 40%, on well-drained relatively rocky soils. The extent of impacts expected would likely be similar to those reported by Collins (DNRC, 2004), or approximately 12-14% of the harvest area. Table ST-2 summarizes the expected impacts to soils within harvest units.

Table ST-2: Expected acres of impact to soil from compaction and displacement

Harvest Method and Season	No Action Alternative	Action Alternative
Ground Based (12-14% of harvest area)	0	27-31 acres
Area in roads	0	0.6
Total Area of Impacts (acres)	0	27.6-31.6 acres
Total Harvest Acres	0	221
Percent Area Impacted	0	12.4%-14.3%

Road construction would likely result in more erosion than native topography; however BMP implementation would minimize the risk of erosion. Because no stream crossings are proposed, the risk of delivering soil to watercourses would be very low.

As vegetation begins to establish on the impacted areas, and freeze-thaw cycles occur, the area of reduced productivity would decrease.

Cumulative Soil Effects

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

By mitigating the direct and indirect effects with soils moisture restrictions, season of use and method of harvest, the risk of unacceptable long-term impacts to soil productivity from compaction and displacement would be low.

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WILDLIFE ANALYSIS

INTRODUCTION

During the initial scoping, no issues were identified by the public regarding wildlife impacts. Several issues were expressed from internal discussions regarding the potential effects of the proposed timber harvesting:

- Retention and recruitment of large-sized snags and coarse woody debris could be altered with timber harvesting
- Timber harvesting could alter habitats for threatened, endangered, or sensitive wildlife species and/or alter their movements through the area
- Timber harvesting could alter habitats for "sensitive" wildlife species and/or alter their movements through the area
- Big game winter range could be affected by timber harvesting and associated activities

Description of Alternatives

No Action Alternative

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

Action Alternative

Timber harvesting would aim to reduce fuel loadings and remove trees infected with insects or disease on approximately 240 acres. Younger stands (100 years or less) would be commercially thinned to approximately 25 feet between stems (65 trees per acre), favoring western larch and ponderosa pine. Older stands (150 years) would have a combination commercial thin/improvement cut, leaving the most vigorous and healthy trees; spacing would be variable, ranging from approximately 40-80 trees per acre.

ANALYSIS AREA

Existing conditions and potential effects to wildlife species are assessed at two different spatial scales. The first is the "project area," which consists of the State managed lands north of Highway 93 in section 34 in T31N, R22W. The second scale, or the "cumulative effects analysis area" relates to the surrounding landscape for assessing cumulative effects of this project and other past and reasonably foreseeable future projects. The cumulative effects analysis area consists of nine sections including section 34 and all directly adjacent sections (sections 26, 27, 28, 33, 34, and 35 in T31N, R22W; and sections 2, 3, 4 in T30N, R22W).

ANALYSIS METHODS

DNRC promotes biodiversity by taking a "coarse-filter" approach to wildlife habitat management, favoring an appropriate mix of stand structures and compositions on State lands (ARM 36.11.404). The coarse-filter approach supports diverse wildlife populations by managing for a variety of forest structures and compositions that approximate historic conditions across the landscape.

Because some species have specialized needs, DNRC also employs a "fine filter" approach for threatened, endangered, and sensitive species (TES species), focusing on these species' specific habitat requirements (ARM 36.11.406). These species are sensitive to human activities, have special habitat requirements that might be altered by timber management, or currently are or might become listed under the Federal Endangered Species Act. Because TES species usually have specific habitat requirements, consideration of their needs serves as a useful "fine filter" for ensuring that the primary goal of maintaining healthy and diverse forests is met.

To assess the existing condition of the project area and the surrounding landscape, a variety of techniques were used. Data to assist in evaluations were obtained from field visits, scientific literature research, DNRC's Stand Level Inventory (SLI) data, MT Natural Heritage Program data, and aerial photographs. To assess effects to wildlife species, existing habitat was defined, and then the changes to habitat quality and quantity resulting from each alternative was discussed.

Issue #1: Snags and Coarse Woody Debris-- *There is a concern that retention and recruitment of large-sized snags and coarse woody debris could be altered with timber harvesting.*

Existing Conditions:
Snags and coarse woody debris are important components of the forested ecosystem. Five primary functions of deadwood in the forest are: 1) increase structural diversity; 2) alter canopy microenvironment, 3) promote biological diversity, 4) provide important habitat for wildlife, and 5) act as a storehouse for nutrient and organic matter recycling agents (Parks and Shaw 1996). Snags and defective trees (including partially dead, spike top, broken top, etc.) are used by a wide variety of wildlife species for nesting, denning, roosting, feeding, and cover. Snags and defective trees may be the most valuable individual component of Northern Rocky Mountain forests for wildlife species (Heijl and Woods 1991). The quantity, quality, and distribution of snags affect the presence and population size of many of these species. Larger diameter, taller snags tend to provide nesting sites, while shorter snags, smaller diameter snags and stumps tend to provide feeding sites for a variety of birds and mammals.

Coarse woody debris (CWD) provides food sources, areas with stable temperatures and moisture, shelter from the environment, lookout areas, and food storage sites for several wildlife species. Small mammals, such as red-backed voles (*Clethrionomys gapperi*) to large mammals, such as black bears (*Ursus americana*) rely on deadwood for survival and reproduction. The size, length, decay, and distribution of woody debris affect their capacity to meet these life requisites. Logs less than 6 feet in length tend to dry out and provide limited habitat for wildlife species. Single scattered downed trees could provide lookout and travel sites for squirrels or access under the snow for small mammals and weasels, while log piles provide foraging sites for weasels and denning sites for Canada lynx (*Lynx canadensis*).

Within the area proposed for treatment, significant mortality in the lodgepole pine has created an abundance of snags and CWD. CWD is heavily abundant in areas, although most of it is <10" diameter. Large-sized snags (21" dbh or larger) and medium-sized snags (15-20" dbh) are rare. Therefore, although deadwood is dense and abundant in the proposed treatment area, the size classes are not those that provide a diversity of habitats for wildlife species—especially not those, like pileated woodpeckers, for example—that need larger (15"+ dbh) snags for nesting. Open roads, proximity to town, and the relatively flat terrain in much of the project area also leads to a loss of large snags or CWD due to firewood gathering.

Environmental Consequences:
Direct and Indirect Effects of the No-Action Alternative on Snags and Coarse Woody Debris:
All the dead wood (snags and coarse woody debris) that currently exist on the project area would be retained. This material would provide foraging opportunities for some wildlife species, and large snags and CWD may provide denning or nesting sites. Through time, snag and CWD densities would continue to increase as more trees die and fall. Deadwood could be removed by firewood gatherers near open roads, but lacking a fire, deadwood resources would continue to be

abundant in the project area. Thus, no short-term effects and slightly positive long-term effects for wildlife species that rely on snags and coarse woody debris would be expected.

Direct and Indirect Effects the Action Alternative on Snags and Coarse Woody Debris:
Many of the standing snags would be harvested under this alternative, although a minimum of two large snags (21" or larger) would be retained per acre. If large snags are not available, snags in the next largest size class will be retained. These trees will continue to provide habitat for wildlife species that utilize large dead trees for nesting and/or foraging. This alternative would also decrease coarse woody debris densities. Dead trees that are currently down would be salvaged if possible. Others may be piled and burned, but measures would be taken to ensure some CWD is left in areas that are not adjacent to open roads. Next to open roads, CWD would be heavily reduced to provide a high standard for fuels reduction. This could remove potential habitat and feeding structures for wildlife species in the area. However, future snag and CWD quality would be enhanced with silvicultural prescriptions that should lead to the re-establishment of western larch and ponderosa pine across much of the project area. Given the current over-abundance of smaller-sized snags and CWD but the lack of large, high quality deadwood resources, minor negative direct and indirect effects to wildlife species that use these resources would be expected.

Cumulative Effects of the No-Action Alternative on Snags and Coarse Woody Debris:
Snags and CWD would not be altered in the project area. Wlesewhere in the cumulative effects analysis area, snags have been or may soon be reduced with the Lion Mountain 612 permit, Beaver/Swift/Skyles Timber Sale, and activities on private lands. Throughout the analysis area, snags and CWD would occur at fairly low densities compared with forests that are not in the urban interface. However, since no harvesting would occur, there would be no cumulative effects to snags and CWD.

Cumulative Effects of the Action Alternative on Snags and Coarse Woody Debris:
Under this alternative, snags and CWD would be reduced within the project area. These reductions would be additive to the reductions in deadwood resources associated with the Lion Mountain 612 permit, Beaver/Swift/Skyles Timber Sale, and activities on private lands within the cumulative effects analysis area that have recently removed snags and CWD (mostly for the sake of housing developments). Throughout the analysis area, snags and CWD would occur at fairly low densities compared with forests that are not in the urban interface. Harvesting associated with this project would increase the acreage that does not provide high snag and CWD densities within the cumulative effects analysis area. However because larger, high quality snags and CWD would be retained on the project area where possible, and the project would affect a relatively small area, cumulative effects to wildlife relying on snags and CWD would be minimal.

Issue #2: Threatened and Endangered Species—*There is a concern that timber harvesting could alter habitats for threatened or endangered wildlife species and/or alter their movements through the area.*

Existing Conditions:
Two terrestrial species indigenous to Montana are listed under the Endangered Species Act of 1973. The Canada lynx and grizzly bear are classified as "threatened." The gray wolf, which was recently removed from the Endangered Species List, was still listed when initial planning for this project began, and the listing decision may be reversed by lawsuit before this project is completed. Thus wolves will also be considered "endangered" in this analysis.

Canada Lynx (*Lynx canadensis*)
Canada lynx are associated with subalpine fir forests, generally between 4,000 to 7,000 feet in elevation in western Montana (Ruediger et al. 2000). Primary lynx habitats are subalpine-fir types with abundant coarse woody debris for denning; however, lynx will use a mix of species compositions (subalpine fir, lodgepole pine, Douglas-fir, grand fir, and western larch). The proposed project area ranges from approximately 3,240 to 3,840 feet in elevation and does not contain typical lynx habitats. It does, however, lie within big game winter range where lynx use is unlikely to due abundances of other carnivores. Thus since lynx habitats are not present and lynx use is highly unlikely, no risk of direct, indirect, or cumulative effects would be expected under either alternative, and this species will not be discussed further.

Gray Wolf (*Canis lupus*)
The wolf is a wide-ranging species that occupies a wide range of vegetation community types, which possess adequate prey and low potential for wolf/human encounters or disturbance, especially at den and/or rendezvous sites. The proposed project area is located approximately 8 miles southeast of the Lazy Creek wolf pack's home range.

The abundant big game species wintering and living in the vicinity of the project area could provide prey for wolves. However, given the current level of disturbance associated with Hwy 93 and human developments near the proposed project area, wolf use of the area is expected to be transitory or sporadic if at all. Thus, since wolf use of the area is unlikely, no risk of direct, indirect, or cumulative effects would be expected under either alternative, and this species will not be discussed further.

Grizzly Bear (*Ursus arctos*)
Grizzly bears are wide-ranging mammals that use forested upland habitats. Preferred grizzly bear habitats are meadows, riparian zones, avalanche chutes, subalpine forests, and big game winter ranges, all of which provide seasonal food sources. The proposed project area is >4 miles southwest of the NCDE Recovery Zone (USFWS 1993) and is just outside of "occupied habitat" (Wittinger 2002). Grizzly bears could use of the project area as a periphery part of their home range or for travel. Specific habitat features that typically attract grizzly bears (e.g. riparian areas, avalanche chutes, secure forest) are not present in the project area. The density of houses, open roads (approx. 3 mi/sq mi in Section 34), and human developments near the project area and throughout much of the cumulative effects analysis area likely deter use of the area, unless bears become habituated to human disturbance.

Potential effects to grizzly bears related to forest management projects include 1) disturbance and risk of mortality associated with open roads; 2) risk of disturbance to bears in seasonally important habitats; and 3) reduction in hiding cover (defined in ARM 36.11.403(32) as "vegetation that provides visual screening capable of obstructing from view 90% of an adult grizzly bear at 200 ft"). This analysis considers the potential effects to grizzly bears in terms of these issues.

Environmental Consequences:

Direct and Indirect Effects of the No-Action Alternative on Grizzly Bears:
No changes to road densities, human disturbance, or hiding cover would occur under this alternative. Thus, no direct or indirect effects to grizzly bears would be expected.

Direct and Indirect Effects of the Action Alternative on Grizzly Bears Grizzly Bears:
Under this alternative, open road densities would not increase; however, approximately 1000 ft (0.2 mi) of road could be built. Vehicular access would be restricted with a gate or other closure device. Human disturbance would increase during harvesting, which could displace any bears using the area. However, the project area does not include seasonally important habitats for grizzly bears. Hiding cover could be reduced in some parts of the project area where more intensive harvest occurs. The prescription, however, calls for approximately 40-80 leave trees per acre, which would provide some visual screening for bears. Additionally, efforts will be made to retain patches of young regeneration throughout the unit where appropriate. Visual screening will be left along open roads where practicable, in accordance with ARM 36.11.433(1)(b)), but due to the goals for fuels reduction, dense visual screening may not be appropriate in many areas. Overall, direct and indirect effects to grizzly bears would be expected to be minor with this alternative, given that 1) open road densities will not increase, 2) seasonally important habitats will not be disrupted, and 3) hiding cover reductions would not compromise bears' safety or security.

Cumulative Effects of the No-Action Alternative on Grizzly Bears:
Motorized access and hiding cover in the project area would remain unchanged. Reductions in hiding cover and increases in disturbance have recently occurred with the Lion Mountain 612 project adjacent to the proposed project area, and are anticipated to occur with the Beaver/Swift/Skyles Timber Sale proposed within parts of the cumulative effects analysis area. Because this alternative would not affect open roads, disturbance, or hiding cover within the cumulative effects analysis area, no cumulative effects to grizzly bears would be expected.

Cumulative Effects of the Action Alternative on Grizzly Bears:
Although open road densities would not increase with this alternative, total roads could increase by 0.2 miles, adding to the abundance of . The increase in roads that provide non-motorized access to potential bear habitats in the cumulative effects analysis area has increased especially within the last decade or two, as human development has increased in the analysis area. Additional closed roads could be built with the Beaver/Swift/Skyles Timber Sale, and the Trail Runs Through It project would further increase non-motorized access in the cumulative effects analysis area, resulting in increased disturbance for bears using the area. Reductions in hiding cover would be additive to those associated with the Lion Mtn 612 permit, Beaver/Swift/Skyles Timber Sale, and activities on private lands within the cumulative effects analysis area that have recently removed hiding cover (mostly for the sake of housing developments). Given that 1) only minor increases in road densities and no changes to open roads will occur, 2) the fact that seasonally important habitats will not be disturbed, and 3) the minor additional reductions in hiding cover, the cumulative effects of this alternative would be expected to be minor, and grizzly bear use of the cumulative effects analysis area would likely remain at its presently low rate.

Issue #3: Sensitive Species -- *There is a concern that timber harvesting could alter habitats for "sensitive" wildlife species and/or affect their movements through the area*

Existing Conditions:
The proposed project area provides potential habitat for three species considered "sensitive" by DNRC at the Northwest Land Office. Table W-1 lists species considered sensitive by the DNRC on the Northwest Land Office, and shows whether each sensitive species was either included in the following analysis of was removed from further analysis due to lack of habitat availability.

Table W-1. Status of sensitive species for the DNRC's Northwest Land Office in relation to the proposed Lion Mountain Fuels Reduction project.

STATUS	SPECIES	DETERMINATION – BASIS
Sensitive species	Bald eagle	No further analysis conducted – The proposed project occurs >5 miles from the nearest known bald eagle nest (on Whitefish Lake) and is outside of the primary use areas associated with this territory. Given the distance from the nest and habitats present, no direct, indirect, or cumulative effects to bald eagles would be anticipated.
	Black-backed woodpecker	No further analysis conducted – No recently (less than 5 years) burned areas are in the project area. Thus, no direct, indirect or cumulative effects would be expected.
	Coeur d'Alene salamander	No further analysis conducted – No moist talus or streamside talus habitat occurs in the project area. Thus, no direct, indirect or cumulative effects would be expected.
	Columbian sharp-tailed grouse	No further analysis conducted – No suitable grassland communities occur in the project area. Thus, no direct, indirect or cumulative effects would be expected.
	Common loon	No further analysis conducted – No lakes exist within the project area. The nearest lake that could support loons is Skyles Lake, in the adjacent section to the West. The harvest units would be >1,000 feet from the lake shore. Thus no direct, indirect, or cumulative effects would be expected.
	Fisher	No further analysis conducted – The proposed treatments would not affect the overall cover type within the stand, thus the stand would remain a preferred fisher habitat type, though crown and stocking densities would be reduced in this upland habitat. However, fisher use of the area is unlikely, given the lack of riparian habitats or forest connectivity to fisher habitats and the amount of human development in the vicinity. Thus, negligible direct, indirect, or cumulative effects would be expected.
	Flammulated owl	Included – Suitable dry ponderosa pine habitats occur within the project area.
	Harlequin duck	No further analysis conducted – No suitable high-gradient stream or river habitats occur in the project area. No direct, indirect or cumulative effects would be expected.
	Northern bog lemming	No further analysis conducted – No suitable sphagnum bogs or fens occur in the project area. Thus, no direct, indirect or cumulative effects would be expected.
	Peregrine Falcon	No further analysis conducted – No potential habitat is expected in the project area. Thus, no direct, indirect or cumulative effects would be expected.
	Pileated woodpecker	Included- Western large/Douglas-fir, ponderosa pine, and/or mixed-conifer habitats occur in the project area.
Sensitive Species (cont.)	Townsend's big-eared bat	No further analysis conducted ─ DNRC is unaware of any mines or caves in the project area or close vicinity that would be suitable for use by Townsend's big-eared bats. Thus, no direct, indirect or cumulative effects would be anticipated.

Flammulated owls (*Otus flammeolus*)
Flammulated owls are small, migratory, insectivorous forest owls that inhabit old, open stands of warm-dry ponderosa pine and cool-dry Douglas-fir forests in the western United States. These owls are secondary cavity nesters, usually nesting in cavities excavated by pileated woodpeckers or northern flickers in large aspen, ponderosa pine, or Douglas-fir trees or snags. Nesting typically occurs in stands with moderate canopy closure (30-50%) with at least 2 canopy layers (MCallum 1994). Flammulated owls feed on moths and other insects, and thus need fairly open forests in which to forage.

Potential habitats of ponderosa pine and Douglas-fir/western larch exist within much of the proposed project area. SLI data indicates approximately 99 acres of potential flammulated owl habitat in the project area. Tree densities within these areas have increased due to fire suppression and lack of timber stand management, and thus highly suitable habitat for flammulated owls is likely limited. Effects to flammulated owls were assessed with consideration to the amount of open, mature stands of ponderosa pine/Douglas-fir and the abundance of large snags.

Environmental Consequences:
Direct and Indirect Effects of the No-Action Alternative on Flammulated Owls:
No changes to the existing conditions on DNRC-managed lands would occur. The lack of open areas would hinder the use of the area for foraging flammulated owls. However, large snags would likely remain scarce, as competition would not allow larger trees to grow in the area. Thus in the long term, habitat for flammulated owls would be suppressed.

Direct and Indirect Effects of the Action Alternative on Flammulated Owls:
The proposed harvest would occur in Douglas-fir/western larch forests. Although some ponderosa pine is present, Douglas-fir encroachment has reduced the habitat suitability for flammulated owls. The proposed treatment would favor western larch and ponderosa pine, and create a more open-structured forest. Thus the effects of the proposed treatment should have no direct effects on flammulated owls, and may increase habitat suitability, thus potentially having positive indirect effects on flammulated owls.

Cumulative Effects of the No-Action Alternative on Flammulated Owls:
Untreated stands in the cumulative effects analysis area would be expected to continue developing a closed canopy and become denser. However, adjacent lands that have been treated with the Lion Mountain 612 permit and could be treated with the Beaver/Swift/Skyles Timber Sale have or could enhance conditions for flammulated owls by providing more open stands. Elsewhere on adjacent ownerships, some stands will continue to mature and become denser with lack of disturbance, which would not benefit flammulated owls. No cumulative increase in flammulated owl habitat would be expected.

Cumulative Effects of the Action Alternative on Flammulated Owls:
The minor improvement in flammulated owl habitats associated with the proposed treatment would be additive to those associated with the Lion Mountain 612 permit and the Beaver/Swift/Skyles Timber Sale, which have or could enhance conditions for flammulated owls by providing more open stands. Elsewhere on adjacent ownerships, some stands will continue to mature and become denser with lack of disturbance, which would not benefit flammulated owls. A slight cumulative increase in flammulated owl habitat would be expected with this alternative.

Pileated woodpeckers (*Drycopus pileatus*)
Pileated woodpeckers are closely associated with mature and late successional forest communities at low to mid elevations. The pileated woodpecker plays an important ecological role by excavating cavities that are used in subsequent years by many other species of birds and mammals. Preferred nest trees for pileated woodpeckers are western larch, ponderosa pine, black cottonwood, and quaking aspen, usually 20 inches dbh and larger. Pileated woodpeckers primarily eat carpenter ants and other insects, which inhabit large downed logs, stumps and snags. Nesting habitat consists of mature stands below 5,000 feet in elevation that are 50-100 contiguous acres in size, with 100-125 square feet per acre of basal area and a relatively closed canopy (Aney and McClelland 1985).

Within the project area, 16 acres of pileated woodpecker habitat were identified by SLI data models. Because of the lack of large snags and live trees, and the lack of a large contiguous area of habitat, nesting likely does not occur within the proposed project area. The area could, however, be used for feeding sites, as snags and coarse woody debris are abundant in the proposed project area.

Environmental Consequences:
Direct and Indirect Effects of the No-Action Alternative on Pileated Woodpeckers:
No changes to the existing conditions on DNRC-managed lands would occur. Shade-intolerant trees would continue to grow and die over time, providing nesting and foraging habitats. As these trees die, replacement shade-intolerant trees would be underrepresented in the stand unless other disturbances occur. Through time, few trees would attain the size required for pileated woodpeckers due to the high stocking densities. A reduction in suitable nesting trees would be likely over time. Thus, foraging habitat for pileated woodpeckers could benefit in the short-term with additional snags, but nesting and foraging habitat in the long term would decrease.

Direct and Indirect Effects of the Action Alternative on Pileated Woodpeckers:
Pileated woodpeckers tend to be tolerant of human disturbance (Bull and Jackson 1995), but might be temporarily displaced by the proposed harvesting. Reductions in canopy cover could decrease the value of nesting habitat in the short-term until tree canopies grow back to ~40% or more. Elements of the forest structure important for pileated woodpeckers would be retained, including live snags and coarse woody debris where applicable, numerous leave trees, and snag recruits. In the short-term, the reduction in snags and coarse woody debris could reduce foraging opportunities, but long-term habitat values would be expected to increase as leave trees grow larger and provide larger snags for nesting and foraging.

Cumulative Effects of the No-Action Alternative on Pileated Woodpeckers:
Untreated stands in the cumulative effects analysis area would be expected to continue developing a closed canopy and become denser, and perhaps support pileated woodpeckers. However, adjacent lands that have been treated with the Lion Mountain 612 permit and could be treated with the Beaver/Swift/Skyles Timber Sale could temporarily decrease foraging opportunities for pileated woodpeckers by reducing snags and coarse woody debris. Because this alternative would not alter snags and coarse woody debris, no short-term cumulative effects would be expected. Long-term effects could include the further reduction in potential nesting sites if shade-intolerant trees are not allowed to grow into large snags.

Cumulative Effects of the Action Alternative on Pileated Woodpeckers:
Untreated stands in the cumulative effects analysis area would be expected to continue developing a closed canopy and become denser, and perhaps support pileated woodpeckers. However, adjacent lands that have been treated with the Lion Mountain 612 permit and could be

treated with the Beaver/Swift/Skyles Timber Sale could temporarily decrease foraging opportunities for pileated woodpeckers by reducing snags and coarse woody debris. Thus the potential short-term reduction in foraging opportunities would have minor cumulative effects to pileated woodpeckers. In the long-term, however, all of the treatments would lead to an increase in larger trees and snags, which would have positive cumulative effects to pileated woodpecker nesting habitat.

Issue #4: Big Game Winter Range -- *There is a concern that winter range could be affected by timber harvesting and associated activities*

Existing Conditions:
Winter ranges enable big game survival by minimizing the effects of sever winter weather conditions. Winter ranges tend to be relatively small areas that support large numbers of big game, which are widely distributed during the remainder of the year. Characteristics of habitats that make them suitable for buffering the effects of severe winter conditions include having adequate midstory and overstory to reduce wind velocity and moderate ambient temperatures. Besides providing a moderated climate, the snow-intercept capacity effectively lowers snow depths, which enables big game movement and access to forage.

Montana Fish, Wildlife, and Parks identified approximately 2600 acres of elk and mule deer winter range NW of Whitefish, about 75 acres of which exists in Section 34, and 1140 acres exist in the cumulative effects analysis area. No moose or white-tailed deer winter range exists in Section 34 or in the cumulative effects analysis area.

Environmental Consequences:
Direct and Indirect Effects of the No-Action Alternative on Big Game Winter Range:
Big game thermal cover in the project area would not be altered in the short-term. Existing stands would continue to provide moderate thermal cover for big game, though openings in the canopy caused by dying trees would decrease thermal cover and snow intercept over time. Additionally, the amount of dead jack-strawed trees in area would continue to make movement through the area difficult for big game. Thus, minor negative effects to big game would be expected.

Direct and Indirect Effects of the Action Alternative on Big Game Winter Range:
Some displacement of big game animals could occur as a result of the proposed harvesting operations, especially if conducted in the winter. Approximately 55 acres of winter range would be affected with this alternative. Thermal cover and snow intercept for big game would be reduced with a reduction in canopy, as the prescription calls for leaving approximately 6-10 feet of open air space between tree canopies in some areas. However, the clean-up of jack-strawed trees in some areas could make for easier travel throughout much of the proposed treatment area. Thus, minor negative effects to big game would be expected.

Cumulative Effects of the No-Action Alternative on Big Game Winter Range:
No changes to thermal cover and snow intercept would be anticipated. Thermal cover and snow intercept was slightly altered with the Lion Mountain 612 permit, which opened the canopy to an extent. Winter range in the cumulative effects analysis area could also be affected by the Beaver/Swift/Skyles Timber Sale, which proposes commercial thins and regeneration harvests within portions of the winter range. Continued forest management and development on other ownerships could decrease winter range values, while continued succession in non-managed or recently-managed areas could gradually improve winter range. Continued use of the winter range by big game would be expected.

Cumulative Effects of the Action Alternative on Big Game Winter Range:
Thermal cover and snow intercept potential would be decreased on approximately 55 acres. These reductions would be additive to reductions associated with the Lion Mtn Mountain permit, which opened the canopy to an extent. Winter range in the cumulative effects analysis area could also be affected by the Beaver/Swift/Skyles Timber Sale, which proposes commercial thins and regeneration harvests within portions of the winter range. Continued forest management and development on other ownerships could decrease winter range values, while continued succession in non-managed or recently-managed areas could gradually improve winter range. Continued use of the winter range by big game would be expected, and thus minor cumulative effects to big game winter range would be expected.

Mitigations for Wildlife Species:

- Retain at least two large snags (21" dbh or greater) and two large snag recruits per acre; if large snags and recruits are not available, substitute trees in the next largest size class (15-21" dbh)
- Retain coarse woody debris where possible, especially large rotting pieces.
- Close new road construction to vehicular traffic using a gate or other closure device.
- Retain visual screening along open roads where appropriate.
- Retain dense patches of regenerating trees to provide visual screening.

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Attachment 4
Mitigations

Mitigation Measures for Action Alternative

The following mitigations would be required under the action alternative:

Vegetation

- Grass seed new and disturbed roads and landings; spot spray new weed infestations
- Washing logging equipment prior to use.
- Trample slash in skid trails
- Treating existing weed populations along or within roads with herbicide spray.

Water Resources and Soils

- Upgrade roads to incorporate Forestry Best Management Practices (BMPs)
- Limit timber harvest activities to time when ground is frozen or soil moisture is below 20%
- Apply all applicable Forestry Best Management Practices (including Streamside Management Zone Law and Rules).

Wildlife

- Maintain a minimum of 2 snags and 2 snag recruitment trees over 21 inches dbh per acre, on average, for all harvest units. If unavailable, retain the next largest size class. Additional snag resources could be retained within the harvest units.
- Retain 10-15 tons CWD post harvest.
- Prohibit contractors from carrying firearms on restricted roads.
- If a wolf den or rendezvous site were identified, operations would be suspended within 1 mile or 0.5 mile, respectively.
- Reduce open road density following completion of the project through road closures.
- During the harvest activities, restrict public motorized access along restricted routes through signing when operations are active and closure devices when operations are inactive (nights, weekends, shutdown periods).
- Protect submerchable trees, brush, some cull material and non-commercial trees would occur in select areas that have potential for high levels of human activity to provide visual screening cover for big game species.

Attachment 5
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