

# Lazy Swift 2 Timber Sale



## Draft Checklist Environmental Assessment December 2012

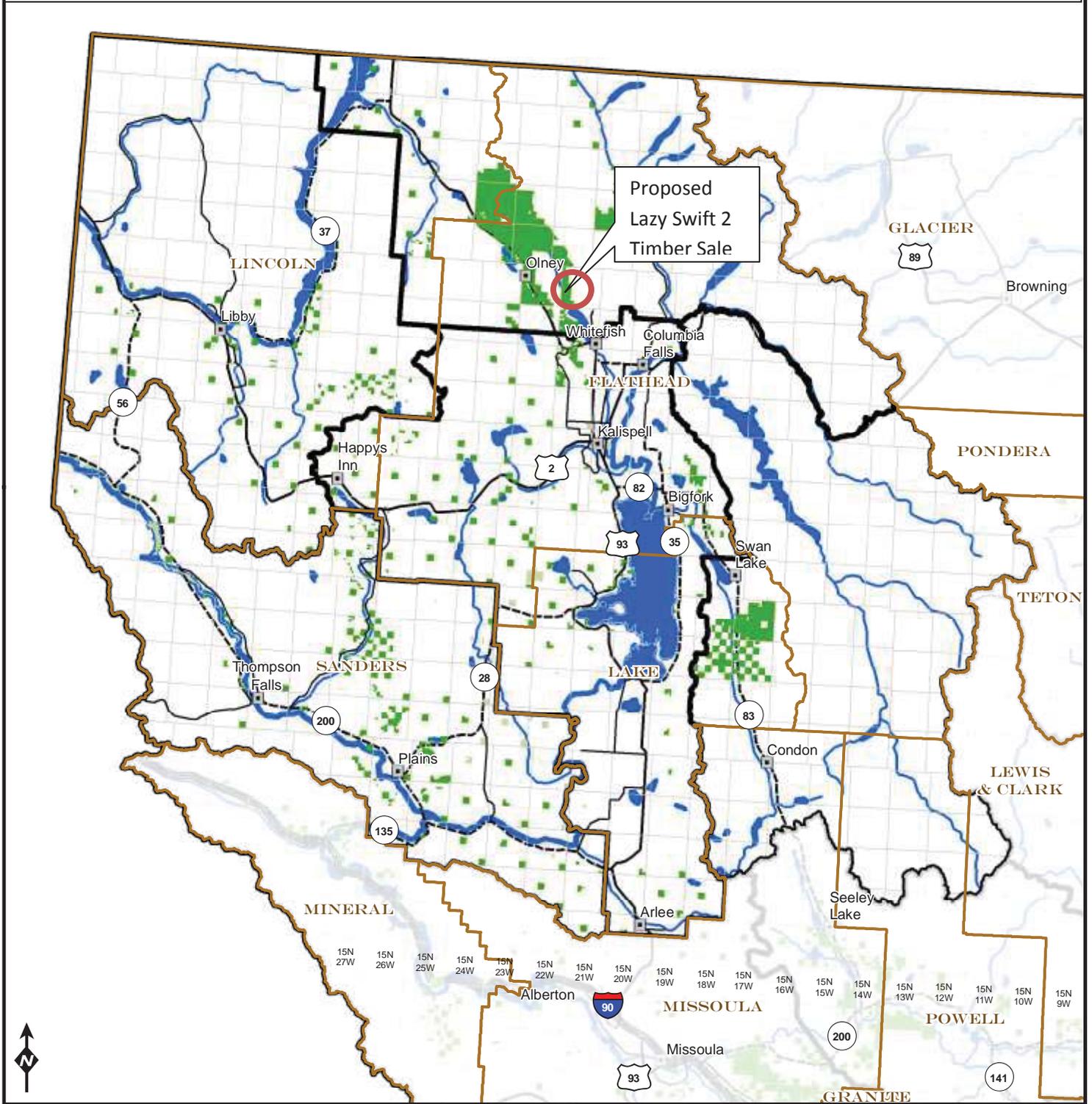
Department of Natural Resources and Conservation  
Northwestern Land Office— Stillwater Unit



# Lazy Swift 2 Timber Sale Vicinity Map

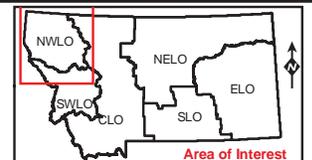
## Sections 19, 30 & 31 of T32N R22W

### Flathead County



	Interstate Highway		County		City
	U.S. Route		DNRC other		Township/Range
	State Highway		DNRC managed for timber		Management Unit
	Secondary Roads				

6 December 2010  
 Montana DNRC  
 Technical Services Section/dr



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## DRAFT CHECKLIST ENVIRONMENTAL ASSESSMENT

<b>Project Name:</b>	<b>Lazy Swift 2 Timber Sale</b>
<b>Proposed Implementation Date:</b>	Summer 2013
<b>Proponent:</b>	Montana Department of Natural Resources (DNRC), Northwestern Land Office, Stillwater Unit
<b>Location:</b>	Sections 19, 30, and 31 of Township 32 north, Range 22 west
<b>County:</b>	Flathead

### I. TYPE AND PURPOSE OF ACTION

Montana Department of Natural Resources and Conservation (DNRC), Stillwater Unit, proposes to harvest approximately 5.5 million board feet of timber from the Stillwater State Forest (*see Vicinity Map*). The proposed activities would regenerate new stands of healthy trees as well as improve the vigor and growth of the remaining trees. This would not only benefit the forest but would also benefit the state trusts into the future. The proposed project would also reduce the amount of forest fuels and density of trees to mitigate potential effects of wildland fire. This project would produce an estimated \$900,000 in revenue and approximately \$133,000 in Forest Improvement Fees for the Montana State University Agricultural College (MSU 2<sup>nd</sup> Grant) Trust.

The lands in this project are held in trust by the State of Montana for the support of specific beneficiary institutions (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners (Land Board) and DNRC are legally required to administer these trust lands to produce the largest measure of reasonable and legitimate long-term return for the trust beneficiaries (Montana Code Annotated 77-1-202).

This project was developed in compliance with the State Forest Land Management Plan (SFLMP), the Administrative Rules for Forest Management (Forest Management Rules; ARM 36.11.401 through 471), and the Montana DNRC Forested State Trust Lands Habitat Conservation Plan (HCP). Sections 30 and 31 are within the Swift Creek Subarea of the Whitefish Neighborhood Plan (WNP) and all activities within the proposed timber sale are compatible with the future goals of the WNP, as well as other applicable state and federal laws.

### II. PROJECT DEVELOPMENT

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

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

In March 2012, DNRC solicited public participation on the Lazy Swift 2 Timber Sale Project. Scoping notices were advertised in the Daily InterLake (Kalispell), and in the Whitefish Pilot (Whitefish). The Initial Proposal (with maps) was posted on the DNRC website, sent to neighboring landowners, individuals, agencies, industry representatives, and other organizations that have expressed interest in DNRC's management activities. The mailing list of parties receiving the Initial Proposal, and the comments received, are located in the project file at the Stillwater Unit Headquarters. The public comment period for the Initial Proposal was open for 30 days. DNRC received three letters, four emails, and one phone call.

In May 2012, the Interdisciplinary (ID) Team began to compile issues based on the comments received and to gather information related to current conditions. From the public scoping the following comments and/or concerns were presented:

ISSUE/CONCERN	RESPONSE
Timber harvest activities could negatively impact water quality in Swift Creek and Lazy Creek.	Please refer to Section III.5 and Attachment IV-WATER RESOURCES for information on water quality.
Cumulative effects from timber harvesting may affect channel stability and fisheries habitat by decreasing the amount of recruitable woody debris in streams and/or increasing stream temperatures.	Please refer to Section III.8.B and Attachment IV-WATER RESOURCES for information on water quality.
Timber harvest activities could negatively impact riparian zones.	Please refer to Section III.8.B and Attachment IV-WATER RESOURCES for information on water quality.
How proposed project conforms to the Whitefish Neighborhood Plan (WNP), which identifies area as high value for watershed health, wildlife habitat, old growth, and recreational opportunities.	Please refer to Section IV.20 for information related to the WNP.
Timber harvest activities could impact wildlife.	Please refer to Section III.8 and Attachment V-WILDLIFE ANALYSIS for information on wildlife.
Timber harvest activities could impact the soil resource.	Please refer to Section III.4 for information on soils.
Timber harvest activities could impact recreational opportunities.	Please refer to Section IV.20 for information on recreation.
Timber harvest activities could impact the viewshed.	Please refer to Section III.11 for information related to viewshed.
Timber harvest activities could impact the aesthetics of the project area.	Please refer to Section III.11 for information on aesthetics.
Issuance of Timber Conservation Licenses could reduce the future revenue stream of licensed lands.	This is out of the scope of this project.

Overall, soils, wildlife, vegetative, and hydrological concerns were identified by DNRC resource specialists and field foresters as elements to be addressed on this project. With all this information, the ID Team determined that the issues raised by the public and DNRC resource specialists directly related to the proposed actions could be addressed in one action alternative.

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

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

### Montana Department of Environmental Quality (DEQ)

DNRC, classified as a major open burner by DEQ, is issued a permit from DEQ to conduct burning activities on state lands managed by DNRC. As a major open-burning permit holder, DNRC agrees to comply with the limitations and conditions of the permit.

### Montana/Idaho Airshed Group

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

### Montana Department of Fish, Wildlife and Parks (DFWP)

A Stream Protection Act Permit (124 Permit) is required from DFWP for activities that may affect the natural shape and form of a stream's channel, banks, or tributaries. Such activities include the installation and/or replacement of numerous stream crossing culverts.

## United States Fish and Wildlife Service (USFWS)

DNRC is managing the habitats of threatened and endangered species on this project by implementing the Montana DNRC Forested Trust Lands Habitat Conservation Plan (HCP) and the associated Incidental Take Permit that was issued by the United States Fish & Wildlife Service (USFWS) in February of 2012 under Section 10 of the Endangered Species Act. The HCP identifies specific conservation strategies for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout, and Columbia redband trout. This project complies with the HCP, which can be found at [www.dnrc.mt.gov/HCP](http://www.dnrc.mt.gov/HCP).

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### 3. ALTERNATIVE DEVELOPMENT:

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

The No-Action and Action Alternatives are described in this section. The decisionmaker may select a modification or combination of these alternatives.

#### Alternatives Considered

- **No-Action Alternative**

Under this alternative, no timber would be harvested and therefore no revenue would be generated for the MSU 2<sup>nd</sup> Grant Trust at this time. Salvage logging, firewood gathering, recreational use, fire suppression, noxious-weed control, additional requests for permits and easements, and ongoing management requests may still occur. Natural events, such as plant succession, tree mortality due to insects and diseases, windthrow, down fuel accumulation, in-growth of ladder fuels, and wildfires would continue to occur.

The No-Action Alternative is used as a baseline for comparing the effects that the Action Alternative would have on the environment and is considered a possible alternative for selection.

- **Action Alternative**

The Action Alternative was developed to include timber harvest and to address current forest and resource conditions within the project area and cumulative effects areas. The following are the main issues related to forest and resource conditions:

- High levels of root and stem rot have caused and will continue to cause mortality in the overstory.
- The understory that is regenerating under the mature forest canopy will move current cover types away from desired future conditions if harvesting and forest improvement actions do not occur.
- Large areas of blowdown up to several acres in size, particularly in Engelmann spruce, would continue to be a loss of revenue for the trust.

As a result, mitigation measures developed for this project would:

- Maintain a 300-foot travel corridor for wildlife, linking the Swift Creek and Lazy Creek drainages (see Figure W-1 – Wildlife Analysis Areas in *Attachment V-- Wildlife Analysis*).
- Continue to provide hiding cover, nesting sites, and important habitat components for wildlife.
- Provide a buffer between the logging activities and several eroding Pleistocene clay banks adjacent to Swift Creek.
- Improve timber stand health and strive to maintain the desired forest conditions in regard to tree species occupying the project area.

A more detailed description of mitigation measures can be found in *Attachment VI - Stipulations and Specifications*.

### **Details**

Under this alternative, the silvicultural and harvest treatments include:

- harvesting approximately 5.5 million board feet of timber from approximately 659 acres;
- regeneration of new stands of healthy trees on approximately 639 acres through seed tree with reserves treatments;
- site scarification;
- planting, and natural regeneration; and
- commercial thinning of approximately 20 acres.

Detailed descriptions of the harvesting methods and silvicultural prescriptions can be found in *Attachment II – Project Map and Attachment III – Prescription Table*.

The road work associated with this project includes:

- Maintenance of up to 4.6 miles of existing road
- 3.4 miles of new road construction
  - 1.4 miles of new permanent road
  - 2.0 miles of temporary road
- 0.6 miles of existing road bed reconstructed to a temporary road standard
- 0.3 miles of temporary snow road
- Reclaim 2.5 miles of existing road

## **III. IMPACTS ON THE PHYSICAL ENVIRONMENT**

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

### **4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:**

*Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify direct, indirect, and cumulative effects to soils.*

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

No timber harvesting or associated activities would occur under this alternative. Skid trails from past harvesting would continue to recover from compaction as freeze-thaw cycles continue and vegetation root mass increases. Because harvesting would not be implemented, compaction, displacement and erosion rates above natural levels would not be expected. Coarse woody debris levels and nutrient cycling would continue as dictated by natural events. No additional adverse cumulative effects would be expected from the implementation of the No-Action Alternative.

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

Given the soil types, input from field reconnaissance, and topographic features within the proposed harvest unit map, ground-based skidding would occur on slopes of up to 40 percent. The extent of expected impacts would likely be similar to those reported in the *DNRC SOIL MONITORING REPORT (DNRC, 2011)* on post-1990 sites with similar soil textures, or approximately 14.5 percent of the harvest area for ground-based operations during summer conditions. The project proposes to harvest 659 acres; therefore, DNRC would expect moderate or higher impacts on up to 96 acres.

Although erosion would potentially result from this alternative, the magnitude, area and duration of erosion and other adverse impacts such as compaction and displacement would remain very low. Therefore the risk of unacceptable adverse direct and indirect impacts to physical soil properties would be low.

Coarse woody debris would be left on-site in volumes recommended to help maintain soil moisture and forest productivity, generally in the 10 to 24 tons per acre range for habitat types found in the harvest locations (Graham et al. 1994). Because coarse woody debris would be left on site in amounts recommended by scientific literature, and fine debris would be maintained as much as practicable, the risk of measureable adverse direct or indirect impacts to nutrient cycling would be low.

Cumulative effects would be controlled by limiting the area of adverse soil impacts to less than 15 percent of the harvest units (as recommended by the SFLMP) through implementation of Best Management Practices (BMPs), skid trail planning on tractor units, and limiting operations to dry or frozen conditions. Future harvesting opportunities would likely use the same road system, skid trails, and landing sites to reduce additional cumulative impacts. Due to these mitigation measures and the limited existing impacts, the cumulative effects from compaction, erosion and displacement would be low.

By designing the proposed harvesting operations with soil-moisture restrictions, season of use, and method of harvesting, the risk of unacceptable long-term impacts to soil productivity from compaction and displacement and nutrient pool losses would be low.

Both fine and large woody debris would be retained for nutrient cycling for long-term soil productivity. By following research recommendations on the levels of coarse and fine material left on site, the risk of cumulative impacts to forest productivity from nutrient pool loss would be low.

**Additional information can be found in the Project File: Soils, located at the Stillwater Unit office.**

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## 5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

*Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify direct, indirect, and cumulative effects to water resources.*

### **Existing Condition**

Water rights for surface water exist within three miles downstream of the project area in the Lazy and Swift Creek watersheds for domestic use, livestock watering, and irrigation use.

Designated beneficial water uses within the project area include cold-water fisheries, aquatic life support, and recreational use in the streams, wetlands, and lakes in the surrounding areas.

Roads proposed for use in conjunction with this timber sale cross relatively gentle terrain and have a total of 4 stream crossings. All of the stream crossings meet Forestry Best Management Practices by minimizing sediment delivery into streams.

There are 2 watersheds analyzed for in this project area:

- **Lazy Creek and tributaries**

Lazy Creek is the main channel of a 10,430-acre watershed that contributes surface flow to Whitefish Lake. Annual precipitation in the watershed ranges from 20 to 30 inches. The elevation ranges from 3,000 feet above sea level at the mouth of the creek at Whitefish Lake to approximately 4,800 feet above sea level at the northern boundary; however most (91%) of the watershed area is below 3,600 feet in elevation indicating that terrain is quite gentle. Ownership within the watershed is 73 percent industrial lands (Plum Creek Timber Company); 17 percent State of Montana; and 10 percent in private non-industrial ownership.

Lazy Creek and its three main tributaries—East Fork, Middle Fork and West Fork—all originate on industrial forest lands. This Class 1 stream flows into and through several meadows and wetlands as it flows across State lands for approximately 1.5 miles prior to crossing non-industrial private lands and entering Whitefish Lake. In-channel sediment sources such as mass wasting sites or excessive erosion were not found during field reconnaissance. Two other streams in the project area on state-managed lands are intermittent and discontinuous, meaning they do not contribute surface flow to a downstream body of water.

- **Swift Creek**

Swift Creek is the main channel of a 48,978-acre watershed that contributes surface flow to Whitefish Lake. Annual precipitation in the watershed ranges from 20 inches at its lowest elevations to 70 inches near Stryker Peak. Average annual precipitation is approximately 48 inches per year. The elevation ranges from 3,000 feet above sea level at the mouth of the creek at Whitefish Lake to approximately 7,420 feet above sea level at the watershed divide. Ownership within the watershed is 72 percent State Trust Lands managed by DNRC, 19 percent federal lands managed by the USFS, 8.5 percent industrial timber lands, and less than 1 percent in private non-industrial ownership.

Swift Creek and its two main tributaries—East Fork and West Fork—all flow on State Trust Lands for the majority of their length. The main channel of this Class 1 fish-bearing stream flows at the base of several eroding Pleistocene banks found above, below and adjacent to the project area (*Watershed Consulting, LLC 2004*). These eroding banks are very similar to eroding banks on the North and Middle Forks of the Flathead River and are considered as predominantly natural features. Suspended sediment in Swift Creek is high during the high flow period but low during the low flow period (*DEQ 2012a*)

### **Environmental Effects**

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

Under this alternative, no timber harvesting or related activities would occur. A low risk of sediment delivery from all sources would be expected to remain unchanged. No increased risk of increase or reductions in total nitrogen and total phosphorus would result from this alternative. Cumulative changes in nutrient concentrations would be driven by natural events.

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

Because DNRC would incorporate BMPs into the project design as required by *ARM 36.11.422 (2)* and all laws pertaining to SMZs would be followed, a low risk of sediment from timber-harvesting activities would result from the implementation of this alternative. Additionally, sedimentation from the eroding banks on Swift Creek would not be expected to increase or decrease. Therefore, the risk of long-term adverse direct, indirect or cumulative effects to water quality or beneficial uses due to increased sediment would be low.

This alternative would result in a low risk of adversely affecting drinking water quality in Lazy Creek, Swift Creek or in Whitefish Lake. The concentrations of total nitrogen (including NO<sub>3</sub>) would be expected to remain below the drinking water standard of 10 mg/L. Additionally, riparian buffers would be expected to remove some portion of the nutrients released during harvest activities. Therefore, the risk of adverse direct, indirect or cumulative effects to drinking water standards or beneficial uses due to increased nutrient concentrations would be very low.

***Additional information can be found in ATTACHMENT IV – Water Resources Analysis.***

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## **6. AIR QUALITY:**

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

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

Under this alternative, no timber harvest or related activities would occur. No dust associated with log hauling traffic and no burning of slash piles would occur from this proposed action, therefore no direct, indirect or cumulative effects to air quality would be expected.

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

The project is located in Airshed 2 which covers the Kalispell/Whitefish area. Some particulate matter would be introduced into the airshed from the burning of logging slash. Slash burning would be conducted when conditions favor good to excellent smoke dispersion and burning would be conducted during times of adequate

ventilation and according to existing rules and regulations. Thus, direct, indirect, and cumulative effects to air quality are expected to be minor and temporary.

During dry periods of the year, road dust may be created on gravel and dirt (native-surfaced) roads, relative to the amount of use. The log-hauling traffic from this proposed sale may increase by 6 to 12 truckloads per day. Depending on the season of harvest and the weather conditions, road dust may increase. In cases where the Forest Officer considers the dust level unacceptable, the application of dust abatement, such as magnesium chloride, may be required.

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## 7. VEGETATION COVER, QUANTITY AND QUALITY:

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

### **Existing Condition**

The Forest Management Rules direct DNRC to promote biodiversity by taking a coarse-filter approach that favors an appropriate mix of stand structures and composition on state lands (ARM 36.11.404). The two cover types present within the proposed harvest units are western larch/Douglas-fir (646 acres), and mixed conifer (13 acres). The desired future cover type for these stands, based on Stand Level Inventory (SLI) data is western larch/Douglas-fir (646 acres) and mixed conifer (13 acres).

The entire project area was first logged for railroad ties in the early 1930's. This first entry removed large western larch and Douglas-fir. Younger, mature timber (approximately 50 feet tall and less) was left scattered throughout the logged area. A second entry was made in Sections 19 and 30 in 1951 where some selective harvest occurred over an unknown number of acres (*MSFD and Passman*). In 1996, 634 acres of Section 31 was logged under the Lazy Swift Timber Sale. The purpose of the timber sale was to harvest mountain pine beetle-killed and at-risk lodgepole pine. Lodgepole pine was the only species harvested at that time.

The major insects and diseases present are spruce budworm, dwarf mistletoe and *Phellinus pini* rot in western larch, Douglas-fir beetle. Various other stem and root rot exists throughout the sale area. There are large pockets of blowdown from weather events. Some of these pockets are fairly large (>10 acres) with Engelmann spruce being the most affected during recent 2012 wind events.

Noxious weeds are present along the roads within the project area; these include oxeye daisy, spotted knapweed, orange hawkweed, and St. Johnswort.

Based on Montana Administrative Rules for Forest Management, Stand level methodology, *Green et. al.* and the habitat types within the project area, old growth is defined as any stand that is at least 5 contiguous acres, has at least 10 trees per acre that are 21 inches or greater in DBH and are at least 180 years old. Although there are places within the project area that have individual trees that meet the size and age requirement, there are no stands that meet the 10 trees per acre density requirement. The stand level density range for trees per acre that meet the old growth definition within the project area is 0 to 5 TPA.

Using the Natural Heritage Program (NHP) database, no sensitive, threatened, or endangered plant species have been documented within the project area.

### **Environmental Effects**

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

Timber harvesting would not occur at this time. Neither cover types nor age class distributions would be directly or indirectly affected. Stocking levels of shade-tolerant trees and downed woody debris would increase within those stands over time. Various factors, such as insects, diseases, and weather events, would eventually cause more snags to occupy portions of the stands. This, in turn, would increase the potential and/or severity of a wildfire, and in the event that one was ignited, would make it harder to suppress.

In addition, 646 acres of the proposed units which currently meet the desired future cover type would shift into a mixed conifer cover type as the dominant over story species continue to decline and alpine and grand fir succeed over time.

Additional mineral soil would not be exposed, and heavy tree canopies would continue to compete with weeds; therefore the risk of additional establishment of weed populations would not likely increase.

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

Under the proposed action:

- 646 acres of the 659 acres proposed for timber harvesting would maintain current cover types which are also the desired future condition cover types. Treating these acres would maintain the current cover type into the future.
- Approximately 13 acres of mixed conifer would be converted to a western larch/Douglas fir cover type.
- Approximately 639 acres would receive a regeneration harvest treatment and approximately 20 acres would receive a commercial thin treatment, however no change in age class would occur due to the amount of older-aged trees being retained following harvest. DNRC's Stand Level Inventory (SLI) methodologies evaluate age class based on the sawtimber components within stands; stands with greater than 10 percent canopy coverage of sawtimber-size trees will not be classified in the "non-stocked" or "0-39 year age class".

Following harvest and fuels treatments, the connectivity of dense fuel loading and ladder fuels leading to the tree crowns would be removed in the proposed harvest units. The success of aerial and ground attacks on wildfires would likely be improved.

The spread of noxious weeds from the use of mechanized equipment and ground disturbance would be minimized, but not completely eliminated, by the washing of equipment before entering the site, sowing grass seed on roads after road construction and harvesting (ARM 36.11.445), and applying herbicide on spots of weed outbreaks along approximately 6 miles of roadway.

**Additional information can be found in the Project File: Vegetation, located at the Stillwater Unit office.**

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## **8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:**

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

### **A. TERRESTRIAL AND AVIAN LIFE AND HABITATS**

The proposed project area provides habitat for a variety of wildlife species, including a host of species that require mature forests and/or use snags and coarse woody debris. The project area contains approximately 970 acres of well-stocked, mature forest (80.1% of the project area). Old growth forest habitat is not present within the project area. Existing levels of snags and downed woody debris are within the range expected for the habitat types present (*Graham et al. 1994*) and are likely providing habitat for wildlife species utilizing these forest attributes. Deer, elk, and moose likely use the project area much of the year. Big game winter range habitat is present within the project area and current habitat conditions are providing appreciable amounts of thermal cover and snow intercept.

Refer to *ATTACHMENT V - WILDLIFE ANALYSIS* for in-depth evaluation of the No-Action and Action Alternatives and notes pertaining to species potentially present in the project area.

### **B. AQUATIC LIFE AND HABITATS**

After reviewing the public and internal comments, DNRC developed the following issue statement regarding the potential effects of the proposed timber harvesting:

- *Cumulative effects from timber harvest may affect channel stability and fisheries habitat by decreasing the amount of recruitable woody debris into streams and/or increasing stream temperatures.*

## **FISH HABITAT PARAMETERS**

### **Large Woody Debris Recruitment:**

Quantitative woody debris data was collected for Lazy Creek and Swift Creek fisheries habitat inventory in 2002 and 2006. Both streams are Rosgen C channels (*Rosgen 1996*) and results showed 40 and 58 pieces per 1000 feet of stream channel for Lazy and Swift creeks respectively. Stream channels with similar characteristics in northwest Montana averaged 61 pieces per 1000 feet of channel (*Bower 2008*). Although evidence of timber harvest was observed in riparian stands along the streams, canopy coverage was very dense throughout the watershed.

### **Stream Temperature:**

Stream temperature data in Lazy Creek has been collected monthly (May through October) by the Whitefish Lake Institute since 2007. Of the 37 individual temperature readings, two have been over 15 degrees Celsius. Swift Creek has a cold water temperature regime that supports cold water fisheries. Summer temperatures are below levels that have been shown to adversely affect bull trout and Westslope cutthroat trout (*MDEQ 2012a*). Stream temperatures are likely within the natural range of variation for these streams.

### **Fish Passage:**

No changes to fish connectivity—in the form of culvert installations—are proposed for any alternative, and will not be discussed further.

## **Environmental Effects**

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

### **Large Woody Debris Recruitment**

No reduction in recruitable large woody debris would result from the implementation of this alternative. Cumulatively, no reduction in recruitable large woody debris would result. Recruitable large woody debris would be retained at an adequate level to maintain stream form and function. Past impacts to recruitable woody debris would continue to ameliorate as existing harvest units revegetate and grow.

### **Stream Temperature**

No increases in stream temperature from a reduction in stream shading would be expected under this alternative.

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

### **Large Woody Debris Recruitment**

While evidence of past riparian harvest was found during field review and this project would harvest approximately 5.5 acre of timber within the RMZ of Class 1 streams. A majority of the stands within the RMZ of Class 1 streams would remain intact. This proposal would result in low risk of adverse direct, indirect, or cumulative impacts to recruitable woody debris.

### **Stream Temperature**

Due to the limited amount of canopy removed in the RMZ of Class 1 streams, a low risk of direct, indirect, or cumulative temperature increases would result from the implementation of this alternative.

For more information on existing aquatic habitat and potential effects refer to *ATTACHMENT IV– Water Resources Analysis*.

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

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

Suitable habitat for grizzly bear and Canada lynx is abundant and well connected in the project area. Both of these species likely use the proposed project area, and have been documented in the vicinity of the project area in the past. The project area does not contain any open roads and existing levels of disturbance are likely minimal.

The Northwest Land Office "Sensitive Species List," as developed from the State Forest Management Plan, was also consulted. This list includes the following species: Bald Eagle, Black-Backed Woodpecker, Coeur d'Alene Salamander, Columbian Sharp-Tailed Grouse, Common Loon, Fisher, Flammulated Owl, Gray Wolf, Harlequin Duck, Northern Bog Lemming, Peregrine Falcon, Pileated Woodpecker, and Townsend's Big-Eared Bat. The following species were included for detailed study due to historical observations and habitat present within the proposed project area: Bald Eagle, Fisher, Gray Wolf and Pileated Woodpecker.

Bull trout, westslope cutthroat trout, eastern brook trout, mountain whitefish, rainbow trout and slimy sculpin are found in Swift Creek; eastern brook trout are present in Lazy Creek (*MFISH, 2012*).

Because all proposed harvest units are at least 275 feet from Swift Creek, no reduction in stream shading or coarse woody debris recruitment would occur in the Swift Creek watershed and therefore will not be further addressed.

Refer to *ATTACHMENT IV- WATER RESOURCE ANALYSIS* and *ATTACHMENT V- WILDLIFE ANALYSIS* for in-depth evaluations of the No-Action and Action Alternatives and notes pertaining to species potentially present in the project area.

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## 10. HISTORICAL AND ARCHAEOLOGICAL SITES:

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

A portion of Section 31 was inventoried in June of 1989. At the time, two cultural resources were recorded: a logging railroad system built in 1929 (*Passman- 24FH0425*) and an early 1930's railroad tie mill (*Passman- 24FH0426*). At the time of the inventory, parts of the railroad system had been used as a motor vehicle road by recreationists and firewood cutters. The first Lazy Swift Timber Sale in the mid-1990's upgraded a portion of the railroad grade for use as a haul route. The proposed Lazy Swift 2 Timber Sale would use the same portions of the railroad grade haul route through Section 31 as the first Lazy Swift sale, with minor improvements. Other segments of excavated railroad grade were found during sale layout in Section 30. Portions of these old excavated grades could be impacted to varying degrees during logging activities. During sale layout for the proposed Lazy Swift 2 sale, some evidence of the tie mill site was seen and found to be outside of any proposed harvest area.

If previously unknown cultural or paleontological materials are identified during project related activities, all work will cease until a professional assessment of such resources can be made.

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## 11. AESTHETICS:

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

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

Under this alternative, no timber harvesting or related activities would occur. No changes in visual aesthetics would occur outside of natural events.

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

The project area is located on low lying, rolling ground with limited public access. Visual aesthetic impacts from the proposed project would vary depending on the location of the vantage point. At long range the visual impact would vary depending on the elevation of the vantage point. At low elevation, long range vantage points, visibility of the project area would be very limited due to surrounding forest and hills and therefore visual impacts would be minimal. At long range, high elevation vantage points, such as Big Mountain, a greater extent of the project area may be visible as scattered trees and patches of forest of varying density juxtaposed across a small part of the greater landscape and would result in minor visual impacts. At mid-range vantage points, the variations in spacing of the trees retained in the units, location of units and rolling topography would break up visual sight distance resulting in minor visual impacts. At close range (standing within individual harvest units), visual impacts would be the greatest. At this close range, individual scattered trees, stumps and some logging slash would be visible until regeneration has reached a point where sight distance is limited again. Under the Habitat Conservation Plan grizzly bear commitments, DNRC is required to design new clearcut and seed tree units so that visual sight distance is no greater than 600 feet in at least one direction from any point in the unit. Impacts to visual aesthetics at close range would be minimized by limiting visual sight distance to 600 feet or less, maintaining a 300 foot habitat connectivity corridor, and retaining higher tree densities around streams and wetlands.

---

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

*Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify direct, indirect, and cumulative effects to environmental resources.*

No demand for limited environmental resources or other activities demanding limited environmental resources were identified; therefore, no direct, indirect, or cumulative impacts would occur under either alternative.

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**13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:**

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

- Mystery Fish Timber Sale Environmental Assessment (EA) (April 2012)
- Upper Whitefish Timber Sale Checklist Environmental Assessment (March 2012)
- Fish Bull Timber Sale Checklist Environmental Assessment (April 2012)
- Beaver Smith Timber Sale Environmental Assessment (April 2009)
- Swedish Chicken Timber Sale Environmental Assessment (February 2011)

<p><b>IV. IMPACTS ON THE HUMAN POPULATION</b></p>
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- |  |
|--|
| <ul style="list-style-type: none"><li>• <i>RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.</i></li><li>• <i>Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.</i></li><li>• <i>Enter "NONE" if no impacts are identified or the resource is not present.</i></li></ul> |
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**14. HUMAN HEALTH AND SAFETY:**

*Identify any health and safety risks posed by the project.*

No unusual safety considerations are associated with the proposed timber sale. Warning signs would be located along the Lupfer County Road cautioning recreational and residential traffic of log hauling. Log trucks would be required to adhere to all posted speed limits and other applicable traffic laws. Time restrictions for log hauling would be implemented during peak hours school buses are running on the Lupfer County Road. Dust abatement may be required if dust produced from log hauling poses a safety risk due to lowered visibility. To facilitate safe log hauling during the winter months, plowing and sanding portions of the Lupfer County Road may be required in addition to that already being done by the Flathead County Road Department.

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**15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:**

*Identify how the project would add to or alter these activities.*

The proposed timber harvest would provide continued industrial production to the region.

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**16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:**

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

Due to the relatively small size of the proposed timber sale, no measurable direct, indirect, or cumulative effects to the employment market would be likely although based upon *Bureau of Business and Economic Research, 2008* an average of 10.0 jobs per million board feet of timber harvested are maintained in the timber industry.

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**17. LOCAL AND STATE TAX BASE AND TAX REVENUES:**

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

Due to the relatively small size of the proposed timber sale, no measurable direct, indirect, or cumulative impacts to the tax base or tax revenue would be likely from either alternative.

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**18. DEMAND FOR GOVERNMENT SERVICES:**

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

Log trucks hauling to the purchasing mill would result in temporary increases in traffic on Lupfer County Road and U.S. Highway 93. This temporary increase on Highway 93 is a regular occurrence on public roads in Northwest Montana and no additional government service would be required.

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**19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:**

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

In 2004, the Montana DNRC and the Whitefish Area Trust Lands Advisory Committee collaborated in the design of a land use plan encompassing 13,000 acres of State School Trust Lands surrounding the community of Whitefish in Flathead County, Montana. This plan is known as the Whitefish Area Trust Lands Neighborhood Plan (WNP). The WNP defines future land uses for these acres in cooperation with the Whitefish City Master Plan adopted in 1996, and the Flathead County Master Plan of 1987. Sections 30 and 31 are within the Swift Creek Subarea of the WNP and all activities within the proposed timber sale are compatible with future goals outlined in the plan.

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

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

The project area receives very little recreational activity due to difficult public access. The easiest public access available is via non-motorized travel over several miles of minimally-maintained roads through Plum Creek Timber Company land. General public access through Plum Creek is subject to change at any time pending the

outcome of potential real estate transactions. Access through other State lands includes cross country travel over steep, heavily forested and brushy ground including fording Swift Creek which is only possible and safe during low water flows. Recreationalists on Swift Creek would experience very little noticeable change due to unit locations and buffers built into the project design. In the proposed harvest units, recreationalists would experience more open forest conditions for a short period of time. Public access would be restricted within the proposed harvest units during active logging operations due to safety concerns.

Portions of Sections 30 and 31 are within the Swift Creek Subunit of the Whitefish Neighborhood Plan. The Whitefish Trail Master Plan considered a trail location alternative which would cross through a small segment of the SE corner of Section 31, however several other routes were also considered. The trail does not currently travel through any portion of the project area, and a specific proposal to build this portion of trail has not been proposed. Therefore, any future plans for the Whitefish Trail in this area currently fall outside the scope of this CEA.

No direct, indirect, or cumulative impacts related to access to and quality of recreational and wilderness activities would be expected under either alternative.

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## **21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:**

*Estimate population changes and additional housing the project would require. Identify direct, indirect, and cumulative effects to population and housing.*

No measurable direct, indirect, or cumulative impacts related to population and housing would be expected under either alternative, due to the relatively small size of the proposed timber sale project.

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## **22. SOCIAL STRUCTURES AND MORES:**

*Identify potential disruption of native or traditional lifestyles or communities.*

No direct, indirect, or cumulative impacts related to social structures and mores would be expected under either alternative.

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## **23. CULTURAL UNIQUENESS AND DIVERSITY:**

*How would the action affect any unique quality of the area?*

No direct, indirect, or cumulative impacts related to cultural uniqueness or diversity would be expected under either alternative.

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## **24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:**

*Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify direct, indirect, and cumulative economic and social effects likely to occur as a result of the proposed action.*

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

No revenue would be generated for the MSU 2<sup>nd</sup> Grant Trust at this time. Small timber permits and other land uses could yield some additional revenue.

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

The timber harvest would generate approximately \$900,000 for the MSU 2<sup>nd</sup> Grant Trust, and approximately \$133,000 in Forest Improvement (FI) fees would be collected for FI projects. This is based on a stumpage rate of \$26.63 per ton, multiplied by the estimated volume of tons. This stumpage rate was derived by comparing

attributes of the proposed timber sale with the attributes and results of other DNRC timber sales recently advertised for bid. Costs related to the administration of the timber sale program are only tracked at the Northwestern Land Office (NWLO) and statewide level. DNRC does not track project-level costs for individual timber sales. An annual cash flow analysis is conducted on the DNRC forest product sales program. Revenue and costs are calculated statewide and by the NWLO. From 2006 through 2010, revenue-to-cost ratio of the Northwestern Land Office was 2.51. This means that, on average, for every \$1.00 spent in costs, \$2.51 in revenue was generated. 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.

<b>EA Checklist Prepared By:</b>	<p><b>Name/</b> Elspeth Pevear, Management Forester  <b>Title:</b> Jason Glenn, Management Forester  Chris Forristal, Wildlife Biologist  Marc Vessar, Hydrologist</p> <p><b>Date:</b> 12/14/2012</p>
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**V. FINDING**

The finding will be determined after the 30-day public review of the Draft Checklist EA.

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**25. ALTERNATIVE SELECTED:**

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**26. SIGNIFICANCE OF POTENTIAL IMPACTS:**

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**27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:**

EIS

More Detailed EA

No Further Analysis

<b>EA Checklist Approved By:</b>	<b>Name:</b>
	<b>Title:</b>
<b>Signature:</b>	<b>Date:</b>

Attachment I:  
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# Proposed Lazy Swift 2 Timber Sale Project

Sections 19, 30 & 31 T32N R22W

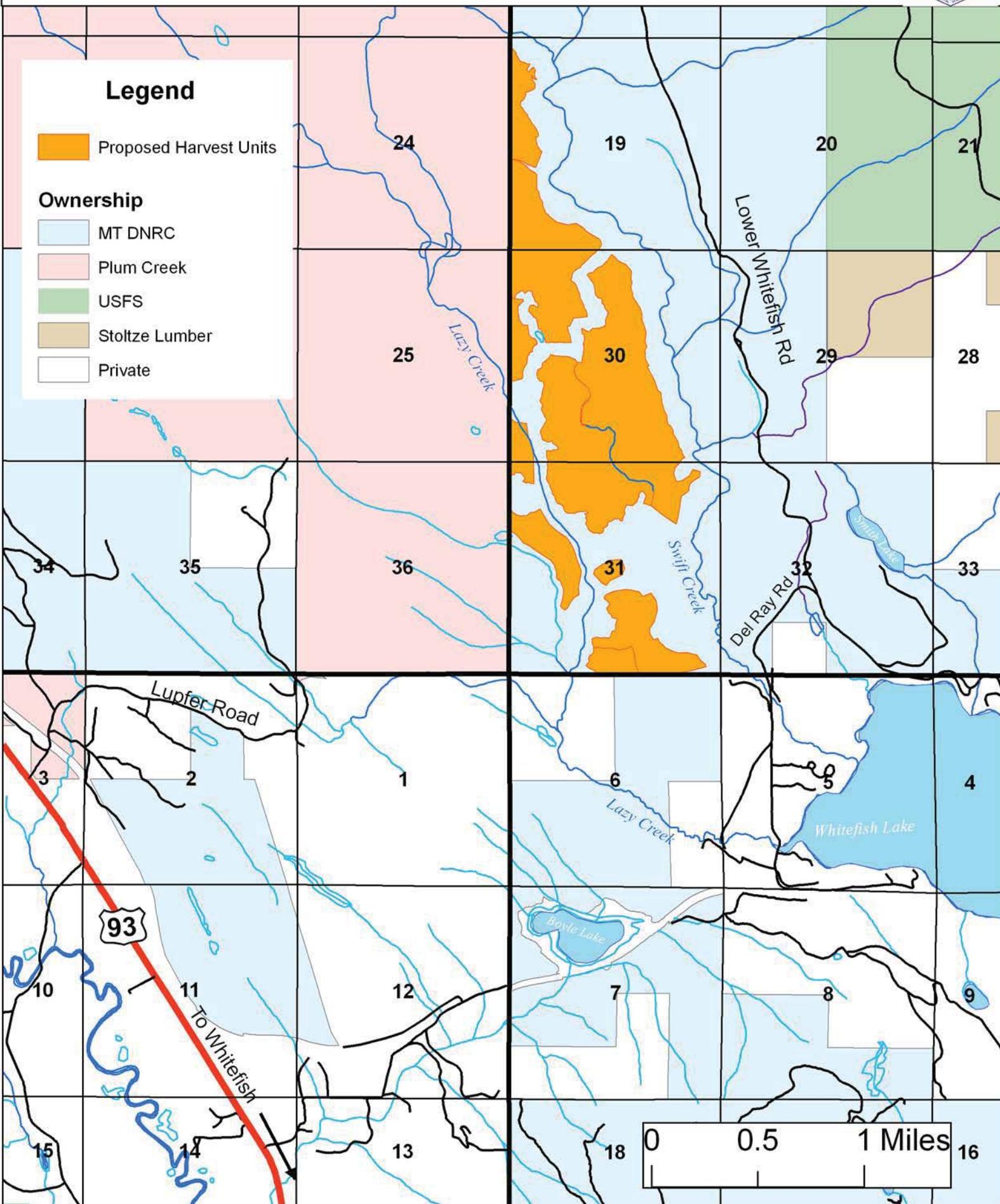


## Legend

Proposed Harvest Units

## Ownership

- MT DNRC
- Plum Creek
- USFS
- Stoltze Lumber
- Private



# Proposed Lazy Swift 2 Timber Sale Project

Sections 19, 30 & 31 T32N R22W



23 24

19 20

## Legend

Proposed Harvest Units

### Road Work

- Existing; Maintenance
- Existing; Reconstruct Temporary
- New Permanent
- New Temporary
- Potential Snow Road
- Abandonment

### Ownership

- MT DNRC
- Plum Creek
- Private

0 0.5 1 Miles

26 25

35 36

30 29

31 32

T32N R23W

T32N R22W

Hwy 93 and Whitefish

Lupfer County Rd

Haul Route

Anchor Creek

Lower Whitefish Road

Lazy Creek

Bear Creek

Swift Creek

King Creek

Lazy Creek

Swift Creek

1

2

5

6

3

4

7

8

9

10

Attachment III:  
**PRESCRIPTIONS TABLE**

Unit number	Est. Acres	Prescription	Marking guides	Particulars involved in unit
1	33	Seedtree w/ reserves	<p><b>Leave Tree Mark:</b></p> <ul style="list-style-type: none"> <li>● Mark 7-9 seedtrees per acre (70' to 80' spacing).</li> <li>● Species designated to leave = WL, DF and WWP.</li> <li>● Keep up to 2 snags and 2 snag recruits per acre &gt;21" DBH.</li> <li>● Cut tree mark up to 60% canopy cover within the ERZ buffer along eastern unit boundary.</li> <li>● Leave heavier retention (up to 50' spacing) within 50' of the ERZ boundary line along east edge of unit.</li> </ul>	<ul style="list-style-type: none"> <li>- 1 designated crossing of a Class 3 SMZ.</li> <li>- SMZs – interior SMZ marked with "Xs", cut tree mark to SMZ specifications for Class 3 stream.</li> <li>- Access to unit would be via a temporary road and would involve crossing an adjacent wetland. This would require either a snow road (winter) or an improved skid crossing (summer).</li> <li>- ERZ (Equipment Restriction Zone) buffer exists along most of the eastern edge of the unit. The minimum width between the ERZ and unit boundary is 30'.</li> <li>- Excavator pile and prepare sites for new regeneration.</li> <li>- Plant with western larch and western white pine.</li> </ul>
2	130	Seedtree w/ reserves	<p><b>Leave Tree Mark:</b></p> <ul style="list-style-type: none"> <li>● Mark 7-9 seedtrees per acre (70' to 80' spacing).</li> <li>● Species designated to leave = WL, DF and WWP.</li> <li>● Keep up to 2 snags and 2 snag recruits per acre &gt;21" DBH.</li> <li>● Cut tree mark up to 60% canopy cover within the ERZ buffer along eastern unit boundary.</li> <li>● Leave heavier retention (up to 50' spacing) within 50' of the ERZ boundary line along east edge of unit.</li> </ul>	<ul style="list-style-type: none"> <li>- An existing jeep trail and another existing excavated road grade in the unit would be reconstructed to a temporary road standard.</li> <li>- A short segment of new temporary road construction would be necessary.</li> <li>- ERZ (Equipment Restriction Zone) buffer exists along most of the eastern edge of the unit. The minimum width between the ERZ and unit boundary is 30'.</li> <li>- ERZ's exist around isolated wetlands, marked with "Xs", cut tree mark to Wetland Management Zone specification.</li> <li>- Excavator pile and prepare sites for new regeneration.</li> <li>- Plan for natural regeneration and interplant with western white pine.</li> </ul>

Lazy Swift 2 Timber Sale Draft Checklist EA

Unit number	Est. Acres	Prescription	Marking guides	Particulars involved in unit
3	200	Seedtree w/ reserves and a minor amount of clear cut	<p><b>Cut by Description:</b></p> <ul style="list-style-type: none"> <li>● Leave 7-9 seedtrees per acre (70' to 80' spacing).</li> <li>● Species designated to leave = WL and DF.</li> <li>● Keep up to 2 snags and 2 snag recruits per acre &gt;21" DBH.</li> <li>● Cut tree mark up to 60% canopy cover within the ERZ buffer along eastern unit boundary.</li> <li>● Leave heavier retention (up to 50' spacing) within 50' of the ERZ boundary line along east edge of unit.</li> </ul>	<ul style="list-style-type: none"> <li>- An existing jeep trail would be reconstructed to a temporary road standard in places.</li> <li>- Some new temporary road construction would be necessary.</li> <li>- ERZ (Equipment Restriction Zone) buffer exists along most of the eastern edge of the unit. The minimum width between the ERZ and unit boundary is 30'.</li> <li>- ERZ's exist around steep areas, wetlands and areas of sensitive soil and are marked with "Xs".</li> <li>- SMZs – interior SMZ marked with "Xs", cut tree mark to SMZ specifications for Class 2 stream.</li> <li>- A small yarder system or winch line would be necessary to harvest trees from ravine areas.</li> <li>- Excavator pile and prepare sites for new regeneration.</li> <li>- Plan for natural regeneration where adequate seed source is present. Plant with western larch and ponderosa pine where appropriate.</li> </ul>
4	138	Seedtree w/ reserves	<p><b>Cut by Description:</b></p> <ul style="list-style-type: none"> <li>● Leave 7-9 seedtrees per acre (70' to 80' spacing).</li> <li>● Species designated to leave = WL and DF.</li> <li>● Keep up to 2 snags and 2 snag recruits per acre &gt;21" DBH.</li> </ul>	<ul style="list-style-type: none"> <li>- SMZs – interior SMZ marked with "Xs", cut tree mark to SMZ specifications for Class 2 stream.</li> <li>- A small yarder system or winch line would be necessary to harvest trees from ravine areas.</li> <li>- A segment of new permanent road would be constructed through the unit.</li> <li>- Some new temporary road construction would be necessary.</li> <li>- Excavator pile and prepare sites for new regeneration.</li> <li>- Plan for natural regeneration and interplant with western larch and western white pine.</li> </ul>
5	19	Seedtree w/ reserves and a minor amount of commercial thin	<p><b>Leave Tree Mark:</b></p> <ul style="list-style-type: none"> <li>● Leave 7-9 seedtrees per acre (70' to 80' spacing).</li> <li>● Leave 17-27 trees per acre (40' to 50' spacing) for commercial thin areas.</li> <li>● Species designated to leave = WL and DF.</li> <li>● Keep up to 2 snags and 2 snag recruits per acre &gt;21" DBH.</li> </ul>	<ul style="list-style-type: none"> <li>- Winter access unit via temporary snow road for logging.</li> <li>- There may be some opportunity at the southern end of the unit to leave healthy, young Douglas-fir and western larch at a commercial thin spacing.</li> <li>- Excavator pile and prepare sites for new regeneration.</li> <li>- Summer access for site prep possible through unit 2.</li> <li>- Plan for natural regeneration and interplant with western larch and western white pine.</li> </ul>

Lazy Swift 2 Timber Sale Draft Checklist EA

Unit number	Est. Acres	Prescription	Marking guides	Particulars involved in unit
6	17	Seedtree w/ reserves and a minor amount of commercial thin	<p><b>Leave Tree Mark:</b></p> <ul style="list-style-type: none"> <li>• Leave 7-9 seedtrees per acre (70' to 80' spacing).</li> <li>• Leave 17-27 trees per acre (40' to 50' spacing) for commercial thin areas.</li> <li>• Species designated to leave = WL and DF.</li> <li>• Keep up to 2 snags and 2 snag recruits per acre &gt;21" DBH.</li> </ul>	<ul style="list-style-type: none"> <li>- Some cut trees would be marked outside of the unit boundary along the eastern edge of the unit; reserve trees, submerchantable trees and brush must be protected from logging damage.</li> <li>- There may be some opportunity at the southern end of the unit to leave healthy, young Douglas-fir at a commercial thin spacing.</li> <li>- Excavator pile and prepare sites for new regeneration.</li> <li>- Plan for natural regeneration.</li> </ul>
7	35	Seedtree w/ reserves and a minor amount of commercial thin	<p><b>Cut by Description:</b></p> <ul style="list-style-type: none"> <li>• Leave 7-9 seedtrees per acre (70' to 80' spacing).</li> <li>• Leave 17-27 trees per acre (40' to 50' spacing) for commercial thin areas.</li> <li>• Species designated to leave=WL and DF.</li> <li>• Keep up to 2 snags and 2 snag recruits per acre &gt;21" DBH.</li> </ul>	<ul style="list-style-type: none"> <li>- A short segment of temporary road would be required to access this unit.</li> <li>- Some cut trees would be marked outside of the unit boundary along the eastern edge of the unit; reserve trees, submerchantable trees and brush must be protected from logging damage.</li> <li>- There may be opportunity at the southern end of the unit to leave healthy, young Douglas-fir and western larch at a commercial thin spacing.</li> <li>- Excavator pile and prepare sites for new regeneration.</li> <li>- Plan for natural regeneration and interplant with western larch where appropriate.</li> </ul>
8	7	Seedtree with reserves	<p><b>Cut by Description:</b></p> <ul style="list-style-type: none"> <li>• Leave 7-9 seedtrees per acre (70' to 80' spacing).</li> <li>• Species designated to leave=WL and DF.</li> <li>• Keep up to 2 snags and 2 snag recruits per acre &gt;21" DBH.</li> </ul>	<ul style="list-style-type: none"> <li>- Excavator pile and prepare sites for new regeneration.</li> <li>- Plan for natural regeneration.</li> </ul>
9	76	Combination commercial thin and overstory removal with some seedtree	<p><b>Cut by Description:</b></p> <ul style="list-style-type: none"> <li>• Leave 7-9 seedtrees per acre (70' to 80' spacing).</li> <li>• Leave 17-27 trees per acre (40' to 50' spacing) for commercial thin areas.</li> <li>• Species designated to leave=WL and DF.</li> <li>• Keep up to 2 snags and 2 snag recruits per acre &gt;21" DBH.</li> </ul>	<ul style="list-style-type: none"> <li>- Approximately 40 acres of this unit was logged in the mid-1990's; pockets of saplings in previously logged portions of the unit should be protected to the greatest extent possible during logging.</li> <li>- Excavator pile and prepare sites for new regeneration.</li> <li>- Plan for natural regeneration.</li> </ul>

NOTES: ERZ=Equipment Restriction Zone; TPA=Trees Per Acre; LTM=Leave Tree Mark; SMZ=Streamside Management Zone; RMZ=Riparian Management Zone

Attachment IV:  
**WATER RESOURCES ANALYSIS**

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**INTRODUCTION**

This analysis is designed to disclose the existing condition of the hydrologic and fisheries resources and to describe the anticipated effects that may result from each alternative of this proposal. During the initial scoping, issues were identified regarding water-quality and fisheries resources. After reviewing the public and internal comments, DNRC developed the following issue statements regarding the potential effects of the proposed timber harvesting:

- *Timber harvesting activities may adversely affect water quality in Swift Creek and Lazy Creek due to sediment delivery and increased nutrients.*
- *Cumulative effects from timber harvest may affect channel stability and fisheries habitat by decreasing the amount of recruitable woody debris into streams and /or increasing stream temperatures.*

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

**ANALYSIS METHODS**

***Sediment Delivery***

The methods applied to the project area to evaluate potential direct, indirect, and cumulative effects include a field review of potential sediment sources from haul routes. Stream crossings and roads were evaluated to determine existing sources of introduced sediment from existing and proposed roads.

Potential sediment delivery from harvest units will be evaluated from a risk assessment. This risk assessment will use the soil information provided in the *SOILS ANALYSIS* (located in project file at Stillwater Unit) and the results from soil monitoring on past DNRC timber sales.

***Nutrients***

Nutrients (generally nitrogen and phosphorous) were mentioned in reference to a recent septic leachate report conducted by the Whitefish Lake Institute (*Curtis and Koopal 2012*). Concern was expressed that drinking water may be affected by increased nutrients associated with the proposed timber sale. The analysis method to disclose potential impacts will be to compare existing nutrient data in Lazy Creek and Swift Creek with the Montana Numeric Water Quality Standards Circular DEQ-7 (*DEQ 2012*) and present a risk assessment of exceeding the standards post project using relevant scientific literature as an estimate of potential increases.

***Woody Debris Recruitment***

The analysis method for woody debris recruitment will evaluate the potential reduction in available woody debris and shading due to timber-harvesting activities in the riparian management zone (RMZ) of the project area.

***Stream Temperature Increases***

Stream temperature will be addressed by evaluating the risk of stream temperature increases due to reduced shading from existing vegetation.

**ANALYSIS AREA**

***Sediment Delivery***

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

***Nutrients***

The analysis area for nitrogen will be Lazy Creek at the stream gauging site monitored by Whitefish Lake Institute and the gauging site at the county road bridge across Swift Creek (monitored by DNRC and the Whitefish Lake Institute). Because Whitefish Lake is a municipal water supply, a qualitative discussion for Whitefish Lake will be provided as well.

***Woody Debris Recruitment***

The analysis area for woody debris recruitment is the RMZ along Class 1 streams in the Lazy Creek watershed. Because mature trees in the area are generally less than 130 feet tall, and all proposed harvest units are at least 275 feet from Swift Creek, no reduction in woody debris recruitment would occur in the Swift Creek watershed and therefore it will not be further addressed.

***Stream Temperature Increases***

The analysis area for woody debris recruitment is the RMZ along Class 1 streams in the Lazy Creek watershed. Because all proposed harvest units are at least 275 feet from Swift Creek, no reduction in stream shading from vegetation would be reduced in the Swift Creek watershed and therefore will not be further addressed.

**WATER USES AND REGULATORY FRAMEWORK**

***WATER QUALITY STANDARDS***

This portion of the Flathead River basin, including the Whitefish River and its tributaries, is classified as A-1 by the DEQ, as stated in the ARM 17.30.608. 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 [ARM 17.30.602 (17)]. Reasonable land, soil and water conservation practices include, “methods, measures or practices that protect present and reasonably anticipated beneficial uses...” [ARM 17.30.602 (21)]. The State of Montana has adopted Best Management Practices (BMPs) through its non-point source management plan (MDEQ, 2007) as the principle means of meeting the Water Quality Standards. These practices include, but are not limited to, structural and nonstructural controls as well as operation and maintenance procedures. Appropriate practices may be applied before, during, or after completion of activities that could create their own impacts.

#### **WATER QUALITY LIMITED WATERBODIES**

Lazy and Swift creeks are not considered as impaired waterbodies and listed on the 2012 303(d) list.

Whitefish Lake, which is the receiving waterbody from these creeks, is listed on the 2012 303(d) list as fully supporting all assessed beneficial uses, however aquatic life support is considered ‘threatened’ (DEQ 2012a). Probable causes for the ‘threatened’ status include mercury, polychlorinated biphenyls and sedimentation from forest roads, silviculture activities and unknown sources.

#### **STREAMSIDE MANAGEMENT ZONE LAW (SMZ)**

All rules and regulations pertaining to the SMZ Law are to be followed. An SMZ width of 100 feet is required on Class 1 and 2 streams and lakes when the slope is greater than 35 percent. An SMZ width of 50 feet is required when the slope is less than 35 percent.

#### **FOREST MANAGEMENT RULES**

In 2003, DNRC drafted Administrative Rules for Forest Management. The portion of those rules applicable to watershed and water resources include ARM 36.11.422 through 426 and 470 through 471.

#### **HABITAT CONSERVATION PLAN (HCP)**

DNRC is managing the habitats of threatened and endangered species on this project by implementing the Montana DNRC Forested Trust Lands Habitat Conservation Plan (HCP) and the associated Incidental Take Permit that was issued by the United States Fish & Wildlife Service (USFWS) in February of 2012 under Section 10 of the Endangered Species Act. The HCP identifies specific conservation strategies for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout,

*The **303(d)** list is compiled by DEQ as required by Section 303(d) of the Federal Clean Water Act and the Environmental Protection Agency Water Quality Planning and Management Regulations (40 CFR, Part 130). Under these laws, DEQ is required to identify water bodies that do not fully meet water quality standards, and/or where beneficial uses are threatened or impaired.*

and Columbia redband trout. This project complies with the HCP, which can be found at [www.dnrc.mt.gov/HCP](http://www.dnrc.mt.gov/HCP).

### ***WATER RIGHTS AND BENEFICIAL USES***

Water rights for surface water exist within three miles downstream of the project area in the Lazy and Swift creek watersheds for domestic use, livestock watering, and irrigation use. Whitefish Lake has several domestic use water rights as well as a municipal water supply water right.

Designated beneficial water uses within the project area include cold-water fisheries, aquatic life support, and recreational use in the streams, wetlands, and lakes in the surrounding areas. Whitefish Lake includes additional beneficial uses for domestic use and municipal water supply.

### ***FISHERIES—THREATENED, ENDANGERED AND SENSITIVE SPECIES***

Westslope cutthroat trout are listed as a Class-A Montana Animal Species of Concern. A Class-A designation is defined as a species or subspecies that has limited numbers and/or habitats both in Montana and elsewhere in North America, and elimination from Montana would be a significant loss to the gene pool of the species or subspecies (*Montana Fish, Wildlife and Parks, Montana Natural Heritage Program, and Montana Chapter American Fisheries Society Rankings*). DNRC has also identified westslope cutthroat trout as a sensitive species (ARM 36.11.436).

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

Bull trout, westslope cutthroat trout, eastern brook trout, mountain whitefish, rainbow trout and slimy sculpin are found in Swift Creek; eastern brook trout are present in Lazy Creek (*MFISH, 2012*).

## **EXISTING CONDITIONS**

### ***GENERAL DESCRIPTION***

#### **► *Lazy Creek and tributaries***

Lazy Creek is the main channel of a 10,430-acre watershed that contributes surface flow to Whitefish Lake. Annual precipitation in the watershed ranges from 20 to 30 inches. The elevation ranges from 3,000 feet above sea level at the mouth of the creek at Whitefish Lake to approximately 4,800 feet above sea level at the northern boundary; however most (91%) of the watershed area is below 3,600 feet in elevation. Terrain is generally gentle with slopes predominately less than 40%. Ownership

within the watershed is 73 percent industrial lands (Plum Creek Timber Company), 17 percent State of Montana, and 10 percent in private non-industrial ownership.

Lazy Creek and its three main tributaries—East Fork, Middle Fork and West Fork—all originate on industrial forest lands. This Class 1 stream flows into and through several meadows and wetlands as it flows across State lands for approximately 1.5 miles prior to crossing non-industrial private lands and entering Whitefish Lake. Two other streams in the project area on state-managed lands are intermittent and discontinuous, meaning they do not contribute surface flow to a downstream waterbody.

► *Swift Creek*

Swift Creek is the main channel of a 48,978-acre watershed that contributes surface flow to Whitefish Lake. Annual precipitation in the watershed ranges from 20 inches at its lowest elevation to 70 inches near Stryker Peak. Average annual precipitation is approximately 48 inches per year. The elevation ranges from 3,000 feet above sea level at the mouth of the creek at Whitefish Lake to approximately 7,420 feet above sea level at the watershed divide. Ownership within the watershed is 72 percent State Trust Lands managed by DNRC, 19 percent federal lands managed by the USFS, 8.5 percent industrial timber lands managed by Plum Creek Timber Company and F.H. Stoltze Land and Lumber, and less than 1 percent in private non-industrial ownership.

Swift Creek and its two main tributaries—East Fork and West Fork—all flow on State Trust Lands for the majority of their length. The main channel of this Class 1 fish-bearing stream flows at the base of several eroding Pleistocene banks along the middle and lower reaches of the stream (*Watershed Consulting, LLC 2004*).

### **SEDIMENT DELIVERY**

Proposed harvest units in the project area are all well vegetated with grasses, forbs shrubs and trees. No high erosion risk landtypes were identified in the Soils Analysis.

Roads proposed for use in conjunction with this timber sale cross relatively gentle terrain with very few stream crossing structures. A total of four existing stream crossings are present on the proposed haul route—all of these meet Forestry Best Management Practices by minimizing the risk of sediment delivery into streams.

In-channel sediment sources such as mass wasting sites or excessive erosion were not found during field reconnaissance in the Lazy Creek watershed. However, as noted earlier, several large eroding Pleistocene banks can be found along Swift Creek above, below and along the eastern side of the project area. These eroding banks are very similar to eroding banks on the North and Middle Forks of the Flathead River and are considered natural features. Suspended sediment in Swift Creek is high during the high flow period but low during the low flow period (*DEQ 2012a*).

## **NUTRIENTS**

In Lazy Creek, total nitrogen data collected by the Whitefish Lake Institute since 2007 have concentrations ranging from ‘no detection’ to 0.40 mg/L. Total phosphorus data collected by DNRC from 1985 through 1997 in Lazy Creek shows a range of 0.001 to 0.079 mg/L.

For Swift Creek, total phosphorus data and nitrate + nitrite as nitrogen has been collected by DNRC for more than 20 years. However, only two years of data collection included total nitrogen as nitrate + nitrite + total Kjeldahl nitrogen. During this two year period (2008-2009), the concentrations ranged from <0.05 mg/L to 0.66 mg/L. Only 7 of the 28 samples collected during this period had values reported above the laboratory reporting limit of 0.05 mg/L. Total phosphorus from 2003 to 2012 ranged from <0.001 mg/l to 0.209 mg/L.

All of the total nitrogen data is well below the drinking water standard of 10 mg/L. For total phosphorous, no numeric criteria have been adopted for drinking water standards.

Other beneficial uses such as aquatic life and recreation can be affected if nitrogen and/or phosphorus concentrations are too high. If nitrogen and phosphorus levels are too high, an algae bloom and low dissolved oxygen levels could result. According to the DEQ water quality assessment records, Whitefish Lake water quality “is suitable for growth and propagation of salmonids”, dissolved oxygen levels are adequate for salmonids and nutrients are low(MDEQ 2012a).

## **RECRUITABLE WOODY DEBRIS**

Large woody debris recruitment to streams is important to maintain channel form and function and as a component of fish habitat. According to ARM 36.11.425, DNRC will establish a RMZ ‘...when forest management activities are proposed ...on sites that are adjacent to fish bearing streams and lakes.’ One reason for the RMZs is to retain adequate levels of large woody debris recruitment to the stream channel. Site potential tree height (SPTH) is the method used to identify RMZ width according to ARM 36.11.425 (5). Data collection for site potential tree height in the project area resulted in SPTH of 90 feet.

Quantitative woody debris data was collected for Lazy Creek and Swift Creek fisheries habitat inventory in 2002 and 2006. Both streams are Rosgen C channels (Rosgen 1996) and results showed 40 and 58 pieces per 1000 feet of stream channel for Lazy and Swift creeks, respectively. Stream channels with similar characteristics in northwest Montana averaged 61 pieces per 1000 feet of channel (Bower 2008) however the existing levels are within the range of conditions for the reference reaches in the Flathead National Forest. Although evidence of timber harvest was observed in riparian stands along the streams, canopy coverage was very dense throughout the watershed.

### ***STREAM TEMPERATURE INCREASES***

Stream temperature data in Lazy Creek has been collected monthly (May through October) by the Whitefish Lake Institute since 2007. Of the 37 individual temperature readings, two have been over 15 degrees Celsius. Swift Creek has a cold water temperature regime that supports cold water fisheries. Summer temperatures are below levels that have been shown to adversely affect bull trout and westslope cutthroat trout (*DEQ 2012a*).

### **ENVIRONMENTAL EFFECTS**

#### ***DESCRIPTION OF ALTERNATIVES***

- ***No-Action Alternative***

No timber harvesting or associated activities would occur under this alternative. Existing activities such as recreational use, individual Christmas tree harvesting, and firewood gathering would continue.

- ***Action Alternative***

Ten units totaling approximately 659 acres would be commercially harvested under this alternative. All of the proposed harvest would be regeneration harvest (seed tree with reserves) except for approximately 20 acres of commercial thinning. All units would be harvested using conventional ground-based equipment. An alternative practice to cross an approximately 20-foot wide adjacent wetland during dry or frozen conditions would be required. Approximate miles of road activities include:

- 0.6 miles of road reconstruction for temporary use
- 1.4 miles of new permanent road construction
- 2.1 miles of new temporary road construction
- 0.3 miles of snow road
- Up to 4.6 miles of existing road would be maintained or have drainage improvements installed as necessary to protect water quality
- 2.5 miles of road abandonment

Existing activities such as recreational use, individual Christmas tree harvesting, and firewood gathering would continue.

#### ***DIRECT AND INDIRECT EFFECTS***

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

##### **Sediment Delivery**

Under this alternative, no timber harvesting or related activities would occur. Increases in sediment from all sources would not be expected under this alternative.

**Nutrients**

No increased risk of increases or reductions in total nitrogen and total phosphorus would result from this alternative.

**Large Woody Debris Recruitment**

No reduction in recruitable large woody debris would result from the implementation of this alternative.

**Stream Temperature Increases**

No increases in stream temperature from a reduction in stream shading would be expected under this alternative.

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

**Sediment Delivery**

Past monitoring of DNRC timber harvests across Montana has shown erosion on approximately 6 percent of the sites monitored, although no water-quality impacts from the erosion were found (DNRC 2005). These sites were harvested during the summer period, and the erosion was attributed to inadequate skid-trail drainage. Displacement was limited to main skid trails that occupy “less than 2% of the harvest units.” (DNRC 2005). By minimizing displacement, less erosion would likely occur compared to other harvest methods with more extensive disturbance (Clayton 1987 *in* DNRC 2005).

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

Within the Project Area, existing roads would have drainage improvements and BMP upgrades implemented under this alternative to maintain a low risk of sediment delivery to streams. Minor drainage improvements include reshaping drain dips and cleaning ditch-relief culvert catchbasins.

No new stream crossings would be developed, however a temporary bridge would be installed at a previously developed crossing site. Road construction/reconstruction activities would disturb soil from approximately 4.1 miles of road prism. An adjacent wetland would be crossed using skidding equipment with an alternative practice. Because skidding would be done during dry or frozen conditions risk of sediment delivery to a stream would be low. Because no new stream crossings are associated with this roadwork and the terrain within the project area is generally flat to gently rolling, the risk of sediment delivery to streams from the proposed roadwork would be low.

Proposed harvest units closest to the eroding Pleistocene banks along Swift Creek were intentionally designed to limit the risk of exacerbating erosion. All proposed activities would be at least 75 feet from the edge any of these sites. By maintaining a buffer, the risk of adversely impacting water quality due the implementation of this alternative would be low.

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

### **Nutrients**

Nitrogen is generally found in low concentrations in streams flowing out of undisturbed forested watersheds (*Fredriksen 1971*). Timber harvest can increase the addition of these nutrients into streams; however the increases are generally less than from uses benefiting from fertilized applications and in urban areas (*Fredriksen 1971, J.A. Gravelle et al, 2009; Binkley and Brown 1993*). Additionally, Binkley and Brown (1993) state that increases from timber harvesting activities are generally well below the drinking water standard of 10 mg/L. Nitrate (NO<sub>3</sub>) is a form of nitrogen included in the total nitrogen analysis and also has a drinking water standard of 10mg/L (*DEQ 2012*). Average NO<sub>3</sub> concentration in forested streams across the U.S. was 0.31 mg/L which is well below the drinking water standard (*Binkley et al, 2004*). To assess the NO<sub>3</sub> concentrations from timber harvesting, Binkley and Brown (1993) looked at over 30 paired-watershed studies from the United States and southern Canada. Data showed that average annual NO<sub>3</sub> concentration for harvested and control watersheds remained below 0.5 mg/L, although increases in NO<sub>3</sub> was noted post-harvest.

A literature review by Wenger (1999) indicates varying conclusions for the effectiveness of riparian buffers to remove NO<sub>3</sub>, however a reduction was noted in most studies. Some studies suggest that nearly all nitrates can be removed by using a riparian buffer up to 100 feet (*Fennesy and Cronk, 1997*). Much of the phosphorus in the area is attached to soil particles and transported to surface water during road construction. Because no new stream crossings are proposed and all applicable BMPs would be implemented, the risk of increased phosphorus from sediment-borne sources would be low.

Given the low levels of nitrogen in the site-specific data from Lazy and Swift creeks and by applying the information provided in reviewed literature on increases from forest practices, this alternative would result in a low risk of adversely affecting drinking water quality in Lazy Creek, Swift Creek or in Whitefish Lake. The concentrations of total nitrogen (including NO<sub>3</sub>) would be expected to remain below the drinking water standard of 10 mg/L. Additionally, riparian buffers would be expected to remove some portion of the nutrients released during harvest activities. Increases in total nitrogen would be expected to short-lived and remain within the

range of data disclosed in the *EXISTING CONDITION* section of this analysis. Due to the low risk of increasing phosphorus and the low risk of increasing total nitrogen above previous levels, beneficial uses would have a low risk of being adversely affected.

#### **Large Woody Debris Recruitment**

Although no harvest is proposed within 50 feet of any Class 1 stream, a minor portion of trees in the RMZ are proposed for harvest. Up to 5.5 acres of proposed harvest would take place in the RMZ but outside of the SMZ; and within this RMZ area up to 50% of the trees greater than or equal to 8-inches DBH would be harvested. While this proposal would reduce the recruitable woody debris for these reaches, a majority of the recruitable woody debris and all submerchantable vegetation would be retained. This level of harvest in the RMZ would be expected to have a low risk of adverse impacts to fish habitat as discussed in the Montana DNRC Forested State Trust Lands Habitat Conservation Plan Final EIS (USFWS and DNRC 2010).

#### **Stream Temperature Increases**

As described in the Montana DNRC Forested Trust Lands Habitat Conservation Plan Final EIS (DNRC 2010), a no-harvest zone of 50 feet immediately adjacent Class 1 streams (such as Lazy and Swift creeks) is expected to retain a level of stream shading similar to pre-harvest conditions. The RMZ buffers proposed under this alternative would maintain all of the trees within 50 feet of Class 1 streams and remove a maximum of 50 percent of the trees greater than or equal to 8-inches DBH in the remaining RMZ width. Therefore, stream shading post-project is expected to maintain a low risk of increasing stream temperatures due to timber harvesting.

### ***CUMULATIVE EFFECTS***

- ***Cumulative Effects of the No-Action Alternative to Water Resources***

#### **Sediment Delivery**

No additional cumulative impacts from sediment delivery would be expected. A low risk of sediment delivery from roads on the proposed haul routes would remain unchanged, as would the sediment sources described in *EXISTING CONDITION*.

#### **Nutrients**

No increased risk of increases or reductions in total nitrogen and total phosphorus would result from this alternative. Cumulative changes in nutrient concentrations would be driven by natural events.

#### **Large Woody Debris Recruitment**

No reduction in recruitable large woody debris would result from the implementation of this alternative. Recruitable large woody debris would be retained at an adequate level to maintain stream form and function. Past impacts to recruitable woody debris would continue to ameliorate as existing harvest units revegetate and grow.

### **Stream Temperature Increases**

No increases in stream temperature from a reduction in stream shading would be expected under this alternative because no harvesting would occur.

- *Cumulative Effects Summary - No-Action Alternative*

Because no timber harvesting or associated activities would occur under this alternative, cumulative effects would be limited to the existing condition. Sediment sources are currently limited, and no increase or decrease would be expected. Conditions would continue to provide adequate levels of large woody debris recruitment and shade retention. Under this alternative, fisheries habitat and water quality variables described in this assessment would be maintained at their current level.

### *Cumulative Effects of the Action Alternative to Water Resources*

#### **Sediment Delivery**

Under this alternative, the proposed timber-harvesting and road-construction activities would occur. A cumulative increase in sediment delivery as a result of timber harvesting and roadwork would have a low risk of occurring because of the BMP application and adequate stream buffers to filter potential displaced soil. Sedimentation from the eroding banks on Swift Creek would not be expected to increase or decrease as a result of implementing the proposed actions. Small sediment would continue to exist and erode as natural events dictate. As a result of the activities proposed and the mitigation measures recommended, a low risk of affecting beneficial uses would be expected.

#### **Nutrients**

An increase in nitrogen would be expected as a result of this alternative; however the risk of adversely impacting drinking water standards would be low. As disclosed in the *DIRECT AND INDIRECT EFFECTS*, due to the low risk of increasing phosphorus and the low risk of increasing total nitrogen above previous levels, beneficial uses would have a low risk of adverse cumulative impacts.

#### **Large Woody Debris Recruitment**

While evidence of past riparian harvest was found during field review and this project would harvest up to 5.5 acres of timber within the RMZ of Class 1 streams, the large majority of the stands within RMZ of Class 1 streams are intact. Therefore, this proposal would result in low risk of adverse cumulative impacts to recruitable woody debris.

**Stream Temperature Increases**

Due to the limited amount of canopy removed in the RMZ of Class 1 streams, a low risk of cumulative temperature increases would result from the implementation of this alternative.

• *Cumulative Effects Summary – Action Alternative*

Because all timber-harvesting activities would follow BMPs as required by ARM 36.11.422 and the direct and indirect effects would have a low or very low risk of impacts, a low risk of additional adverse cumulative effects would be expected to occur under this alternative. This expectation includes the results of: (1) a slight decrease in the recruitable woody debris in the RMZ along Class 1 streams; (2) soil disturbance associated with approximately 4.1 miles of road work; and (3) a potential increase in nitrogen following harvest activities.

Because BMPs would be implemented during timber-harvesting and road-construction operations, the risk of adverse cumulative impacts to water quality and beneficial uses, including the fisheries habitat and water quality addressed by this assessment, would be low.

Attachment V:  
**WILDLIFE ANALYSIS**

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## INTRODUCTION

This analysis discloses the existing condition of relevant wildlife resources, and displays the anticipated effects that may result from each alternative of this proposal. There is a general discussion on the analysis areas and analysis methods employed to disclose the anticipated direct, indirect, and cumulative effects to these wildlife resources in the analysis area from the proposed actions. Past and current activities on all ownerships in each analysis area, as well as known planned future agency actions have been taken into account for the cumulative effects analysis.

Considerations and concerns raised by DNRC specialists and public comments received during initial scoping for the proposed project led to the following list of issues:

- The proposed activities could decrease forested cover, which may reduce habitat connectivity and suitability for wildlife species associated with mature forest.
- The proposed activities could reduce abundance of snags and coarse woody debris, which could lower habitat quality for species that depend on these structural attributes.
- The proposed activities could alter grizzly bear (*Ursus arctos*) cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats and/or increase risk of human-caused bear mortality.
- The proposed activities could result in the modification of habitat preferred by Canada lynx (*Felis lynx*) and decrease the area's suitability for lynx.
- The proposed activities could reduce bald eagle nesting and perching habitats and/or disturb nesting bald eagles (*Haliaeetus leucocephalus*).
- The proposed activities could decrease habitat suitability for fishers (*Martes pennanti*) by decreasing canopy cover in mature forest stands, decreasing abundance of snags and coarse woody debris, and by increasing roads, which could elevate risk of trapping mortality.
- The proposed activities could displace gray wolves (*Canis lupus*) from the vicinity of the project area, particularly denning and rendezvous sites, and/or alter big game prey availability, which could adversely affect gray wolves.
- The proposed activities could negatively affect pileated woodpecker (*Dryocopus pileatus*) habitat suitability by removing canopy cover and snags used for foraging and nesting, and by creating disturbance.

- The proposed activities could reduce habitat quality for big game, especially during the fall hunting and winter seasons, by removing forest cover, increasing roads in secure areas, and disturbing animals.

## ANALYSIS AREAS

The discussions of existing conditions and environmental effects will focus on two different spatial scales. The first scale will be the "project area," which was used to assess direct and indirect effects to wildlife species and their habitats. The "project area," totaling 1,211 acres, consists of portions of Township 32 North, Range 22 West, Sections 19, 30, and 31. This project area surrounds the proposed timber harvest units and is the area where all proposed new road construction would occur. Portions of the project area within Sections 19 and 30 are lands included in DNRC's Habitat Conservation Plan (HCP) whereas Section 31 is not. Elevation within the project area ranges between 3,040 and 3,320 feet. The proposed project area contains a variety of slope aspects and wildlife habitats.

The second scale is the "cumulative effects analysis area," which refers to the surrounding landscape for assessing cumulative effects to wildlife species and their habitat. Cumulative effects analysis areas (CEAAs) are named according to the size of the area and are summarized in TABLE W-1 –WILDLIFE ANALYSIS AREAS and FIGURE W-1 – WILDLIFE ANALYSIS AREAS. CEAAs include the project area as well as lands managed by other agencies and private landowners. Detailed descriptions of each analysis area are located in the **Existing Condition** section for each issue or wildlife species evaluated. In general, cumulative effects analysis areas were delineated to approximate the size of a focal species' home range or to approximate a surrounding landscape in which the proposed activities could most likely have measureable cumulative effects to wildlife habitat. See FIGURE W-1- WILDLIFE ANALYSIS AREAS for a map showing the project and cumulative effects analysis areas.

**TABLE W-1. WILDLIFE ANALYSIS AREAS.** Descriptions of the project area and CEAs.

ANALYSIS AREA NAME	DESCRIPTION	TOTAL ACRES	ISSUE(S)/SPECIES ANALYZED
Project Area	DNRC managed lands situated west of Swift Creek in Sections 19, 30, and 31, T32N, R22W.	1,211	direct & indirect effects for all issues/species
Medium CEAA	The project area and 12 sections surrounding it.	9,595	mature forests and connectivity, snags and coarse woody debris, and pileated woodpeckers
Bald Eagle CEAA	The home range of the Whitefish Lake/Swift Creek bald eagle territory.	12,566	bald eagles
Lynx CEAA	The Stillwater East Lynx Management Area and section 31, T32N, R22W.	37,451	Canada lynx
Large CEAA	The Lazy Creek Grizzly Bear Subunit of the Northern Continental Divide Ecosystem combined with lands located north of Whitefish Lake, north of the BNSF railway, and east of Montana Highway 93.	41,100	grizzly bears, fishers

In December 2011, DNRC adopted a Habitat Conservation Plan (HCP) in cooperation with the USFWS to minimize potential impacts of the Forest Management Program to grizzly bears, Canada lynx and three species of fish. As a part of the HCP, DNRC agreed to limit road construction and use for 50 years in a transportation plan developed for blocked forestlands managed by the DNRC Stillwater Unit. This comprehensive access plan is called the Stillwater Block Transportation Plan and includes blocked lands on the Stillwater and Coal Creek state forests. To analyze effects associated with roads and access for this project, the Stillwater Block Transportation Plan was used as the foundation and baseline for analysis. Changes in road amounts and densities are described in relation to the project area and applicable CEAs. The effects to wildlife associated with the full transportation plan were analyzed in the DNRC HCP EIS (USFWS and DNRC 2010). This effects assessment tiers to the detailed analyses contained in those documents.

### ANALYSIS METHODS

DNRC attempts to promote biodiversity by taking a coarse-filter approach, which favors a mix of stand structures and compositions on state lands (ARM 36.11.404). Appropriate stand structures are based on ecological characteristics (e.g., landtype, habitat type, disturbance regime, unique characteristics). A coarse-filter approach assumes that if landscape patterns and processes are maintained similar to those with which the species evolved, the full complement

of species would persist and biodiversity would be maintained. This coarse-filter approach supports diverse wildlife populations by managing for a variety of forest structures and compositions that approximate historic conditions across the landscape. DNRC cannot assure that the coarse-filter approach will adequately address the full range of biodiversity; therefore, DNRC also employs a fine-filter approach for threatened, endangered, and sensitive species (ARM 36.11.406). The fine-filter approach focuses on habitat requirements of several individual species.

To assess the existing condition of the proposed project area and surrounding landscape, a variety of information and techniques were used. Field visits, scientific literature, DNRC’s stand level inventory (SLI) data, aerial photographs, USDA Forest Service Geographical Information System (GIS) data, Montana Natural Heritage Program (MNHP) data, and consultations with other professionals provided information for the following discussion and effects analysis. Specialized methodologies are discussed under the species in which they occur. Species were dismissed from further analysis if habitat did not exist in the project area, or the species would not be affected by any alternative.

Cumulative effects analyses account for known past and current activities, as well as planned future agency actions. Ongoing and proposed timber sale projects that could contribute to cumulative effects are summarized in TABLE W-2 RECENT AND PROPOSED PROJECTS.

**TABLE W-2. RECENT AND PROPOSED PROJECTS.** Recent and proposed timber harvest projects that could contribute to cumulative effects and the number of harvested acres that occur in each analysis area.

Sale Name	Agency	Status	Project Area	Medium CEAA	Lynx CEAA	Large CEAA
Hwy 93 Corridor	DNRC	ongoing	-	-	-	74
Lupfer #3	DNRC	ongoing	-	-	-	265
NE Smith	DNRC	ongoing	-	63	-	63
Olney Urban Interface	DNRC	ongoing	-	-	-	457
SE Stryker Ridge	DNRC	ongoing	-	-	446	52
Swedish Chicken	DNRC	ongoing	-	-	357	90
Upper Whitefish Lake	DNRC	ongoing	-	-	164	-
Lower Herrig	DNRC	proposed	-	-	270	-

Changes to vegetation and forest structure resulting from all DNRC projects, with the exception of the proposed DNRC Lower Herrig Timber Sale, have been accounted for in SLI data used for this analysis. The effects of ongoing sales on wildlife will be discussed in cumulative effects analyses.

## RELEVANT AGREEMENTS, LAWS, PLANS, RULES, AND REGULATIONS

Various policy and procedural documents provide the foundation for management criteria pertaining to wildlife and their habitat on state lands. The documents most pertinent to this

project include *DNRC Forest Management Rules*, *DNRC Forested Trust Lands Final Environmental Impact Statement and Habitat Conservation Plan (HCP)*, the *Endangered Species Act*, the *Migratory Bird Treaty Act*, and the *Bald and Golden Eagle Protection Act*.

## **COARSE FILTER WILDLIFE ANALYSIS**

### ***MATURE FORESTED HABITAT AND LANDSCAPE CONNECTIVITY***

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

#### **Introduction**

A variety of wildlife species rely on older, mature forests to meet some or all of their life history requirements. Mature forests, generally characterized by abundant large diameter trees and dense canopy cover, play an important role in providing food, shelter, breeding sites, resting areas, and/or travel corridors for certain animals. Wildlife use of older, mature forests is species-specific; some species use this habitat exclusively, other species only temporarily or seasonally, and some species avoid mature forests altogether. Several species known to be strongly associated with mature and old forests include American marten (*Martes americana*), northern goshawk (*Accipiter gentilis*), and winter wrens (*Troglodytes troglodytes*).

Forested landscapes in the western United States were historically shaped by natural disturbance events -- primarily wildfire, blowdown, and pest outbreaks. Resulting broad landscape patterns were a mosaic of forest patches varying in age, composition and development. Timber harvest, like stand-replacement fire and blowdown, is a disturbance event that can create open, non-forested patches that over time develop into young, conifer forests. Patch size, age, shape, abundance, and distance to similar patches (connectivity) can be factors influencing wildlife use. The way through which patch characteristics influence wildlife use and distribution are dependent upon the particular species and its habitat requirements. Temporary non-forested openings, patches, and forest edges created by timber harvest and associated roads may be avoided by certain wildlife species adapted to mature, well-stocked forest. In contrast, other wildlife species flourish in early seral habitats created by disturbance. Connectivity under historical fire regimes within forest types found in the vicinity of the project area was likely relatively high as fire differentially burned various habitats across the landscape (*Fischer and Bradley 1987*).

#### **Analysis Areas**

Direct and indirect effects were analyzed on the project area (1,211 acres). Cumulative effects were analyzed on the surrounding sections directly adjacent to the proposed project area sections (CEAA = 9,595 acres, see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale of analysis would be large enough to support a diversity of species that use mature forested habitat and/or require connected forested habitats, and centers evaluation of cumulative effects on those areas most likely to be affected by the proposed action.

### **Analysis Methods**

Mature forested habitats and landscape connectivity were assessed using field evaluations, DNRC's stand level inventory (SLI) data, aerial-photograph interpretation, USDA Forest Service data (VMap 9.1.1), and GIS analysis. Mature forested habitat was defined as forest stands typically >100 years old with  $\geq 40\%$  canopy cover comprised primarily of trees >9 inches dbh. Forested stands containing trees of at least this size and density were considered adequate for providing minimal conditions necessary to facilitate movements of many wildlife species that benefit from well-connected mature forest conditions across the landscape. Road density was calculated in linear miles per square mile by dividing the number of road miles by the specified analysis area in square miles. Factors considered in the analysis include: 1) availability of mature forested habitats ( $\geq 40\%$  canopy cover, >9 inches dbh), 2) average patch size, 3) the degree of timber harvesting, 4) open and restricted road density, and 5) the availability of potential travel corridors.

### **Existing Environment**

The project area currently contains approximately 970 acres (80.1% of project area) of Douglas-fir/western larch, Engelmann spruce, and mixed-conifer stands that have a reasonably well-developed canopy ( $\geq 40\%$  crown closure). Selective salvage harvest in the mid 1990's has resulted in approximately 238 acres (19.7% of project area) of more open canopy forest (<40% crown closure) within the project area. Scattered non-forested wetlands occupy another 3.5 acres of the project area. Mature forested stands are well-connected within the proposed project area, functioning as one forest patch (see FIGURE W-2 - MATURE FORESTED HABITAT AND LANDSCAPE CONNECTIVITY CORRIDORS). Old-growth forest, as defined by Green et al. (1992), is not present within the proposed project area. Small, dense patches of regenerating conifers less than 30 feet in height are interspersed throughout the area.

Approximately 4.3 miles (2.3 miles/sq. mile) of DNRC roads exist in the project area (see TABLE W-4 – ROAD MANAGEMENT AND CONSTRUCTION). All roads within the project area are currently restricted to non-motorized use by the general public. All of the road miles within the project area are inaccessible by wheeled motor vehicles during average winter conditions. Due to abundant mature forest cover and low open road densities, habitat connectivity for species using older (100+ years), undisturbed forest is good within the project area (see FIGURE W-2 - MATURE FORESTED HABITAT AND LANDSCAPE CONNECTIVITY CORRIDORS).

Abundance and locations of mature, closed canopy forest within the CEAA is influenced by land ownership patterns. Lands within the CEAA are comprised of DNRC (45%), Plum Creek Timber (27%), other private owners (15%) USDA Forest Service (8%), Stoltze Lumber (2%), and water/lakes (3%). Presently, 48 percent (4,586 acres) of the cumulative effects analysis area is comprised of relatively well-connected mature forest stands possessing  $\geq 40\%$  crown closure. Most of these stands (3,620 acres) occur on DNRC and Forest Service lands within the CEAA. Approximately 967 acres of mature forest with  $\geq 40\%$  crown closure occurs on private industrial timberlands and other private lands. Average patch size of mature forest in the CEAA is 287 acres (16 patches, range 2.5 to 4,338 acres). Landscape connectivity of mature forest stands within the CEAA is good, with a single large patch providing connectivity throughout most of

the CEAA. Unharvested patches of mature forest adjacent to streams offer linear connectivity on private industrial timberlands within the CEAA. About 3,630 acres of the CEAA (38%) have been harvested within the last 40 years. Approximately 2,102 acres (22% of CEAA) of private timberlands have been harvested within the last 20 years. These lands consist of young, regenerating forest with few large scattered trees and do not provide suitable habitat for species that utilize well-stocked, mature forests. Lakes, private cleared meadows, and wetland/riparian meadows comprise 630 acres (7%) of the CEAA. These areas limit connectivity of existing mature stands and likely influence movement of some forest-dwelling species. Within the CEAA, there are 15.7 miles of open roads that equate to a density of 1.0 mile/square mile. These roads are primarily a result of housing/private land developments in the southern portion of the CEAA. Ongoing harvesting associated with the NE Smith Timber Sale in the CEAA is currently altering forested habitats and landscape connectivity on approximately 63 acres in the Smith Lake area (TABLE W-2 - RECENT AND PROPOSED PROJECTS). Across the cumulative effects analysis area, mature forest habitat and landscape connectivity are largely available for species that require and/or prefer these conditions.

### **Environmental Effects**

#### **Direct and Indirect Effects of the No-Action Alternative on Mature Forested Habitat and Connectivity**

Under this alternative no timber harvesting activities would occur. This would result in: 1) no changes to existing stands; 2) no appreciable changes to forest age, the distribution of forested cover, or landscape connectivity; and 3) no changes to wildlife use. Thus, no direct or indirect effects to mature forested habitat suitability and connectivity would be expected.

#### **Direct and Indirect Effects of the Action Alternative on Mature Forested Habitat and Connectivity**

Under the Action Alternative, approximately 659 acres (54.4% of the project area) would be harvested. Of these acres, 616 acres (50.9% of the project area) of dense, mature forest would undergo harvesting (see TABLE W-3 – MATURE FORESTED HABITAT). All of these acres of mature forest would receive harvest treatments that would reduce overstory crown closure from >40% to 5-15% and increase mature tree spacing to 75 to 80 feet. Species that rely on these mature forested habitats would experience a reduction in habitat for 50 to 80 years. Under the proposed silvicultural prescriptions, residual trees would be healthy seral species (e.g. western larch, Douglas-fir). Average mature forest patch size would be reduced from 970 acres (1 patch) to 71 acres (5 patches). Remaining mature forest and connectivity would primarily be located along riparian areas and ravines in a linear fashion (see FIGURE W-2 - MATURE FORESTED HABITAT AND LANDSCAPE CONNECTIVITY CORRIDORS). Approximately 354 acres (29%) of mature forest in the project area would remain unharvested and could provide suitable habitat for species utilizing smaller patches of mature forest, particularly those associated with riparian areas. These unharvested areas could serve as travel corridors for some species favoring mature forest. After harvesting, the project area would continue to provide a variety of forested habitat conditions for wildlife, but the proportions of these habitats would change. Species preferring larger continuous patches of well-stocked mature forest would likely find the

project area unsuitable for 50 to 80 years. After harvest completion, the project area would appear more similar to adjacent private industrial forestland to the west, and patch size of young, regenerating forest stands would increase. In general, under this alternative, habitat conditions would improve for species adapted to more open forest conditions with seral species, while reducing habitat quality for species that prefer dense, mature forest habitats.

**TABLE W-3 – MATURE FORESTED HABITAT.** Existing acres, proposed harvest acres, and percentages of mature forested habitat possessing ≥40% canopy closure within the project area and cumulative effects analysis area.

Analysis Area	Total Acres	Mature Forested Habitat Present (% area)	Proposed Harvest Under Action Alternative (% area)	Mature Forested Habitat Post-Harvest (% area)
Project Area	1,211	970 (80.1%)	616 (50.9%)	354 (29.2%)
Cumulative Effects Analysis	9,595	4,586 (47.8%)	616 (6.4%)	3,970 (41.4%)

Under the Action Alternative, approximately 1.4 miles of new permanent restricted road would be constructed. Approximately 2.5 miles of existing restricted road would be closed and reclaimed. Thus, total restricted roads would be reduced by 1.1 miles at the end of harvesting activities. Approximately 2.1 miles of temporary road would also be built under the proposed action. No new open roads would be built under this action. During harvest activities, up to 6.0 miles of road (restricted and temporary) within the project area could receive use and have elevated traffic levels (see TABLE W-4 – ROAD MANAGEMENT AND CONSTRUCTION). Motorized public access would be restricted on all roads during and after harvesting activities. Under the Action Alternative, open road density would be unchanged. All temporary roads would be reclaimed and closed to all motorized vehicles following use. At the conclusion of the proposed project, the total amount of roads would be reduced by 1.1 miles and overall road density would be reduced from 2.3 to 1.7 miles/sq. mile.

Thus, moderate adverse direct and indirect effects to connectivity and suitability of mature forested habitat in the project area would be expected since: 1) harvesting would appreciably reduce tree density and existing cover on approximately 616 acres (63.5%) of existing available mature stands, 2) connectivity of mature forest would be altered with an increase in the number of patches from 1 to 5 and a decrease in average patch size from 970 to 71 acres, 3) a measure of connectivity would be maintained on 354 acres (29% of project area) of mature forest along riparian areas and topographic features, and 4) open road density would not change and long-term restricted road density would decrease from 2.3 miles/sq. mile to 1.7 miles/sq. mile.

**TABLE W-4 – ROAD MANAGEMENT AND CONSTRUCTION.** Miles and density (miles/square mile) of existing road and new road that would be used in the project area under the proposed Action Alternative.

Road Types	Existing Condition Road Miles (mi./sq. mi.)	During Proposed Activities Road Miles (mi./sq. mi.)	After Proposed Activities Road Miles (mi./sq. mi.)
Open	0 (0)	0 (0)	0 (0)
Restricted Road	4.3 (2.3)	3.9 (2.1)	3.2 (1.7)
Temporary Road	N/A	2.1 (1.1)	0 (0)
<b>Total Roads</b>	4.3 (2.3)	6.0 <sup>a</sup> (3.2)	3.2 (1.7)

<sup>a</sup>Of the 6.0 miles of road that would be functionally open during activities, 0.0 miles would be open for public motorized access.

### **Cumulative Effects of the No-Action Alternative on Mature Forested Habitat and Connectivity**

Under this alternative no timber harvesting activities would occur. Thus: 1) no changes to existing stands would occur, 2) no further changes to the suitability of mature forested cover or connectivity would be anticipated, and 3) no changes to wildlife use would be expected. Past and ongoing forest management projects not associated with the proposed Lazy Swift 2 Timber Sale have affected mature forest wildlife habitat in the CEAA, and other proposed projects could affect mature forest habitat in the future (see TABLE W-2 – RECENT AND PROPOSED PROJECTS). Activities associated with the NE Smith Timber Sale would continue altering mature forest habitat and create disturbance within the CEAA. No additional cumulative effects to connectivity and suitability of mature forested habitat are expected to result from the No-Action Alternative that could affect wildlife in the cumulative effects analysis area.

### **Cumulative Effects of the Action Alternative on Mature Forested Habitat and Connectivity**

Proposed harvesting would remove 616 acres (6.4%) of mature forest stands within the CEAA (see TABLE W-3 – MATURE FORESTED HABITAT). This would result in a reduction of 13.4% of the total 4,586 acres of mature forest habitat currently available. Reductions in mature forested habitats associated with this alternative would be additive to losses associated with past harvesting activities and any ongoing activities within the CEAA (see TABLE W-2 - RECENT AND PROPOSED PROJECTS). Across the CEAA, 42.3% of mature, forested habitats would remain and landscape connectivity would be altered to a minor degree given the existing condition of the surrounding forested landscape. Existing landscape connectivity would be slightly reduced, as the number of mature forest patches would increase from 16 to 19. Average patch size would decrease from 287 acres to 209 acres. The largest retained mature patch (323 acres) within the project area would remain connected to a larger 3,712-acre patch of mature stands within the CEAA. Connectivity of mature forest within the CEAA would be

maintained through forest retention along linear features such as riparian areas and ravines. Habitat for species associated with dense, mature stands would be reduced in the CEAA, however, the remaining habitat would be expected to persist in the absence of large-scale disturbance or timber harvest. Wildlife species using and preferring young forest stands in the CEAA would benefit from increases of this habitat in the project area for 10 to 30 years post-harvest.

In addition to the 6.0 miles of potential road use within the project area, approximately 2.5 miles of restricted road would receive additional traffic within the CEAA. Thus, a total of 8.2 miles of restricted and temporary roads would be used within the CEAA to conduct project activities. Proposed harvesting and associated activities could temporarily increase (up to 3 years) open road density within the CEAA from 1.0 miles/sq. mile to 1.6 miles/sq. mile. After project completion, open road density would return to 1.0 miles/sq. mile. Thus, minor to moderate adverse cumulative effects to mature forested habitat suitability and connectivity for wildlife would be expected in the cumulative effects analysis area since: 1) harvesting would remove 616 acres (13.4%) of existing mature forest in the CEAA and average patch size would be reduced from 287 acres to 209 acres; 2) current availability of mature, closed canopy habitat would be reduced and connectivity would be altered; 3) mature forest connectivity of the largest patch in the CEAA would be maintained through riparian areas and topographic features; and 4) long-term open road density associated with this action would not change.

### **SNAGS AND COARSE WOODY DEBRIS**

***Issue:*** *The proposed activities could reduce abundance of snags and coarse woody debris, which could lower habitat quality for species that depend on these structural attributes.*

#### **Introduction**

Snags and coarse woody debris are important components of forested ecosystems. The following are five primary functions of snags and downed logs in forest ecosystems: 1) increase structural diversity, 2) alter the canopy microenvironment, 3) promote biological diversity, 4) provide important habitat substrate for wildlife, and 5) act as storehouses for nutrient and organic matter recycling agents (*Parks and Shaw 1996*).

Snags and defective trees (e.g. partially dead, spike top, broken top) are used by a 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 (*Hejl and Woods 1991*). The quantity, quality, and distribution of snags affect the presence and abundance of many wildlife species relying upon them. Snags provide foraging sites for insectivorous species and provide structures used by primary cavity-nesting species to excavate nests. The cavities created by primary excavators (i.e. woodpeckers) provide habitat for secondary cavity users, including other birds and small to mid-sized mammals. Snags and defective trees can also provide nesting sites for secondary cavity users where cavities are formed by broken tops and fallen limbs. Large, tall snags tend to provide nesting sites, while short snags and stumps tend to provide feeding sites (*Bull et al. 1997*). Many species that use

small-diameter snags will also use large snags; however, the opposite is not true. Typically, old stands will have greater numbers of large snags. The density of snags is another important indicator of habitat quality for some cavity-nesting species. Species such as the black-backed woodpecker tend to nest and forage in areas where snag densities are high, using one snag for nesting and others nearby for foraging and roosting.

Coarse woody debris provides food sources, areas with stable temperatures and moisture, shelter from the environment, lookout areas, and food-storage sites for several wildlife species. Several mammals rely on downed logs and snags for survival and reproduction. The size, length, decay, and distribution of woody debris affect the capacity of various species to meet their life requisites. Single, scattered downed trees can provide lookout and travel sites for squirrels or access under the snow for small mammals and weasels, while log piles may provide foraging sites for weasels and secure areas for snowshoe hares.

### **Analysis Areas**

Direct and indirect effects were analyzed within the project area (1,211 acres). Cumulative effects were analyzed within the surrounding sections directly adjacent to the proposed project area (9,595 acres, see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). Wildlife species associated with snags and coarse woody debris found in the CEEA would be those most likely to be influenced by cumulative effects associated with nearby activities and proposed habitat alteration on the project area.

### **Analysis Methods**

The abundance of snags and coarse woody debris were quantitatively estimated in the proposed project area using 13 randomly (per proposed harvest unit) placed plots 0.15 acres in size. Factors considered in the analysis included the level of proposed harvesting, past timber harvest, number of snags, and weight in tons of coarse woody debris.

### **Existing Environment**

Analysis of sampling plots and field observations indicated snags within the project area occurred at a density of 11.5 snags per acre (range 0-39.6). The average diameter of all snags >8" dbh was 11.5" dbh (range 8-20"); and snag species composition was diverse, with the most abundant snag species being subalpine fir. No snags ≥21" dbh were observed within project area sampling plots. Snags were generally distributed unevenly, with some areas containing higher densities than others. The lack of large, high quality snags can be partially attributed to harvest history, as harvest has occurred within the project area in the past. Signs of firewood gathering were not present and public motorized access to the project area is not permitted. Evidence of snag use for feeding and/or cavity building was observed in snags that were present. Coarse woody debris levels were also variable across the project area, averaging ~8.1 tons per acre (range 0.8-21.7 tons per acre). Similar to snags, downed logs were generally small diameter (5.1" at transect line, range 3-12"), although some larger logs were observed. Thus, habitat quality for wildlife utilizing snags and/or coarse woody debris is likely moderate within the project area.

Overall, snags exist at current levels to meet DNRC's minimum-retention thresholds (*ARM 36.11.411*), although size classes are smaller than preferred. Large diameter (>21" dbh) snags and snag recruits are rare within the project area. Coarse woody debris in the majority of the project area is present in appropriate amounts for the current existing habitat types (*Graham et al. 1994*).

Similar to unaltered forested landscapes, snags and coarse woody debris are not distributed evenly across the project area (*Harris 1999*) or CEAA. Snags and coarse woody debris are frequently collected for firewood near open roads, which are concentrated in the southeast corner of the CEAA and along the Lower Whitefish Lake road running north-south through the CEAA. Abundance and distribution of snags and coarse woody debris within the CEAA is likely similar to patterns observed on sampling plots, except near housing developments, and on 2,102 acres (22% of CEAA) of recently harvested private industrial timberlands. In addition to private industrial timberlands within the CEAA, past harvesting on 1,242 acres of DNRC lands (13.0% of CEAA), has altered snags, snag recruits, and coarse woody debris levels. On these acres of harvested land within the cumulative effects analysis area, snag and downed wood abundance is likely lower than levels in unharvested areas.

### **Environmental Effects**

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

No direct changes in the abundance or distribution of snags and downed logs would be expected. Existing snags would continue to provide wildlife habitat, and new snags and coarse woody debris would be recruited as trees die. No direct or indirect effects to habitat quality for wildlife species requiring snags and coarse woody debris would be expected since: 1) no harvesting would occur that would alter present or future snag or coarse woody debris concentrations, and 2) no changes to human access for firewood gathering would occur.

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

Existing snags, live recruitment trees and coarse woody debris would be altered due to timber harvesting on 659 acres (54.4%) in the proposed project area. Coarse woody debris amounts would likely remain similar to existing levels in harvest units or increase under the proposed action. Proposed harvesting would likely decrease snag abundance and the number of live trees that could be recruited into snags or coarse woody debris. Harvest prescriptions call for retention of 2 snags, and 2 large snag recruits per acre greater than 21 inches dbh where they exist, otherwise the next largest size class would be retained. Additional large-diameter recruitment trees would be left if sufficient large snags are not present. Coarse woody debris would be left in amounts ranging from 12 to 25 tons/acre, depending upon habitat type of the proposed harvest areas (*Graham et al. 1994*). Although current snags present in the project area are generally small diameter (average 11.5" dbh), ample large live trees suitable for snag recruitment exist within proposed harvest units. Future snag quality in the harvested areas would be enhanced with proposed silvicultural prescriptions. Proposed treatments would be expected to promote increased tree growth, larger tree diameters, and the reestablishment of shade-intolerant species like western larch, which provide high-quality structures important for

nesting and foraging. The potential future risk for snag and coarse woody debris loss due to firewood gathering would not be expected to change, as no new open roads would be constructed. Thus, minor to moderate adverse direct and indirect effects to snags and coarse woody debris would be anticipated that would affect habitat quality of wildlife species requiring these habitat attributes since: 1) harvesting would reduce the density of existing snags and snag recruitment trees on 659 acres (54% of project area), 2) coarse woody debris amounts would be retained at similar or greater levels to those existing, 3) levels of snags and coarse woody debris in unharvested areas comprising 45.6% of the project area would remain unaltered, 4) two large snags and two future recruitment trees per acre would be retained in all proposed treatment areas, and 5) open road access for firewood gathering would not change.

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

Snags and coarse woody debris would not be altered in the project area under this alternative. Past and ongoing forest management projects not associated with the proposed Lazy Swift 2 Timber Sale have affected snag and coarse woody debris in the CEAA (see TABLE W-2 - RECENT AND PROPOSED PROJECTS). Ongoing harvesting associated with the NE Smith Timber Sale in the CEAA is currently altering snags and coarse woody debris on approximately 63 acres in the Smith Lake area. No additional cumulative effects to habitat quality for wildlife species that utilize snags and coarse woody debris are expected to result from the No-Action Alternative would be anticipated since: 1) no further harvesting would occur that could affect existing snag and coarse woody debris abundance, and 2) no changes to human access for firewood gathering would occur.

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

Wildlife species that rely on snags and coarse woody debris would experience a reduction in habitat quality within 659 acres (6.9% of the CEAA) of harvest units. Some snags would be removed from the project area, whereas coarse woody debris material would remain in similar amounts. Lands of various ownerships within the CEAA have been influenced by differing management objectives over time. Thus, snags and coarse woody debris have received different levels of consideration regarding their management and retention. Generally, past harvesting on 3,630 acres across all ownerships (37.8% of the CEAA) has likely reduced these attributes. The reduction of snags associated with this alternative would be additive to the losses associated with past harvesting and any ongoing harvesting within the CEAA (see TABLE W-2 - RECENT AND PROPOSED PROJECTS). However, the project requirements to retain 2 large snags and 2 large snag recruits per acre (greater than 21 inches dbh or next largest size class), and 12 to 25 tons of coarse woody debris per acre (depending upon habitat type) would mitigate additional cumulative effects associated with this project. Approximately 4,586 acres (47.8%) within the CEAA have not been recently harvested and likely contain moderate levels of snags and coarse woody debris. Under the Action Alternative, long-term open road amounts would not be altered; thus, risk of potential loss of snags and coarse woody debris resulting from firewood gathering would remain the same. Thus, minor adverse cumulative effects to habitat quality for wildlife requiring snags and coarse woody debris would be anticipated over the next 30 to 100 years since: 1) 659 acres (6.9%) of the CEAA would be

harvested reducing snags and snag-recruit trees while coarse woody debris levels would increase or not appreciably change, 2) much of the CEAA (48.7%) that would not be harvested would continue to provide snags and downed wood habitat attributes, 3) motorized public access and associated firewood gathering would not change, and 4) there would be increased representation of shade-intolerant tree species within harvest units that could become high-quality snags in the long term.

### FINE-FILTER WILDLIFE ANALYSIS

In the fine-filter analysis, individual species of concern are evaluated. These species include those listed as threatened or endangered under the Endangered Species Act of 1973, species listed as sensitive by DNRC, and animals managed as big game by Montana DFWP. TABLE W-5 – FINE FILTER summarizes how each species considered was included in detailed subsequent analysis or removed from further consideration, since suitable habitat either did not occur within the project area or proposed activities would not affect their required habitat components.

**TABLE W-5 – FINE FILTER.** Species considered in the fine-filter analysis for the Lazy Swift 2 Timber Sale.

	SPECIES/HABITAT	DETERMINATION – BASIS
Threatened and Endangered Species	<b>Grizzly bear</b> ( <i>Ursus arctos</i> ) Habitat: Recovery areas, security from human activity	<i>Detailed analysis provided below</i> – The proposed project area occurs in the Lazy Creek Subunit of the Northern Continental Divide Ecosystem (NCDE) Recovery Area ( <i>USFWS 1993</i> ) and within non-recovery occupied habitat ( <i>Wittinger 2002</i> ).
	<b>Canada lynx</b> ( <i>Felis lynx</i> ) Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zones	<i>Detailed analysis provided below</i> – Potential lynx habitat types occur within the project area.
Sensitive Species	<b>Bald eagle</b> ( <i>Haliaeetus leucocephalus</i> )  Habitat: Late-successional forest less than 1 mile from open water	<i>Detailed analysis provided below</i> – Approximately 1,025 acres of the home range of the Whitefish Lake/Swift Creek bald eagle pair occurs within the proposed project area.

	SPECIES/HABITAT	DETERMINATION – BASIS
Sensitive Species	<p><b>Black-backed woodpecker</b> (<i>Picoides arcticus</i>) Habitat: Mature to old burned or beetle-infested forest</p>	No recent (less than 5 years) burned areas are in the project area. Thus, no direct, indirect, or cumulative effects to black-backed woodpeckers would be expected to occur as a result of either alternative.
	<p><b>Coeur d'Alene salamander</b> (<i>Plethodon idahoensis</i>) Habitat: Waterfall spray zones, talus near cascading streams</p>	No moist talus or streamside talus habitat occurs in the project area. Thus, no direct, indirect, or cumulative effects to Coeur d'Alene salamanders would be expected to occur as a result of either alternative.
	<p><b>Columbian sharp-tailed grouse</b> (<i>Tympanuchus Phasianellus columbianus</i>) Habitat: Grassland, shrubland, riparian, agriculture</p>	No suitable grassland communities occur in the project area. Thus, no direct, indirect, or cumulative effects to Columbian sharp-tailed grouse would be expected to occur as a result of either alternative.
	<p><b>Common loon</b> (<i>Gavia immer</i>) Habitat: Cold mountain lakes, nest in emergent vegetation</p>	No suitable lakes occur within 500 feet of the project area. Thus, no direct, indirect or cumulative effects to common loons would be expected to occur as a result of either alternative.
	<p><b>Fisher</b> (<i>Martes pennanti</i>) Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian</p>	<i>Detailed analysis provided below</i> – Potential fisher habitat occurs within the project area.
	<p><b>Flammulated owl</b> (<i>Otus flammeolus</i>) Habitat: Late-successional ponderosa pine and Douglas-fir forest</p>	No potentially suitable dry Douglas-fir stands exist in the project area. Thus, no direct, indirect or cumulative effects to flammulated owls would be expected to occur as a result of either alternative.
	<p><b>Gray wolf</b> (<i>Canis lupus</i>) Habitat Features: Ample big game populations, security from human activities</p>	<i>Detailed analysis provided below</i> – Wolf packs have used the vicinity of the proposed project area in the past, and future use of the area by wolves is likely.

	SPECIES/HABITAT	DETERMINATION – BASIS
Sensitive Species	<p><b>Harlequin duck</b> (<i>Histrionicus histrionicus</i>) Habitat: White-water streams, boulder and cobble substrates</p>	Swift Creek forms the eastern border of the project area and has records of harlequin duck sightings in the past (MNHP 2012). Proposed harvest units are on average over 300 feet away from the edge of steep embankments/cliffs dropping to Swift Creek. Proposed roads receiving temporary use would be over 1,000 feet from Swift Creek. Aside from Swift Creek, the project area does not contain any suitable habitat for harlequin ducks. Thus, negligible direct, indirect or cumulative effects to harlequin ducks would be expected to occur as a result of either alternative.
	<p><b>Northern bog lemming</b> (<i>Synaptomys borealis</i>) Habitat: Sphagnum meadows, bogs, fens with thick moss mats</p>	No suitable sphagnum bogs or fens occur in the project area. Thus, no direct, indirect, or cumulative effects to northern bog lemmings would be expected to occur as a result of either alternative.
	<p><b>Peregrine falcon</b> (<i>Falco peregrinus</i>) Habitat: Cliff features near open foraging areas and/or wetlands</p>	Cliffs occur on the eastern edge of the project area, however they appear to be unsuitable for nesting as the primary substrate is loose clay. No historical records of peregrine falcons in this area exist (MNHP 2012). Thus, no direct, indirect, or cumulative effects to peregrine falcons would be anticipated as a result of either alternative.
	<p><b>Pileated woodpecker</b> (<i>Dryocopus pileatus</i>) Habitat: Late-successional ponderosa pine and larch-fir forest</p>	<i>Detailed analysis provided below</i> – Potential suitable mature stands exist within the proposed project area.
	<p><b>Townsend's big-eared bat</b> (<i>Plecotus townsendii</i>) Habitat: Caves, caverns, old mines</p>	No suitable caves or mine tunnels are known to occur in the project area. Thus, no direct, indirect or cumulative effects to Townsend's big-eared bats are anticipated as a result of either alternative.
Big Game Species	<b>Elk</b> ( <i>Cervus canadensis</i> )	<i>Detailed analysis provided below</i> – Year-round use by deer, elk, and moose is possible. Big game winter range is present within the project area.
	<b>Moose</b> ( <i>Alces americanus</i> )	
	<b>Mule Deer</b> ( <i>Odocoileus hemionus</i> )	
	<b>White-tailed Deer</b> ( <i>Odocoileus virginianus</i> )	

## **THREATENED AND ENDANGERED SPECIES**

### **GRIZZLY BEAR**

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

#### **Introduction**

Grizzly bears are generalist omnivores that use a diversity of habitats found in western Montana, and are currently listed as “threatened” under the Endangered Species Act. Preferred grizzly bear habitats are meadows, riparian zones, avalanche chutes, subalpine forests, and big game winter ranges, all of which provide seasonal food sources. Of these, meadows, riparian areas, and big game winter ranges occur in the project area. Primary threats to grizzly bears are related to human-bear conflicts, habituation to unnatural foods near high-risk areas, and long-term habitat loss associated with human development (*Mace and Waller 1997*). Forest-management activities may affect grizzly bears by altering cover, and/or by creating roads, which can increase access for humans in otherwise secure areas (*Mace et. al. 1997*). These actions could lead to the displacement of grizzly bears from preferred areas, and/or result in an increased risk of human-caused mortality. By developing roads and reducing forest cover, forest management activities can bring humans and bears into closer contact, and make bears more detectable, which can increase their risk of being shot illegally. Displacing bears from preferred areas may increase their energetic costs, potentially lowering their ability to survive, and/or reproduce successfully.

#### **Analysis Areas**

Direct and indirect effects were analyzed for activities conducted within the 1,211-acre project area. Cumulative effects were analyzed in a 41,100-acre area (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS) that encompasses the project area and approximates the home range size of a female grizzly bear in northwest Montana (*Mace and Roberts 2011*). This CEAA contains the Lazy Creek Grizzly Bear BMU Subunit and additional lands extending south to Whitefish Lake and the Burlington Northern-Santa Fe Railway, and west to Montana Highway 93.

#### **Analysis Methods**

Field evaluations, aerial photograph interpretation, scientific literature and GIS queries were the basis for this analysis. Grizzly bear hiding cover was considered to be forest vegetation that will hide 90% of a grizzly bear at a distance of 200 feet. Within the CEAA, open road densities were calculated using the simple linear calculation method (road length in miles divided by area in square miles). Factors considered within this cumulative effects analysis area include availability of timbered stands for hiding cover, level of human disturbance, and miles of open, restricted, and temporary roads.

#### **Existing Environment**

Approximately 634 acres of the proposed project area occurs in the Lazy Creek subunit of the NCDE Recovery Area (*USFWS 1993*) while the remaining 577 acres of the project area lies

within non-recovery occupied habitat described by Wittinger (2002). The proposed project area does not contain Stillwater Block Class A lands that are managed as "quiet areas" requiring special management under the DNRC HCP (*USFWS and DNRC 2010*). Grizzly bears have been observed in the vicinity of the project area in the past, and continued appreciable use by bears is anticipated. Approximately 1,208 acres (99.7%) of grizzly bear hiding cover is present within the proposed project area. The abundance of vegetative cover likely contributes to security for bears, and facilitates their ability to move freely within the project area. Stands harvested within the last 20 years (238 acres, 19.7%) within the project area contain dense patches of regenerating conifers that currently break up sight distances and provide hiding cover for grizzly bears. Preferred riparian and wetland areas are present throughout the project area. Managing human access is a major factor in management of grizzly bear habitat. Presently, open road density in the proposed project area is 0.0 miles/sq. mile and total road density is 2.3 miles/sq. mile.

The CEAA is a relatively intact, mostly undeveloped forested area with a variety of preferred grizzly bear habitats (avalanche chutes, berry fields, riparian areas, big game winter ranges). Ownership of the CEAA is 43% DNRC, 37% Plum Creek Timber, 11% USDA Forest Service, 7% private, and 1% none (lakes). Forest stands that provide hiding cover persist on over 66% of the CEAA (>27,187 acres). Forest habitats across the cumulative effects analysis area are a combination of age classes, ranging from recently harvested stands to mature stands. Approximately 51% of the CEAA (21,038 acres) has been harvested within the last 40 years and consists of young stands with regenerating trees. Ongoing timber sale projects within the CEAA (see TABLE W-2 - RECENT AND PROPOSED PROJECTS) are sources of disturbance and are currently altering grizzly bear habitat. Reductions in vegetative cover and increased disturbances, such as those associated with timber harvest, can lower effective use of habitat by bears and render bears more vulnerable to human-caused mortality (*Servoheen et. al. 1999*). Human disturbance levels are closely tied to road abundance and access. Open road density within the CEAA is approximately 1.2 miles/sq. mile and total road density is approximately 3.9 miles/sq. mile (simple linear calculations). Roads present in the cumulative effects analysis area are primarily a result of past timber management activities, but also include roads used to access USDA Forest Service and privately owned lands. The greatest risk factors for bears within the CEAA are likely associated with homes, developments, and railway activities near the southern end of the CEAA. Unnatural attractants potentially associated with these areas could increase the probability of human-bear conflicts, which can result in bear mortality.

### **Environmental Effects**

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

None of the proposed forest management activities would occur. No changes to grizzly bear habitat would be expected. Visual screening, existing secure areas, risk of displacement, and open and restricted road density would remain the same. Thus, since: 1) no timber harvesting would alter existing visual screening cover, 2) risk of displacement from important habitat would not increase, 3) no existing secure areas would be affected, and 4) no changes to open or restricted road density would occur; no direct or indirect effects associated with grizzly bear

displacement or human-caused bear mortality risk would be anticipated as a result of the No-Action Alternative.

### **Direct and Indirect Effects of the Action Alternative on Grizzly Bears**

Under the Action Alternative, grizzly bear hiding cover would be reduced for 10 to 20 years on approximately 659 acres (54.4%) of the project area. Harvesting associated with the Action Alternative would increase sight distances within all proposed harvest units. Existing dense patches of regenerating conifers, neighboring mature forest patches, and topographic breaks would exist in such a manner that no point in any harvest unit would be greater than 600 feet to screening cover. Current levels of patchy cover in the form of brush, shrubs, and sub-merchantable trees would be retained where present and feasible in 659 acres of harvest units. Topography within much of the project area is rolling, which creates additional visual screening. Existing riparian cover along 3.2 miles of Class 1 and 2 streams would be largely protected and offer movement corridors as well as hiding cover for bears in this preferred habitat. Open roads are absent from the project area, which lessens the risk of mortality by accidental or intentional shooting. Levels of hiding cover would be expected to recover within 10 to 20 years following proposed treatments as shrub and tree regeneration proceeds. Should grizzly bears be present in the area at the time of harvest operations, they could be affected by increased road traffic, noise, and human activity, and by reduced amounts of hiding cover. Proposed activities in grizzly bear habitats would reduce grizzly bear security, possibly resulting in increased stress and/or energy expenditures to endure the disturbance, or to move away from the area. These disturbances would only occur during harvesting operations (1 to 3 years). Contract requirements would assist in mitigating bear-human conflict risk by specifying that contractors are not permitted to carry firearms on the work site and that unnatural attractants must be stored or disposed of in a bear-resistant manner. Spring restrictions on motorized use and commercial harvest restrictions would apply to 659 acres of proposed harvest, which would minimize disturbance to bears during the spring period (April 1–June 15).

Motorized activities associated with the Action Alternative, such as the use of restricted roads and the construction of new roads, could affect grizzly bears by temporarily (1 to 3 years) displacing them from previously secure areas. See TABLE W-4 – ROAD MANAGEMENT AND CONSTRUCTION for road summaries within the project area. No new open roads would be built. Approximately 1.4 miles of permanent restricted road would be built, 2.1 miles of temporary road constructed, and 2.5 miles of existing restricted road could be used under the Action Alternative. The use of up to 6.0 miles of restricted and temporary roads would increase motorized vehicle activity during the non-denning season for up to 3 years. Functionally, the use of existing and new restricted roads and temporary roads would contribute to open road density in the short term (1 to 3 years), increasing potential for disturbance to grizzly bears. All 3.9 miles of restricted roads (both existing and new) that would be used temporarily (1 to 3 years) to complete proposed project activities would be closed in a manner to prohibit public motorized access during, and after, the proposed activities. Including temporary roads, functional open road amounts could increase temporarily from 0.0 miles (density 0.0 mi./sq. mi.) up to 6.0 miles (density 3.2 mi./sq. mi.)

during project operations. Public motorized access would not be permitted during proposed activities or following proposed activities.

Thus, minor adverse direct or indirect effects to grizzly bears associated with displacement and mortality risk would be expected since:

- 1) low to moderate levels of temporary (1 to 3 years) disturbance and displacement would be anticipated;
- 2) hiding cover on 659 acres (54.4%) would be reduced in the short term, but would be expected to recover in 10 to 20 years;
- 3) hiding cover would remain on approximately 500 acres (41.3%) of the project area;
- 4) reductions in hiding cover would be mitigated through vegetation retention patches within units, vegetation retention along riparian corridors, and reduced sight distances associated with varied topography;
- 5) commercial harvest and motorized activities would be restricted during the spring period; and
- 6) short-term increases in functional open road densities from 0.0 mi/sq. mi. to 3.0 miles/sq. mi. would be anticipated and long-term open road density would not change.

#### **Cumulative Effects of the No-Action Alternative on Grizzly Bears**

Under the No-Action Alternative, no proposed project activities would occur. No additional cumulative changes to the level of disturbance to grizzly bears or secure areas would be anticipated. No additional cumulative changes in open-road densities or hiding cover from the existing conditions would be anticipated. Past and ongoing forest management projects not associated with the proposed Lazy Swift 2 Timber Sale have affected grizzly bear habitat in the project area, and other ongoing projects (see TABLE W-2 – RECENT AND PROPOSED PROJECTS) could continue to alter grizzly bear habitat and/or disturb bears in the future. Thus, since no additional changes in available habitats or level of human disturbance would be anticipated as a result of the No-Action Alternative, no cumulative effects to grizzly bear displacement or effects involving mortality risk would be anticipated.

#### **Cumulative Effects of the Action Alternative on Grizzly Bears**

The increased use of road systems during the proposed project would temporarily increase human disturbance and displacement risk for grizzly bears within a portion of the cumulative effects analysis area. Collectively, a short-term (1 to 3 years) increase in human disturbance would be anticipated in the CEAA, but contract requirements would lessen risk of human-bear conflicts during active harvest operations (e.g. proper storage/disposal of unnatural attractants, prohibit possession of firearms, etc.). Reductions in forest cover on 659 acres (1.6 % of the CEAA) and anticipated elevated disturbance levels would be additive to past timber harvesting that has affected approximately 21,038 acres (51.2%), and current harvest projects (see TABLE W-2 – RECENT AND PROPOSED PROJECTS). Harvesting and road building within the last 40 years in the cumulative effects analysis area has altered grizzly bear cover and habitat connectivity, however 31.7% (12,975 acres) of the area would remain in mature forest possessing  $\geq 40\%$  canopy cover in the overstory. Additionally, areas harvested over 15 years ago are likely providing hiding cover and reduced sight distances. Continued use of the CEAA by grizzly

bears would be anticipated. Mature stands and young, fully stocked stands that likely provide hiding cover would make up approximately 26,528 acres (64.5%) of the CEAA. Early successional stages of vegetation occurring in harvest units provide foraging opportunities that do not exist in some mature stands across the cumulative effects analysis area. A short-term increase in open road density would occur, increasing from 1.2 mi/sq. mi. to 1.4 miles/sq. mile in the CEAA. Long-term open road densities would not be altered. Long-term density of all roads within the CEAA would not change. Disturbance associated with temporarily accessed roads would be additive to that occurring on roads used for other ongoing forest management projects (see TABLE W-2 – RECENT AND PROPOSED PROJECTS). Within the CEAA, high-risk factors for bears associated with human developments (e.g. pets, livestock, garbage, etc.) and the railway would continue to be present near the southern end of the area. Thus, minor adverse cumulative effects to grizzly bears associated with displacement or effects involving mortality risk would be expected in the short term (1 to 3 years) and long term (10 to 20 years) since:

- 1) short-duration (1-3 year) increases in human disturbance levels would be expected within the cumulative effects analysis area,
- 2) hiding cover would be removed in the short-term (~10-20 years) on a relatively small portion (1.6%) of the cumulative effects analysis area,
- 3) a large portion of the cumulative effects analysis area (>50%) would continue to provide hiding cover, and
- 4) short-term increases in functional open road densities from 1.2 mi/sq. mi. to 1.4 miles/sq. mi. would be anticipated and long-term open road density would not change.

## CANADA LYNX

***Issue:*** *The proposed activities could result in the modification of habitat preferred by Canada lynx and decrease the area's suitability for lynx.*

### **Introduction**

Canada lynx are listed as “threatened” under the Endangered Species Act. 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*). Lynx abundance and habitat use are strongly associated with snowshoe hare populations; thus activities which decrease habitat quality for snowshoe hares can reduce the availability of prey for lynx. Lynx habitat in western Montana consists primarily of stands that provide habitat for snowshoe hares including dense, young and mature coniferous stands (*Squires et al. 2010*). Forest type, tree densities, natural disturbance history, and time since harvesting play important roles in shaping the suitability of young foraging habitat for lynx. Mature subalpine fir stands with abundant horizontal cover and coarse woody debris also provide structure important for foraging, denning, travel, and security. These conditions are found in a variety of habitat types (*Pfister et al. 1977*), particularly within the subalpine fir series. Historically, northwest Montana contained a variety of stand types with differing fire regimes. This variety of stand types combined with patchy elevation and snow-depth gradients preferred by lynx, likely formed a non-continuous mosaic of lynx and non-lynx habitats (*Fischer and Bradley 1987, Ruggiero et al. 1999, Squires et al. 2010*). Forest management

considerations for lynx include providing a mosaic of young and mature lynx habitats that are well connected across the landscape.

### **Analysis Areas**

Direct and indirect effects were analyzed for activities conducted within the 1,211-acre project area. The cumulative effects analysis area consisted of the Stillwater East Lynx Management Area and Section 31 of the project area (37,451 acres, see FIGURE W-1 – WILDLIFE ANALYSIS AREAS), which approximates the home range size of a Canada lynx. Lynx Management Areas (LMA) are designated portions of DNRC land “where resident lynx populations are known to occur or where there is a high probability of periodic lynx occupancy over time,” (*USFWS and DNRC 2010, Vol. II, p. 2-46*).

### **Analysis Methods**

Analysis methods include field evaluations, aerial photograph interpretation, and GIS analysis of SLI data and suitable lynx habitats. Suitable lynx habitat was subdivided into the following lynx habitat types: 1) winter foraging, 2) summer foraging, 3) other suitable, and 4) temporary non-habitat. Classification occurred according to DNRC HCP lynx habitat mapping protocols (*DNRC 2010*) based upon a variety of vegetation characteristics important to lynx and snowshoe hares (i.e., forest habitat type, canopy cover, stand age class, stems/acre, and coarse woody debris). Other suitable lynx habitat is defined as habitat that has the potential to provide connectivity and lower quality foraging habitat. The temporary non-habitat category consists of non-forest and open forested stands that are not expected to be used appreciably by lynx until adequate horizontal and vertical cover develops. Factors considered in the analysis include: 1) the abundance of lynx habitat types, 2) landscape connectivity, and 3) the level of harvesting.

### **Existing environment**

Approximately 1,211 acres (100%) of potential lynx habitat occurs in the 1,211 acre project area. Of this potential habitat, 1,011 (83.6%) are currently providing suitable habitat (TABLE W-6 – LYNX HABITAT). Suitable lynx habitat within the project area is defined as the sum of the summer foraging, winter foraging, and “other suitable” lynx habitat categories. In the project area, winter foraging habitat is the most abundant type of suitable habitat (TABLE W-6 – LYNX HABITAT). Amounts of coarse woody debris were quantitatively assessed within the project area and found to be appropriate for the habitat types present (see SNAGS AND COARSE WOODY DEBRIS section of this analysis for further detail). Additionally, riparian areas are present within the proposed project area that provide a number of potential travel corridors for lynx, should they be present in the area. Past harvesting of 198 acres (16.4%) within the proposed project area has altered lynx habitat, however all of these acres received intermediate harvest treatments and will likely provide suitable habitat for lynx within the next 5 to 10 years. Throughout the project area, habitat and connectivity conditions are favorable for potential use by lynx, however shallow snow depths and lower elevation (below 4,000 feet) likely limit extended use by lynx.

Canada lynx have been documented within the CEAA in the past (DNRC unpublished data, and *MNHP 2012*). DNRC manages 99% of the CEAA, with the other 1% consisting of lakes.

Habitat types preferred by lynx are abundant within the CEAA (TABLE W-6 – LYNX HABITAT). The distribution of the various lynx habitat elements on DNRC-managed lands is the result, primarily, of past natural disturbances, past timber harvesting and the general lack of recent wildfire. The lack of recent fire disturbance in the CEAA (influenced by modern-day fire suppression) has likely led to a smaller proportion of young foraging habitat and a greater proportion of mature foraging habitat or forested travel/other habitats on DNRC lands than was typically present pre-European settlement (*Losensky 1997*). Suitable habitat is well connected within the CEAA. Timber harvesting on 6,273 acres (16.7%) within the CEAA in the last 40 years has altered lynx habitat, however those harvest units older than 20 years are now providing suitable summer foraging or other suitable habitat.

**TABLE W-6 – LYNX HABITAT.** Estimates of existing lynx habitat and habitat that would persist post-harvest on DNRC lands in the project area, Stillwater East LMA, and CEAA. Percent refers to the percent of the lynx habitat category of the total potential habitat<sup>a</sup> present on DNRC-managed lands.

LYNX HABITAT  CATEGORY	Acres of lynx habitat (percent of DNRC lynx habitat)					
	Project Area		Stillwater East LMA		Cumulative Effects Analysis Area	
	Existing	Post-Harvest	Existing	Post-Harvest	Existing	Post-Harvest
OTHER SUITABLE	16.7 (1.4%)	13.4 (1.1%)	2,609.3 (7.6%)	2,609.3 (7.6%)	2,626.0 (7.5%)	2,622.6 (7.5%)
SUMMER FORAGE	0.0 (0%)	0.0 (0%)	2,599.9 (7.6%)	2,599.9 (7.6%)	2,599.9 (7.4%)	2,599.9 (7.4%)
TEMP. NON-SUITABLE	198.3 (16.4%)	826.2 (68.3%)	4,875.3 (14.2%)	5,308.3 (15.4%)	5,109.7 (14.6%)	5,737.5 (16.4%)
WINTER FORAGE	994.2 (82.2%)	369.7 (30.6%)	24,350.2 (70.7%)	23,917.2 (69.5%)	24,730.9 (70.5%)	24,106.4 (68.7%)
<b>Grand Total Suitable Lynx Habitat</b>	<b>1,010.9 (83.6%)</b>	<b>383.0 (31.7%)</b>	<b>29,559.3 (85.8%)</b>	<b>29,126.3 (84.6%)</b>	<b>29,956.7 (85.4%)</b>	<b>29,328.9 (83.6%)</b>

<sup>a</sup> Total potential lynx habitat is a habitat category that describes all areas that are providing suitable lynx habitat now, or those likely to provide suitable habitat at some time in the future. Total potential lynx habitat is the sum of the other suitable, summer forage, temp. non-suitable, and winter forage habitat categories.

## **Environmental Effects**

### **Direct and Indirect Effects of the No-Action Alternative on Canada Lynx**

Under this alternative, no changes in lynx habitat elements would be expected in the project area and landscape connectivity would not be altered. Thus, no direct or indirect effects influencing lynx habitat suitability would be expected to occur in the project area.

### **Direct and Indirect Effects of the Action Alternative on Canada Lynx**

Approximately 628 acres (51.9% of project area) of suitable lynx habitat would be subject to harvesting with this alternative. Proposed harvest prescriptions on 628 acres of suitable lynx habitat would decrease mature tree abundance to 6 to 25 trees per acre and reduce overstory crown closure to <15%. All acres of suitable lynx habitats inside harvest units would be converted to temporary non-suitable habitat (TABLE W-6 – LYNX HABITAT) for the next 10 to 20 years. Where operationally feasible, existing patches of shade-tolerant sub-mechantable conifers would be retained. The total area of these patches would not be expected to comprise more than 10% of the acres proposed for harvest. Growth of retained mature trees and patches of sapling to pole-sized conifers, combined with post-harvest conifer regeneration following harvest, would lessen the time logged stands would be temporarily unsuitable for lynx. Activities associated with active logging operations could temporarily displace any lynx using the area for 1 to 3 years. Following proposed logging, 383 acres (31.7% of project area) of suitable lynx habitat would remain within the project area. Suitable lynx habitat would be largely retained along streams and ravines in the project area, and thus provide habitat connectivity between larger patches of suitable habitat. Although vegetation retention along important travel features could facilitate lynx movement in the area, appreciable use by lynx would not be expected in the project area for 10 to 20 years. In the proposed harvest units, 12 to 25 tons/acre of coarse woody debris would be retained that would provide horizontal cover and security structure for lynx and lynx prey, once harvest units regenerated into suitable habitat in 10 to 20 years. Thus, moderate adverse direct and indirect effects to habitat suitability for Canada lynx would be expected, since collectively: 1) the amount of existing suitable lynx habitat in the project area would be reduced by 62.1% (TABLE W-6– LYNX HABITAT); 2) suitable lynx habitats would likely develop on 198 acres during the next 5 to 10 years within the project area; 3) coarse woody debris and patches of regenerating conifers would be retained to promote forest structural complexity in harvest units, expediting their growth back into suitable lynx habitat; and 4) moderate levels of landscape connectivity would persist along important travel features despite an overall reduction in landscape connectivity.

### **Cumulative Effects of the No-Action Alternative on Canada Lynx**

No appreciable change in lynx habitats would occur under this No-Action Alternative, and no further changes in landscape connectivity would be anticipated. Past forest management projects not associated with the proposed Lazy Swift 2 Timber Sale have affected lynx habitat in the project area, and ongoing and proposed projects could alter lynx habitat in the future (see TABLE W-2 – RECENT AND PROPOSED PROJECTS). Thus, no additional cumulative effects to suitable lynx habitat are expected to result from the No-Action Alternative that could affect lynx habitat suitability in the CEAA.

### **Cumulative Effects of the Action Alternative on Canada Lynx**

Under the Action Alternative, approximately 659 acres (1.8%) of the 37,451-acre cumulative effects analysis area would be altered by harvesting. Of these acres, harvesting would affect 628 acres of currently suitable lynx habitat. Following proposed harvesting, the CEAA would contain 29,329 acres (83.6%) of suitable lynx habitat (TABLE W-6 – LYNX HABITAT). Expected

reductions in suitable lynx habitat and increases in temporary unsuitable habitat in the proposed harvest units would not be expected to appreciably alter lynx use of the cumulative effects analysis area, particularly given that habitat suitability is high in the surrounding landscape. Following treatments, connectivity of suitable lynx habitat would also be maintained along riparian areas and features frequently used by lynx during daily movements (i.e. drainages, ridges etc.). Suitable lynx habitat within the CEAA is being altered by ongoing DNRC timber sales (TABLE W-2 – RECENT AND PROPOSED PROJECTS), and could be altered within next 5 years by the proposed Lower Herrig Timber Sale. Increased levels of motorized activities associated with the Action Alternative would be additive to current and proposed timber sales, which could temporarily displace lynx should they be present near the proposed project area and associated roads. Thus, minor adverse cumulative effects to lynx and the suitability of their habitat would be expected as a result of proposed activities since: 1) overall baseline habitat suitability would remain high; 2) existing suitable lynx habitat on DNRC lands would be reduced by 1.8% in the CEAA and those areas would remain unsuitable for at least 10 years; 3) stands converted to temporary non-suitable habitat in old logging units would continue maturing and developing into suitable habitat within the CEAA in the absence of natural disturbance; 4) habitat connectivity within the CEAA would be minimally affected by proposed activities, and 5) lynx could be temporarily displaced by logging activities in the cumulative effects analysis area.

### ***SENSITIVE SPECIES***

When conducting forest-management activities, the *SFLMP* directs DNRC to give special consideration to sensitive species. These species may be sensitive to human activities, have special habitat requirements, are associated with habitats that may be altered by timber management, and/or, could become listed under the *Federal Endangered Species Act* if management activities result in continued adverse impacts. Because sensitive 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. A search of the *Montana Natural Heritage Database* was used to locate historical records of sensitive species (shown in TABLE W-5 – FINE FILTER) in the vicinity of the project area.

### **BALD EAGLE**

***Issue:*** *The proposed activities could reduce bald eagle nesting and perching habitats and/or disturb nesting bald eagles.*

#### **Introduction**

Bald eagles are diurnal raptors associated with significant bodies of water, such as rivers, lakes, and coastal zones. The diet of bald eagles consists primarily of fish and waterfowl, but includes carrion, mammals, and items taken from other birds of prey. In northwestern Montana, bald eagles begin breeding with courtship behavior and nest building in early February. The young fledge by approximately mid-August, ending the breeding process. Important habitat

attributes found in nesting stands include large, emergent trees screened from disturbance by vegetation that are within sight distances of lakes and rivers.

### **Analysis Areas**

Direct and indirect effects were analyzed for activities conducted within the 1,211-acre project area. Cumulative effects were analyzed on the Whitefish Lake/Swift Creek bald eagle home range, which is a 2.5-mile radius circle (12,566 acres) extending out from the nest site (FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This CEAA encompasses a portion of the project area and likely includes the areas used by the pair of eagles occupying the territory.

### **Analysis Methods**

Effects were analyzed using a combination of field evaluations and aerial photograph interpretation within the bald eagle home range. Factors considered within this analysis included evaluating the potential for disturbance to nesting birds and availability of mature, well-stocked stands containing large, emergent trees with stout horizontal limbs for nests and perches.

### **Existing Conditions**

The proposed project area contains approximately 1,025 acres of the Whitefish Lake bald eagle home range. Neither the nest site area nor the primary use area of the Whitefish Lake bald eagle nest occurs within the project area. Observations of eagles nesting in the vicinity of the proposed project area have been recorded since 1985. DNRC is not aware of any records of past nest sites within the project area. The Whitefish Lake territory has been active most years; with nest locations situated either near the inlet of Swift Creek into Whitefish Lake or on DNRC-managed land near Smith Lake. During an eagle monitoring flight in April 2012, a pair of eagles was observed occupying a historical nest site on Swift Creek just upstream from the head of Whitefish Lake. The aquatic habitats associated with this bald eagle territory are primarily Whitefish Lake, Smith Lake, Boyle Lake, and Swift Creek. Because Swift Creek is a relatively small, high gradient stream where it runs adjacent to the project area, it likely receives less use by foraging eagles than the aforementioned lakes. The Whitefish Lake bald eagle territory contains a mix of coniferous forest, riparian deciduous forests, meadows, swamp and housing developments along the lakeshore. Within the present home range, large emergent cottonwood trees and conifers such as ponderosa pine and western larch provide suitable nesting, roosting, and perching sites.

Bald eagle habitat is managed at three spatial scales: 1) the nest area (area within a 0.25-mile radius of the active nest tree or trees that have been active within five years), 2) the primary use area (an area 0.25-0.50-miles from the nest tree), and 3) the home range (area within 2.5 miles of all nest sites that have been active within five years). Approximately 0 acres of DNRC-managed lands occur within the nest site area, 63 acres in the primary use area, and 4,694 acres within the bald eagle home range.

Human disturbance, including timber harvesting, residential development, agricultural activities (e.g. hay production), and various forms of recreation are potential sources of

disturbance to the nesting territory. Recreational boating and human activity associated with houses along the shoreline of Whitefish Lake likely serve as the primary sources of disturbance in this eagle territory. Numerous residential dwellings are situated within the 2012 nest site area and boating is common within the primary use area. Eagles using the Whitefish Lake territory are likely habituated to a great deal of disturbance, as the nest is within 400 feet of an occupied home and the lake receives high amounts of recreational activity. Many large, emergent trees are available across portions of the home range, but logging in the last 100 years has likely reduced some of these trees while others have experienced mortality and are declining in quality.

### **Environmental Effects**

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

Under the No-Action Alternative, no proposed activities would occur. Human disturbance would continue at approximately the same levels. No changes in available nest sites or forest structure would occur. Thus, since: 1) no increases in human disturbance levels would occur, and 2) no changes in the availability of large, emergent trees would be expected; negligible direct and indirect effects would be expected to affect bald eagles using the Whitefish Lake territory.

- **Direct and Indirect Effects of the Action Alternative on Bald Eagles**

The proposed project area contains approximately 1,025 acres of the Whitefish Lake bald eagle home range. Neither the nest site area nor the primary use area occurs within the project area. Proposed harvesting in the project area would be carried out on approximately 535 acres (44.2% of the project area) of coniferous forest occurring within the home range of the Whitefish Lake territory, and would be potentially usable by that pair. The project area and all harvest units are outside of the nest site and primary use areas. Seasonal restrictions would prohibit harvesting activities between April 1 and June 15. Harvesting could occur between June 15 and April 1 when appropriate soil moisture conditions are met. The potential for temporary displacement would only be expected to affect eagles during the physical harvest activities and not beyond. Within harvest units, prescriptions call for the retention of large seral snag species and emergent trees that could be used in the future as nest or perch trees as the stands develop around these resources. Proposed harvest units are on average >300 feet from Swift Creek, thus potential eagle nest or perch sites within site distance of Swift Creek would not be appreciably impacted. No long-term changes to human access within the project area would occur, thus limiting potential for introducing additional human disturbance to this territory. Thus, minor direct and indirect effects to nesting bald eagles and bald eagle habitat would be anticipated since: 1) disturbance could be elevated within 535 acres of the territory during operations, but harvest-related disturbance would not occur within the nest site or primary use areas; 2) the eagle pair is likely habituated to high levels of disturbance closer to the nest than proposed activities; 3) no change in long-term human access within the project area would occur; 4) harvesting would occur on a small proportion (4.3%) of the outermost portion of the home range area; 5) negligible changes in the availability of large, emergent trees near water would be

expected; and 6) all project activities would occur at least 0.6 miles distant from areas that would likely receive frequent use by bald eagles during the nesting season in the project area.

- **Cumulative Effects of the No-Action Alternative on Bald Eagles**

No harvesting would occur under the No-Action Alternative. Thus, no additional cumulative effects to bald eagles would be expected since: 1) no changes to human disturbance levels would occur; and 2) no changes in the availability of large, emergent trees would be expected. Past forest management projects not associated with the proposed Lazy Swift 2 Timber Sale have affected bald eagle habitat in the CEAA, and ongoing and proposed projects could alter bald eagle habitat in the future (TABLE W-2 – RECENT AND PROPOSED PROJECTS).

- **Cumulative Effects of the Action Alternative on Bald Eagles**

Proposed harvesting would be carried out on approximately 535 acres of coniferous forest occurring within the CEAA (i.e. Whitefish Lake territory), that would be potentially usable by that pair. The acreage that would be affected comprises 4.3% of the CEAA. None of the proposed harvest activities would occur within the nest site or primary use areas. Nesting bald eagles would continue to experience varying levels of disturbance from the ongoing recreational use of the CEAA, as well as disturbance associated with lakeshore developments and forest management activities on surrounding non-DNRC lands. Additionally, new housing developments on private lands would continue to provide potential sources of disturbance to the territory. Any harvesting that may be occurring on other ownerships in the home range could continue disturbing bald eagles or modifying their habitats. Any potential disturbance and/or noise from the proposed harvesting would be additive to any of these other forms of disturbance, however no appreciable changes in bald eagle behavior would be anticipated due to the Action Alternative. Emergent trees exist across ownerships in the home range and would be expected to persist at adequate levels. Thus, minor cumulative effects to nesting bald eagles and bald eagle habitat would be anticipated since: 1) disturbance would be elevated within the territory during harvesting operations, but harvest-related disturbance would not occur within the nest site or primary use areas; 2) no changes in long-term human access within the territory would occur; 3) negligible changes in the availability of large, emergent trees within site distance of Swift Creek or lakes within the CEAA would be expected. and 4) all project activities would occur at least 0.6 miles distant from areas that would likely receive frequent use by bald eagles during the nesting season in the CEAA.

## **FISHER**

***Issue:** The proposed activities could decrease habitat suitability for fishers by decreasing canopy cover and snag/coarse woody abundance, and by increasing risk of trapping mortality through greater road access.*

### **Introduction**

Fishers are generalist predators that prey upon a variety of small mammals and birds, as well as snowshoe hares and porcupines. They also eat carrion and seasonally available fruits and

berries (Foresman 2012). Fishers use a variety of forest successional stages, but are disproportionately found in low to mid elevation mature stands with dense canopies (Powell 1982, Johnson 1984, Jones 1991, Heinemeyer and Jones 1994). They generally avoid openings or young forested stands (Buskirk and Powell 1994). However, some use of openings does occur for short hunting forays or if sufficient overhead cover (shrubs, saplings) is present. Fishers appear to be highly selective of stands that contain resting and denning sites, and tend to use areas within 150 feet of water (Jones 1991). Resting and denning sites are found in cavities of live trees and snags, downed logs, brush piles, mistletoe brooms, squirrel and raptor nests, and holes in the ground. Forest management considerations for fisher involve maintaining large snags, retaining abundant coarse woody debris, providing habitat suitable for resting and denning near riparian areas, and maintaining travel corridors.

### **Analysis Areas**

Direct and indirect effects were analyzed for activities conducted within the 1,211-acre project area. Cumulative effects for fisher habitat were analyzed on the contains the Lazy Creek Grizzly Bear BMU Subunit and additional lands extending south to Whitefish Lake and the Burlington Northern-Santa Fe railway, and west to Montana Highway 93 for a total CEAA of 41,100 acres (FIGURE W-1 – WILDLIFE ANALYSIS AREAS). The proposed project area ranges from 3,040 and 3,320 feet in elevation.

### **Analysis Methods**

Analysis methods include field evaluations, aerial photograph interpretation, and GIS analysis of travel corridors, preferred fisher cover types (ARM 36.11.403(60)), and habitat structure. To assess potential fisher habitat and travel cover on DNRC managed lands, sawtimber size class stands ( $\geq 9$  inches dbh average) within preferred fisher cover types below 6,000 feet in elevation with 40 percent or greater canopy closure were considered potential habitat suitable for use by fishers (ARM 36.11.403(60)). On non-DNRC lands, mature forest below 6,000 feet in elevation with  $\geq 40\%$  crown closure was considered to be potentially suitable habitat for fishers. Fisher habitat was further divided into upland and riparian-associated areas depending upon the proximity to Class 1 and Class 2 streams (ARM 36.11.403(15) and (16)). DNRC manages preferred fisher cover types within 100 feet of Class 1 and 50 feet of Class 2 streams, so that at least 75 percent of the acreage (trust lands only) remains in the sawtimber size class in moderate to well-stocked density (ARM 36.11.440(1)(b)(i)). Effects were analyzed using field evaluations, GIS analysis of SLI stand data to estimate potential habitat, and aerial photograph interpretation to evaluate habitat conditions on non-DNRC lands. Potential suitable fisher habitat on non-DNRC lands was considered to be mature forest with  $\geq 40\%$  crown closure generally below 6,000 feet in elevation. Snags and coarse woody debris were assessed using plot data (described in the snag and coarse woody debris analysis subsection above), site visits, and by reviewing past DNRC harvesting information. Factors considered in this analysis include the level of harvesting, number of snags, relative amounts of coarse woody debris, and risk level of firewood harvesting and trapping mortality.

### **Existing Environment**

The proposed project area contains 957 acres (79.0% of project area) of suitable fisher habitat (TABLE W-7 – FISHER HABITAT). Riparian fisher habitat within the project area is comprised of approximately 68 acres of preferred fisher cover types, of which 55 acres (80.8% of preferred cover types) of riparian habitat are suitable for use by fishers. Snags and coarse woody debris (CWD) were quantified at sampling plots within proposed harvest units and were generally found to be within levels recommended by Graham et al. (1994) for the habitat types present (see WILDLIFE- SNAGS AND COARSE WOODY DEBRIS). Suitable fisher habitat that provides good habitat connectivity occurs along most of the perennial streams in the project area. Within uplands on the project area, suitable fisher habitat is scattered, but provides the mature forest conditions ( $\geq 40$  crown closure) necessary for use as fisher travel habitat. Open roads facilitate firewood gathering, which can affect the abundance of snags and CWD used by fishers. Additionally, roads near streams can also offer trappers convenient access to forested riparian areas, which increase trapping risk to fishers should they be using the area. There are no open roads within the project area and illegal firewood gathering is minimal. The lack of convenient vehicle access to the project area, combined with surrounding private land, likely limits trapper presence and mortality risk for fisher. Overall, fisher habitat suitability and connectivity within the project area is moderate to good and risk factors are low.

Historical records of fisher occurring in the CEAA within the last 50 years are generally lacking, however fishers have been documented in Flathead County (*MNHP 2012, Foresman 2012*) and fishers are likely to use the CEAA. Within the CEAA on 17,579 acres of DNRC lands, there are 9,328 acres (53.1% of DNRC lands) of suitable fisher habitat (TABLE W-7 – FISHER HABITAT). Riparian fisher habitat within the CEAA consists of approximately 809 acres of preferred fisher cover types on DNRC lands, of which 760 acres (93.9% of preferred fisher cover types) are currently suitable for use by fishers. The CEAA also contains 4,563 acres (11.1% of CEAA) of potential fisher habitat associated with areas of mature forest on non-DNRC lands. Total riparian habitat suitable for fisher use on DNRC and non-DNRC lands combined in the cumulative effects analysis area is 890 acres. Including riparian and upland habitat, potentially suitable fisher habitat within the CEAA totals approximately 13,892 acres (33.8% of the CEAA). The majority of Class 1 and 2 streams within the CEAA (below 6,000 feet elevation) have accompanying riparian vegetation that would facilitate fisher travel, and contribute to habitat suitability and connectivity; however suitable upland habitat is largely absent on private commercial timberlands within the CEAA. Within the CEAA, past harvesting has influenced mature crown closure, snags and coarse woody debris levels on about 21,038 acres (51.2%). The CEAA contains a network of existing open roads (1.2 mi/sq. mile) that facilitates trapper access, although most are not plowed, which limits motorized vehicle use during typical winter conditions. Collectively, habitat suitability for fishers within the CEAA is moderate.

## **Environmental Effects**

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

No change to the stands providing fisher denning and foraging habitats would be expected as no timber harvesting activities would occur under this alternative. Thus, since: 1) no changes to existing habitats would be anticipated; 2) landscape connectivity would not be altered; 3) no appreciable changes to canopy cover, snags, snag recruits, and coarse woody debris levels would be anticipated; and 4) no changes to human access or potential for trapping mortality would be anticipated, no direct or indirect effects associated with fisher habitat suitability would be expected in the project area.

### **• Direct and Indirect Effects of the Action Alternative on Fishers**

Approximately 622 acres of the 957 acres (65.0%) of suitable fisher habitat in the project area would be harvested under the Action Alternative (TABLE W-7 – FISHER HABITAT). Approximately 616 acres of upland fisher habitat within the project area harvest units would receive harvest treatments that would likely yield stands too sparsely forested for appreciable use by fishers for 40 to 80 years. Up to 5.5 acres of fisher riparian habitat (1.0%) adjacent to a Class 1 stream could receive an intermediate harvest treatment that would leave the harvested area still suitable for fisher use. No harvesting would occur within 50 feet of Class 1 or Class 2 streams. Approximately 80.8% (55 acres) of preferred fisher cover types in riparian areas would remain suitable for use by fishers. After harvest activities, remaining suitable fisher habitat and habitat connectivity would be primarily associated with riparian areas running through the project area. In all areas, harvest prescriptions call for retention of 2 snags and 2 snag recruits per acre ( $\geq 21$  in. dbh) where they exist, otherwise the next largest size class. Also, 12 to 25 tons of coarse woody debris per acre would be planned for retention within the proposed units. While the proposed harvest may reduce density of snags and their recruits in the near future, the sustainability of snags in the area would be maintained by retention of appreciable numbers of shade-intolerant leave trees and snag recruitment trees. Harvest prescriptions call for retention of large, dominant trees in the project area; further improving the development and sustainability of large snags. These large snags and trees could be a source for fisher denning and resting sites in the future when intensively harvested stands regenerate and develop mature stand characteristics (40-80 years). Approximately 189 acres of riparian and upland preferred fisher cover types that currently do not provide ample structural attributes found in suitable fisher habitat would continue maturing and could provide suitable habitat in the next 15-40 years. Construction and use of restricted and temporary roads within the project area would not increase long-term open road density; all roads within the project area would remain restricted. Because roads would remain restricted, fisher mortality risk due to trapping would be expected to remain the same and negligible reductions of snags/coarse woody debris due to firewood gathering would be anticipated. Thus, minor to moderate adverse direct and indirect effects would be anticipated that would affect fisher habitat suitability in the project area since: 1) harvesting would sizable amount of upland (68.4%) fisher habitat in the project area, 2) reductions in habitat connectivity would occur but existing levels of riparian fisher habitat

would be maintained, and 3) overall risk factors associated with motorized human access levels would not appreciably change.

### **Cumulative Effects of the No-Action Alternative on Fishers**

No additional effects to riparian or upland fisher habitats on DNRC-managed lands would be expected as no timber harvesting activities would occur under the No-Action Alternative. Thus, no further cumulative effects to fisher habitat suitability would be anticipated in the cumulative effects analysis area since: 1) no changes to existing habitats on DNRC ownership would occur; 2) landscape connectivity afforded by the stands on DNRC ownership would not change; 3) no changes to canopy cover, snags, snag recruits, or coarse woody debris levels would be expected; and 4) no changes to human access or potential for trapping mortality would be anticipated. Ongoing forest management projects not associated with the proposed Lazy Swift 2 Timber Sale have affected fisher habitat in the CEAA and other proposed projects could alter fisher habitat suitability in the future (see TABLE W-2 – RECENT AND PROPOSED PROJECTS).

### **Cumulative Effects of the Action Alternative on Fishers**

Approximately 622 acres (4.5%) of 13,892 acres of potentially suitable fisher habitat in the CEAA would be harvested. Of these proposed acres, 616 acres would be upland fisher habitat and 5.5 acres would be fisher riparian habitat. Riparian fisher habitat would receive an intermediate harvest and would remain suitable for use by fishers. Of the approximately 809 acres of preferred fisher cover types associated with Class 1 and 2 streams on DNRC lands, 760 acres (93.9% of preferred fisher cover types) would remain suitable for use by fishers (*ARM 36.11.440(1)(b)(i)*). Reductions in upland fisher habitat would be additive to the losses associated with past and current timber harvesting in the cumulative effects analysis area (see TABLE W-2 – RECENT AND PROPOSED PROJECTS). Approximately 13,270 acres of the 41,100-acre cumulative effects analysis area (32.3%) would remain as suitable fisher habitat (TABLE W-7 – FISHER HABITAT). Reductions in landscape connectivity of suitable fisher habitat within the cumulative effects analysis area would occur; however suitable forest stands along the majority of riparian areas would persist. Human access and potential trapping mortality would be minimally influenced. Thus, minor adverse cumulative effects would be anticipated that would affect fisher habitat suitability within the cumulative effects analysis area since: 1) harvesting would alter tree density and stand structure in 4.5% of suitable fisher habitat within the cumulative effects analysis area, 2) negligible changes to fisher habitat associated with riparian areas in the CEAA would be anticipated and 93.9% of the total preferred cover type acreage would remain moderately to well-stocked, 3) suitable fisher habitat would remain connected within riparian areas, and 4) negligible changes to motorized public access would occur.

**TABLE W-7 – FISHER HABITAT.** Estimates of existing and post-harvest acreages of suitable fisher habitat within the project area and CEAA for the Lazy Swift 2 Timber Sale. Values in parentheses refer to the percentage of the fisher habitat in a category of the total area within the corresponding analysis area.

Fisher Habitat Category	Existing		Post-Harvest	
	Project Area	CEAA	Project Area	CEAA
	1,211 acres	41,100 acres	1,211 acres	41,100 acres
Upland Fisher Habitat (DNRC)	901 (74.4%)	8,568 (20.8%)	279 (23.1%)	7,946 (19.3%)
Upland Fisher Habitat (non-DNRC)	0* (0%)	3,886 (9.5%)	0* (0%)	3,886 (9.5%)
Riparian Fisher Habitat (DNRC)	55 (4.6%)	760 (1.8%)	55 (4.6%)	760 (1.8%)
Riparian Fisher Habitat (non-DNRC)	0* (0%)	678 (1.6%)	0* (0%)	678 (1.6%)
Total Suitable Fisher Habitat (DNRC)	957 (79%)	9,328 (22.7%)	335 (27.6%)	8,706 (21.2%)
Total Suitable Fisher Habitat (DNRC lands & non-DNRC lands)	957 (79%)	13,892 (33.8%)	335 (27.6%)	13,270 (32.3%)

\*Non-DNRC lands are absent from the proposed project area.

## GRAY WOLF

**Issue:** *The proposed activities could displace gray wolves from the vicinity of the project area, particularly denning and rendezvous sites, and/or alter big game prey availability, which could adversely affect gray wolves.*

### Introduction

In April 2011, gray wolves were removed from the federal list of threatened and endangered species in Montana, Idaho and parts of Washington, Oregon, and Utah. DNRC currently considers them as a sensitive species for the purpose of analyzing impacts associated with forest management activities.

Wolves are wide-ranging opportunistic carnivores that prey primarily on white-tailed deer, and, to a lesser extent, elk and moose, in northwest Montana (Kunkel et al. 2004). In general,

wolf densities are positively correlated to prey densities (*Oakleaf et al. 2006, Fuller et al. 1992*). Some studies have shown that wolves may prey upon elk more frequently during certain portions of the year (particularly winter) or in areas where elk numbers are higher (*Arjo et al. 2002, Kunkel et al. 2004, Garrott et al. 2006*). Thus, reductions in big game numbers and/or winter range productivity could indirectly be unfavorable to wolves.

Wolves typically den during late April in areas with gentle terrain near a water source (valley bottoms), close to meadows or other openings, and near big game wintering areas. When the pups are 8 to 10 weeks old, wolves start leaving their pups at rendezvous sites while hunting. These sites are used throughout the summer and into the fall. Disturbance at den or rendezvous sites could result in avoidance of these areas by the adults or force the adults to move the pups to a less adequate site. In both situations, the risk of pup mortality increases.

### **Analysis Areas**

Direct and indirect effects were analyzed for activities conducted within the 1,211-acre project area. Cumulative effects were analyzed on a 41,100 acre CEAA around the project area (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale approximates an area large enough to support a wolf pack in northwest Montana (based upon DFWP wolf pack home range data, 2010-2011).

### **Analysis Methods**

Since changes in big game distribution could have an effect on availability of prey for wolves, portions of this analysis tier to the big game winter range section below. Direct, indirect, and cumulative effects were analyzed using field evaluations, aerial photograph interpretation, and a GIS analysis of habitat components. Factors considered in the analysis include the amount of winter range modified and level of human disturbance in relation to any known wolf dens or rendezvous sites.

### **Existing Conditions**

The proposed project area is within the annual home range of the Lazy Creek wolf pack. No denning or rendezvous sites are known or have been recorded in the project area (*Kent Laudon, DFWP, personal comm. 2012*). However, landscape features commonly associated with denning and rendezvous sites, including meadows and other openings near water and in gentle terrain, are present within the project area. Thus, current or future presence of wolves in the vicinity of the project area is likely.

In northwest Montana, wolves and habitats they use generally mirror those of their ungulate prey - primarily white-tailed deer, moose, and elk. The proposed project area contains summer habitat for the aforementioned prey species, as well as 1,211 acres of winter range habitat for white-tailed deer, mule deer, elk, and moose (see WILDLIFE – BIG GAME HABITAT). Signs of use by deer, elk, and moose in summer were observed during field visits. The proposed project area contains 0.0 miles of open roads and 4.3 miles of restricted roads that could serve as a source of disturbance and mortality for both wolves and big game (see TABLE W-4– ROAD MANAGEMENT AND CONSTRUCTION).

Within the larger CEAA, winter range for white-tailed deer (25.1% of CEAA), mule deer (14.0%), and elk (18.3%) is relatively limited, while moose (96.0%) winter range is more abundant. Landscape features commonly associated with denning and rendezvous sites, including meadows, and openings near water, and gentle terrain, occur within the CEAA. Past harvesting on all ownerships in the cumulative effects analysis area has altered mature forest on 21,038 acres (51.2% of CEAA), which could influence use of the area by big game. Harvesting has reduced the amount of mature forest within the cumulative effects analysis area, reducing the amount of thermal cover and snow intercept available to big game. Current and proposed harvesting (see TABLE W-2 – RECENT AND PROPOSED PROJECTS) could continue to alter big game habitat and indirectly influence wolves. However, the CEAA contains 13,544 acres (33.0%) of mature forest that likely provide cover for big game and important thermal cover/snow intercept characteristics. The CEAA contains an extensive network of restricted and open roads (total road density 3.9 miles/sq mile), which, has increased human access and the potential for wolf-human interactions. Increasing access to these areas can elevate risk of wolf/human encounters and elevate the vulnerability of their ungulate prey, especially during the hunting season. Open roadways and a small number of human dwellings mainly situated within 0.5 miles of Highway 93 and near Whitefish Lake in the CEAA pose additional risk for wolves. Pets and livestock associated with homes and nearby agricultural areas likely pose the greatest risk to wolves within the CEAA due to the heightened potential for associated conflicts. Big game habitat within CEAA remains largely intact and undeveloped; thus, continued wolf use of the area is expected.

### **Environmental Effects**

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

No timber harvesting or associated activities would occur under the No-Action Alternative. Thus, since: 1) no additional changes in human disturbance levels would occur; and 2) no changes to the vegetation on big game winter ranges would occur, no direct and indirect effects would be expected to affect gray wolf displacement risk, or big game prey availability that could subsequently affect wolves.

- **Direct and Indirect Effects of the Action Alternative on Gray Wolves**

Wolves using the area could be temporarily disturbed by harvesting activities; however, they are most sensitive at den and rendezvous sites, which are not known to occur within the project area. In the short term (approximately 1-3 years), activities associated with the proposed harvest could displace wolves and big game, should they be present in the area. Additionally, the resulting open stand conditions could increase the probability of a wolf or big game animal being observed and harvested during future hunting seasons. Approximately 3.9 miles of restricted roads would be used for harvest activities for no more than three consecutive years. During this period, a total of 6.0 miles of temporary and restricted roads would be used to conduct project activities. Following harvest, all existing and newly constructed roads used to conduct project activities would be closed to motorized use by the public. Temporary roads and unused restricted roads would be reclaimed following use associated with the project.

After timber harvesting, motorized disturbance levels would be expected to return to baseline levels. Potential for any use of the project area by wolves for denning and rendezvous sites would likely revert to pre-harvest levels following operations. Harvest would result in the reduction of thermal cover on 659 acres (54.4%) of big game winter range within the project area. These moderate reductions in cover on big game winter range could result in minor shifts in prey availability for wolves. Additional impacts to big game winter range are discussed in more detail in the WILDLIFE – BIG GAME HABITAT section of this wildlife analysis. Thus, minor adverse direct and indirect effects to wolf prey availability and minor adverse direct and indirect effects associated with gray wolf displacement risk would be expected since: 1) no known wolf den and/or rendezvous sites are within 1 mile of the project area, 2) there would be moderate reductions in habitat quality of big game winter range that could alter wolf prey availability, and 3) there would be short-term increases in motorized disturbance and but no change in long-term public motorized use of the project area.

- **Cumulative Effects of the No-Action Alternative on Gray Wolves**

No additional disturbance of gray wolves, their prey, or their habitat would occur under this alternative as no timber harvesting activities would occur. Past and ongoing forest management projects not associated with the proposed Lazy Swift 2 Timber Sale have affected wolf prey availability in the CEAA (see TABLE W-2 – RECENT AND PROPOSED PROJECTS), and other proposed projects could displace wolves and/or alter wolf prey availability in the future. No additional cumulative effects to wolves associated with displacement or prey availability would be expected to result from the No-Action Alternative within the CEAA.

- **Cumulative Effects of the Action Alternative on Gray Wolves**

In the CEAA, temporary displacement of big game and wolves is possible, should they occur in the area within close proximity to proposed timber harvest and hauling activities. Disturbance associated with the Action Alternative would be additive to ongoing and proposed forest management activities within the CEAA (see TABLE W-2 – RECENT AND PROPOSED PROJECTS). Reductions in cover may cause minor decreases in use by deer, moose, and elk; however, minor changes in deer and elk distribution or abundance would be expected at the scale of the CEAA (see WILDLIFE – BIG GAME HABITAT). Cover would be reduced on 659 acres (1.6% of CEAA) of big game winter range within the CEAA. Reductions in cover would be additive to 21,038 acres (51.2% of CEAA) of past timber-harvesting activities within the last 40 years in the CEAA. The reductions that would occur under this alternative to big game winter range would not be expected to affect the overall potential for use of the CEAA by wolves. In addition to the 6.0 miles of potential road use within the project area, approximately 2.5 miles of restricted road would receive additional traffic within the CEAA. Thus, 8.2 miles total of restricted and temporary roads would be used within the CEAA to conduct project activities. Under this alternative, motorized disturbance associated with harvest activities would increase for up to 3 years, however public motorized use and associated hunting mortality risk to wolves and big game would not change. All temporary roads and new restricted roads used to conduct project-related work would be closed to motorized public use during harvest and following completion of harvest activities. Other minor risks within the

CEAA, such as pets and livestock on private land, would continue to pose risks to wolves in this area because of the potential for conflicts and resulting management actions. No substantive change in long-term potential for wolf use of the cumulative effects analysis area would be expected. Thus, minor adverse cumulative effects to gray wolf displacement risk and minimal changes to big game prey availability would be expected under the Action Alternative since: 1) localized, temporary disturbance and displacement could occur due to logging activities in the area for up to 3 years; 2) winter range habitat quality would be reduced on 1.6% of the CEAA, however carrying capacity of wintering areas would not be appreciably reduced; and 3) there would be no long-term increase in public motorized access.

## **PILEATED WOODPECKER**

***Issue:** The proposed activities could negatively affect pileated woodpecker habitat suitability by removing canopy cover and snags used for foraging and nesting, and by creating disturbance.*

### **Introduction**

Pileated woodpeckers play an important ecological role by excavating cavities that are used in subsequent years by many other species of birds and mammals. Pileated woodpeckers excavate the largest cavities of any woodpecker. Preferred nest trees are western larch, ponderosa pine, cottonwood, and quaking aspen, usually 20 inches dbh and larger. Pileated woodpeckers primarily eat carpenter ants, which inhabit large downed logs, stumps, and snags. Aney and McClelland (1985) described pileated nesting habitat as...“stands of 50 to 100 contiguous acres, generally below 5,000 feet in elevation with basal areas of 100 to 125 square feet per acre and a relatively closed canopy.” Necessary feeding and nesting habitat attributes, include large snags, large decayed trees, and downed wood, which closely tie these woodpeckers to mature forests with late-successional characteristics. The density of pileated woodpeckers is positively correlated with the amount of dead and/or dying wood in a stand (McClelland 1979).

### **Analysis Areas**

Direct and indirect effects were analyzed for activities conducted within the 1,211-acre project area. For cumulative effects, the project area and sections immediately surrounding the project area were used to define the CEAA, which comprises 9,595 total acres of DNRC and non-DNRC lands (see TABLE W-1 – WILDLIFE ANALYSIS AREAS and FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale includes sufficient area to support multiple pairs of pileated woodpeckers if enough suitable habitat is present (Bull and Jackson 1995).

### **Analysis Methods**

Analysis methods include field evaluation, aerial photograph interpretation, and GIS analysis of available habitats. SLI data were used to identify preferred pileated woodpecker habitat (ARM 36.11.403(58)). Direct and indirect effects as well as cumulative effects were analyzed using a combination of field evaluation, aerial photograph interpretation, and mapped potential habitat. For this analysis on DNRC-managed lands in the cumulative effects analysis area, sawtimber stands  $\geq 100$  years old within preferred pileated cover types (ARM 36.11.403(58))

with 40 percent or greater canopy closure were considered potential pileated woodpecker habitat. Cumulative effects were analyzed using field evaluations, GIS analysis of potential habitat, and aerial photograph interpretation of potential habitat on all other lands within the CEAA. Potential suitable pileated woodpecker habitat on non-DNRC lands was considered to be mature forest with  $\geq 40\%$  crown closure. Factors considered include the amount of potential pileated woodpecker habitat, degree of harvesting, and the amount of continuous mature forested habitat suitable for use by pileated woodpeckers.

### **Existing Conditions**

In the project area, there are approximately 745 acres (61.5% of project area) of potential pileated woodpecker habitat. Current potential pileated habitat within the project area consists of mature Douglas-fir, western larch, and mixed conifer stands in a single patch. This single patch is part of a larger suitable pileated habitat patch including lands outside of the project area. Large-scale disturbance, primarily in the form of a timber harvest, has resulted in an abundance of young stands and cover types not suitable for pileated woodpeckers. Snags and coarse woody debris within the proposed project area are present at levels generally appropriate for the existing habitat types (see SNAGS AND COARSE WOODY DEBRIS), although average snag size is too small for pileated nesting. Pileated woodpecker foraging evidence was readily observed during field visits. Past harvesting has altered mature stands, snags, and coarse woody debris on roughly 275 acres (22.7%) of the project area. Firewood gathering, which can result in a reduction of snags and downed logs valuable as woodpecker nesting and foraging substrates, is minimal within the project area due to the lack of open roads and surrounding private land. Given these observed existing habitat conditions, pileated woodpecker habitat suitability is currently moderate to good within the project area.

The CEAA contains approximately 2,522 acres (26.3% of the CEAA) of potential pileated woodpecker habitat on DNRC-managed lands. Another 1,404 acres (14.6% of the CEAA) of additional mature forest within the CEAA provides potentially suitable habitat conditions for pileated woodpeckers. Together, these 3,926 acres (40.9% of CEAA) are distributed among 20 patches and average patch size is 196 acres (range 3-3,163 acres). Pileated woodpecker habitat within the project area is part of a larger 3,163-acre patch in the CEAA (33.0% of the CEAA). Presently, 6.6 percent (630 acres) of the CEAA not forested and is not suitable for use by pileated woodpeckers. These non-forested areas include: meadows, lakes, roads, and home sites. Most of the remaining 5,669 acres (59.1%) within the CEAA consist of young, forested stands or less preferred cover types that are not likely providing suitable habitat for pileated woodpeckers. Firewood gathering is active on many private lands and along 16 miles of open road within the CEAA. Thus, habitat quality and availability for pileated woodpeckers within the CEAA is currently moderate.

### **Environmental Effects**

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

No timber harvesting activities would occur under this alternative. Thus, no adverse direct and indirect effects associated with disturbance levels or habitat suitability for pileated woodpeckers

in the project area would be expected since: 1) no changes in the amount of continuously forested habitat would be anticipated, 2) no changes to existing pileated woodpecker habitat would be anticipated, and 3) no additional disturbance would take place.

- **Direct and Indirect Effects of the Action Alternative on Pileated Woodpeckers**

Harvesting in suitable pileated woodpecker habitat within the project area would reduce forested habitat for pileated woodpeckers and create younger-aged stands with widely scattered mature trees. Approximately 548 acres (73.6%) of available pileated woodpecker habitat in the project area would be altered with regeneration-type treatments and would be too open to be suitable habitat following logging. Approximately 197 acres (26.4%) of currently suitable pileated habitat would remain unharvested within the project area. In the stands proposed for treatment, suitable pileated habitat would be removed for 50-80 years. Snags important for nesting pileated woodpeckers would be retained in the proposed harvest areas (see SNAGS AND COARSE WOODY DEBRIS), however the abundance of snags and snag recruitment trees would be reduced. Since pileated woodpecker density is positively correlated with the amount of dead and/or dying wood in a stand (McClelland 1979), pileated woodpecker habitat quality in the project area would be expected to be reduced on 548 acres. Overall patch size of contiguous pileated habitat in the project area would decrease from 745 acres to an average of 32 acres (largest 148 acres). The largest pileated habitat patch within the project area would remain >100 acres in size and be connected to suitable habitat outside of the project area, but would primarily be linear in shape as it follows riparian areas and draw bottoms. Silvicultural prescriptions in harvest units would retain healthy western larch and Douglas-fir trees in low densities (6-20 per acre), while promoting the regeneration of many of these same species, which would benefit pileated woodpeckers in the future by providing high-quality nesting, roosting, and foraging habitat. Low-quality habitat associated shade-tolerant tree species would likely be converted to a more desirable forest type, although it would take about 50-80 years to mature into pileated habitat. Pileated woodpeckers tend to be tolerant of human-caused disturbance (Bull and Jackson 1995), but they could be temporarily displaced by the noise and activity associated with the proposed harvesting. Thus, moderate adverse direct and indirect effects would be anticipated that would affect pileated woodpeckers in the project area since: 1) 73.6% of available suitable habitat would be harvested; 2) the amount of contiguous suitable pileated woodpecker habitat would be reduced by 548 acres but an unharvested habitat patch would remain >100 acres in size; 3) some snags and snag recruits would be removed, however, mitigation measures to retain a minimum of 2 snags per acre and 2 snag recruits per acre in harvest areas would be included; 4) harvest prescriptions would retain and promote seral tree species in all proposed harvest areas; and 5) temporary levels of potential disturbance would increase over a 1-4 year period, but long-term disturbance would be unchanged.

- **Cumulative Effects of the No-Action Alternative on Pileated Woodpeckers**

No timber harvesting activities would occur under this alternative. Past and ongoing forest management projects not associated with the proposed Lazy Swift 2 Timber Sale have affected pileated woodpecker habitat in the project area, and other proposed projects could disturb

pileated woodpecker and/or alter habitat suitability in the future (TABLE W-2 – RECENT AND PROPOSED PROJECTS). No additional cumulative effects to pileated woodpeckers associated with disturbance risk or habitat suitability are expected to result from the No-Action Alternative that could affect pileated woodpeckers in the CEAA since: 1) no changes in the amount of continuously forested habitat would be anticipated, 2) no changes to existing pileated woodpecker habitat would be anticipated, and 3) no additional disturbance would take place.

- **Cumulative Effects of the Action Alternative on Pileated Woodpeckers**

Under this alternative, pileated woodpecker habitat would be reduced on 548 acres (14.0%) of the 3,926 acres of existing suitable habitat in the CEAA. Forest canopy on the 548 acres of treated area would be too open for appreciable use by pileated woodpeckers, and would be more similar to other recently harvested stands that comprise 3,630 acres (37.8%) of the CEAA. The number of habitat patches would increase from 20 to 24 and average patch size would decrease from 196 acres to 142 acres (range 2-2,634 acres). Harvesting would reduce the largest existing 3,163-acre patch in the CEAA (33.0% of the CEAA) to 2,634 acres (27.6% of the CEAA). Snags, coarse woody debris, and potential nesting trees would be retained in the project area according to forest management ARM 36.11.41; however, snags and snag recruitment trees would be reduced from existing levels in all of the proposed harvest units. Recent harvesting in the cumulative effects analysis area has altered the quality and abundance of pileated woodpecker habitat; reductions associated with the Action Alternative would be additive to those reductions. Overall habitat suitability of the CEAA to pileated woodpeckers would be expected to decrease for 30-50 years until harvested stands from the last 20-30 years mature. Firewood gathering along open roads would continue to limit the abundance of snags and woody debris within small areas of the CEAA. In the long term, maturation of stands across the cumulative effects analysis area would increase suitable pileated woodpecker habitats through time. Thus, minor cumulative effects to habitat suitability for pileated woodpeckers would be anticipated since: 1) a minor amount (14.0%) of suitable pileated woodpecker habitat currently present within the CEAA would be altered; 2) existing baseline level of pileated woodpecker habitat suitability is moderate; 3) average patch size of suitable habitat would be reduced by 54 acres; 4) some snags and snag recruits per acre would be removed in the proposed harvest areas for operational and human safety purposes, however, mitigation measures would retain at least 2 large snags and 2 large recruitment trees in harvested areas; and 5) disturbance and firewood gathering would not appreciably change in the long-term given maintained restrictions on access.

## **BIG GAME HABITAT**

***Issue:** The proposed activities could reduce habitat quality for big game, especially during the fall hunting and winter seasons, by removing forest cover, disturbing animals, and increasing roads in secure areas.*

## **Introduction**

Timber harvesting can affect big game and habitat quality through disturbance during harvest activities, removal of forest crown closure, and by creating openings in the forest used for foraging. Forested habitat on winter ranges enables big game survival by ameliorating the effects of severe winter weather conditions. Winter ranges tend to be areas found at lower elevations that support concentrations of big game, which are widely distributed during the remainder of the year. Suitable winter ranges have adequate midstory and overstory cover that reduces wind velocity and intercepts snow, while moderating ambient temperatures. Besides providing a moderated climate, the snow-intercept capacity effectively lowers snow depths, which enables big game movement and access to forage. Snow depths differentially affect big game; deer are most affected, followed by elk, then moose.

Timber harvesting can increase big game (e.g. elk) vulnerability by changing the size, structure, juxtaposition, and accessibility of areas that provide security during times of hunting pressure (*Hillis et al. 1991*). As visibility and accessibility increase within forested landscapes, elk and deer have a greater probability of being observed and, subsequently, harvested by hunters. Because the female segments of the elk and deer populations are normally regulated carefully during hunting seasons, primary concerns are related to a substantial reduction of the male segment and resulting decrease in hunter opportunity.

## **Analysis Areas**

Direct and indirect effects were analyzed for activities conducted within the 1,211-acre project area. Cumulative effects were analyzed on a 41,100 acre CEAA (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale of analysis approximates an area capable of supporting an elk herd home range in the fall.

## **Analysis Methods**

To assess big game habitat on the project area, SLI data were used to identify stands with cover types and forest structure ( $\geq 40$  crown closure) that could provide thermal and/or hiding cover for big game species. Cumulative effects were analyzed using field evaluations, GIS analysis of potential habitat, and aerial photograph interpretation of potential habitat on all other lands within the CEAA. Potential thermal and/or hiding cover habitat on non-DNRC lands was considered to be mature forest with  $\geq 40\%$  crown closure. Direct, indirect, and cumulative effects were analyzed using a combination of field evaluation, aerial photograph interpretation, and a GIS analysis of available habitats. Factors considered in the analysis include the amount of big game winter range habitat available, the extent of past and proposed harvesting, and level of human access for recreational hunting.

## **Existing Environment**

The entire proposed project area (1,211 acres) has been identified by DFWP as white-tailed deer, mule deer, moose and elk winter range. Evidence of summer/fall moose and deer use was

observed during field visits to the project area. The project area contains approximately 970 acres (80.1%) of habitat that is currently providing year-round cover and visual screening for big game. These acres also provide moderate to high amounts of thermal cover and snow intercept for wintering big game. Due to past forest management, 238 acres (19.7%) of the project area have forested stands that contain a more open overstory canopy (<40% canopy cover) than what would be considered high-quality thermal cover or cover that would provide appreciable snow intercept. However, small dense patches of mature trees less than 2 acres in size exist within most of these harvested acres and could be providing marginal levels of thermal cover/snow intercept. Additionally, existing patches of scattered, dense conifer regeneration supply additional cover (<25% of area) capable of ameliorating the influences of cold and snow. Low levels of hunter access exist in the project area, as there are no open roads within the area, and the closest practical access point for the public is over one mile away. Thus, hunting pressure is limited to non-motorized access opportunities on closed roads. The density of restricted roads in the project area is 2.3 miles/sq. mile.

White-tailed deer and mule deer winter range occupy approximately 10,328 acres (25.1%) and 5,741 acres (14.0%) of the CEAA, respectively. Approximately 39,458 (96.0%) and 7,500 acres (18.3%) of the CEAA were identified as moose and elk winter range, respectively. Thus, excluding moose, winter range amounts across the entire CEAA are relatively low (25%-14%). White-tailed deer winter range within the CEAA is connected to a much larger winter range area (>500,000 acres) extending south through the Flathead Valley. Presently, approximately 13,634 acres (33.2%) within the CEAA are providing usable thermal cover and snow intercept for big game. These forest patches are currently distributed primarily on DNRC and Forest Service lands within the CEAA, as extensive harvesting on private industrial timberlands has reduced these attributes. In the last 20 years, harvesting has reduced thermal cover and snow intercept on winter range within the CEAA. These recent harvests have reduced the quality and quantity of usable cover on winter range within the area, but they may have increased forage quality and quantity by opening up the forest overstory canopy. However, forage occurring in forest openings is often not available to wintering animals during appreciable portions of the winter due to deep, crusted snow conditions. Encroachment of noxious weeds into recently logged areas has also likely offset some of the potential gain in forage production. Ongoing and future harvesting (see TABLE W-2 – RECENT AND PROPOSED PROJECTS) could continue to reduce cover attributes on winter range and temporarily displace big game within the CEAA. The CEAA also likely receives moderate levels of hunter access, especially in areas where roads, both open and restricted, are more numerous. Open road density within the CEAA is 1.2 miles/sq. mile and total road density is 3.9 miles/sq. mile.

### **Environmental Effects**

- **Direct and Indirect Effects of the No-Action Alternative on Big Game Habitat**

No changes in big game habitat would be expected as no timber harvesting activities would occur. Existing cover would continue to contribute to winter range quality and security habitat would not be altered. Thus, no direct or indirect effects to big game habitat in the project area

would be anticipated since: 1) no changes to existing thermal cover would be anticipated and continued maturation of forest cover would improve thermal cover and snow intercept, and 2) the level of human access would remain unchanged.

- **Direct and Indirect Effects of the Action Alternative on Big Game Habitat**

Under the Action Alternative, approximately 659 acres (54.4% of project area) of big game habitat and winter range would be harvested on the project area. Of these acres, roughly 616 acres of mature canopy forest currently providing thermal cover would be harvested. Harvest prescriptions in all harvest units would result in areas too open to effectively function as thermal cover or snow intercept. Forest vegetation capable of providing these big game habitat attributes would require 40-60 years for suitable sized trees (>40 ft. tall) to develop in harvested stands. Continued maturation of 274 acres of previously harvested stands within the project area would improve thermal cover/snow intercept habitat attributes and partially offset losses associated with the Action Alternative within 20 to 40 years.

Proposed tree removal would increase sight distances in harvest units and could increase risk of hunting mortality for 10-20 years. Rolling topography and the retention of scattered patches of regenerating conifers <20 feet tall within harvest units would help mitigate some loss of big game security. Some short-term (1-3 years) displacement of big game would be expected as a result of the proposed motorized logging disturbance. No long-term changes in the amount of open roads or motorized access would occur; however, up to 3.9 miles of existing and newly constructed restricted road, combined with 2.1 miles of temporary road could be opened for commercial harvest activities within the project area (TABLE W-4 – ROAD MANAGEMENT AND CONSTRUCTION). New construction of 1.4 miles of permanent, restricted road could result in an increase in non-motorized public use within a portion of the existing big game habitat, however 2.5 miles of currently restricted road would be abandoned and reclaimed under the proposed project. During all phases of the project, any restricted roads and new road construction opened with project activities would be restricted from motorized-use by the general public and closed after completion of project activities.

Thus, moderate adverse direct and indirect effects to big game security habitat and winter range habitat quality would be expected for the next 40 to 60 years since: 1) a moderate percentage of available effective thermal cover/snow intercept (63.6%) in the project area would be removed; 2) lesser amounts of unaltered winter range (552 acres) and thermal/cover (354 acres) would remain; 3) sight distances would increase on 659 acres, which could increase big game vulnerability and associated hunting mortality risk; 4) low hunter access, rolling topography, and retained patches of regenerating conifers would limit the adverse effects of mature cover removal; 5) relatively short-term logging activities would create disturbance in this area; and 6) there would be no long-term changes in open road density.

- **Cumulative Effects of the No-Action Alternative on Big Game Habitat**

No additional changes in big game habitat would be expected as no timber harvesting activities would occur. Existing levels of cover would persist. Past and ongoing forest management projects not associated with the proposed Lazy Swift 2 Timber Sale (see TABLE W-2 – RECENT AND PROPOSED PROJECTS) have affected big game habitat in the project area, and other proposed projects could disturb big game species and/or alter habitat quality in the future. No additional cumulative effects to big game habitat quality are expected to result from the No-Action Alternative that could affect big game species in the CEAA since: 1) no big game habitat would be altered and continued maturation of forest cover would improve thermal cover and snow intercept, and 2) the level of human access would remain unchanged.

- **Cumulative Effects of the Action Alternative on Big Game Habitat**

Forest stands providing suitable thermal cover and snow intercept would be removed from approximately 616 acres (1.5%) of winter range within the CEAA (41,100 acres). This reduction thermal cover and snow intercept would be additive to past reductions within the CEAA due to forest management. A minor decrease in big game habitat quality on winter range within the CEAA would be expected, however winter range is not abundant within the CEAA (except for moose) and only a small portion (<1%) of the larger winter range area falls within the CEAA . Continued maturation of previously harvested stands within the CEAA would improve thermal cover/snow intercept and partially offset these current losses within 20 to 40 years.

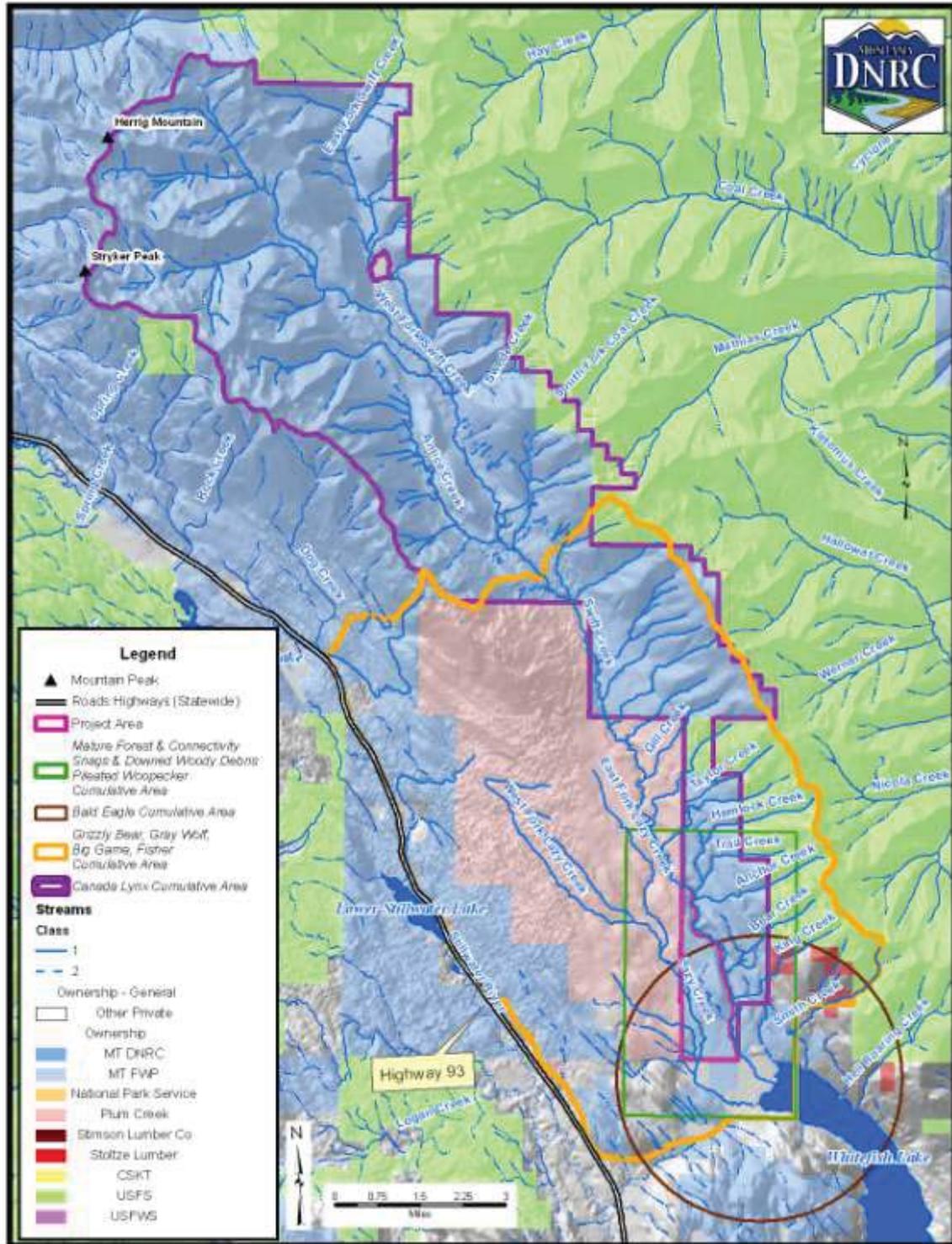
Harvesting and motorized disturbance within the CEAA associated with the proposed project would displace wintering big game and reduce available winter range habitats. Displacement associated with this alternative would be additive to any displacement associated with ongoing timber harvesting (see TABLE W-2 – RECENT AND PROPOSED PROJECTS). Under the Action Alternative, use of existing restricted roads and new roads constructed for completing harvesting activities could temporarily increase access and disturbance on 6.0 miles and result in a temporary increase in open road density from 0.0 miles/sq. mile to 3.2 miles/sq. mile. After harvesting, open road density would remain at current levels in the CEAA and continue to facilitate low amounts of hunter access.

Thus, minor adverse cumulative effects to big game winter range and elk security habitat would be expected since: 1) harvesting would reduce overall levels of cover on 616 acres (1.5%) of winter range within the CEAA; 2) existing thermal cover and snow intercept on winter range in the cumulative effects analysis area would be altered, but approximately 12,928 acres of these attributes would remain; 3) abundance of winter range within the CEAA is limited for most species; 4) overall habitat quality within the larger winter range would not be appreciably altered; 5) logging activities would create disturbance on approximately 2% of the CEAA; and 6) long-term open road densities would not change.

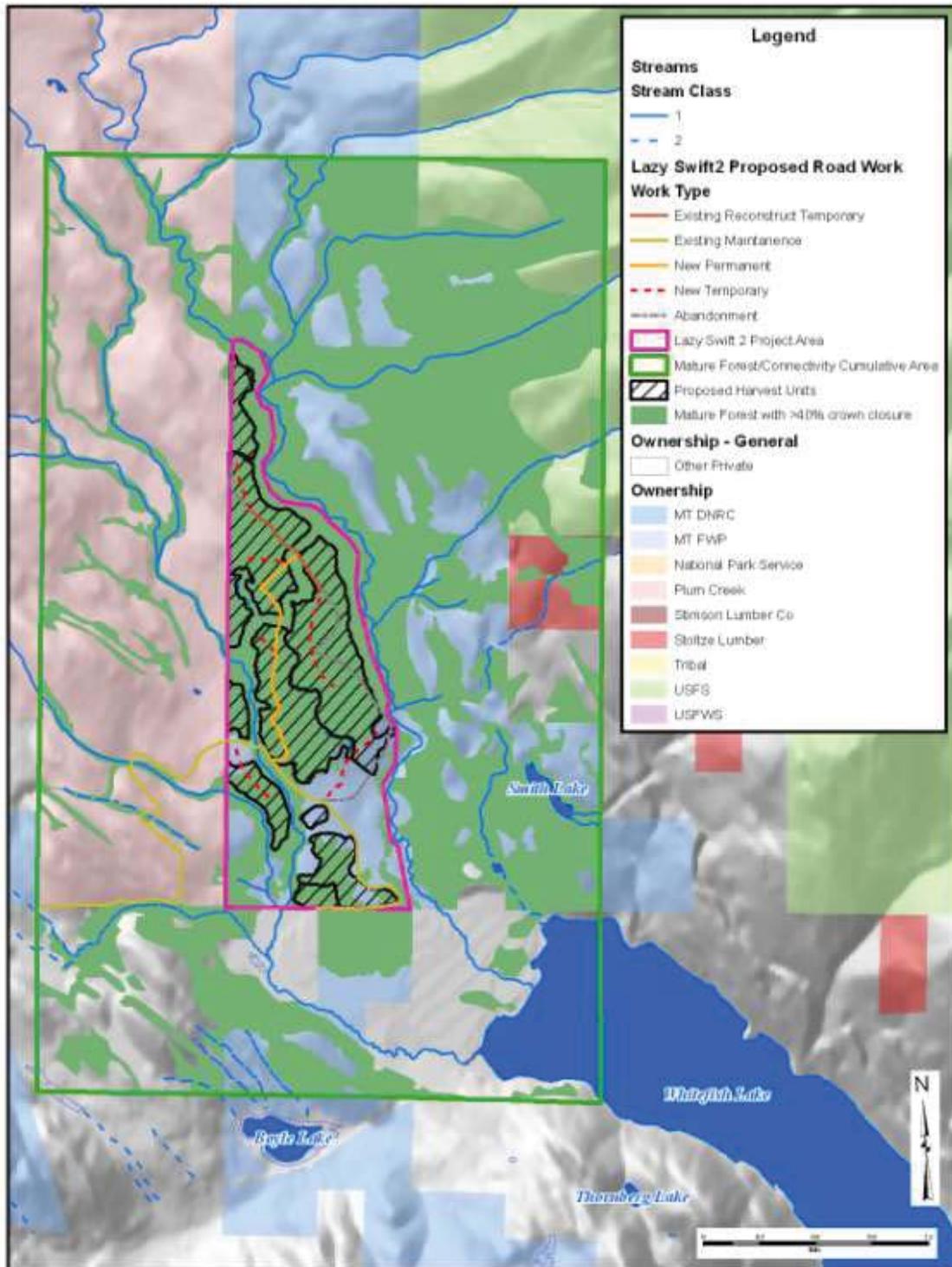
### **Wildlife Mitigations associated with the Action Alternative**

- If a threatened or endangered species is encountered, consult a DNRC biologist and develop additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (*ARM 36.11.428 through 36.11.435*).
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while on duty as per *ARM 36.11.444(2)* and *GB-PR2 (USFWS AND DNRC 2010, Vol. II p. 2-5)*.
- Contractors will adhere to food storage and sanitation requirements as per *GB-PR3 (USFWS AND DNRC 2010, Vol. II p. 2-6)*.
- Manage road closures and restrictions in accordance with the Stillwater Block Transportation Plan as per *GB-ST1 (USFWS AND DNRC 2010, Vol. II p.2-21)*
- Public access would be restricted at all times on restricted roads that are opened for harvesting activities; signs will be used during active periods and a physical closure (gate, barriers, equipment, etc.) will be used during inactive periods (nights, weekends, etc.).
- Restrict commercial harvest and motorized activities on restricted roads to reduce disturbance to grizzly bears from April 1-June 15 during the Spring Period (*GB-NR3, USFWS AND DNRC 2010, Vol. II pp. 2-11, 2-12*).
- In a portion of harvest units, retain patches of advanced regeneration of shade-tolerant trees as per *LY-HB4 (USFWS AND DNRC 2010, Vol. II pp. 2-50, 2-51)*.
- Retain at least 2 snags per acre and 12-25 tons of coarse woody debris per acre, and emphasize the retention of downed logs  $\geq 15$  inches dbh where they occur as per *LY-HB2(1) and (2) (USFWS AND DNRC 2010, Vol. II p. 2-48)*. Favor ponderosa pine, western larch and Douglas-fir for snag retention and recruitment.
- Close roads and trails to the extent possible following the proposed activities to reduce the potential for unauthorized motor vehicle use and/or loss of snags to firewood gathering.

**FIGURE W-1 – WILDLIFE ANALYSIS AREAS.** Areas used to assess effects of the action and no-action alternatives on wildlife and wildlife habitat for the proposed DNRC Lazy Swift 2 Timber Sale.



**FIGURE W-2 – MATURE FORESTED HABITAT AND LANDSCAPE CONNECTIVITY.** Relationship of the project area and proposed units to mature forested stands and potential connectivity for the DNRC Lazy Swift 2 Timber Sale.



Attachment VI:  
**STIPULATIONS AND SPECIFICATIONS**

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Stipulations and specifications for the Action Alternative include project design provisions that follow Forest Management Rules, relevant laws and regulations. They also include mitigations that were designed to avoid or reduce potential effects to resources considered in this analysis. In part, stipulations and specifications are a direct result of issue identification and resource concerns. This section is organized by resource.

Stipulations and specifications that apply to operations required by, and occurring during the contract period, would be contained within the Timber Sale Contract. As such, they are binding and enforceable. Project administrators would enforce stipulations and specifications relating to activities such as hazard reduction, site preparation, and planting, that may occur during or after the contract period.

The following stipulations and specifications would be incorporated into the selected action alternative to mitigate potential effects of resources.

### **Aesthetics**

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- The size and number of landings would be limited.
- Disturbed soils along road right-of-ways would be grass-seeded.
- Leave trees would be left with even and clumpy distributions.
- The temporary roads and all jump-ups would be reclaimed after harvesting.
- Where possible, the new road construction would be located where cut and fill would be minimized thus making the new construction less visible.

### **Air Quality**

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- To minimize cumulative effects during burning operations, burning would be done in compliance with the Montana Airshed Group. Reporting regulations and any burning restrictions imposed in Airshed 2 would be followed; this would provide for burning during conditions of acceptable ventilation and dispersion.
- Dozer, excavator, landing, and roadwork debris would be piled clean to allow ignition during fall and spring when ventilation is good and surrounding fuels are wet. The Forest Officer may require that piles be covered so the fuels are drier, ignite easier, burn hotter, and extinguish sooner.

- In order to reduce smoke production, some large woody debris would be left in the forest to minimize the number of burn piles.
- Dust abatement may be applied on some road segments, depending on the seasonal conditions and level of public traffic.

## Archaeology

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- A contract clause provides for suspending operations if cultural resources were discovered; operations in that area may only resume as directed by the Forest Officer following consultation with a DNRC Archeologist.
- If cultural resources were discovered, the Confederated Salish-Kootenai Tribe would be notified.

## Fisheries

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- Apply all applicable Forestry Best Management Practices (BMPs), including the Streamside Management Zone (SMZ) Law and Rules, HCP commitments, and Forest Management Rules for fisheries, soils, and watershed management (*ARMs 36.11.425 and 36.11.426*).
- Apply the SMZ Law and Rules to all streams.
- Monitor all road-stream crossings periodically for sedimentation and deterioration of road prism.
- Only allow equipment traffic at road-stream crossings when road prisms have adequate load-bearing capacity, thus reducing the potential for rutting.

## Noxious Weed Management

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- All tracked and wheeled equipment would be cleaned of noxious weeds prior to beginning project operations. The Forest Officer would inspect equipment for compliance before equipment is allowed to operate in the project area.
- Disturbed roadside sites would be promptly revegetated with a native grass seed mix. Roads used and closed as part of this proposal would be reshaped and reseeded.
- DNRC would spray weeds on restricted roads that would be used for log hauling in the project area.

## Recreation

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- Stillwater Block Transportation Plan would apply for the general public, DNRC and their operators.

## Soils

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### *Soil Compaction and Displacement*

- Logging equipment would not operate off forest roads unless:
  - Soil is relatively dry (moisture is less than 18 percent), frozen, or snow-covered to minimize soil compaction and rutting, and maintain drainage features; and
  - Soil moisture conditions are checked prior to equipment start up.
- On ground based units, the logger and sale administrator would agree to a skidding plan prior to equipment operations. Skid-trail planning would identify which main trails to use and how many additional trails are needed. Trails that do not comply with BMPs (i.e. trails in draw bottoms) would not be used unless impacts can be adequately mitigated. Regardless of use, these trails may be closed with additional drainage installed, where needed, or grass-seeded to stabilize the site and control erosion.
- Skid trail density in a harvest area would not exceed 20 percent of the total area in a cutting unit.
- Provide for drainage in skid trails and roads concurrently with operations.
- Tractor skidding would be limited to slopes of less than 40 percent unless the operation can be completed without causing excessive soil displacement or erosion. Based on site review, short, steep slopes may require a combination of mitigation measures, such as adverse skidding to a ridge or winchline, and skidding from more moderate slopes of less than 40 percent. Cable yarding would be used on steeper slopes.
- Slash disposal would be treated as follows:
  - Limit the combination of disturbance and scarification to 30 to 40 percent of the harvest units.
  - Consider disturbance incurred during skidding operations to, at least, partially provide scarification for regeneration.
  - No dozer piling on slopes over 35 percent; no excavator piling on slopes over 40 percent, unless the operation can be completed without causing excessive erosion.
  - Consider lopping and scattering or jackpot burning on the steeper slopes.
- Retain 12 to 24 tons of large woody debris (depending on habitat type) and a feasible majority of all fine litter following harvest operations.

- On units where whole tree harvesting is used, implement one of the following mitigations for nutrient cycling:
  - Use in-woods processing equipment that leaves slash on site.
  - For whole-tree harvesting, return-skid slash and evenly distribute within the harvest area.
  - Cut tops from every third bundle of logs so that tops are dispersed as skidding progresses.

### ***Erosion***

- Ground-skidding machinery would be required to be equipped with winchline to limit equipment operations on steeper slopes.
- Roads used by the purchaser would be reshaped and the ditches redefined following use to reduce surface erosion.
- Drain dips and gravel would be installed on roads as needed to improve road drainage and reduce maintenance needs and erosion.
- Some road sections would be repaired to upgrade the roads to design standards that reduce erosion potential and maintenance needs.
- Certified weed-free grass seed and fertilizer would be applied in a prompt and timely manner to all newly constructed road surfaces, cutslopes, and fillslopes. These applications would also be applied to any existing disturbed cutslopes, fillslopes, and landings immediately adjacent to open roads. Seeding to stabilize soils and to reduce or prevent the establishment of noxious weeds would include:
  - Seeding all road cuts and fills concurrent with construction.
  - Applying “quick-cover” seed mix within 1 day of work completion at culvert installation sites involving stream crossings.
  - Seeding all road surfaces and reseeding culvert installation sites when the final blading is completed for each specified road segment.
- Based on ground and weather conditions, water bars, logging-slash barriers and, in some cases, temporary culverts would be installed on skid trails where erosion is anticipated, and as directed by the Forest Officer. These erosion-control features would be periodically inspected and maintained throughout the contract period or extensions thereof.

### **Vegetation**

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- All harvest areas shall have a minimum of 2 snags and 2 snag-recruits over 21 inches dbh, or the next largest size class available. Additional large-diameter recruitment trees may be left if sufficient large snags are not present. These snags and recruitment trees may be clumped or evenly distributed throughout the harvest units.

- Certain portions of the harvest areas would be left uncut; these areas may include large healthy trees, snag patches, small healthy trees, rocky outcrops, SMZs, small wetlands, etc.

## Watershed

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- Planned erosion-control measures include:
  - grade breaks on roads,
  - surface water-diverting mechanisms on roads,
  - slash-filter windrows, and
  - grass seeding.
- Details for these control measures would be included in *ATTACHMENT B* of the *TIMBER SALE CONTRACT*.
- Streamside Management Zones (SMZs) and Riparian Management Zones (RMZs) would be defined along those streams and/or wetlands where they occur within, or adjacent to, harvest areas. This project would meet or exceed SMZ and RMZ rules.
- Brush would be removed from existing road prisms to allow for effective road maintenance. Road maintenance can help reduce sediment delivery.
- The contractor would be responsible for the immediate cleanup of any spills (fuel, oil, dirt, etc.) that may affect water quality.
- Leaking equipment would not be permitted to operate at stream-crossing construction sites.
- Segments of temporary road would be reclaimed to near-natural levels following the sale.

## Wildlife

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- If a threatened or endangered species is encountered, consult a DNRC biologist and develop additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (*ARM 36.11.428 through 36.11.435*).
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while on duty as per GB-PR2 (*USFWS AND DNRC 2010, Vol. II p. 2-5*).
- Contractors would adhere to food storage and sanitation requirements as per GB-PR3 (*USFWS AND DNRC 2010, Vol. II p. 2-6*).
- Manage road closures and restrictions in accordance with the Stillwater Block HCP Transportation Plan as per GB-ST1 (*USFWS AND DNRC 2010, Vol. II p.2-21*).

- Restrict public access at all times on restricted roads that are opened for harvesting activities. Signs would be posted during active periods and a physical closure (gate, barriers, equipment, etc.) would be used during inactive periods (nights, weekends, etc.).
- Restrict commercial harvest and motorized activities on seasonally restricted roads (refer to Stillwater Block HCP transportation plan) to reduce disturbance to grizzly bears from April 1-June 15 during the Spring Period (*GB-NR3, USFWS AND DNRC 2010, Vol. II pp. 2-11, 2-12*).
- Seed tree units would be designed to provide visual screening for bears by ensuring that vegetation or topographic breaks are no greater than 600 feet in at least one direction from any point in the unit per *GB-NR4 (USFS AND DNRC 2010, Vol. II p. 2-3)*.
- When possible, forested corridors would be retained to maintain landscape connectivity, and patches of dense vegetation would be retained to provide security cover.
- Manage for snags, snag recruits, and coarse woody debris, particularly favoring western larch and Douglas-fir (*ARM 36.11.411 through 36.11.414*). Emphasize the retention of downed logs  $\geq 15$  inches dbh where they occur as per *LY-HB2 (USFWS AND DNRC 2010, Vol. II p. 2-48)*.
- Roads and skid trails that may be opened with the proposed activities would be reclosed to reduce the potential for unauthorized motor vehicle use.

Attachment VII:  
**GLOSSARY**

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**Administrative road use:** Road use that is restricted to DNRC personnel and contractors or for purposes such as monitoring, forest improvement, fire control, hazard reduction, etc.

**Airshed:** An area defined by a certain set of air conditions; typically, a mountain valley in which air movement is constrained by natural conditions such as topography.

**Basal area:** A measure of the number of square feet of space occupied by the stem of a tree.

**Best Management Practices:** A practice or combination of land use management practices that are used to achieve sediment control and protect soil productivity and prevent or reduce non-point pollution to a level compatible with water quality goals. The practices must be technically and economically feasible and socially acceptable.

**Biodiversity:** The variety of life and its processes. It includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

**Board foot:** A unit for measuring wood volumes. One board foot is a piece of wood 1 foot long, 1 foot wide, and 1 inch thick (144 cubic inches). This measurement is commonly used to express the amount of wood in a tree, saw log, or individual piece of lumber.

**Canopy:** The upper level of a forest consisting of branches and leaves of the taller trees.

**Canopy closure:** The percentage of a given area covered by the crowns, or canopies, of trees.

**Cavity:** A hollow excavated in trees by birds or other animals. Cavities are used for roosting and reproduction by many birds and mammals.

**Class 1 stream segment:** See “Stream Class”

**Coarse down woody material:** Dead trees within a forest stand that have fallen and begun

decomposing on the forest floor; generally larger than 3 inches in diameter.

**Coarse-filter:** An approach to maintaining biodiversity as described in the State Forest Land Management Plan (DNRC 1996) that involves maintaining a diversity of structures and species composition within stands and a diversity of ecosystems across the landscape.

**Compaction:** Increased soil density caused by force exerted at the soil surface, modifying aeration and nutrient availability.

**Connectivity:** The quality, extent, or state of being joined; unity; the opposite of fragmentation.

**Connectivity (fish):** The capability of different life stages of HCP fish species to move among the accessible habitats within normally occupied stream segments.

**Connectivity (lynx):** Stand conditions where sapling, pole or sawtimber stands possess at least 40% crown canopy closure, in a patch greater than 300 feet wide.

**Cover:** See *Hiding cover* and/or *Thermal cover*.

**Coverttype:** A classification of timber stands based on the percentage of tree species composition.

**Crown cover or crown closure:** The percentage of the ground surface covered by vertical projection of tree crowns..

**Cutting units:** Areas of timber proposed for harvesting.

**Cumulative effect:** The impact on the environment that results from the incremental impact of the action when added to other actions. Cumulative impacts can also result from individually minor actions, but collectively they may compound the effect of the actions.

**Desired future conditions:** The land or resource conditions that will exist if goals and

objectives are fully achieved. It is considered synonymous with appropriate conditions.

**Direct effect:** Effects on the environment that occur at the same time and place as the initial cause or action.

**Ditch relief:** A method of draining water from roads using ditches and corrugated metal pipe. The pipe is placed just under the surface of the road.

**Dominant tree:** Those trees within a forest stand that extend their crowns above surrounding trees and capture sunlight from above and around the crown.

**Drain dip:** A graded depression built into a road to divert water and prevent soil erosion.

**Ecosystem:** An interacting system of living organisms and the land and water that make up their environment; the home place of all living things, including humans.

**Edge:** The border between two or more habitats such as a wetland and mature forest.

**Equivalent clearcut acres (ECA):** This method equates the area harvested and the percent of crown removed with an equivalent amount of clearcut area.

- Allowable ECA* - The estimated number of acres that can be clearcut before stream channel stability is affected.
- Existing ECA* - The number of acres that have been previously harvested, taking into account the degree of hydrologic recovery that has occurred due to revegetation.
- Remaining ECA* - The calculated amount of harvesting that may occur without substantially increasing the risk of causing detrimental effects to the stability of the stream channel.

**Excavator piling:** The piling of logging residue using an excavator.

**Fire regimes:** Describes the frequency, type, and severity of wildfires. Examples include: frequent nonlethal underburns; mixed-severity fires; and stand-replacement or lethal burns.

**Forage:** All browse and nonwoody plants available and acceptable to grazing animals or

that may be harvested for feeding purposes.

**Forest improvement:** The establishment and growing of trees after a site has been harvested.

Associated activities include:

- site preparation,
- planting,
- survival checks,
- regeneration surveys, and
- stand thinnings.

**Fragmentation (forest):** A reduction of connectivity and an increase in sharp stand edges resulting when large contiguous areas of forest with similar age and structural character are interrupted through disturbance (stand-replacement fire, timber harvesting, etc.).

**Habitat:** The place where a plant or animal naturally or normally lives and grows.

**Habitat type:** Forest vegetation types that follow the habitat type climax vegetation classification system developed by *Pfister et al.* (1977).

**Hazard reduction:** The reduction of fire hazard by processing logging residue with methods such as separation, removal, scattering, lopping, crushing, piling and burning, broadcast burning, burying, and chipping.

**Hiding cover:** Vegetation capable of hiding some specified portion of a standing adult mammal from human view, at a distance of 200 feet.

**Historical forest condition:** The condition of the forest prior to settlement by Europeans.

**Indirect Effects:** Secondary effects that occur in locations other than the initial action or significantly later in time.

**Interdisciplinary team (ID Team):**

A team of resource specialists brought together to analyze the effects of a project on the environment.

**Intermediate trees:** A characteristic of certain tree species that allows them to survive in relatively low light conditions, although they may not thrive.

**Landscape:** An area of land with

interacting ecosystems.

**Mitigation measure:** An action or policy designed to reduce or prevent detrimental effects.

**Multistoried stands:** Timber stands with 3 or more distinct stories.

**Nest-site area (bald eagle):** The area in which human activity or development may stimulate abandonment of the breeding area, affect successful completion of the nesting cycle, or reduce productivity. This area is either mapped for a specific nest based on field data, or, if that is impossible, is defined as the area within a quarter-mile radius of all nest sites in the breeding area that have been active within 5 years.

**No-action alternative:** The option of maintaining the status quo and continuing present management activities; the proposed project would not be implemented.

**Nonforested area:** A naturally occurring area where trees do not establish over the long term, such as bogs, natural meadows, avalanche chutes, and alpine areas.

**Old growth:** For this analysis, old growth is defined as stands that meet the minimum criteria (number of trees per acre that have a minimum dbh and a minimum age) for a given site (old-growth group from habitat type). These minimums can be found in the *Green et al Old Growth Forest Types of the Northern Region* (see *REFERENCES*).

**Old growth maintenance:** Silviculture treatments in old growth stands designed to retain old growth attributes, including large live trees, snags and CWD, but that would remove encroaching shade-tolerant species, create small canopy gaps generally less than one acre in size, and encourage regeneration of shade-intolerant species. This type of treatment is applicable on sites that historically would be characterized by mixed severity fire regimes, either relatively frequent or infrequent. ARM 36.11.403 (49)

**Open-Road Densities:** Percent of the grizzly bear subunit exceeding a density of 1 mile per square mile of open roads.

**Overstory:** The level of the forest canopy including the crowns of dominant, codominant, and intermediate trees.

**Patch:** A discrete area of forest connected to other discrete forest areas by relatively narrow corridors; an ecosystem element (such as vegetation) that is relatively homogeneous internally, but differs from what surrounds it.

**Project file:** A public record of the analysis process, including all documents that form the basis for the project analysis. The project file for the Mystery Fish Timber Sale is located at the Stillwater State Forest office near Olney, Montana.

**Redds:** The spawning ground or nest of various fish species.

**Regeneration:** The replacement of one forest stand by another as a result of natural seeding, sprouting, planting, or other methods.

**Restricted road:** A road that is managed to limit the manner in which motorized vehicles may be used. Restricted roads have a physical barrier that restricts the general use of motorized vehicles. Restrictions may be man-made or naturally occurring.

**Residual stand:** Trees that remain standing following any harvesting operation.

**Road:** Any created or evolved access route that is greater than 500 feet long and is reasonably and prudently drivable with a conventional two-wheel-drive passenger car or two-wheel-drive pickup.

**Road-construction activities:** In general, the term 'road construction activities' refers to all the activities conducted while building new roads, reconstructing existing roads, and obliterating roads. The activities may include any or all of the following:

- road construction;
- right-of-way clearing;
- excavation of cut/fill material;
- installation of road surface and ditch drainage features;
- installation of culverts at stream crossings;
- burning right-of-way slash;

- hauling and installation of borrow material; and
- blading and shaping road surfaces.

**Road improvements:** Construction projects on an existing road to improve ease of travel, safety, drainage, and water quality.

**Saplings:** Trees 1 to 4 inches in diameter at breast height.

**Sawtimber trees:** Trees with a minimum dbh of 9 inches.

**Scarification:** The mechanized gouging and ripping of surface vegetation and litter to expose mineral soil and enhance the establishment of natural regeneration.

**Scoping:** The process of determining the extent of the environmental assessment task. Scoping includes public involvement to learn which issues and concerns should be addressed and the depth of assessment that will be required. It also includes a review of other factors, such as laws, policies, actions by other landowners, and jurisdictions of other agencies that may affect the extent of assessment needed.

**Security:** For wild animals, the freedom from the likelihood of displacement or mortality due to human disturbance or confrontation.

**Seedlings:** Live trees less than 1 inch dbh.

**Sediment:** In bodies of water, solid material, mineral or organic, that is suspended and transported or deposited.

**Sediment yield:** The amount of sediment that is carried to streams.

**Seral:** Refers to a biotic community that is in a developmental, transitional stage in ecological succession.

**Shade intolerant:** Describes the tree species that generally can only reproduce and grow in the open or where the overstory is broken and allows sufficient sunlight to penetrate. Often these are seral species that get replaced by more shade-tolerant species during succession. In Stillwater State Forest, shade-intolerant species generally include ponderosa pine, western larch, Douglas-fir, western white pine, and lodgepole pine.

**Shade tolerant:** Describes tree species that can reproduce and grow under the canopy in poor sunlight conditions. These species replace less shade-tolerant species during succession. In Stillwater State Forest, shade-tolerant species generally include subalpine fir, grand fir, Engelmann spruce, and western red cedar.

**Sight distance:** The distance at which 90% of an animal is hidden from view. On forested trust lands, this is approximately 100 feet, but may be more or less depending on specific vegetative and topographic conditions.

**Siltation:** The process of very fine particles of soil (silt) settling. This may occur in streams or from runoff. An example would be the silt build-up left after a puddle evaporates.

**Silviculture:** The art and science of managing the establishment, composition, and growth of forests to accomplish specific objectives.

**Site preparation:** A hand or mechanized manipulation of a harvested site to enhance the success of regeneration. Treatments are intended to modify the soil, litter, and vegetation to create microclimate conditions conducive to the establishment and growth of desired species.

**Slash:** Branches, tree tops, and cull trees left on the ground following a harvest.

**Snag:** A standing dead tree or the portion of a broken-off tree. Snags may provide feeding and/or nesting sites for wildlife.

**Snow intercept:** The action of trees and other plants in catching falling snow and preventing it from reaching the ground.

**Spur roads:** Low-standard roads constructed to meet minimum requirements for harvest-related traffic.

**Stand:** An aggregation of trees occupying a specific area and sufficiently uniform in composition, age arrangement, and condition so as to be distinguishable from the adjoining forest.

**Stand density:** Number of trees per acre.

**Stocking:** The degree of occupancy of land by trees as measured by basal area or number of trees, and as compared to a stocking standard (which is an estimate of either the basal area) or

the number of trees per acre required to fully use the growth potential of the land.

**Stream Class:** A “Class 1 stream segment” means a portion of stream that supports fish; or a portion of stream that normally has surface flow during 6 months of the year or more; and that contributes surface flow to another stream, lake, or other body of water.

“Class 2 stream segment” means a portion of stream that is not a Class 1 or Class 3 stream segment. Two common examples of class 2 stream segments are: (a) A portion of stream which does not support fish; normally has surface flow during less than 6 months of the year; and contributes surface flow to another stream, lake or other body of water; or (b) “A portion of stream that does not support fish/ normally has surface flow during y months of the year or more; and does not contribute surface flow to another stream, lake or other body of water.

“Class 3 stream segment” means a portion of a stream that does not support fish; normally has surface flow during less than 6 months of the year; and rarely contributes surface flow to another stream, lake or other body of water.

**Stream gradient:** The slope of a stream along its course, usually expressed in percentage indicating the amount of drop per 100 feet.

**Stumpage:** The value of standing trees in the forest; sometimes used to mean the commercial value of standing trees.

**Succession:** The natural series of replacement of one plant (and animal) community by another over time in the absence of disturbance.

**Suppressed:** The condition of a tree characterized by a low growth rate and low vigor due to competition.

**Temporary road:** Roads built to the minimal standards necessary to prevent impacts to water quality and provide a safe and efficient route to remove logs from the timber sale area. Following logging operations or site preparations, the road would no longer function as an open road, restricted road or trail. DNRC would assure that they no longer could be accessed for commercial, administrative or

public motorized use.

- Segments near the beginning of the new temporary road systems would be reshaped to their natural contours and reclaimed for approximately 200 feet by grass seeding and strewing slash and debris.

- The reclamation of the remaining road would include a combination of ripping or mechanically loosening the surface soils on the road, removing culverts or bridges that were installed, spreading forest debris along portions of the road, and allowing the surface to revegetate naturally.

**Texture:** A term used in visual assessments indicating distinctive or identifying features of the landscape depending on distance.

**Thermal cover:** For white-tailed deer, thermal cover has 70 percent or more coniferous canopy closure at least 20 feet above the ground, generally requiring trees to be 40 feet or taller.

For elk and mule deer, thermal cover has 50 percent or more coniferous canopy closure at least 20 feet above the ground, generally requiring trees to be 40 feet or taller.

**Timber-harvesting activities:** In general, the term timber-harvesting activities refers to all the activities conducted to facilitate timber removal before, during, and after the timber is removed. These activities may include any or all of the following:

- felling and bucking standing trees into logs;
- skidding logs to a landing;
- processing, sorting, and loading logs onto trucks at the landing;
- hauling logs by truck to a mill;
- slashing and sanitizing residual vegetation damaged during logging;
- machine piling logging slash;
- burning logging slash;
- scarifying and preparing the site for planting; and
- planting trees.

**Total Road Densities:** Percent of grizzly bear subunit with more than 2 miles per square mile of total road.

**Understory:** The trees and other woody species growing under a, more or less, continuous cover of branches and foliage formed collectively by the overstory of adjacent trees and other woody growth.

**Uneven-aged stand:** Various ages and sizes of trees growing together on a uniform site.

**Ungulates:** Hoofed animals, such as mule deer, white-tailed deer, elk, and moose, that are mostly herbivorous; many are horned or antlered.

**Vigor:** The degree of health and growth of a tree or stand of trees.

**Visual screening:** Vegetation and/or topography providing visual obstruction capable of hiding a grizzly bear from view. The distance or patch size and configuration required to provide effective visual screening depends on the topography and/or type and density of cover available.

**Watershed:** The region or area drained by a river or other body of water.

**Water yield:** The average annual runoff for a particular watershed expressed in acre-feet.

**Water-yield increase:** Due to forest canopy removal, an increase in the average annual runoff over natural conditions.

**Windthrow:** A tree pushed over by wind. Windthrows (blowdowns) are common among shallow-rooted species and in areas where cutting or natural disturbances have reduced the density of a stand so individual trees remain unprotected from the force of the wind.

Attachment VIII:  
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## Acronyms

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ARM.....	<i>Administrative Rules of Montana</i>	MNHP.....	<i>Montana Natural Heritage Program</i>
BMP .....	<i>Best Management Practices</i>	NCDE.....	<i>Northern Continental Divide Ecosystem</i>
BMU.....	<i>Bear Management Unit</i>	NWLO.....	<i>Northwestern Land Office</i>
CEAA.....	<i>Cumulative Effects Analysis Area</i>	RL .....	<i>Random Lengths</i>
cmp .....	<i>corrugated metal pipe</i>	RMZ .....	<i>Riparian Management Zone</i>
CMZ.....	<i>Channel Migration Zone</i>	SFLMP.....	<i>State Forest Land Management Plan</i>
CWD .....	<i>Coarse Woody Debris</i>	SLI.....	<i>Stand Level Inventory</i>
dbh .....	<i>diameter at breast height</i>	SMZ.....	<i>Streamside Management Zone</i>
DEQ .....	<i>Department of Environmental Quality</i>	SPTH.....	<i>Site Potential Tree Height</i>
DFWP .....	<i>Montana Department of Fish, Wildlife, and Parks</i>	STW .....	<i>Stillwater Unit</i>
DFC.....	<i>Desired Future Conditions</i>	TLMD.....	<i>Trust Land Management Division</i>
DNRC .....	<i>Department of Natural Resources and Conservation</i>	TMDL.....	<i>Total Maximum Daily Load</i>
EA .....	<i>Environmental Assessment</i>	USFS.....	<i>United States Forest Service</i>
ECA.....	<i>Equivalent Clearcut Acres</i>	USFWS.....	<i>United States Fish and Wildlife Service</i>
EIS .....	<i>Environmental Impact Statement</i>	WFP .....	<i>Washington Forest Practices Board</i>
ERZ .....	<i>Equipment Restriction Zone</i>	WMZ.....	<i>Wetland Management Zone</i>
FIA .....	<i>Forest Inventory and Analysis group</i>	WYI .....	<i>Water Yield Increases</i>
FI .....	<i>Forest Improvement</i>	124 Permit..	<i>Stream Protection Act Permit</i>
FNF .....	<i>Flathead National Forest</i>	318 Authorization.....	<i>A Short-Term Exemption from Montana's Surface Water Quality and Standards</i>
FRTA.....	<i>Federal Roads and Trails Act</i>		
FOGI .....	<i>Full Old-Growth Index</i>		
GBS.....	<i>Grizzly Bear Subunit</i>		
GIS.....	<i>Geographic Information System</i>		
HCP .....	<i>Habitat Conservation Plan</i>		
ID Team.....	<i>Interdisciplinary Team</i>		
MCA .....	<i>Montana Codes Annotated</i>		
MEPA .....	<i>Montana Environmental Policy Act</i>		
Mbf.....	<i>Thousand Board Feet</i>		
MMbf.....	<i>Million Board Feet</i>		

## **LAZY SWIFT 2 TIMBER SALE DRAFT CHECKLIST ENVIRONMENTAL ASSESSMENT**

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