# Good Long Boyle 2 Timber Sale

## CHECKLIST ENVIRONMENTAL ASSESSMENT

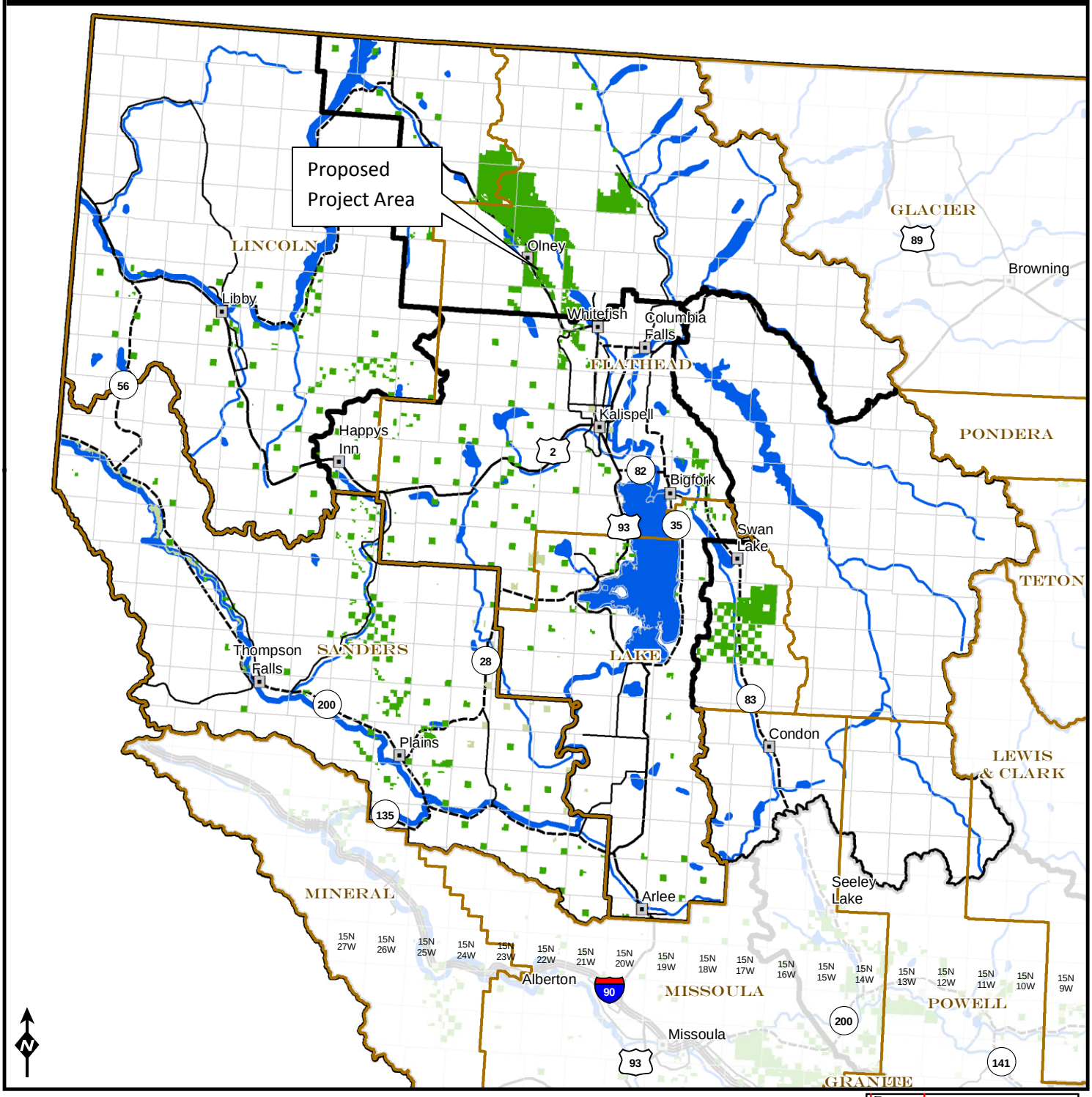
**August 2013**

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

# Good Long Boyle 2 Timber Sale Vicinity Map

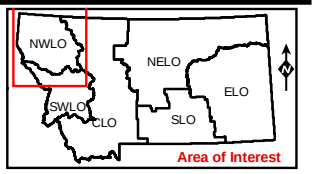
Sections 17, 21, and 27, T32N R23W Flathead County

***DNRC – Stillwater Unit, Olney, Montana***




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

0 5 10 20 30 40 50 Miles




6 December 2010
Montana DNRC
Technical Services Section/dr

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**CHECKLIST ENVIRONMENTAL ASSESSMENT**

| | |
|---|---|
| **Project Name:** | Good Long Boyle 2 Timber Sale |
| **Proposed Implementation Date:** | October 2013 |
| **Proponent:** | Montana Department of Natural Resources and Conservation (DNRC), Northwestern Land Office, Stillwater Unit |
| **Location:** | Sections 17, 21, 27, Township 32 North, Range 23 West |
| **County:** | Flathead |

## I. TYPE AND PURPOSE OF ACTION

Montana Department of Natural Resources and Conservation (DNRC), Stillwater Unit, proposes to harvest approximately 1.5 MMBF of timber from approximately 409 acres on the Stillwater State Forest near Olney, MT (see Attachment I -- Project Map). The proposed project would:

- regenerate new stands of healthy trees by planting and/or natural regeneration;
- remove trees overtopping seedling/sapling-sized trees to improve the vigor and growth; and
- reduce the amount of forest fuels present to mitigate the potential effects of wildland fire.

During the project, 0.7 miles of temporary road would be constructed and/or reconstructed, and 9.7 miles of existing road would be maintained or have drainage improvements installed as necessary to protect water quality.

This project would produce an estimated $400,000 in revenue for the State Normal Schools (76%) and Public Buildings (24%) trusts.

The lands in this project area 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), 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 February 2013, the Interdisciplinary (ID) Team began to gather information related to the current conditions of the project area. Hydrological, soils, wildlife, vegetative, and visual concerns were identified by DNRC resource specialists and field foresters for the No-Action and Action Alternatives. The ID Team determined that the issues directly related to the proposed actions could be addressed through project design and/or mitigation measures.

In March 2013, DNRC solicited public participation on the proposed Good Long Boyle 2 Timber Sale Project. Scoping notices were advertised in the Daily Inter Lake (Kalispell), Whitefish Pilot (Whitefish) newspapers, and posted at the Olney post office. The Initial Proposal with maps was 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 one email and 3 phone calls in response. The majority of responses received were from adjacent landowners who feel inconvenienced by active timber sales within the area and are concerned with noise and traffic from equipment and logging trucks. The DNRC appreciates the fact that logging can be a disturbance and mitigates individual concerns when possible.

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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)**

The DNRC, classified as a major open-burner by the DEQ, is issued a permit from the DEQ to conduct burning activities on state lands managed by the DNRC. As a major open-burning permit holder, the DNRC agrees to operate within the confines of the permit at all times.

**Montana/Idaho Airshed Group**

The DNRC is a member of the Montana/Idaho Airshed Group which regulates prescribed burning, including both slash and broadcast burning, resulting from forest-management activities performed by the DNRC. As a member of the Airshed Group, the DNRC agrees to only burn on days that meet acceptable smoke dispersion levels determined by the Smoke Management Unit in Missoula, Montana.

**United States Fish and Wildlife Service (USFWS)**

The DNRC is managing for the habitats of threatened and endangered species on this project by implementing the Montana DNRC Forested Trust Lands Habitat Conservation Plan (HCP), with 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.

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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.*

**ALTERNATIVES CONSIDERED**

- **No-Action Alternative**

Under this alternative no timber would be harvested and, therefore, no revenue would be generated for the State Normal Schools and Public Buildings trusts. 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 from insects and disease, windthrow, downed fuel accumulation, in-growth of ladder fuels, and wildfires would continue to occur.

- **Action Alternative**

The Action Alternative was developed to address the current forest and resource conditions within the project and cumulative effects areas. In 2004, 241 acres of the proposed timber harvest were logged under the Good Long Boyle East Timber Sale. One of the primary objectives of that project was to move stands toward a historic cover type via seed tree harvesting. Field review has determined that appropriate number and species

of regeneration is present, and in order to complete the initial prescription the over-story species should be removed to free resources for the incoming stand.

One of the primary concerns within the remaining 168 acres of proposed harvest units is declining stand vigor and increased mortality resulting from various diseases and insects, moderate levels of blowdown, fuel buildup, and the fact that these acres do not meet desired future conditions related to forest cover types.

Reconnaissance of the project area highlighted the following forest health concerns:

- High levels of Indian paint fungus (*E. tinctorium*) have caused, and will continue to cause decline and loss of timber value in the grand fir and subalpine fir.
- White pine blister rust is endemic and has led to severe loss of both overstory and understory western white pines, which is the historic and desired covertype within 168 acres of proposed harvest areas.

During the design and development process for this project the following resource issues and design criteria were also identified:

- Maintaining connectivity of mature forest throughout the project area is important to various wildlife species. Project design will maintain several 300-foot corridors of relatively dense, mature timber for wildlife where feasible.
- The high amount of disease present within Unit 3 has resulted in the potential for less snag recruits over time. Mitigations were designed to leave patches of snags (2 snags per acre ≥ 21 inches) and future snag recruits (2 live trees per acre ≥ 21 inches) or the next largest size class available to meet snag retention requirements.
- Continuing to provide hiding cover, nesting sites, and important habitat components for wildlife by maintaining 12 to 20 tons of coarse woody debris, emphasizing pieces to be ≥ 15 inches, and meeting the snag and future snag recruit requirements.
- HCP conservation commitments restrict all heavy machinery from operating behind gated or barricaded roads during the spring period (April 1 through June 15) in the project area to mitigate for spring bear habitat.
- Current species composition has moved the existing cover types away from desired conditions within portions of the proposed sale. A combination of slashing undesirable species, scarifying to facilitate natural regeneration, and inter-planting western larch and western white pine would move cover types towards desired future conditions.

**Details**

Under this alternative the silvicultural and harvest treatments would be to:

- Harvest approximately 1.5 MMBF of timber from 409 acres.
- Regenerate new stands of healthy trees on 168 acres using seed tree with reserves treatments.
- Remove the overstory on 241 acres of seedtree that was harvested in 2004.
- Site preparation through scarification, and piling and burning of excess slash.
- Planting and natural regeneration on 174 acres.

Refer to *ATTACHMENT I – PROJECT MAP* and *ATTACHMENT II – PRESCRIPTION TABLE* for detailed descriptions of the harvesting methods and silvicultural prescriptions.

The road work associated with this project would include:

- Brushing approximately 4.2 miles of restricted roads off of the Lupfer and Upper Whitefish roads;
- Blade approximately 5.5 miles of the Lupfer and Upper Whitefish roads; and
- Construction, followed by reclamation, of 0.7 miles of low standard temporary roads.

## 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.*

The following issue statements were compiled from interdisciplinary team discussions regarding the effects of the proposed timber harvesting:

- *Timber harvesting activities may adversely affect soil resources due to increased compaction, displacement and erosion.*
- *Removal of both coarse and fine woody material off site during timber harvest operations can reduce nutrient pools required for future forest stands and can affect the long-term productivity of the site.*

**EXISTING CONDITIONS**

Four landtypes were identified in the project area; harvesting is proposed on three of these landtypes (14-2, 23-7, and 28-7). All of these landtypes are considered as having a moderate erosion risk. All landtypes are suitable for conventional ground-based timber harvest.

Cumulative effects from past forest management in the proposed harvest units are a result of roads, skid trails and landings. Impact from skid trails and landings from older sales have been greatly reduced through freeze-thaw cycles and root mass penetrating the soil. While many of the impacts have ameliorated over time, skid trails are still visible in the proposed harvest units and elsewhere in the project area. Impacts from skidding are estimated to be between 5 and 10 percent within the proposed units.

DNRC strives to maintain soil productivity by limiting cumulative soil impacts to 15 percent or less of a harvest area, as noted in the SFLMP (*DNRC, 1996*). As a recommended goal, if existing detrimental soil effects exceed 15 percent of an area, proposed harvesting should minimize any additional impacts. Harvest proposals on areas with existing soil impacts in excess of 20 percent should avoid any additional impacts and include restoration treatments, as feasible, based on site-specific evaluation and plans. Past monitoring on DNRC timber sales from 1988 to 2011 has shown an average of 12.2 percent soil impacts due to compaction, displacement or severe erosion across all parent materials. Eighteen monitoring sites had soil textures (silt loam/gravelly silt loam) similar to the areas proposed for harvest in this project. Stratifying the results by soil texture that are similar to the majority of the proposed harvesting shows an average of approximately 16.9 percent of the harvest areas impacted from erosion, displacement or severe compaction on ground-based harvesting operations (*DNRC, 2011*).

During field reconnaissance, 8 transects were used to estimate coarse woody debris in the proposed units. *TABLE ST-2 – COARSE WOODY DEBRIS AMOUNTS* displays the average, minimum, maximum and median levels of coarse woody debris within transects in the project area and the proposed units. The median is the point with half the transects showing more, and half the transects showing less.

***TABLE ST-2: COARSE WOODY DEBRIS AMOUNTS***

| | Number of transects | Average | Minimum | Maximum | Median |
|---|---|---|---|---|---|
| | | *tons per acre* | | | |
| Within proposed units | 8 | 11.7 | 2.6 | 32.7 | 6.9 |

## ENVIRONMENTAL EFFECTS

### *Soil Physical Properties*

- **Direct, Indirect, and Cumulative Effects of the No-Action Alternative on Soil Physical Properties**

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. No additional adverse cumulative effects would be expected from the implementation of the No-Action Alternative. Because harvesting would not be implemented, compaction, displacement and erosion rates above existing levels would not be expected. Coarse woody debris levels and nutrient cycling would continue as dictated by natural events.

- **Direct, Indirect, and Cumulative Effects of the Action Alternative on Soil Physical Properties**

The comparison of the soil type map, field reconnaissance notes, and topographic map features with the proposed harvest unit map indicates that ground-based skidding would occur on slopes of up to 40 percent. No dozer piling is proposed for any units under the Action Alternative. Therefore, the extent of expected impacts would likely be similar to those reported in the *DNRC SOIL MONITORING REPORT (DNRC, 2011)* or approximately 12.2 percent for ground-based harvesting. The project proposes to harvest 409 acres using ground-based operations, which would be expected to have moderate or higher impacts on up to 50 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 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 12 to 20 tons per acre range for habitat types found in the harvest locations *(Graham et al. 1994)*. Because coarse woody debris would be left on site in amounts recommended by scientific literature, and fine debris removal would be minimized 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 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*, which is located at the Stillwater Unit office.**

## 5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

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

The following issue statements were compiled from internal discussions regarding the effects of the proposed timber harvesting:

- *Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.*
- *Cumulative effects from timber harvest may affect channel stability and fisheries habitat by increasing annual water yields, decreasing the amount of recruitable woody debris into streams and /or increasing stream temperatures.*

### EXISTING CONDITIONS

This portion of the Stillwater State Forest is characterized with disconnected streams and also with broad, well-vegetated draws that serve as a conduit for snowmelt runoff. Most of these draws do not have scoured channels, but are considered to be wetlands (isolated or adjacent) and are protected by the Streamside Management Zone Law (ARM 36.11.301 through ARM 36.11.312).

Field reviews of the haul route during 2009 for the Lupfer 3 Timber Sale (*DNRC, 2010*) and in 2013 for this project show no evidence of sediment delivery to streams from roads. Past timber sale projects and the Stillwater State Forest road maintenance programs have installed adequate surface drainage on most roads proposed for hauling. A few minor improvements on the open roads that should be considered include reshaping drain dips and cleaning ditches on in-sloped roads to ensure all features are properly functioning.

A review of the harvest history for the project area watersheds was conducted for this project using aerial photos, timber sale contracts, and section record cards. Additionally, a field review of stream channels and wetlands was completed in May 2013.

Past harvesting operations in the project area include harvests since the 1920's. A list of harvesting in the project area can be found in the project file. Other forest product removals include fence posts and rails, firewood, and individual and commercial Christmas tree harvests throughout the last 70 years.

Stream channels—where they exist—are well vegetated and stable with no evidence of impacts from annual water yield increases.

### ENVIRONMENTAL EFFECTS

#### *Sediment Delivery*

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

This Alternative would have no direct, indirect, or cumulative effects to sediment delivery beyond those currently occurring. Existing sources of sediment, both in-channel and out of channel would continue to recover or degrade based on natural or preexisting conditions.

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

Five units totaling approximately 409 acres would be commercially harvested under this alternative. All of the proposed harvest would be completed using conventional ground-based equipment. Site preparation would include machine piling and scarification on the ground-based units. Approximate miles of road activities include:

- 0.7 miles of road construction/reconstruction for temporary use.

- 9.7 miles of existing road would be maintained or have drainage improvements installed as necessary to protect water quality.

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

Existing roads would have minor 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 ditches.

Because DNRC would incorporate BMPs into the project design as required by *ARM 36.11.422 (2)* and all laws pertaining to Streamside Management Zones (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.

***Water Yield***

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

There would be no direct, indirect, or cumulative effects on water yield. Water quantity would not be changed from present levels, while historic harvest units regenerate returning to fully stocked forested conditions.

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

Approximately 409 acres would be harvested using conventional ground-based methods. Approximately 241 acres of the proposed harvest would be a seed tree removal; the remainder 168 acres would be a regeneration harvest. Harvest in the project area watersheds would not be expected to generate a measurable increase water yield because of:

1) the amount and intensity of proposed harvest;
2) the intermittent and discontinuous nature of the stream channels; and
3) the ability of the wetlands to store runoff.

Therefore, the risk of impacts from annual water yield increases would be very low.

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

Refer to *ATTACHMENT IV – WATER RESOURCES ANALYSIS* for in-depth evaluations of the No-Action and Action Alternatives.

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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 and no slash piles would be burned resulting in the introduction of increased particulate matter.

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

This project is located in Airshed 2. Some particulate matter may be introduced into the airshed during slash burning activities associated with this timber sale. As a result, slash burning would only be conducted when conditions favor good to excellent smoke dispersion as directed by the Montana/Idaho airshed group, thereby minimizing the potential impacts and length of exposure. Thus, direct, indirect, and cumulative effects to air quality are expected to be minimal.

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 CONDITIONS**

The Forest Management Rules direct the 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). Cover type refers to the dominant tree species that currently occupy a forested area. The two cover types present within the proposed harvest units are western larch/Douglas-fir (241 acres) and mixed conifer (168 acres). The desired future cover types for these units based on Stand Level Inventory (SLI) data are western larch/Douglas-fir (241 acres) and western white pine (168 acres).

Age class distributions are another important characteristic for determining trends on a landscape level. Historical data for the Upper Flathead Valley climatic section (*Losensky,* 1997) shows that the Stillwater Unit currently has proportionately less area in the 0-to-39-year (seedling/sapling stands) and 100-to-150-year age classes, and higher proportions of areas in the 40-to-99-year and greater-than-150-year age classes.
All age classes are represented in the project area, however the majority of the stands in the proposed harvest areas are in the 150+ year age class (372 acres).

Much of the proposed harvest areas (241 acres) were logged in 2004 under the Good Long Boyle-East Timber Sale. The primary goal at that time was to promote structural diversity by promoting understory serals and to regenerate stands and move them toward historic cover types through species selection and regeneration. Results from regeneration surveys conclude that the intent of that prescription has been met. The other 168 acres proposed for harvesting were logged in the late 1940's.

*Fisher and Bradley* (*Fire Ecology of Western Montana Habitat Types, 1987*) described fire ecology of habitat-type groups in Montana. The proposed harvest areas are Moist Lower Subalpine fir habitat types (Fire Group 9). Fire Group 9 habitat types are in the subalpine fir and spruce climax series and fire history studies are limited but generally indicate infrequent, mixed-severity fires.

There is no old growth present within the proposed harvest units.

The major diseases present are Indian Paint fungus (*E. tinctorium*) within the alpine fir, and white pine blister rust within the western white pines. There are minor amounts of dwarf mistletoe within the western larch. Various other stem and root rot exists throughout the sale area.

Noxious weeds are present along the Bonneville Power Administration powerline right-of-way, in particular spotted knapweed and oxeye daisy. Unit 1 has orange hawkweed and knapweed on the closed road going into the unit and within the unit itself. The orange hawkweed within Unit 1 is extensive.

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. None of the cover types or 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 dead downed woody material 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.

Species composition within Unit 3 would continue to move further from desired future conditions as the dominant, preferred overstory species continue to decline, and subalpine fir, western red cedar, and Engelmann spruce persist as the major species present in the stand 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 except within Unit 1, where existing orange hawkweed and spotted knapweed populations would likely continue to spread.

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

Directly, within the areas where treatment is proposed (409 acres), approximately 168 acres of mixed conifer would be converted to a western white pine cover type, while no change would occur on 241 acres of western larch/Douglas-fir cover type.

Based on DNRC's Stand Level Inventory [SLI] methodologies for evaluating age classes of the sawtimber component within stands, 241 acres would change from the 150+ year age class to a 0-39 year age class.

Indirectly, harvesting could increase risk of blow down of Engelmann spruce, particularly within Unit 3. This would be due to the shallow root systems of spruce, the high water table within Unit 3, and relatively wide spacing of remaining trees.

Treatments within Unit 3 would remove those species or individuals affected by insects and diseases and would plant rust-resistant western white pine in order to help move stands towards the historic cover type.

Although the potential for ignition of a wildfire would continue to exist following treatment, fuel treatments following harvest would limit the fire intensity under most circumstances. The proposed treatments would reduce the number of trees, creating a wider spacing and reducing the amounts of understory trees with boughs that extend to the ground and act as ladder fuels which can carry fires into the crowns of the forest. The success of aerial and ground attacks on wildfires would potentially be improved because fires would most likely burn through and remain in the understory, rather than climbing into the overstory and moving through the upper canopy. Cumulatively, natural stand development and past timber sales have created a mosaic in the area. Maintaining the mosaic, in conjunction with future fuel-treatment projects, would reduce the potential for high intensity wildfires.

The proposed activities would result in an increase in ground disturbance. Mechanized equipment and ground disturbance could increase or introduce noxious weeds along roads and throughout forested areas. Weed seeds are likely to be scattered throughout the forested areas, and the reduction of canopy and disturbance from the timber harvesting activities would likely cause establishment of new weed populations. Mitigation measures would include washing equipment before entering the site, sowing grass seed on roads after harvesting, and applying herbicide along roadsides and on spots of weed outbreaks. Additionally, Unit 1 would be logged during winter conditions (snow-covered ground) to prevent the spread of existing hawkweed populations located within the unit. Cumulatively, the roads in the project area receive traffic from dispersed recreation, timber-management activities, local residents and other uses on a regular basis. These disturbances could increase exposure to weed establishment. The weed management program at Stillwater

Unit, including cooperation with the county weed department of Flathead County, has improved over time and more weed control is taking place.

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.*

**The full, detailed 28 page wildlife analysis is contained at the end of this document (ATTACHMENT V - WILDLIFE ANALYSIS). It provides an in-depth coarse filter evaluation of the No-Action and Action Alternatives and notes pertaining to species potentially present in the project area. The following text provides a brief summary of that document.**

The 1,788-acre project area provides habitat for many species of wildlife found in western Montana. Of 108 mammal species found in Montana, 74 are suspected or known to occur in Flathead County (*Foresman 2001*). The majority of terrestrial vertebrates that were present at the time of European settlement likely still occur in the vicinity of the proposed project area. Six amphibian and seven reptile species have also been documented in Flathead County (*Maxell et al. 2003*), and at least 65 species of birds have been documented in the vicinity in the last 10 years (*Lenard et al. 2003*).

For this project a coarse filter analysis was conducted that addressed potential adverse effects to wildlife associated with habitat connectivity and removal of mature forest cover, and changes in the abundance of snags and coarse woody debris. Minor adverse effects associated with these habitat parameters would be anticipated under the Action Alternative. See Attachment V – Wildlife Analysis for the complete analyses.

The project area contains potential white-tailed deer winter range habitat as identified by DFWP (*DFWP 2008*). Due to the lack of existing thermal cover within the areas proposed for overstory removal treatments and because there would be no changes to long-term road density, negligible direct, indirect or cumulative effects to big game would be expected.

Due to the intermittent and disconnected characteristic of the streams in the project area, fish are not present in the streams within the project area.

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**9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:**
*Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify direct, indirect, and cumulative effects to these species and their habitat*

**The full 28 page wildlife analysis is contained at the end of this document (ATTACHMENT V - WILDLIFE ANALYSIS). It provides an in-depth evaluation of the No-Action and Action Alternatives and notes pertaining to threatened, endangered and sensitive species potentially present in the project area. The following text provides a brief summary of that document.**

Suitable potential habitat for grizzly bear and Canada lynx is present in the project area. Both of these species have been documented in their respective cumulative effects analysis areas in the past. Given the level of disturbance and extent of habitat alteration associated with the proposed action, minor adverse effects to grizzly bears and Canada lynx would be expected under the Action Alternative.

Habitat assessments were also conducted for the following sensitive species: bald eagle, black-backed woodpecker, Coeur d'Alene salamander, Columbian sharp-tailed grouse, common loon, fisher, flammulated owl, gray wolf, harlequin duck, northern bog lemming, peregrine falcon, pileated woodpecker, and Townsend's big-eared bat. From this list of species, it was determined that three species warranted more detailed study due to historical observations and the presence of habitat in the project area: bald eagle, fisher, and pileated woodpecker. As a result of the proposed action, minor adverse effects would be anticipated for these three species. See Attachment V – Wildlife Analysis for details.

Refer to *ATTACHMENT IV- WATER RESOURCES 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.*

The DNRC has no record of cultural resources within the project's area of potential effect. However, a professional inventory of cultural resources has not been conducted. 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 traffic, visual aesthetics or noise pollution would occur outside of natural events.

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

The proposed project area is not located on any prominent topographic position or visible from any densely populated areas. Units 2 and 4 would be visible from Lupfer Road although the proposed prescription would change the visuals very little and there would be minimal harvesting within the first 100 feet of the road edge.

Overall, timber sale design would minimize the visual impacts to foreground views by randomly spacing leave trees and by keeping a textured, uneven look to unit boundaries; thus, direct, indirect, and cumulative impacts to aesthetics are expected to be minimal.

The expected haul route would channel logging trucks north up the Lupfer Road onto Highway 93, avoiding the section of Lupfer Road that travels past private residences.

Logging and associated activities do increase noise pollution for the period of the sale. Although little can be done to mitigate this, it is only for the duration of the sale.

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**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.*

There is no demand for the limited environmental resources noted above in this project area or from any other nearby activities. Therefore no direct, indirect, or cumulative effects would occur under either alternative.

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

- Lazy Swift II Timber Sale Project CEA (February 2013)
- Ewing Central Timber Sale Project Checklist Environmental Assessment (CEA) (January 2013)
- Mystery Fish Timber Sale Project Environmental Assessment (EA) (April 2012)
- Highway 93 Corridor Timber Sale Project CEA (November 2011)
- Final Habitat Conservation Plan/EIS (USFWS/DNRC) (September 2010)

## IV. IMPACTS ON THE HUMAN POPULATION

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

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

No unusual safety considerations are associated with the proposed timber sale. Warning signs would be located along Lupfer Road and Highway 93 cautioning recreational and residential traffic of logging activities.

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

The proposed timber sale would continue to provide logging-related industrial production in the region.

**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, there would be no measurable direct, indirect, or cumulative effects to the employment market. However, according to a report issued by the Bureau of Business and Economic Research (2008), an average of 10.0 jobs per million board feet of timber harvested is maintained in the timber industry.

**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.

**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*

A temporary increase in traffic would occur on U.S. Highway 93 resulting from log trucks hauling to and from the purchasing mill. This temporary increase on Highway 93 is a regular occurrence on public roads in northwest Montana and no additional government service would be required.

**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.*

There are no locally adopted environmental plans for this area.

**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.*

**Existing Condition**

Lupfer Loop Road, situated off of Highway 93, is a seasonally accessible (Spring/Summer/Fall) open forest road that travels through sections of the Stillwater State Forest located to the east of Highway 93 and Lower Stillwater Lake. Lupfer Loop Road is used primarily to access hiking, hunting and firewood cutting locations on Stillwater State Forest. Lupfer Loop Road is primarily unplowed in the winter except for the last ½ mile to the south where there is a private residence and where the road intercepts the county maintained, Lupfer Road.

Concentrated recreation also occurs within the project area. The concentrated recreation is in the form of a commercial recreation licensee with a current land use license to use portions of the Lupfer Loop Road and the powerline corridor during the winter season for a dogsled trail.

**Direct/Indirect Effects of the Action Alternative**

A proposed cutting unit lies adjacent to a portion of the powerline that the current licensee utilizes for a dogsled trail. Likewise, a small segment of the proposed haul route would be shared with the licensee on Lupfer Loop Road if logging occurred during the winter. In addition, the licensee's trail would intercept and cross a haul route if winter operations were to occur. Mitigations such as signage would be applied to accommodate both logging and activities associated with the licensee.

**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, and 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.

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

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

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

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

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

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

No revenue would be generated for the State Normal Schools and Public Buildings trusts at this time. Small timber permits could yield some additional revenue.

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

The timber harvest would generate approximately $400,000 for the State Normal Schools and Public Buildings trusts and approximately $37,650 in Forest Improvement (FI) fees would be collected for FI projects. This is based on a stumpage rate of $46.00 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 Land Office. From 2006 through 2010, revenue-to-cost ratio of the NWLO 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.

| | | | | |
|---|---|---|---|---|
| **EA Checklist Prepared By**: | **Name:** | Elspeth Pevear, Marc Vessar, Leah Breidinger | **Date:** | 8/13/2013 |
| | **Title:** | Management Forester, Hydrologist, Wildlife Biologist | | |

## V. FINDING

### 25. ALTERNATIVE SELECTED:

Upon Review of the Checklist EA and attachments, I find the Action Alternative, as proposed, meets the intent of the project objectives as stated in Section I – *Type and Purpose of Action*. The lands involved in this project are held by the State of Montana in trust for the support of specific beneficiary institutions and DNRC is required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run (*Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X Section 11; and, 77-1-212 MCA*).

The Action Alternative complies with all pertinent environmental laws, the DNRC SFLMP and HCP, and is based upon a consensus of professional opinion on limits of acceptable environmental impact. For these reasons, I have selected the Action Alternative to be implemented on this project.

### 26. SIGNIFICANCE OF POTENTIAL IMPACTS:

After a review of the scoping documents, project file, Forest Management Rules, SFLMP and HCP checklists, and Department policies, standards, and guidelines, I find that all of the identified resource management concerns have been fully addressed in this Checklist EA and its attachments. Specific project design features and various recommendations by the resource management specialists have been implemented to ensure that this project will fall within the limits of environmental change. Taken individually and cumulatively, the proposed activities are common practices, and no project activities are being conducted on important fragile or unique sites.

I find there will be no significant impacts to the human environments as a result of implementing the Action Alternative. In summary, I find that the identified adverse impacts will be controlled, mitigated, or avoided by the design of the project to the extent that the impacts are not significant.

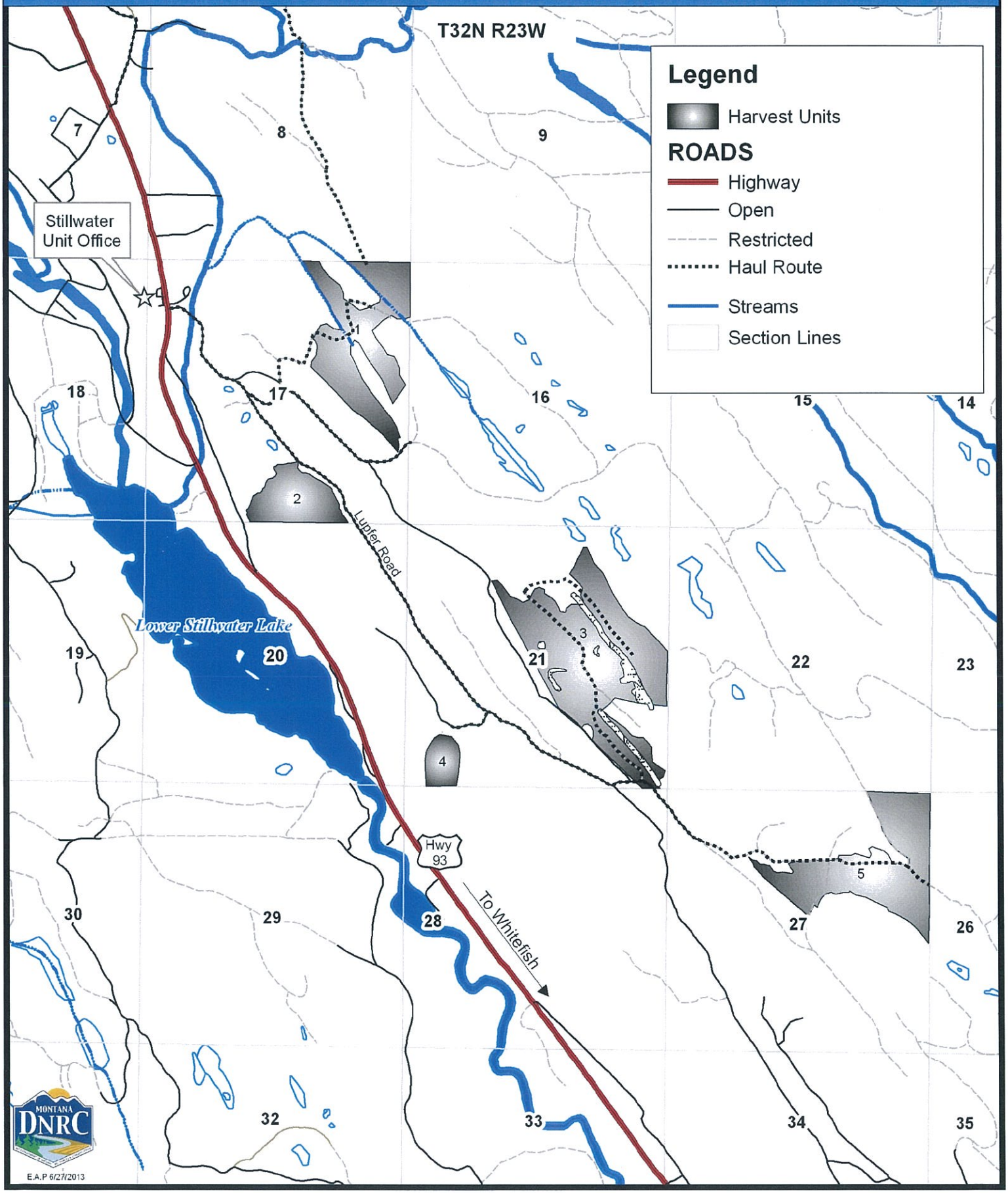
### 27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

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

| | | |
|---|---|---|
| **EA Checklist Approved By**: | **Name:** | Mike McMahon |
| | **Title:** | Forest Management Supervisor, DNRC Stillwater Unit |
| **Signature:** /s/ Mike McMahon | | **Date**: 8/20/2013 |

# Proposed Good Long Boyle 2 Timber Sale

**Attachment I: Project Map**



Attachment II:
**PRESCRIPTION TABLE**

| Unit number | Acres/ MBF | Prescription | Marking guides | Particulars involved in unit |
|---|---|---|---|---|
| 1, 2, 5 | 90 / 316<br>37 / 111<br>99 / 249 | Overstory removal | **Leave Tree Mark**:<br>• Leave Tree Marking with orange horizontal band.<br>• Cut tree mark in SMZ of Unit 1 with blue horizontal band.<br>• **Mark** 2 DEAD snags and 2 LIVE snag recruits per acre >21" DBH (100' spacing).<br>• Species designated to leave = WL, DF and healthy WWP. | - Protect regeneration.<br>- Protect brush within 100' of Lupfer Road.<br>- Maintain 12-20 tons of coarse woody debris per acre.<br>- Burn piles.<br>- Harvesting is proposed within the SMZ's of Unit 1. |
| 3 | 168 / 1,345 | Seedtree w/ reserves | **Harvest by Description:**<br>• Remove all merchantable subalpine fir, grand fir, and lodgepole pine.<br>• Retain healthy spruce 9-inches or smaller.<br>• Retain all trees greater than 17-inches DBH.<br>Criteria for leave trees:<br>• Favor trees with straight healthy boles and 40% live crown ratios.<br>• Maintain a 75-foot spacing in overstory trees.<br>• Leave tree species preference is in the following order: western larch, Douglas-fir, healthy western white pine. | - There are two large interior wetlands and several smaller wetlands that would be protected from equipment to follow SMZ Law [ARM 36.11.425].<br>- Maintain 12 to 20 tons of coarse woody debris per acre.<br>- Excavator scarify and pile logging slash.<br>- Interplant with western white pine and western larch.<br>- There will be areas within the unit where there are no wildlife trees available. There are other areas where there are more than 4 TPA >21". In those cases mark wildlife trees in clumps. |

| Unit number | Acres/ MBF | Prescription | Marking guides | Particulars involved in unit |
|---|---|---|---|---|
| 4 | 15 / 39 | Overstory removal | **Leave Tree Mark**:<br>• Leave Tree Marking with orange horizontal band.<br>• **Mark** 2 DEAD snags and 2 LIVE snag recruits per acre >21" DBH (100' spacing).<br>• Species designated to leave = WL, DF and healthy WWP. | - Protect regeneration.<br>- Leave clumps of healthy Douglas fir and western larch in the 5"-7" range on western boundary of unit and where opportunity arises.<br>- Maintain 12-20 tons of coarse woody debris per acre.<br>- Burn piles. |

**NOTES**:

DBH=Diameter Breast Height
DF = Douglas-fir
ERZ=Equipment Restriction Zone
LTM=Leave Tree Mark
RMZ=Riparian Management Zone
SMZ=Streamside Management Zone
TPA=Trees Per Acre
WL = Western Larch
WWP = Western White Pine

Attachment III:

# STIPULATIONS AND SPECIFICATIONS

Stipulations and specifications for the Action Alternative include project design provisions that follow commitments of the Habitat Conservation Plan, 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

- Damaged residual vegetation visible from open roads would be slashed.
- The size and number of landings would be limited.
- Disturbed soil sites along road right-of-ways would be grass-seeded.
- Leave trees are to be left with both even and clumpy distributions.
- A higher concentration of trees would be left within 100-foot buffers in units along the Lupfer Road.

## Air Quality

- 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. 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 woods 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

- 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

- 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 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

- All tracked and wheeled equipment would be cleaned of noxious weeds prior to beginning project operations.
- 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 with grass seed.
- DNRC would spray weeds on restricted roads that will be used for log hauling in the project area.
- Unit 1 would be logged during winter conditions to prevent further spread of existing hawkweed populations.

## Recreation

- Information would be disseminated to the public through signage, press releases, and pre-operation meetings with DNRC winter recreation lease holders.
- The Stillwater Block Transportation Plan as described in the HCP would apply for all road use.

## Soils

### *Soil Compaction and Displacement*

- Logging equipment would not operate off forest roads unless oven-dry soil moisture is less than 20 percent, frozen, or sufficiently snow-covered to minimize soil compaction and rutting, and maintain drainage features.
- Existing skid trails and landings would be used where their design is consistent with prescribed treatments and meets current BMP guidelines.
- To reduce the number of skid trails and the potential for erosion, designated skid trails would be required where moist soils or short steep pitches (less than 300 feet) would not be accessed by other logging systems.
- Skid trail density in a harvest area would not exceed 20 percent of the total area in a cutting unit.
- Limit the combination of disturbance and scarification to 30 to 40 percent of the harvest unit. 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 disturbance incurred during skidding operations to, at least partially provide scarification for regeneration. A majority of all feasible fine litter and 12 to 20 tons of large woody debris would be retained following harvesting (*ARM 36.11.410* and *36.11.414*).

### *Erosion*

- Ground-skidding machinery would be required to be equipped with winchline to limit equipment operations on moist or steeper slopes.
- Roads used by the purchaser would be reshaped and the ditches redefined following use to reduce surface erosion.
- 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

- 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, SMZs, small wetlands, etc.

## Watershed

- 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.
- Segments of temporary road would be reclaimed to near-natural levels following the sale.
- The BMP audit process will continue. This project would likely be reviewed in an internal audit, and may be selected at random as a statewide audit site.

## Wildlife

- If a threatened or endangered species is encountered, consult a DNRC biologist and develop additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (*ARM 36.11.428* through *36.11.435*).
- 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 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 HCP 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 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*).
- 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*).
- Manage for snags, snag recruits, and coarse woody debris, particularly favoring western larch, Douglas-fir, and western red cedar. Emphasize the retention of downed logs ≥15 inches dbh where they occur as per LY-HB2 (*USFWS AND DNRC 2010, Vol. II p. 2-48).*
- 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.
- Use a combination of topography, group retention, and roadside vegetation to reduce sight distances within harvest units and along open roads where feasible as per GR-NR4 and GR-RZ2 (*USFWS AND DNRC 2010, Vol. II p. 2-13 to 14, 2-17).*

Attachment IV:

# WATER RESOURCES ANALYSIS

## INTRODUCTION

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

- *Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.*
- *Cumulative effects from timber harvest may affect channel stability and fisheries habitat by increasing annual water yields, decreasing the amount of recruitable woody debris into streams and /or increasing stream temperatures.*

These issues will be addressed by assessing the risk of:

- sediment delivery to water bodies from roads and harvest units;
- destabilizing channels from annual water yield increases; and
- impacting recruitable woody debris and stream temperature due to harvesting.

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

## ANALYSIS METHOD

***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* and the results from soil monitoring on past DNRC timber sales.

***Water Yield***

Impacts from increases in annual water yield will be discussed qualitatively in this document. The discontinuous characteristic of streams in the project area coupled with the proposed dispersed harvest diminishes the potential impacts.

Visual inspection of runoff patterns and stream channel stability in the project area along with aerial photo interpretation will be used to determine the impacts and extent of past management in the analysis area.

***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 Class 1 streams in the project area.

***Stream Temperature Increases***
Stream temperature will be addressed by comparing the existing condition or past analysis information with the risk of stream temperature increases in Class 1 streams within the project area.

## 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.

***Water Yield***
The analysis area for annual water yield will include the first order stream in the project area and within the Stillwater River- Lower Stillwater Lake 6$^{th}$ code watershed. None of these streams connect to the Stillwater River or Stillwater Lake via surface flow.

***Woody Debris Recruitment***
The analysis area for woody debris recruitment is the RMZ along Class 1 streams in the project area. Because no harvesting is proposed within one site potential tree height of a Class 1 waterbody; no foreseeable direct, indirect or cumulative effects to recruitable woody debris would be expected from either alternative and therefore will not be further discussed in this document.

***Stream Temperature Increases***
The analysis area for stream temperature increases is identical to the analysis area for woody debris recruitment. Because no harvest is proposed within the RMZ of Class 1 streams, no impacts to stream temperature due to timber harvest would be expected and therefore will not be further discussed.

## WATER USES AND REGULATORY FRAMEWORK

***WATER QUALITY STANDARDS***
This portion of the Flathead River basin, including the Stillwater River and its tributaries, is classified as B-1 by the DEQ, as stated in the ARM 17.30.608. Among other criteria for B-1 waters, no increases are allowed above naturally occurring levels of sediment, and minimal

increases over natural turbidity. "Naturally occurring," as defined by *ARM 17.30.602* (*19*), includes conditions or materials present during runoff from developed land where all reasonable land, soil, and water conservation practices (commonly called Best Management Practices or BMPs) have been applied. The State of Montana has adopted BMPs through its non-point source management plan (*MDEQ, 2007*) as the principle means of meeting the Water Quality Standards. Reasonable practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses. These practices include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures. Appropriate practices may be applied before, during, or after completion of activities that could create impacts.

***WATER QUALITY LIMITED WATERBODIES***

None of the streams in the project area are considered impaired waterbodies and listed on the 2012 303(d) list.

***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 AND HABITAT CONSERVATION PLAN (HCP)***

In 2003, DNRC drafted Administrative Rules for Forest Management. The portion of those rules applicable to watershed and hydrology resources include ARM 36.11.422 through 426 and 470 through 471. The HCP was adopted in December 2011 and all conservation commitments covered by the HCP are also to be applied to this project. All applicable rules will be implemented if they are relevant to activities proposed with this project. This includes implementing RMZs on all Class 1 streams to ensure adequate recruitable coarse woody debris and shade are maintained, and channel migration zones are implemented.

***WATER RIGHTS AND BENEFICIAL USES***

Water rights for surface water exist within three miles downstream of the project area in for domestic use and stock watering.

Designated beneficial water uses for B-1 waters include cold-water fisheries, aquatic life support, and recreational use in the streams, wetlands, and lakes in the surrounding areas.

**EXISTING CONDITION**

***GENERAL DESCRIPTION***

This portion of the Stillwater State Forest is characterized with disconnected streams and also with broad well-vegetated draws that serve as a conduit for snowmelt runoff. Most of these draws do not have scoured channels, but are considered to be wetlands (isolated or adjacent). Adjacent wetlands are protected by the Streamside Management Zone Law (ARM 36.11.301 through ARM 36.11.312) while isolated wetlands management and protections are included in the Forest Management (ARM 36.11.426).

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

***SEDIMENT DELIVERY***

A field review of the haul route during 2009 (*DNRC 2010*) and 2013 found no evidence of sediment delivery to streams from roads. Past timber sale projects and the Stillwater State Forest road maintenance programs have installed adequate surface drainage on most roads proposed for hauling. A few minor improvements on the open roads that should be considered include reshaping drain dips and cleaning ditches on in-sloped roads to ensure all features are properly functioning.

The erosion risk for landtypes in the project area with proposed timber harvest proposed is moderate. No mass wasting sites or unstable soils were observed in any of the proposed harvest areas.

***WATER YIELD***

A review of the harvest history for the project area watersheds was conducted for this project using aerial photos, timber sale contracts, and section record cards. Additionally, a field review of stream channels and wetlands was completed in May 2013.

The 6$^{th}$ code watershed (Stillwater River-Lower Stillwater Lake) contains over 17,500 acres. Harvest has occurred over a majority of the acres at some point in the last century, however stream channels—where they exist—are well vegetated and stable with no evidence of impacts from annual water yield increases.

Past harvesting operations in the project area include harvests since the 1920's. A list of harvesting in the project area can be found in the project file. Other forest product removals include fence posts and rails, firewood, and individual and commercial Christmas tree harvests throughout the last 70 years.

## 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***

  Five units totaling approximately 409 acres would be commercially harvested under this alternative. All of the proposed harvest would be completed using conventional ground-based equipment. Site preparation would include machine piling and scarification on the ground-based units. Approximate miles of road activities include:

- 0.7 miles of road construction/reconstruction for temporary use.
- 9.7 miles of existing road would be maintained or have drainage improvements installed as necessary to protect water quality.

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. Sediment from all sources would continue as described in the existing condition.

  **Water Yield**

  No increased risk of increases or reductions in annual water yield would result from this alternative.

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

  **Sediment Delivery**

  Past monitoring of DNRC timber harvests has shown erosion on approximately 6 percent of the sites monitored, although no water-quality impacts from the erosion were found (*DNRC 2011*). 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 to the stream. Their 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*).

  Existing roads would have minor 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 ditches.

  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.

**Water Yield**

Approximately 409 acres would be harvested using conventional ground-based methods. This area of harvest is approximately 2 percent of the Stillwater River—Lower Stillwater Lake 6th code watershed.

Approximately 241 acres of the proposed harvest would be a seed tree removal; the remainder 168 acres would be regeneration harvest. Harvest in the project area watersheds would not be expected to generate a measurable increase water yield because of:

1) the amount and intensity of proposed harvest;
2) the intermittent and discontinuous nature of the stream channels; and
3) the ability of the wetlands to store runoff.

Therefore, the risk of impacts from annual water yield increases would be very low.

***CUMULATIVE EFFECTS***

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

**Sediment Delivery**

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

**Water Yield**

No increase in water yield would be associated with this alternative. No measureable changes to annual water yield or stream channel impacts would be expected.

- ***Cumulative Effects Summary - No-Action Alternative***

Because no timber harvesting or associated activities would occur under this alternative, cumulative effects would be limited to the existing conditions.

- ***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 long-term cumulative increase in sediment delivery as a result of timber harvesting and roadwork would have a low risk of occurring because of the existing road improvements, BMP application and landtypes in the project area.

**Water Yield**

Adverse cumulative impacts to stream channels in project area from cumulative annual water yield increases would have a very low risk of occurring because of:

1) the limited timber harvest proposed under the action alternative,
2) the high stability of stream channels, where they occur, and
3) the wetlands' ability to store water during snowmelt periods.

- ***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. Because BMPs would be implemented during timber-harvesting and road-construction operations, the risk of adverse cumulative impacts to water quality and beneficial uses would be low.

Attachment V:

# WILDLIFE ANALYSIS

## INTRODUCTION

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

- **Mature forest cover and connectivity.** The proposed activities could decrease mature forested cover, which could reduce habitat connectivity and suitability for wildlife species associated with mature forest.
- **Snags and coarse woody debris.** The proposed activities could reduce the availability of snags and coarse woody debris and increase human access for firewood harvesting, which could adversely affect the quality of wildlife habitat.
- **Canada lynx.** The proposed activities could reduce landscape connectivity and the availability of suitable Canada lynx habitat, reducing the capacity of the area to support Canada lynx.
- **Grizzly bears.** The proposed activities could alter grizzly bear cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats, and/or by increasing risk of human-caused bear mortality.
- **Bald eagles.** The proposed activities could remove large trees and snags and could increase disturbance to bald eagles, which could reduce the quality of bald eagle habitat.
- **Fishers.** The proposed activities could reduce the availability and connectivity of suitable fisher habitat and increase human access, which could reduce fisher habitat suitability and increase trapping mortality.
- **Pileated woodpeckers.** The proposed activities could reduce tree density and alter the structure of mature forest stands, which could reduce habitat suitability for pileated woodpeckers.

## ANALYSIS AREAS

### *Direct and Indirect Effects*

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

### *Cumulative Effects*

The cumulative effects of the proposed activities on all species/issues were analyzed at a broad surrounding landscape scale that varies according to the issue or wildlife species being discussed. Cumulative effects analysis areas (CEAAs) are named according to the size of the area or the wildlife species discussed and are summarized in *TABLE W-1: ANALYSIS AREAS* (*FIGURE W-1: ANALYSIS AREAS*). CEAAs include the project area as well as lands managed by other agencies and private landowners. Detailed descriptions of each analysis area are located in the **Existing Condition** section for each issue or wildlife species evaluated.

***TABLE W-1: ANALYSIS AREAS.*** *Descriptions of the project area and CEAAs.*

| ANALYSIS AREA NAME | DESCRIPTION | TOTAL ACRES | ISSUE(S)/SPECIES ANALYZED |
|---|---|---|---|
| Project Area | DNRC managed lands in sections 17, 20, 21, 27, and 28 of T32N, R23W. | 1,788 | direct & indirect effects for all issues/species |
| Medium CEAA | Portions of the Stillwater River-Lower Stillwater Lake Subwatershed | 7,654 | mature forest cover and connectivity, snags and coarse woody debris, pileated woodpeckers |
| Bald Eagle CEAA | The 2.5 mile radius area surrounding a bald eagle nest located on Lower Stillwater Lake and portions of the project area in section 27 that are located outside of this area | 12,637 | bald eagles |
| Large CEAA | The Lazy Creek Grizzly Bear Subunit of the Northern Continental Divide Ecosystem (NCDE) | 34,559 | grizzly bears, fishers |
| Lynx CEAA | The Stillwater West Lynx Management Area | 39,240 | Canada lynx |

## ANALYSIS METHODS

Analysis methods are based on DNRC State Forest Land Management Rules, which are designed to promote biodiversity. The primary basis for this analysis includes information obtained by: field visits, review of scientific literature, Montana Natural Heritage Program (MNHP) data queries, DNRC Stand Level Inventory (SLI) data analysis, aerial photograph analysis, and consultation with professionals. The coarse-filter wildlife analysis section includes analyses of the direct, indirect and cumulative effects of the proposed alternatives on old-growth forest, connectivity of mature forest habitats, and snags and coarse woody debris. However, old growth does not occur in the project area so the issue will not be discussed further. In the fine-filter analysis, individual species of concern are evaluated. These species include wildlife species federally listed under the Endangered Species Act, species listed as sensitive by DNRC, and species managed as big game by the Montana Dept. of Fish Wildlife and Parks (DFWP).

Cumulative effects analyses account for known past and current activities, as well as planned future agency actions. Recent timber sale projects (≤10 years) that could contribute to cumulative effects are summarized in *TABLE W-2: RECENT PROJECTS*.

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

| Sale Name | Agency | Harvest Year | Project Area | Medium CEAA | Bald Eagle CEAA | Large CEAA | Lynx CEAA |
|---|---|---|---|---|---|---|---|
| Good Long Boyle West | DNRC | 2003 | - | - | 451 | - | - |
| Good Long Boyle East | DNRC | 2004 | 398 | 533 | 531 | 533 | 532 |
| Chicken Werner | DNRC | 2004 | - | - | - | 683 | - |
| Taylor South | DNRC | 2005 | - | - | - | 516 | - |
| Dog Meadow North | DNRC | 2005 | - | - | - | 1 | 337 |
| Dog Meadow South | DNRC | 2006 | - | - | - | 427 | 583 |
| Ewing Middle Road | DNRC | 2006 | - | - | - | - | 128 |
| King Bear | DNRC | 2006 | - | - | - | 26 | - |
| Point of Rocks | DNRC | 2006 | - | - | - | - | 104 |
| Dogwing | DNRC | 2007 | - | - | - | - | 146 |
| Steele Dog | DNRC | 2008 | - | - | - | - | 18 |
| Olney Urban Interface | DNRC | 2009 | - | 397 | 404 | 457 | 457 |
| Swedish Chicken | DNRC | ongoing | - | - | - | 90 | - |
| Lupfer 3 | DNRC | ongoing | 53 | 149 | 93 | 149 | 149 |
| Hwy. 93 Corridor | DNRC | ongoing | - | 75 | 184 | 75 | 75 |
| SE Stryker Ridge | DNRC | ongoing | - | - | - | 52 | 25 |
| Fish Bull Face | DNRC | ongoing | - | - | - | - | 505 |
| Mystery Fish | DNRC | ongoing | - | - | - | - | 456 |
| Ewing Central | DNRC | ongoing | - | - | - | - | 346 |

Changes to forest structure resulting from all DNRC projects, with the exception of the ongoing DNRC Ewing Central Timber Sale, have been accounted for in SLI data used for this analysis. The effects of ongoing and proposed 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 (USFWS and DNRC 2010)*, the *Endangered Species Act*, the *Migratory Bird Treaty Act*, and the *Bald and Golden Eagle Protection Act*.

## COARSE-FILTER WILDLIFE ANALYSIS

Analysis of the anticipated effects of the proposed activities on mature forested cover and connectivity, and snags and coarse woody debris are discussed in detailed analyses below.

### *MATURE FORESTED HABITATS AND CONNECTIVITY*

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

**Introduction**

Mature forests characterized by large-diameter trees and dense canopy cover provide many wildlife species with food, shelter, breeding sites, and travel corridors. Historically, the spatial configuration of mature forested habitats in the western United States was shaped by natural disturbance events, primarily wildfire, blowdown, and pest outbreaks. Natural disturbance events resulted in a mosaic-like spatial configuration of forest patches varying in age, species composition and development. Spatial configuration, including patch size and connectivity of forested habitats, is important for many wildlife species. Patch size may affect the distribution of wildlife species that are attracted to, or avoid forest edges. Additionally, connectivity of mature forested habitats may facilitate movements of wildlife species that avoid openings in canopy cover, or inhibit movements of species that are attracted to openings in canopy cover. Timber harvest, like wildfire and blowdown, is a disturbance event that often creates open patches of young, early-successional habitats. Consequently, timber harvest may negatively affect wildlife species dependent on mature forests by reducing the amount and connectivity of these habitats.

**Analysis Areas**

The analysis area for direct and indirect effects is the 1,788-acre project area (*FIGURE W-1: ANALYSIS AREAS*). The analysis area for cumulative effects is the 7,654-acre medium CEAA described in *TABLE W-1: ANALYSIS AREAS* and depicted in *FIGURE W-1: ANALYSIS AREAS*. The medium CEAA is defined by geographic features and represents an area large enough to support a diversity of species that use mature forested habitats and/or require connected forested habitats.

**Analysis Methods**

Analysis methods for mature forested habitats and landscape connectivity include field evaluations and Geographical Information System (GIS) analysis of aerial-photographs, DNRC stand level inventory data (SLI), and U.S. Forest Service (USFS) canopy cover data (VMap 9.1.1). Mature forested habitat is defined here and in the remainder of the document as forest stands with ≥40% canopy cover comprised of trees that are on average >9 inches dbh. Forested stands containing trees of at least this size and density were considered adequate for providing minimal conditions necessary to facilitate movements of many wildlife species that benefit from well-connected mature forest conditions across the landscape. Factors considered in the analysis include: 1) the degree of timber harvesting, 2) availability and patch size of mature forested habitat (≥40% canopy cover, trees >9 inches dbh average), 3) open and restricted road density, and 4) the availability of potential travel corridors.

**Existing Conditions**

***Mature Forested Habitats and Connectivity***

The project area currently contains 890 acres of mature stands composed primarily of Douglas-fir, larch, and mixed conifer stands (52.2% of project area) (*TABLE W-3: MATURE FOREST*). The remaining habitat consists of 82 acres of permanent non-forested habitat consisting primarily of lakes and wetlands, 452 acres of areas harvested in the Good Long Boyle and Lupfer 3 Timber Sales, as well as additional stands with <40% canopy cover. Average patch size of mature forested habitat is moderate (average: 127 acres, range: 1 to 794 acres). Most patches of mature forested habitat are connected across the project area, potentially facilitating travel of wildlife species that prefer mature forested habitat (*FIGURE W-2: MATURE FOREST*). Mature canopy cover ranges from low (40% closure) to high (90% closure) throughout the project area and the project area likely provides suitable habitat for species requiring connected and/or mature habitats. The project area occurs approximately 4 miles south of an important linkage zone for wildlife identified by *Servheen et al.* (*2003*), and riparian habitat in the project area associated with small streams and wetlands likely facilitates wildlife movements between the project area and adjacent stands of mature forested habitat. The ability of linkage zones to facilitate occupancy and travel by wildlife can be adversely affected by reductions in vegetative cover, increased human development and increases in roads and human access. Open road density in the project area is moderate (2.7 miles/square mile) and total road density is high (4.9 miles/square mile).

The medium CEAA contains 2,346 acres (32.1% of analysis area) of mature stands (>9 inches dbh average) with ≥40% canopy cover (*TABLE W-3: MATURE FOREST*). The majority of the remaining acres in the project area consist of stands with <40% mature canopy cover due to the extensive harvest history on private lands (43% of the medium CEAA is managed by Plum Creek and other private owners). Approximately 333 acres consist of permanent non-forest areas composed of lakes and wetlands. Across, the medium CEAA, landscape connectivity is highest in the western portion of the project area where the land is owned primarily by DNRC. The medium CEAA is adjacent to an important linkage zone for wildlife identified by Servheen et al. (*2003*), and riparian areas associated with small unnamed creeks and wetlands likely provide wildlife travel corridors. The network of open roads has reduced some landscape connectivity. Open road density in the medium CEAA is low (1.6 miles/square mile) and total road density is high (5.1 miles/square mile).

***TABLE W-3: MATURE FOREST.*** *Average patch size and acreage of mature forested habitat (≥40% canopy cover, trees >9 inches dbh) pre- and post-harvest in the project area and medium CEAA for the Good Long Boyle 2 Timber Sale. Percent of the total corresponding analysis area is in parentheses.*

| ANALYSIS AREA | AVERAGE PATCH SIZE | | TOTAL ACRES OF MATURE FOREST | |
|---|---|---|---|---|
| | Existing | Post-harvest | Existing | Post-harvest |
| Project Area -- 1,788 Acres (% of area) | 127 | 87 | 890 (49.8%) | 693 (38.8%) |
| Medium CEAA –7,654 Acres (% of area) | 112 | 90 | 2,346 (30.7%) | 2,150 (28.1%) |

**Environmental Effects**

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

None of the proposed forest management activities would occur. Forests would continue to age and dense stands of shade-tolerant trees would continue to develop. Patch size and the availability of mature forested habitat would likely increase over time, increasing connectivity. Thus, since: 1) no appreciable change in the abundance, patch size, or suitability of mature forested habitat would occur, 2) no changes in open or restricted road density would occur, and 3) no changes in the availability of travel corridors would occur; no direct or indirect effects to mature forested habitat abundance, suitability, or connectivity would be anticipated as a result of the No-Action Alternative.

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

The proposed activities would occur in 197 (22.1%) of the 890 acres of mature stands available in the project area. The proposed harvest would reduce mature canopy cover to <10% in 197 acres of mature forested habitat and average patch size would decrease from 127 acres to 87 acres. Approximately 0.7 miles of temporary road would be constructed, but no permanent roads are proposed for construction. Approximately 5 acres of riparian habitat associated with Class 2 streams would be harvested. However, these acres would retain moderate stocking density and would continue to provide mature forested habitat post-harvest. See WATER RESOURCES section in this document for additional information on riparian habitat. Overall, connectivity of upland mature forest within the proposed project area would be reduced, especially in the center of the project area where one large patch of mature canopy cover would be harvested, isolating a 51-acre stand of mature canopy cover (*FIGURE W-2: MATURE FOREST*). Travel corridors across the project area would become narrower, but would persist post-harvest, facilitating travel across the project area. Given the amount of mature forest cover and patch connectivity that would remain, that no increases in human dwellings or other developments would occur, and that no additional roads would be constructed, the potential for adverse effects to the habitat linkage zone identified by Servheen et al. (*2003*) north of this area would be minimal. Thus, since: 1) the abundance of mature forested habitat would decrease by 197acres (22.1% of existing mature forest); 2) average patch size of mature forested habitat would decrease by 40 acres; 3) 0.7 miles of temporary road would be constructed, but permanent roads would not be constructed; 4) 5 acres of riparian habitat would be harvested, but moderate stocking density would be retained; and 5) overall connectivity of mature forested habitat would decrease, but travel corridors and the linkage zone identified by Servheen et al. (*2003*) would not be affected; minor direct or indirect effects to mature forested habitat abundance, suitability, or connectivity would be anticipated as a result of the Action Alternative.

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

None of the proposed forest management activities would occur. Forests in the project area would continue to age, and dense stands of shade-tolerant trees would continue to develop. Connectivity would not be affected under this alternative. Other proposed or ongoing activities within the medium CEAA could affect the abundance, suitability, and connectivity of mature forested habitats. Thus, since: 1) no appreciable change in the abundance, patch size, or suitability of mature forested habitat would occur associated with this alternative, 2) no changes in open or restricted road density would occur, and 3) no changes in the availability of travel corridors would occur; no additional cumulative effects to mature forested habitat abundance, suitability or connectivity would be anticipated as a result of the No-Action Alternative.

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

The proposed activities would affect 197 acres of the 2,346 acres (8.3%) of mature forested habitat available in the medium CEAA. The proposed harvest would reduce mature canopy cover to <10% in these stands and average patch size would decrease from 112 acres to 90 acres. Reductions in the availability of suitable mature forested habitat would be additive to harvest activities that are proposed or ongoing in the medium CEAA (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). All of these projects have been accounted for in SLI data. The Highway 93 Corridor and Lupfer 3 Timber Sales may occur concurrently with the Good Long Boyle 2 Timber Sale. Approximately 5 acres of riparian habitat associated with Class 2 streams would be harvested; however, these acres would retain moderate stocking density and would continue to provide mature forested habitat post-harvest. Approximately 0.7 miles of temporary road would be constructed, but no permanent roads are proposed for construction. Overall, connectivity of mature forest within the medium CEAA would be reduced, but travel across the analysis area would remain possible due to connected patches of mature forested habitat (*FIGURE W-2: MATURE FOREST*). Given the sizable amount of mature forest cover and patch connectivity that would remain, that no increases in human dwellings or other developments would occur, and that no additional roads would be constructed; the potential for adverse effects to the habitat linkage zone identified by Servheen et al. (*2003*) adjacent to the medium CEAA would be minimal. Thus, since: 1) the abundance of mature forested habitat would decrease by 197 acres (8.3% of existing mature forest); 2) average patch size of mature forest would decrease by 22 acres; 3) 0.7 miles of temporary road would be constructed, but no permanent roads would be constructed; 4) 5 acres of riparian habitat would be harvested, but moderate stocking density would be maintained; and 5) overall connectivity of mature forested habitat would decrease, but travel corridors and the linkage zone identified by Servheen et al. (*2003*) would remain intact; minor adverse cumulative effects to mature forested habitat abundance, suitability, or connectivity would be anticipated as a result of the Action Alternative.

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

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

### Introduction

Snags and coarse woody debris are important components of forest ecosystems that 1) increase structural diversity, 2) alter the canopy microenvironment, 3) promote biological diversity, 4) provide important habitat substrates for wildlife, and 5) act as storehouses for nutrient and organic matter recycling agents (*Parks and Shaw 1996*). Coarse woody debris, snags, and defective trees are used by a wide variety of wildlife species for foraging, nesting, roosting, and cover. Primary cavity users (i.e., woodpeckers) excavate nesting and roosting cavities in snags. These cavities are used as nesting, roosting, and resting sites by a variety of secondary cavity users, such as small mammals and birds, which are unable to excavate their own cavities. Habitat value of snags for wildlife varies according to tree species, diameter, and snag density. Thick-barked species (e.g., western larch and ponderosa pine) provide high quality snag habitat. Snag diameter is important because many species that nest in smaller diameter snags will also use large snags; however, the opposite is not true. Coarse woody debris habitat value varies according to size, length, decay, and distribution. Single, scattered downed trees may provide access under the snow for small mammals, while log piles may provide secure areas for snowshoe hares. Timber harvest may affect the abundance and spatial distribution of snags and coarse woody debris by

direct removal for commercial value or for human safety purposes, or indirectly by increasing human access for firewood harvesting.

**Analysis Areas**

The analysis area for direct and indirect effects is the 1,788-acre project area (*FIGURE W-1: ANALYSIS AREAS*). The analysis area for cumulative effects is the 7,654-acre medium CEAA described in *TABLE W-1: ANALYSIS AREAS* and depicted in *FIGURE W-1: ANALYSIS AREAS*. The medium CEAA is defined by geographic features and represents an area large enough to support a diversity of species that use coarse woody debris and snags.

**Analysis Methods**

The abundance of snags and coarse-woody debris was quantitatively estimated in the proposed harvest units using 8 systematically-placed fixed plots (each 100 feet x 66 feet). Coarse-woody debris tons/acre was estimated for material ≥3 in diameter where it intersected the 100-ft transect line according to methods described by Brown (*1974*). Snags per acre were estimated by recording all snags ≥8 in dbh and ≥6 ft tall located within in each plot. Factors considered in the analysis include: 1) the level of harvesting, 2) availability of snags and coarse woody debris, and 3) risk of firewood harvesting.

**Existing Conditions**

During field assessments, 3.3 snags/acre ≥8 inches dbh were observed (range: 0-6.6 snags/acre) and only 1 snag >21 inches dbh occurred within sample plots. Engelmann spruce, subalpine fir, western larch, and Douglas-fir snags were observed in the sample plots and wildlife use of snags was observed throughout the project area. Coarse woody debris levels ranged from 2.5-32.7 tons/acre across the proposed harvest units, but averaged 11.7 tons/acre. Firewood harvesting has likely reduced the availability of coarse woody debris and snags along open roads in the project area. Overall, firewood cutting risk is currently moderate due to accessibility of the project area (2.7 miles/square mile open road density and 4.9 miles/square mile total road density).

In the medium CEAA, snag and coarse woody debris levels on surrounding parcels vary widely depending on motorized access, harvest history, and natural disturbance history. Snag and coarse woody debris levels are likely limited due to the history of timber harvest on privately owned lands (43% of the medium CEAA). Snags and coarse woody debris are frequently collected for firewood in the medium CEAA, especially near open roads. Overall, open road density is low and provides limited access for firewood cutting (1.6 miles/square mile open road density, 5.1 miles/square mile total road density).

**Environmental Effects**

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

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

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

Some existing snags and snag recruits would be removed from 409 acres within project area due to timber felling operations. Additional recruitment trees and snags may also be lost following timber harvest due to wind throw. Given operability and human safety constraints, existing non-merchantable

snags would be left standing where possible. Across the project area, at least 2 large snags and 2 large recruitment trees (>21 inches dbh) per acre would be retained on DNRC harvest units (*ARM 36.11.411*). If such large trees and snags are absent, the largest available snags and/or recruitment trees would be retained. Additionally, 12-20 tons/acre of coarse woody debris would be retained according to DNRC Forest Management Rules (*ARM 26.11.414*). Firewood cutting risk in the project area would not change following the proposed harvest because no permanent roads are proposed for construction, although 0.7 miles of temporary road would be constructed. Thus, since: 1) proposed actions would remove some snags and minimally influence the amount of coarse woody debris on 409 acres (22.9% of project area), 2) accessibility for firewood harvesting would not change, and 3) snags and coarse woody debris would be retained to meet DNRC Forest Management Rules (*ARM 36.11.411, ARM 26.11.414*); minor adverse direct and indirect effects to snags and coarse woody debris availability associated with wildlife habitat quality would be anticipated as a result of the Action Alternative.

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

None of the proposed forest management activities would occur. No changes in the availability of snags and coarse woody debris would be expected. Existing snags would continue to provide habitat attributes, and new snags would be recruited as trees die. Ongoing and proposed forest management activities may affect the availability of snags and coarse woody debris in the medium CEAA; however, no changes would be expected within the project area under the No-Action alternative. Thus, since: 1) no timber harvesting associated with the proposal would occur there would be no additional effect to present or future snag or coarse woody debris abundance, and 2) no changes to human access for firewood harvesting would occur; no additional cumulative effects to snags and coarse woody debris availability associated with wildlife habitat quality would be anticipated as a result of the No-Action Alternative.

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

Some existing snags and snag recruits would be removed from the 409 acres (5.3% of medium CEAA) proposed for harvest, but retention measures would apply (*ARM 36.11.411, ARM 26.11.414*). Reductions in the availability of coarse woody debris and snags would be additive to forest management activities occurring in the medium CEAA (see **ANALYSIS METHODS** section of the Introduction for a detailed description of recent projects). Ongoing and proposed DNRC timber sales are anticipated to affect approximately 633 acres within the medium CEAA (8.3% of the medium CEAA). Firewood cutting risk in the medium CEAA would not change due to DNRC activities under the Action Alternative because no permanent roads are proposed for construction. Thus, since: 1) proposed actions would be additive to ongoing and proposed activities that would remove snags, snag recruits, and coarse woody debris from up to 633 acres (8.3% of the medium CEAA); 2) accessibility for firewood harvesting would not change; and 3) snags and coarse woody debris would be retained in amounts required to meet DNRC Forest Management Rules (*ARM 36.11.411, ARM 26.11.414*); minor adverse cumulative effects to snags and coarse woody debris availability associated with wildlife habitat quality would be anticipated as a result of the Action Alternative.

## FINE-FILTER WILDLIFE ANALYSIS

The fine-filter wildlife analysis discloses the existing conditions of wildlife resources and the anticipated direct, indirect, and cumulative effects that may result from the No-Action and Action alternatives. Wildlife species considered include: 1) species listed as threatened or endangered under the Endangered Species Act of 1973, 2) species listed as sensitive by DNRC, and 3) species managed as big game by DFWP. *TABLE W-4: FINE-FILTER* provides an analysis of the anticipated effects for each species.

***TABLE W-4: FINE-FILTER.*** *Anticipated effects of the Good Long Boyle 2 Timber Sale on wildlife species. For several species, more detailed analysis is provided below where indicated.*

| SPECIES/HABITAT | EFFECTS ASSESSMENT |
|---|---|
| THREATENED & ENDANGERED SPECIES | |
| **Canada lynx** (*Felis lynx*)<br><br>Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zones | ***Detailed Analysis Provided Below*** – The project area contains 1,368 acres of suitable lynx habitat. |
| **Grizzly bear** (*Ursus arctos*)<br><br>Habitat: Recovery areas, security from human activity | ***Detailed Analysis Provided Below*** – The project area is located in the Lazy Creek Grizzly Bear Subunit of recovery zone habitat associated with the NCDE (*USFWS 1993*). |
| SENSITIVE SPECIES | |
| **Bald eagles** (*Haliaeetus leucocephalus*)<br><br>Habitat: Late-successional forest less than 1 mile from open water | ***Detailed Analysis Provided Below*** – The project area is located within the home range of a bald eagle pair associated with Lower Stillwater Lake. |
| **Black-backed woodpeckers** (*Picoides arcticus*)<br><br>Habitat: Mature to old burned or beetle-infested forest | No recently (<5 years) burned areas occur within 0.25 miles of the project area. Thus, no direct, indirect, or cumulative effects to black-backed woodpeckers would be expected to occur as a result of either alternative. |
| **Coeur d'Alene salamanders** (*Plethodon idahoensis*)<br><br>Habitat: Waterfall spray zones, talus near cascading streams | No moist talus or streamside talus habitat occurs in the project area. Thus, no direct, indirect, or cumulative effects to Coeur d'Alene salamanders would be expected to occur as a result of either alternative. |
| **Columbian sharp-tailed grouse** (*Tympanuchus Phasianellus columbianus*)<br><br>Habitat: Grassland, shrubland, riparian, agriculture | No suitable grassland communities occur in the project area. Thus, no direct, indirect, or cumulative effects to Columbian sharp-tailed grouse would be expected to occur as a result of either alternative. |
| **Common loons** (*Gavia immer*)<br><br>Habitat: Cold mountain lakes, nest in emergent vegetation | No suitable lake habitat occurs 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. |

| | |
|---|---|
| **Fishers** (*Martes pennanti*)<br><br>Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian | ***Detailed Analysis Provided Below*** – Approximately 1,204 acres of suitable fisher habitat occur within the project area. |
| **Flammulated owls** (*Otus flammeolus*)<br><br>Habitat: Late-successional ponderosa pine and Douglas-fir forest | Approximately 59 acres of flammulated owl habitat types occur in the project area. However, the proposed activities would not affect these areas. Thus, given that the proposed activities would not occur within flammulated owl habitat types, no direct, indirect, or cumulative effects to flammulated owls would be expected to occur as a result of either alternative. |
| **Gray wolves** (*Canis lupus*)<br><br>Habitat: Ample big game populations, security from human activities | The 2011 Lazy Creek Wolf Pack territory overlaps with the project area (*DFWP wolf pack data, 2011*). However, no known rendezvous or den sites are located within 1 mile of the project area. Additionally, the proposed activities are anticipated to have a negligible effect on big game since overstory removal treatments proposed in white-tailed deer winter range identified by DFWP (2008) would not affect thermal cover. Thus, negligible direct, indirect, or cumulative effects to gray wolves would be expected to occur as a result of either alternative. |
| **Harlequin ducks** (*Histrionicus histrionicus*)<br><br>Habitat: White-water streams, boulder and cobble substrates | Potentially suitable high-gradient stream habitat does not occur within 0.5 miles of the project area. Thus, no direct, indirect or cumulative effects to harlequin ducks would be anticipated. |
| **Northern bog lemmings** (*Synaptomys borealis*)<br><br>Habitat: Sphagnum meadows, bogs, fens with thick moss mats | Potentially suitable wetlands exist in the project area, however, harvest and heavy equipment restrictions would apply (*ARM 36.11.436*). Thus, negligible direct, indirect, or cumulative effects to northern bog lemmings would be expected to occur as a result of either alternative. |
| **Peregrine falcons** (*Falco peregrinus*)<br><br>Habitat: Cliff features near open foraging areas and/or wetlands | Suitable cliffs/rock outcrops for nest sites were not observed in the project area or within 0.5 miles of the project area. Additionally, peregrine eyries have not been documented in the vicinity of the project area (MNHP data, March 11 2013). Thus, no direct, indirect, or cumulative effects to peregrine falcons would be anticipated as a result of either alternative. |
| **Pileated woodpeckers** (*Dryocopus pileatus*)<br><br>Habitat: Late-successional ponderosa pine and larch-fir forest | ***Detailed Analysis Provided Below*** – Approximately 733 acres of pileated woodpecker habitat occur in the project area. |

| | |
|---|---|
| **Townsend's big-eared bats** (*Plecotus townsendii*)<br><br>Habitat: Caves, caverns, old mines | No suitable caves or mine tunnels are known to occur in the project area. Thus, no direct, indirect or cumulative effects to Townsend's big-eared bats would be expected to occur as a result of either alternative. |
| **Wolverine** (*Gulo gulo*)<br><br>Habitat: Alpine tundra and high-elevation boreal and coniferous forests that maintain deep persistent snow into late spring | No high-elevation habitat with persistent spring snow pack occurs in the project area. Thus, no direct, indirect or cumulative effects to wolverines would be expected to occur as a result of either alternative. |
| BIG GAME | |
| **Elk** (*Cervus canadensis*) | The project area contains potential white-tailed deer winter range habitat as identified by DFWP (*DFWP 2008*). However, most of the units located within this area are proposed for seed tree removal, which is unlikely to adversely affect thermal cover for wintering animals. Additionally, no changes to long-term road density would occur in this area. Thus, negligible direct, indirect or cumulative effects to big game would be expected to occur as a result of either alternative |
| **Mule Deer** (*Odocoileus hemionus*) | |
| **White-tailed Deer** (*Odocoileus virginianus*) | |

## THREATENED AND ENDANGERED SPECIES

### *CANADA LYNX*

***Issue**: The proposed activities could reduce landscape connectivity and the availability of suitable Canada lynx habitat, reducing the capacity of the area to support Canada lynx.*

**Introduction**

Canada lynx are medium-size cats that prey primarily on snowshoe hares and occupy a mosaic of young and mature forests that provide hunting and denning habitats (*Ruediger et al. 2000*). Lynx foraging habitat in western Montana consists of young coniferous stands and mature forested stands with high levels of horizontal cover, which provide snowshoe hare habitat (*Squires et al. 2010*). Additionally, lynx typically avoid large openings in overhead canopy cover in the winter; hence, densely forested cover that is well connected is important for travel and security (*Squires et al. 2010*). Canada lynx are federally listed as a threatened species. Forest management considerations for lynx include providing a mosaic of well-connected young and mature lynx habitats.

**Analysis Areas**

The analysis area for direct and indirect effects is the 1,788-acre project area (*FIGURE W-1: ANALYSIS AREAS*). The analysis area for cumulative effects is the, 39,240-acre lynx CEAA described in *TABLE W-1: ANALYSIS AREAS* and depicted in *FIGURE W-1: ANALYSIS AREAS*. The lynx CEAA is the Stillwater

West Lynx Management Area (LMA), which is a designated portion 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*).

**Analysis Methods**

Analysis methods include field evaluations, aerial photograph interpretation, and GIS analysis of SLI data and suitable lynx habitat. Lynx habitat was subdivided into the following habitat classes: 1) winter foraging, 2) summer foraging, 3) other suitable, and 4) temporary non-habitat. Habitat classes were classified according to DNRC's lynx habitat mapping protocols (*USFWS and 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, coarse woody debris, etc.). Other suitable lynx habitat is defined as habitat that has the potential to provide connectivity and lower quality foraging habitat, but does not contain the necessary attributes to be classified as winter or summer foraging habitat classes. The temporary non-habitat category consists of forested stands that are not expected to be used by lynx until suitable horizontal cover develops. Factors considered in the analysis include: 1) the level of harvesting, 2) the availability of suitable lynx habitat classes, and 3) landscape connectivity.

**Existing Conditions**

The project area contains 1,368 acres of suitable lynx habitat (*TABLE W-5: LYNX HABITAT*). The remaining acres consist of 292 acres of stands that do not contain suitable structure for lynx use and 128 acres of stands that are not suitable habitat types for lynx use. Riparian habitat associated with streams in the project area likely provides some habitat connectivity for lynx (see ***MATURE FORESTED COVER AND CONNECTIVITY*** in the coarse filter analysis section for further information).

The lynx CEAA contains a total of 30,608 acres of suitable lynx habitat (*TABLE W-5: LYNX HABITAT*). The remaining 8,632 acres consists primarily of stands that are not preferred lynx cover types, stands that do not contain suitable structure for lynx use, and non-forested areas composed of lakes and steep high-elevation slopes. Approximately 2,182 acres in the lynx CEAA (5.5%) have been harvested in the last 10 years and account for a portion of habitat that is currently considered temporary non-suitable lynx habitat. In the vicinity of the project area, connectivity of lynx habitats is moderate. The project area is connected to suitable habitat located north of the project area by thin corridors 300-400 feet. The amount and configuration of suitable lynx habitat in these areas is influenced by adjacent older harvest units on DNRC land, vegetation management on nearby private land, and the presence of habitat types that are not suitable for lynx use. However, current levels of connectivity of lynx habitat are likely suitable for travel throughout the lynx CEAA.

***TABLE W-5: LYNX HABITAT.*** *Estimates of existing lynx habitat and lynx habitat that would remain post-harvest on DNRC lands in the project area and lynx CEAA. Values in parentheses refer to the percentages of each lynx habitat category of total potential lynx habitat[a] on DNRC-managed lands.*

| LYNX HABITAT CATEGORY | Acres Of Lynx Habitat (percent of total potential DNRC lynx habitat) | | | |
|---|---|---|---|---|
| | Project Area | | Lynx CEAA | |
| | Existing | Post-Harvest | Existing | Post-Harvest |
| Summer Forage | 10 (0.6%) | 10 (0.6%) | 6,389 (17.9%) | 6,389 (17.9%) |
| Winter Forage | 1,171 (70.5%) | 947 (57%) | 19,751 (55.4%) | 19,527 (54.7%) |
| Other Suitable | 187 (11.3%) | 187 (11.3%) | 4,468 (12.5%) | 4,468 (12.5%) |
| Temporary non-habitat | 292 (17.6%) | 516 (31.1%) | 5,063 (14.2%) | 5,287 (14.8%) |
| Grand Total - Suitable Lynx Habitat | 1,368 (82.4%) | 1,144 (68.9%) | 30,608 (85.8%) | 30,384 (85.2%) |

[a]*Total potential lynx habitat describes all areas that contain appropriate habitat types for lynx (i.e., sum of summer forage, winter forage, other suitable, and temporary non-suitable lynx habitat classes).*
[b]*Total suitable lynx habitat describes all lynx habitat categories that contain structural attributes necessary for lynx use (i.e., sum of summer forage, winter forage, other suitable lynx habitat classes).*

**Environmental Effects**

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

None of the proposed forest management activities would occur. Lynx habitat availability and habitat connectivity would not change. Thus, since: 1) no changes to lynx habitat availability would occur, and 2) no changes to landscape connectivity would occur; no adverse direct or indirect effects to Canada lynx associated with landscape connectivity and availability of suitable habitat would be anticipated as a result of the No-Action Alternative.

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

The proposed activities would affect 184 acres (13.4%) of the 1,368 acres of suitable lynx habitats available in the project area. After harvest, 180 acres of lynx winter foraging habitat would be reclassified as temporary non-suitable habitat due to lack of canopy cover in the understory and overstory (TABLE W-5: LYNX HABITAT). The remaining 4 acres of suitable lynx habitat proposed for harvest would be expected to retain adequate understory and overstory canopy cover, allowing these acres to continue to meet the structural conditions suitable for lynx use. To ensure that forest structural attributes preferred by snowshoe hares remain following harvest, dense patches of advanced regeneration would be retained where possible, especially within lynx winter forage habitat. Additionally, 12-20 tons/acre of coarse woody debris would be retained in accordance with DNRC Forest Management Rules (*ARM 36.11.414)* and retention of downed logs ≥15 inch diameter would be emphasized. Lynx habitat connectivity would

be reduced due to the transition of 180 acres of suitable lynx habitat to temporary non-suitable habitat. The total amount of temporary non-suitable habitat would increase from 17.6% to 31.1% of potential lynx habitat in the project area; however, connectivity would be retained across the project area. Five acres of harvesting within riparian habitat associated with Class 2 streams would occur, but moderate stocking density would be retained and the area would continue providing a potential travel corridor for lynx. See the WATER RESOURCES section in this document for additional information. Additionally, harvest would not occur on major ridgelines. If present in the vicinity of the project area, lynx could be temporarily displaced by forest management activities for up to 3 years due to disturbance caused by motorized activities. Thus, since: 1) lynx suitable habitat availability would be reduced by 180 acres (13.2%); 2) habitat quality would be reduced within 4 acres of lynx suitable habitat; 3) patches of advanced regeneration would be retained where feasible, especially in winter forage habitat; and 4) landscape connectivity would be slightly reduced; minor adverse direct and indirect effects to Canada lynx associated with landscape connectivity and availability of suitable habitat would be anticipated as a result of the Action Alternative.

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

None of the proposed forest management activities would occur. Ongoing and proposed forest management activities may change the availability of suitable lynx habitats and landscape connectivity in the lynx CEAA. Thus, since: 1) no additional changes to lynx habitat type availability would occur, and 2) no additional changes to landscape connectivity would occur on DNRC lands, no additional cumulative effects to Canada lynx associated with landscape connectivity and availability of suitable habitat would be anticipated as a result of the No-Action Alternative.

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

The proposed activities would affect 184 acres (0.6%) of the 30,608 acres of suitable lynx habitat available in the lynx CEAA. After harvest, 180 acres (0.6%) of suitable lynx habitat would be considered temporary non-habitat due to lack of canopy cover in the understory and overstory. The remaining 4 acres of suitable lynx habitat would be expected to retain adequate understory and overstory canopy cover, allowing these acres to continue to meet the structural conditions suitable for use by lynx. Additionally, dense patches of advanced regeneration would be retained where possible, especially within lynx winter foraging habitat. Approximately 12-20 tons/acre of coarse woody debris would be retained in accordance with DNRC Forest Management Rules (*ARM 36.11.414)* and retention of downed logs ≥15 inch diameter would be emphasized. Lynx habitat connectivity would be slightly reduced due to the transition of 180 acres of suitable lynx habitat to temporary non-suitable habitat. However, the total amount of temporary non-suitable habitat would remain low (14.8% of potential lynx habitat in the CEAA and connectivity of lynx habitat would remain high. Riparian habitat harvest is proposed for 5 acres, but these acres would retain adequate stocking densities suitable for lynx use and travel post-harvest. Additionally, harvest would not occur along prominent forested ridgelines. Changes to lynx habitat type availability and habitat connectivity would be additive to recent and ongoing timber sales in the lynx CEAA (see *ANALYSIS METHODS* section of the Introduction for a detailed description of projects). All of these timber sales have been accounted for in SLI data with the exception of the Ewing Central Timber Sale, which is anticipated to reduce suitable lynx habitat by an additional 250 acres. Lynx could be temporarily displaced by forest management activities associated with the Good Long Boyle 2 Timber Sale and other ongoing timber sales occurring across 5.0% of the lynx CEAA for up to 3 years. Thus, since: 1) lynx suitable habitat availability would be reduced by up approximately 430 acres (1.4% of potentially suitable lynx habitat in the lynx CEAA) following the implementation of the Good Long Boyle 2 and Ewing Central Timber Sales; 2) habitat quality would be reduced within 4 acres of lynx suitable

habitat; 3) patches of advanced regeneration and shade-tolerant understory trees would be retained where feasible, especially in winter forage habitat; and 4) landscape connectivity would be slightly reduced, but overall connectivity would remain high; minor adverse cumulative effects to Canada lynx associated with landscape connectivity and suitable habitat type availability would be anticipated as a result of the Action Alternative.

***GRIZZLY BEAR***

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

**Introduction**

Grizzly bears are opportunistic omnivores that inhabit a variety of habitats in Montana. Preferred grizzly bear habitats include avalanche chutes, fire-mediated shrub fields, and riparian areas, all of which provide seasonal food sources (*Servheen 1983, McLellan and Hovey 2001*). Grizzly bears are federally listed as a threatened species and primary threats are related to human-bear conflicts and long-term habitat loss associated with human development (*Mace and Waller 1997*). Forest management considerations for grizzly bears include minimizing potential for conflicts with humans, minimizing adverse effects to vegetation and cover, minimizing access and the construction of new roads, and reducing disturbance levels during the non-denning season, especially in the spring and fall periods when grizzly bears have important nutritional demands.

**Analysis Areas**

The analysis area for direct and indirect effects is the 1,788-acre project area (FIGURE W-1: ANALYSIS AREAS). The analysis area for cumulative effects is the 34,559-acre large CEAA, which is the Lazy Creek Grizzly Bear Subunit as described in TABLE W-1: ANALYSIS AREAS and depicted in FIGURE W-1: ANALYSIS AREAS. Grizzly bear subunits approximate the home range size of a female grizzly bear in northwest Montana and are considered as appropriate analysis units by the USFWS to evaluate effects on grizzly bears.

**Analysis Methods**

Analysis methods included field evaluations, GIS analysis of SLI data, and aerial photograph interpretation. These methods were used to identify potential visual screening cover and to estimate open and restricted road densities. Visual screening was estimated by evaluating forest stand size class and the total crown density of all trees in the stand using GIS and SLI data. For this analysis, grizzly bear visual screening is defined as vegetation that could hide 90% of a grizzly bear at a distance of 200 feet. Seedlings/sapling stands were included in estimates of visual screening cover if they were >4 feet tall and contained ≥350 trees/acre. On non-DNRC lands the acreage of stands with ≥40% canopy cover provided by trees >9 inches dbh on average was queried to estimate the availability of visual screening cover. Factors considered in the analysis included: 1) the degree of harvesting, 2) the availability of visual screening cover, 3) risk of displacement from important grizzly bear habitat including spring habitat and riparian habitat, 4) availability of secure habitat, and 5) open and restricted road densities.

**Existing Conditions**

The project area occurs in the Lazy Creek Grizzly Bear Subunit of the NCDE Recovery Area (*USFWS 1993*). The project area occurs approximately 4 miles south of an important linkage zone for grizzly bears and other wildlife identified by Servheen et al. (*2003*). See the ***Mature Forest Habitat and Connectivity*** subsection of the Coarse Filter Analysis for additional details. The project area is located below 3,400 feet elevation and does not contain habitat suitable for denning. Approximately 840 acres (46.9% project area)

possess cover in amounts capable of providing visual screening for grizzly bears. Old seed tree harvest units occur throughout the project area and contain low amounts of visual screening, but overall grizzly bears are likely capable of moving throughout the project area considering distance to cover is <600 feet throughout the majority of the project area. Riparian habitat can provide important foraging areas for bears, especially in the spring (*Servheen 1983*) and riparian habitat associated with Class 1 (0.4 miles) and Class 2 streams (1.2 miles) (*ARM 36.11.403(16)(17)*) occurs in the project area. Additionally, a series of wetlands located in the western portion of the project area likely provides important spring foraging habitat. Other important grizzly bear habitats including fire-mediated shrub fields and avalanche chutes are not located in the project area. The density of open roads is 2.7 miles/square mile and total road density is 4.9 miles/square mile.

The large CEAA contains a variety of forested and non-forested habitats, several of which are preferred by grizzly bears (i.e., avalanche chutes, berry fields, riparian areas, etc.). There are 1,340 acres of Stillwater Block Class A lands within the large CEAA (3.9%), which are located adjacent to USFS lands and provide secure areas (> 500 meters from an open road) for grizzly bears. Ownership of the Lazy Creek Subunit is 42% Plum Creek, 42% DNRC, 13% USDA Forest Service, and 3% private. Forest habitat across the large CEAA consists of a combination of age classes, ranging from recently harvested stands to mature stands. Roughly 8.5% of the area (2,934 acres) has been harvested within the last 10 years and consists of young stands of regenerating trees. The large CEAA occurs adjacent to an important linkage zone for grizzly bears and other wildlife identified by Servheen et al. (*2003*). A total of 10,667 acres (30.9% large CEAA) provide visual screening for grizzly bears, of which 6,781 acres are on DNRC-managed lands and 3,886 acres are on other ownerships. The density of roads open to public motorized use year-round within the large CEAA is 1.0 miles/square mile, and the total road density is 4.1 miles/square mile.

**Environmental Effects**

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

None of the proposed forest management activities would occur. No changes to grizzly bear habitat would be expected. Visual screening, 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***

Visual screening would be reduced for 10-20 years on approximately 178 acres (21.2%) of the 840 acres of visual screening available in the project area. Harvesting associated with the Action Alternative would increase sight distances within proposed harvest units. However, retained patches of regenerating conifers, mature forest patches, and topographic breaks, would be designed in a manner that would ensure that no point in any harvest unit would be greater than 600 feet to screening cover. Additionally, up to 100 feet of vegetation or topographic breaks would provide visual screening along open roads adjacent to clearcut or seed tree cutting units to reduce the likelihood of bear detection or indirectly potential bear mortality. Approximately 5 acres of riparian habitat associated with Class 2 streams and 9 acres within an adjacent wetland would be harvested, but vegetation retention measures would apply to maintain minimal sight distances in these areas. Proposed harvesting would temporarily (1 to 3 years)

increase traffic on approximately 3.4 miles of restricted and temporary roads; however, access by the general public would remain restricted along these roads during and after project activities. No additional permanent roads are proposed for construction. If present in the vicinity of the project area, grizzly bears could be displaced from portions of the project area by forest management activities for up to 3 years. Thus, since: 1) 178 acres of trees and shrubs providing visual screening (21.2% of visual screening in the project area) would be removed, but visual screening would be retained such that no point would be greater than 600 feet from cover; 2) temporary motorized disturbance would increase on 3.4 miles of restricted roads; 3) approximately 0.7 miles of temporary road would be constructed, but no permanent road construction would occur; and 4) riparian harvest would occur and bears could be temporarily displaced from these areas, but vegetation retention measures would apply; minor adverse direct or indirect effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the Action Alternative.

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

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the large CEAA could change visual screening and open road density. No additional cumulative effects to visual screening, secure areas, risk of displacement, or road densities are expected to result from the No-Action Alternative. 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 additional cumulative effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the No-Action Alternative.

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

The proposed harvest would affect 178 acres (1.7%) of the 10,667 acres of visual screening available in the large CEAA. Harvesting would increase sight distances within proposed harvest units; however, retained patches of regenerating conifers, mature forest patches, and topographic breaks would be designed in a manner that would ensure that no point in any harvest unit would be greater than 600 feet to screening cover. Additionally, topographic breaks and up to 100 feet of vegetation would be used provide visual screening along open roads adjacent to overstory removal and seed tree with reserves treatment cutting units to reduce the likelihood of bear detection or bear mortality. Approximately 5 acres of riparian habitat associated with Class 2 streams and 9 acres within an adjacent wetland would be harvested, but vegetation retention measures would apply to maintain minimal sight distances in these areas. Proposed harvesting would increase traffic on approximately 4.4 miles of restricted and temporary road for up to 3 years; however, access by the general public would remain restricted on these roads during and after project activities. Approximately 0.7 miles of temporary road would be constructed, but permanent road construction would not occur. Reductions in visual screening and riparian habitat would be additive to ongoing projects (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects), although changes to forest structure that would result from these projects has been updated in SLI data. The Good Long Boyle 2 and other ongoing DNRC timber sales could affect up to 685 acres (2.0%) of the large CEAA, temporarily displacing grizzly bears for up to 3 years. Consistent with the assessment above in the ***Mature Forest and Connectivity*** analysis subsection, given the amount of mature forest cover and patch connectivity that would remain post-harvest, that no increases in human dwellings or other developments would occur, and that no permanent roads would be constructed, the potential for adverse effects to the habitat linkage zone identified by Servheen et al. (*2003*) located adjacent to the large CEAA would be minimal. Thus, since: 1) canopy cover and shrubs providing visual screening would be removed from 178 acres (1.7%) of existing visual screening the large

CEAA, but visual screening would be retained such that no point would be greater than 600 feet from cover; 2) temporary motorized disturbance would increase on 4.4 miles of currently restricted road; 3) 0.7 miles of temporary road would be constructed, but no new road construction would occur; 4) riparian harvest would occur but vegetation retention measures would apply; and 5) the project would occur concurrently with other DNRC timber sales affecting up to 685 acres (2.0%) of the large CEAA; minor adverse cumulative effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the Action Alternative.

## SENSITIVE SPECIES

### *BALD EAGLES*

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

**Introduction**

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

**Analysis Area**

The analysis area for direct and indirect effects is the 1,788-acre project area (TABLE W-6: BALD EAGLES). The analysis area for cumulative effects is the 12,637–acre bald eagle CEAA described in TABLE W-1: ANALYSIS AREAS and depicted in FIGURE W-1: ANALYSIS AREAS. The bald eagle CEAA is located within a 2.5-mile radius of the nest and includes portions of the project area in T32N, R223W, Section 27 that are located outside of the 2.5-mile radius area. This analysis area incorporates areas most likely to be used by the nesting pair and includes the project area.

**Analysis Methods**

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

**Existing Conditions**

The project area is located approximately 0.3 miles from an active bald eagle nest, on Lower Stillwater Lake. The pair has used the same nest since 2007 and has successfully produced chicks in at least 3 out of the last 5 years. Approximately 1,281 acres (67.1% of project area) within the project area are considered bald eagle home range habitat (TABLE W-6: BALD EAGLE). Within the project area, <1 snag/acre ≥21 inches dbh was observed, thus suitable snags available for perching and roosting are limited. No known bald eagle-flight paths occur in the project area.

Bald eagle home range habitat within the bald eagle CEAA is managed primarily Montana DNRC (*TABLE W-6: BALD EAGLE*). The majority of breeding activities are likely to occur in nest site habitat and primary use habitat, which are managed by Montana DNRC and private landowners. Within all bald eagle management zones, Lower Stillwater Lake provides important foraging habitat (*FIGURE W-1: ANALYSIS AREAS*). The nest is located 0.3 miles from Highway 93 and bald eagles may be disturbed by recreational activities on the lake; however, the nest has been successful in at least 3 of the past 5 years and the eagles seem to be tolerant of current levels of disturbance.

***TABLE W-6: BALD EAGLE.*** *Land ownership acres (percent of total area in parentheses) within bald eagle management zones. Acreages exclude Lower Stillwater Lake.*

| OWNERSHIP | BALD EAGLE BREEDING MANAGEMENT ZONES | | |
|---|---|---|---|
| | NEST SITE AREA | PRIMARY USE AREA | HOME RANGE |
| Montana DNRC | 25 (19.6%) | 245 (65.0%) | 7,464 (59.4%) |
| Montana FWP | 2 (1.5%) | 2 (0.5%) | 2 (0.0%) |
| Plum Creek | 0 (0.0%) | 0 (0.0%) | 2,066 (16.4%) |
| Private | 2 (1.3%) | 46 (12.2%) | 971 (7.7%) |
| USFS | 0 (0.0%) | 0 (0.0%) | 1,812 (14.4%) |
| ***Total*** | ***28*** | ***293*** | ***12,316*** |

**Environmental Effects**

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

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

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

The proposed timber harvest would affect 355 acres of bald eagle habitat within the home range of the pair (20.7% of bald eagle habitat in the project area). The seed tree with reserves and overstory removal treatments proposed for these acres would retain <10% canopy cover and favor retention of western larch, Douglas-fir, and western white pine. Across the project area, at least 2 large snags and 2 large

recruitment trees per acre (>21 inches dbh or the next largest size class) would be retained (*ARM 36.11.411*). The proposed units are located approximately 0.6 miles from the eagle nest with Highway 93 and a railroad located between the nest and the proposed units. Considering the distance between the proposed units and the nest as well as existing levels of development and disturbance, adverse effects to eagles would likely be minimal. Truck traffic associated with the timber harvest would elevate traffic levels on approximately 8.7 miles of roads located within the bald eagle home range area and 0.7 miles of temporary road would be constructed, but no permanent open or restricted roads are proposed for construction. The proposed activities would occur in the project area for up to 3 years. Thus, since: 1) no harvest would occur within the most sensitive management zones (i.e., nest site or primary use areas); 2) the proposed activities would affect 355 acres (20.7%) of bald eagle habitat located on DNRC-managed lands within the project area; 3) the proposed activities would not affect known bald eagle flight paths; 4) some large trees or snags would be removed within bald eagle home range habitat, but retention measures would apply (*ARM 36.11.411*); and 5) disturbance levels would increase for 3 years due to harvesting and increased logging traffic; minor direct and indirect effects to bald eagle eagles associated with nesting habitat quality or disturbance risk would be anticipated as a result of the Action Alternative.

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

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the bald eagle CEAA could change bald eagle habitat characteristics and disturbance levels. Thus, since: 1) no change in bald eagle habitat characteristics would occur, and 2) no increased disturbance levels within the bald eagle CEAA would occur, no cumulative effects to bald eagle eagles associated with nesting habitat quality or disturbance risk would be anticipated as a result of the No-Action Alternative.

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

The proposed timber harvest would remove some important bald eagle habitat attributes (i.e., large snags, large emergent trees) on 355 acres within bald eagle home range habitat (2.9% of bald eagle home range habitat). These proposed activities would occur outside of the sensitive nest site and primary use area management zones located within 0.5 miles of the nest. Considering that the proposed units are located 0.6 miles from the nest, adverse effects to eagles are expected to be minimal. Disturbance levels would increase during harvest due to increased traffic levels on approximately 9.6 miles of roads. The proposed harvest would be additive to proposed or ongoing DNRC projects (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects) and may occur concurrently with the Highway 93 Corridor and Lupfer 3 Timber Sales. Thus, since: 1) no harvest would occur within the most sensitive management zones (i.e., nest site or primary use areas); 2) the proposed activities would affect 355 acres (2.9%) of bald eagle home range habitat; 3) the proposed activities would not affect known bald eagle flight paths; 4) some large trees or snags may be removed within bald eagle home range habitat, but retention measures would apply (*ARM 36.11.411*); and 5) disturbance levels would increase for up to 3 years due to increased logging traffic from the Good Long Boyle 2, Highway 93 Corridor and Lupfer 3 Timber Sales; minor cumulative effects to bald eagle eagles associated with nesting habitat quality or disturbance risk would be anticipated as a result of the Action Alternative.

***FISHERS***

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

**Introduction**

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

**Analysis Areas**

The analysis area for direct and indirect effects is the 1,788-acre project area (FIGURE W-1: ANALYSIS AREAS). The analysis area for cumulative effects is the 34,559-acre large CEAA described in TABLE W-1: ANALYSIS AREAS and depicted in FIGURE W-1: ANALYSIS AREAS. The CEAA is defined according to geographic features (i.e., ridgelines), which are likely to influence movements of fishers in the vicinity of the project area, providing a reasonable analysis area for fishers that could be influenced by project-related activities.

**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. Fisher habitat classifications considered in the analysis include: 1) upland fisher habitat, and 2) riparian fisher habitat, which are defined according to proximity of the stand to streams. Riparian fisher habitat is located within 100 feet of Class 1 streams or within 50 feet of Class 2 streams (*ARM 36.11.440(b)*). The remaining fisher habitat is considered upland fisher habitat. Habitat structure considered appropriate for fisher use includes stands with 40-100% total stocking density. Potential fisher habitat (riparian, upland) on other ownerships was identified by examining mature forested habitat below 6,000 feet elevation and the proximity of mature forested habitat (≥40% cover, trees >9 inches dbh average) to perennial and intermittent streams. Factors considered in the analysis include: 1) the degree of harvesting, 2) availability and structure of preferred fisher habitats (upland, riparian), 3) landscape connectivity, and 4) human access.

**Existing Conditions**

Approximately 1,204 acres (79.8%) of suitable fisher habitat occurs in the project area. Approximately 17 acres of riparian suitable fisher habitat associated with Class 1 and 2 streams occur in the project area and 91.3% of potential fisher riparian habitat (suitable cover types) in the project area contains vegetation structure necessary for fisher use. Mature forested habitat present on 52.1% of the project area is fairly continuous and thus connectivity within the project area is moderate. The density of open roads is 2.7 miles/square mile and total road density is 4.9 miles/square mile, thus there is a moderate-to-high level of access that could facilitate trapping.

The large CEAA contains approximately 10,784 acres of fisher habitat (31.2% of large CEAA), including 7,328 acres of suitable fisher habitat on DNRC-managed lands and an additional 3,456 acres of mature forested habitat on other ownerships located below 6,000 feet elevation. Of these acres of potential fisher habitat, approximately 1,279 acres are riparian fisher habitat including 661 acres of riparian fisher habitat on DNRC-managed lands and 618 acres of fisher riparian habitat on other ownerships. Approximately 94.9% of potential fisher riparian habitat (suitable cover types) on DNRC-managed lands in the large CEAA contains vegetation structure necessary for fisher use. The remaining 23,775 acres in the large CEAA consist primarily of larch and Douglas-fir stands that are not an appropriate cover type for fisher

habitat, or are poorly stocked stands that are unsuitable for fisher use. In the vicinity of the project area, fisher habitat is fragmented due to the history of timber harvest on private lands, thus connectivity of suitable habitat is low in the large CEAA. The density of open roads within the large CEAA is 1.0 miles/square mile, and the total road density is 4.1 miles/square mile, thus there is a moderate level of access at this scale that could facilitate trapping.

**Environmental Effects**

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

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

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

The proposed activities would affect 218 acres (18.1%) of the 1,204 acres of suitable fisher habitat present in the project area. The overstory removal and seed tree with reserve treatments proposed for these acres would reduce mature canopy cover to <10%, causing these areas to become unsuitable for fisher use post-harvest. The availability of some important habitat characteristics (i.e., snags, coarse woody debris) could be reduced by harvest activities; although retention of dead-woody material and live snag recruitment trees would meet DNRC Forest Management Rules (*ARM 36.11.411, ARM 26.11.414*). Five acres of riparian fisher habitat would be harvested, but moderate stocking density would be retained and these areas would remain classified as suitable fisher habitat post-harvest. Approximately 0.7 miles of temporary road would be constructed, but no permanent roads are planned for construction; thus trapping risk associated with human access would not increase. Connectivity of mature forested habitat suitable for fisher use would be expected to decrease under the Action Alternative, although travel corridors associated with riparian habitat would remain intact. If present in the vicinity of the project area, fishers could be temporarily displaced by forest management activities for up 3 years. Thus, since: 1) fisher habitat availability would be reduced by 218 acres (18.1%), but some snags and coarse woody debris would be retained (*ARM 36.11.411, ARM 26.11.414);* 2) landscape connectivity would be reduced, but riparian travel corridors would remain intact; and 3) no permanent open or restricted road construction would occur; minor adverse direct and indirect effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the Action Alternative.

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

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the large CEAA may influence fisher habitat availability, habitat structure, and landscape connectivity. Thus, since: 1) no change in the amount or structure of preferred fisher habitats would occur, 2) no change in landscape connectivity would occur, and 3) no changes to human access would occur that would facilitate trapping; no additional cumulative effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the No-Action Alternative.

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

The proposed activities would affect 218 acres (2.0%) of the 10,784 acres of potential fisher habitat available in the large CEAA. These acres would not retain vegetation structure necessary for fisher use

post-harvest. The availability of some important habitat characteristics (i.e., snags, coarse woody debris) could be reduced by harvest activities, although retention of some dead material and live snag recruitment trees would be required to meet DNRC Forest Management Rules (*ARM 36.11.411, ARM 26.11.414*). Connectivity of fisher habitats would be reduced, but riparian travel corridors would retain adequate sawtimber stocking density post-harvest for fisher use. Adverse affects to fisher would be additive to recent and ongoing DNRC sales in the large CEAA (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The Good Long Boyle 2 and other ongoing DNRC timber sales could affect up to 685 acres (2.0%) of the large CEAA, temporarily displacing fishers for up to 3 years. Thus, since: 1) fisher habitat availability would decrease by 218 acres (2.0%) following implementation of the Good Long Boyle 2 Timber Sale; 2) proposed and ongoing DNRC timber sales would affect up to 685 acres (2.0%) of the large CEAA, but snags and coarse woody debris would be retained (*ARM 36.11.411, ARM 26.11.414);* 2) landscape connectivity would be reduced, but riparian travel corridors would remain intact; and 3) no open or restricted road construction would occur; minor adverse cumulative effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the Action Alternative.

***PILEATED WOODPECKER***

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

**Introduction**

Pileated woodpeckers require mature forest stands with large dead or defective trees for nesting and foraging. The density of pileated woodpeckers is positively correlated with the amount of dead and/or dying wood in a stand (*McClelland 1979*) and the diet of pileated woodpeckers consists primarily of carpenter ants, which inhabit large downed logs, stumps, and snags. Cavities created by pileated woodpeckers are ecologically important and are often used in subsequent years by a variety of wildlife species for nesting and roosting. Pileated woodpeckers prefer to nest in ≥20 inch dbh western larch, ponderosa pine, cottonwood, or quaking aspen. Forest management considerations for pileated woodpeckers include retaining dense patches of old and mature coniferous forest with abundant large snags and coarse-woody debris.

**Analysis Areas**

The analysis area for direct and indirect effects is the 1,788-acre project area (FIGURE W-1: ANALYSIS AREAS). The analysis area for cumulative effects is the 7,654-acre medium CEAA described in TABLE W-1: ANALYSIS AREAS and depicted in FIGURE W-1: ANALYSIS AREAS. The medium CEAA is centered on the project area and defined according to geographic features (i.e., ridgelines) and provides a reasonable analysis area for pileated woodpeckers that could be influenced by project-related activities. This scale provides a sufficient area to support multiple pairs of pileated woodpeckers (*Bull and Jackson 1995*).

**Analysis Methods**

Analysis methods include field evaluation, aerial photograph interpretation, and GIS analysis of available habitats. SLI data were used to identify preferred pileated woodpecker habitat (*ARM 36.11.403(58)*). To assess potential pileated woodpecker habitat on DNRC-managed lands, sawtimber stands ≥100 years old within preferred pileated cover types (*ARM 36.11.403(58)*) with ≥40% or greater canopy closure were considered potential pileated woodpecker habitat. On non-DNRC lands, the stands considered potential suitable habitat for pileated woodpeckers were mature forest stands (≥40% canopy cover, >9 inches dbh

average) below 6,000 feet elevation. Factors considered in the analysis include: 1) the degree of harvesting and 2) the structure of pileated woodpecker preferred habitat types.

**Existing Conditions**

The project area contains 733 acres (41.0% of project area) of suitable pileated woodpecker habitat. This habitat is composed primarily of mixed conifer, western larch, and Douglas-fir stands located throughout the project area. The remaining acres in the project area consist of 768 acres (42.9% project area) of stands with low stocking of mature trees, as well as stands that are not suitable forest types and non-forested areas composed primarily of wetlands. During field visits, pileated woodpeckers were heard calling and recent foraging on snags was observed throughout the project area. Snag availability in the project is low at 3.3 snags snags/acre ≥8 inches dbh and coarse woody debris moderate at 11.7 tons/acre (see ***SNAGS AND COARSE WOODY DEBRIS*** in the Coarse Filter Analysis section for additional information). These attributes likely facilitate pileated woodpecker use of habitat in the project area, although suitable nest trees may be limited.

The medium CEAA contains 1,866 acres (24.4% of medium CEAA) of potential pileated woodpecker habitat, which includes 1,413 acres of DNRC-managed pileated woodpecker habitats and 453 acres of mature forested habitat (<6,000 feet elevation) on other ownerships. Open road density in the medium CEAA is low (1.6 miles/square mile) and provides limited accessibility for firewood cutting. The majority of the medium CEAA that is not managed by DNRC is managed by Plum Creek Timber Company (42.3% of medium CEAA) and due to the history of timber harvest in this area snags are likely limited. Considering open road density and land ownership patterns, snags and coarse-woody debris are likely limited in the eastern portion of the analysis area.

**Environmental Effects**

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

Timber harvest would not occur in DNRC-managed pileated woodpecker habitats that occur in the project area. Thus, since no change in the structure of pileated woodpecker habitat would occur, no direct or indirect effects to pileated woodpecker habitat suitability would be anticipated as a result of the No-Action Alternative.

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

The proposed activities would occur in 181 acres (24.7%) of the 733 acres of pileated woodpecker habitat available in the project area. The proposed harvest would open stands to <10% canopy cover in these stands; thus, the vegetation structure would become unsuitable for appreciable use by pileated woodpeckers. Snags would be removed by the proposed harvest, but at least 2 large snags and 2 large snag recruitment trees per acre (>21 inches dbh or the next largest size class) would be retained (*ARM 36.11.411*). Disturbance associated with harvesting could adversely affect pileated woodpeckers on portions of the project area for up to 3 years, should they be present in the project area. Thus, since: 1) forest structural changes would occur, but mitigation would include retention of snags and coarse woody debris (*ARM 36.11.411, ARM 36.11.414*); and 2) harvesting would reduce pileated woodpecker suitable habitat availability by 181 acres (24.7%) within the project area; minor adverse direct and indirect effects to pileated woodpecker habitat suitability in the project area would be anticipated as a result of the Action Alternative.

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

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the medium CEAA could change pileated woodpecker habitat availability.

Thus, since no change in the structure of pileated woodpecker habitat would occur, no additional cumulative effects to pileated woodpecker habitat suitability would be anticipated as a result of the No-Action Alternative.

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

The proposed activities would occur in 181 acres (9.7%) of the 1,866 acres of potential pileated woodpecker habitat in the medium CEAA. The proposed activities would open stands to <10% canopy cover, causing habitat structure to become unsuitable for pileated woodpecker use. Snags would be removed by the proposed harvest, but at least 2 large snags and 2 large snag recruitment trees per acre (>21 inches dbh or the next largest size class) would be retained (*ARM 36.11.411*). Changes in pileated woodpecker habitat suitability would be additive to recent and ongoing timber sales in the medium CEAA (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The anticipated effects of these sales on pileated woodpecker habitat have been accounted for in SLI data. Disturbance associated with the Good Long Boyle 2 Timber Sale could adversely affect pileated woodpeckers for up to 3 years, in addition to any displacement that may result from the ongoing Highway 93 Corridor and Lupfer 3 Timber Sales. These timber sales could affect up to 955 acres (9.0%) of the medium CEAA. Ongoing and proposed DNRC timber sales are anticipated to affect approximately 633 acres within the medium CEAA (8.3% of the medium CEAA). Thus, since: 1) structural changes would occur, but mitigation would include retention of snags and coarse woody debris; and 2) harvesting would reduce pileated woodpecker suitable habitat availability by 181 acres (9.7%) within the medium CEAA; minor adverse cumulative effects to pileated woodpecker habitat suitability would be anticipated as a result of the Action Alternative.

***FIGURE W-1: ANALYSIS AREAS**. Wildlife analysis areas for the proposed Good Long Boyle 2 Timber Sale.*

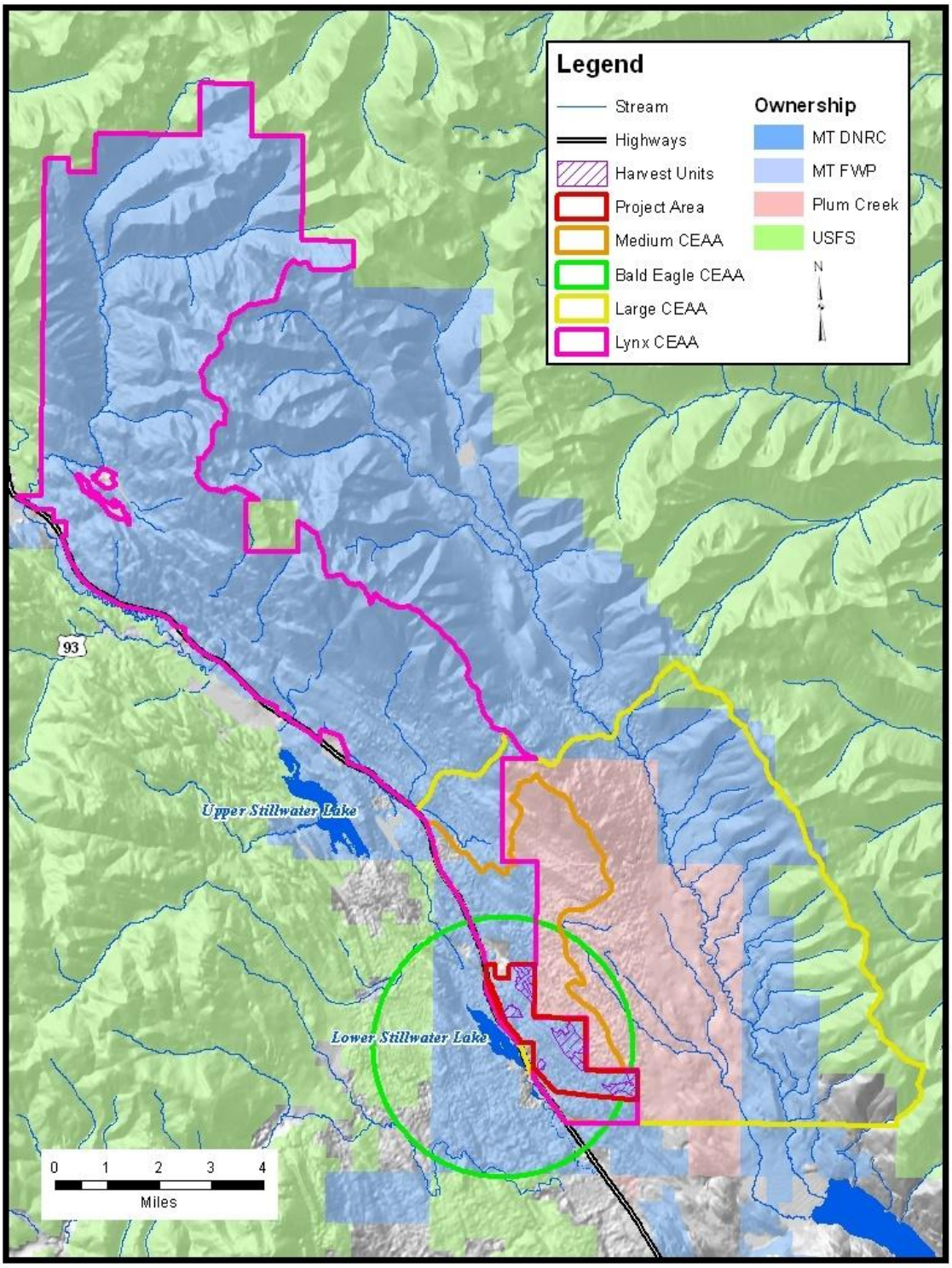
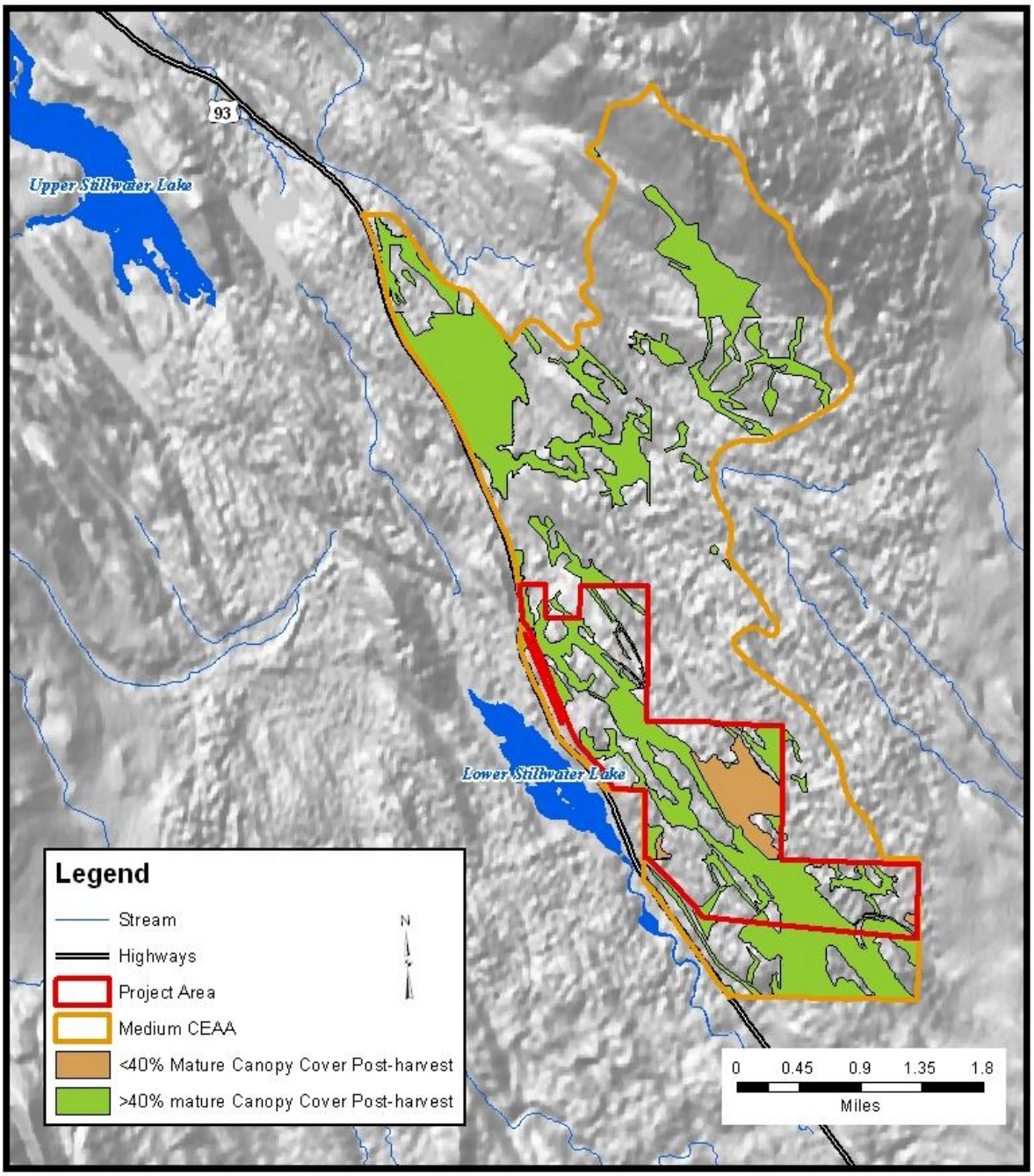


***FIGURE W-2: MATURE FOREST**. Mature forested habitat pre- and post-harvest in the project area and medium CEAA. Brown stands are currently classified as mature forested habitat, but would not be considered mature forested habitat post-harvest due to low stocking density.*



Attachment VI:

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Attachment VII:

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Attachment VIII:

# GLOSSARY

**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.

**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.

**Co-dominant tree:** A tree that extends its crown into the canopy, receiving direct sunlight from above and limited sunlight on its sides. One or more sides are crowded by the crowns of other trees.

**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*.

**Covertype:** 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.

**Cull:** A tree of such poor quality that it has no merchantable value in terms of the product being cut.

**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.

**Homogeneous:** Of uniform structure or composition throughout.

**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.

**Live Crown Ratio:** The percentage of the length of tree having live limbs divided by the tree's height.

**Meter:** A measurement equaling 39.37 inches.

**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).*

**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.

**Phloem:** The living tissue of the tree.

**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. Restriction s 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 that 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 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.

# Acronyms

ARM .....*Administrative Rules of Montana*

BMP .....*Best Management Practices*

BMU .....*Bear Management Unit*

CEAA .....*Cumulative Effects Analysis Area*

CMP.....*corrugated metal pipe*

CWD.....*Coarse Woody Debris*

DBH.....*diameter at breast height*

DEQ.....*Department of Environmental Quality*

DFWP .....*Montana Department of Fish, Wildlife, and Parks*

DNRC.....*Department of Natural Resources and Conservation*

EA .....*Environmental Assessment*

ECA .....*Equivalent Clearcut Acres*

EIS.....*Environmental Impact Statement*

FIA .....*Forest Inventory and Analysis group*

FI.....*Forest Improvement*

FNF .....*Flathead National Forest*

FRTA .....*Federal Roads and Trails Act*

FOGI .....*Full Old-Growth Index*

GBS……*Grizzly Bear Subunit*

GIS .....*Geographic Information System*

HCP .....*Habitat Conservation Plan*

ID Team....*Interdisciplinary Team*

MCA .....*Montana Codes Annotated*

MEPA.....*Montana Environmental Policy Act*

Mbf..... *Thousand Board Feet*

MMbf .....*Million Board Feet*

MNHP.....*Montana Natural Heritage Program*

NCDE.....*Northern Continental Divide Ecosystem*

NWLO.....*Northwestern Land Office*

RL.....*Random Lengths*

RMZ .....*Riparian Management Zone*

SFLMP.....*State Forest Land Management Plan*

SLI .....*Stand Level Inventory*

SMZ.....*Streamside Management Zone*

STW.....*Stillwater Unit*

TLMD.....*Trust Land Management Division*

TMDL.....*Total Maximum Daily Load*

USFS.....*United States Forest Service*

USFWS.....*United States Fish and Wildlife Service*

WFP.....*Washington Forest Practices Board*

WMZ.....*Wetland Management Zone*

WYI .....*Water Yield Increases*

124 Permit…*Stream Protection Act Permit*

318 Authorization .*A Short-Term Exemption from Montana's Surface Water Quality and Standards*

# GOOD LONG BOYLE 2 TIMBER SALE –
# Checklist Environmental Assessment

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