

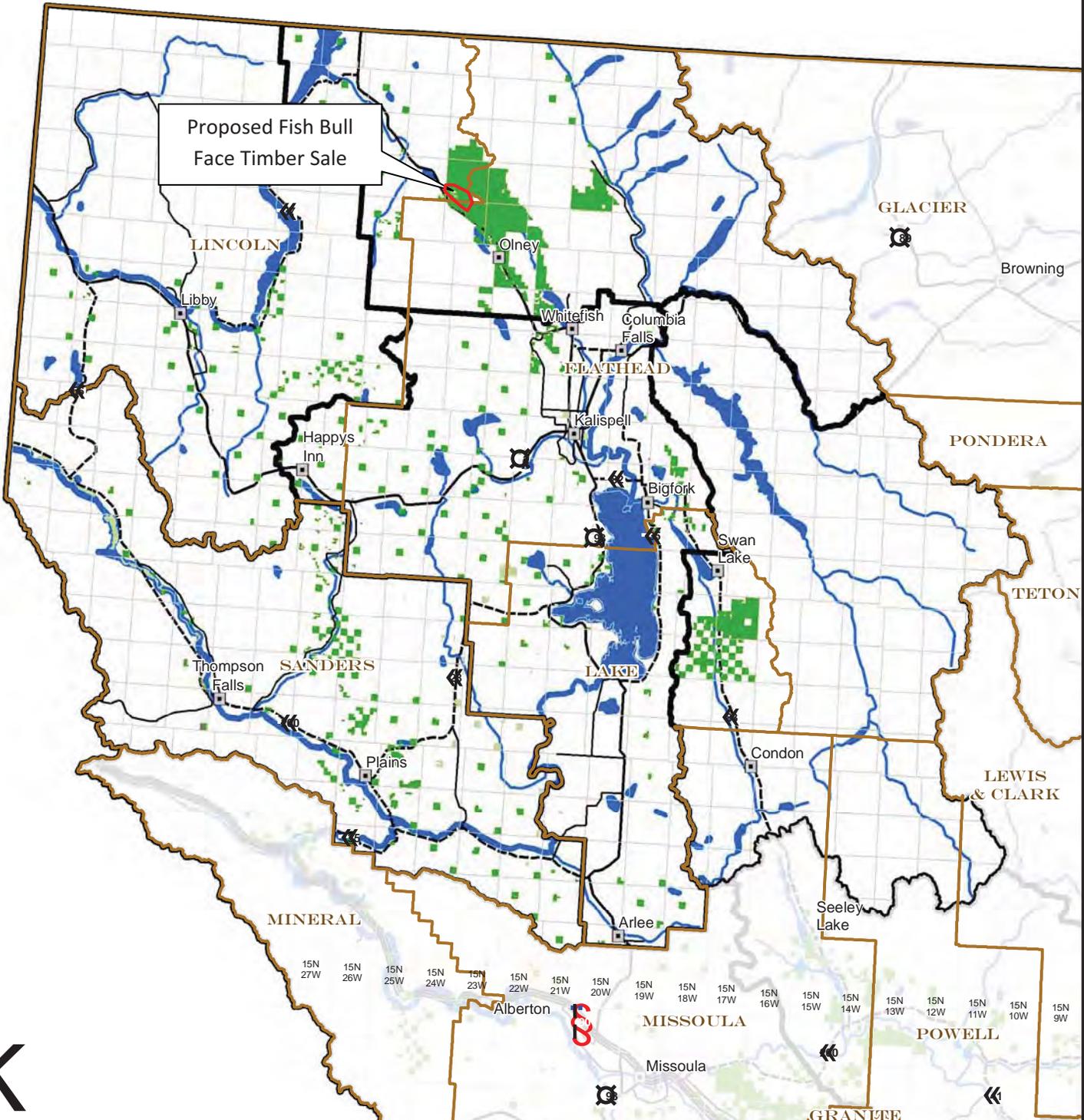
# ***Fish Bull Face Timber Sale***

DRAFT Checklist Environmental Assessment— March 2012

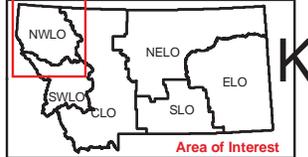


Department of Natural Resources and Conservation  
Northwest Land Office— Stillwater Unit

**Fish Bull Face Timber Sale Vicinity Map**  
 Sections 19, 20, 29, 30, 32, 33 & 34 of T34N R24W  
 and Sections 3 & 4 of T33N, R24W  
 Lincoln County and Flathead County



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



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## CHECKLIST ENVIRONMENTAL ASSESSMENT

|                                     |                                                                                                                                 |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Project Name:</b>                | <b>Fish Bull Face Timber Sale</b>                                                                                               |
| <b>Proposed Implementation Date</b> | Summer 2012                                                                                                                     |
| <b>Proponent:</b>                   | Montana Department of Natural Resources (DNRC), Northwestern Land Office, Stillwater Unit                                       |
| <b>Location:</b>                    | Sections 19, 20,29, 30, 32, 33 & 34 of Township 34 north, Range 24 west; and Sections 3 & 4 of Township 33 north, Range 24 west |
| <b>County:</b>                      | Lincoln                                                                                                                         |

### I. TYPE AND PURPOSE OF ACTION

Montana Department of Natural Resources and Conservation (DNRC), Stillwater Unit, proposes to harvest approximately 1.5 to 2 million board feet of timber from the Stillwater State Forest (see *Vicinity Map*). The proposed activities would regenerate new stands of healthy trees while improving the vigor and growth of trees remaining in the forest for the purpose of benefiting future trust actions. The proposed project would reduce the amount of forest fuels and density of trees to mitigate potential effects of wildland fire. Roads would be brought up to Montana's Best Management Practice (BMP) standards; this includes relocating the existing Fish Lake Road away from the lakeshore. Currently Fish Lake Road travels along the lakeshore in places and several portions of this road would be reclaimed into a foot trail. This project would produce an estimated \$35,500 in revenue for the Common Schools Trust.

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

This project was developed in compliance with the State Forest Land Management Plan (SFLMP), the Administrative Rules for Forest Management (Forest Management Rules; ARM 36.11.401 through 471), and conservation commitments contained in the Selected Alternative in the Final EIS of 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 September 2011, DNRC solicited public participation on the Fish Bull Face Timber Sale Project. Scoping notices were advertised in the Daily InterLake (Kalispell), Tobacco Valley News (Eureka), and at the Olney and Trego post offices. 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 three letters and two emails.

In October 2011, the Interdisciplinary (ID) Team began to compile issues based on the comments received and to gather information related to current conditions. From the public scoping the following comments and/or concerns were presented:

|                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>The proposal would help maintain forest health, forest diversity, as well as resource-based industries and economies.</i></p>                                                     | <p>Please see analyses related to vegetation (Section III.7), industry (Section IV.15), employment (Section IV.16), and economics (Section IV.24) for more details on how this project might affect forest health, forest diversity and resource-based industries and economies.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p><i>Revenue generated from the project will reduce pressures on the taxpayers as well as establish healthy forests by removing hazardous fuels.</i></p>                               | <p>Please see analyses related to local and state tax base (Section IV.17), revenues (Section IV.24), and vegetation (Section III.7) for more details on how this project might affect pressures on taxpayers and hazardous fuels within the forest.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><i>The proposed improvements to the road system were also recognized as being beneficial to protect riparian areas, improve recreational access, and implement weed control.</i></p> | <p>Please see analyses related to vegetation (Section III.7), soils (Section III.4), hydrology (Section III.6), and recreation (Section IV.20) for more details on how the road system with this project might affect riparian areas, recreational access, and weeds.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p><i>The utilization of biomass is encouraged.</i></p>                                                                                                                                 | <p>This area contains a very high level of small diameter trees which do not meet the specifications for sawlogs. This material and landing piles of biomass would be made available to the Purchaser of the timber sale.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p><i>If any new or additional cultural resource information arises during the course of the project, this group would like to be kept informed.</i></p>                                | <p>DNRC will notify the commenter if additional resource information is found and, as noted in Section III.10 of this document, 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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p><i>There should be a 30-day public comment period of a draft environmental assessment.</i></p>                                                                                       | <p>DNRC will have a 30-day public comment period on this Checklist EA.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p><i>DNRC should develop an Old-growth retention cycle.</i></p>                                                                                                                        | <p>There are no stands meeting DNRC old-growth definition within the project area. This comment is also outside of the scope of this project. In general, DNRC manages old growth on a project by project basis according the rules described in <i>ARM 36.11.418</i>. During the course of project development, DNRC evaluates a number of factors affecting old-growth stands in order to determine the necessity for and priority of treatment. These factors include, but are not limited to, stand cover type, location and size; habitat connectivity; forest health factors; stand density and vigor; wildlife use; soils; etc. DNRC's Sustainable Yield Calculation (<i>DNRC 2004</i>) indicates that at current harvesting rates, old-growth stands would be present on at least 8 percent of state lands into the foreseeable future. This indicates that current management would provide for the retention and recruitment of old-growth stands in the future. No additional planning efforts outside of what has been stipulated in state law or Administrative Rules for Forest Management have been undertaken or are planned at this time.</p> |
| <p><i>An effective weed plan to maintain biodiverse forests.</i></p>                                                                                                                    | <p>Section III.7 of this document addresses the general weed management plan for this project</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>What is the Stillwater Unit's road budget for maintenance?</i></p>                                                                                                                                                     | <p>While this comment is outside of the scope of this project, the majority of the road maintenance performed on the Stillwater Unit is from sold timber sales. DNRC also uses funds from the Forest Improvement budget for road maintenance; this budget prioritizes road maintenance projects based upon available funds and emergencies.</p>                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p><i>DNRC is removing biodiversity from its forests by removing western red cedar.</i></p>                                                                                                                                  | <p>The Forest Management Rules (ARM 36.11.404 through 36.11.419) describe the coarse filter approach to analyzing biodiversity of school trust lands. The coarse filter approach is addressed by favoring the appropriate mix of stands structures and compositions on state lands; this is reflected primarily by cover type and age class analyses. A fine filter approach is also employed so as to manage for a desired future condition (DFC) that promotes a diversity of habitat conditions beneficial to wildlife. Western red cedar grows in warmer, moist sites and is a component of all stands in western red cedar and hemlock habitat types; all age classes of this habitat type are represented and will continue to persist on the Stillwater Unit.</p> |
| <p><i>DNRC has a heavy management strategy with long term effects to soils, weeds, unnatural forest conditions, reduced carrying capacity for wildlife, reduced water quality, harmed fisheries, and too many roads.</i></p> | <p>Please refer to:<br/> -III.4 for information on soils,<br/> -III.7 for information on weeds and cover types,<br/> -III.8, III.9 and Attachment IV - WILDLIFE ANALYSIS for effects to wildlife,<br/> -III.5 and Attachment V - WATER RESOURCES for information on water quality,<br/> -III.8 and Attachment V – WATER RESOURCES for information on fisheries, and<br/> -Attachment IV -- WILDLIFE ANALYSIS and Attachment V -- WATER RESOURCES for information on roads.</p>                                                                                                                                                                                                                                                                                           |
| <p><i>DNRC has a forest that is not sustainable.</i></p>                                                                                                                                                                     | <p>This comment is beyond the scope of this project. It pertains to the sustainable yield calculation which is a complex statewide project. The sustainable yield calculation for the Stillwater Unit and for all of DNRC's forest land is based on the best available forest inventory data, modeling current and future growth, the ability of the forest land to grow trees (site index), current board foot volume, manageable forest acres, logging systems, forest management rules, forest management policy, and expected levels of forest management activities. DNRC is required to calculate the annual sustainable yield for forested trust lands at least every 10 years (MCA 77-5-223) and it was last calculated for the HCP/EIS in September 2010.</p>   |

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

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

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

### **Montana Department of Environmental Quality (DEQ)**

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

A Short-term Exemption From Montana's Surface Water Quality Standards (318 Authorization) may also be required from DEQ if activities such as removing a native log-sill crossing on a stream would introduce sediment above natural levels into streams, and if Montana Department of Fish, Wildlife and Parks (DFWP) recommends it.

### **Montana/Idaho Airshed Group**

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

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

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

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

In December 2011, the U.S. Fish and Wildlife Service issued an Incidental Take Permit under Section 10 of the Endangered Species Act. The Permit applies to select forest management activities affecting the habitat of grizzly bear, Canada lynx, and three fish species — bull trout, westslope cutthroat trout, and Columbia redband trout — on project area lands covered under the HCP. DNRC and the USFWS will coordinate monitoring of certain aspects of the conservation commitments to ensure program compliance with the HCP.

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## **3. ALTERNATIVE DEVELOPMENT:**

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

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

### **Alternatives Considered**

- ***No-Action Alternative***

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

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

- **Action Alternative**

The Action Alternative was designed to meet (1) the current Forest Management Rules that govern the forest management program; and, (2) all applicable conservation commitments contained in the Selected Alternative in the Final EIS/HCP and associated Record of Decision. The HCP identifies specific mitigation requirements for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout, and Columbia redband trout. Development of the Action Alternative is based on analyses of current forest and resource conditions within the project area and cumulative effects areas. The following are the main issues related to forest and resource conditions:

- The area is within the Stillwater Subunit of the Northern Continental Divide Ecosystem Grizzly Bear Recovery Area and within critical lynx habitat.
- The existing Fish Lake Road does not have proper drainage and cannot be maintained in its current condition or location; therefore sediment is reaching Fish Lake.
- Several native log-sill culverts are beginning to fail as stream crossing structures.
- Current cover type has departed from historic conditions.
- Approximately 50% of the project area has very dense pole-sized trees that regenerated following the 1926 fire. Some areas average 3,000 trees per acre and this tree density has reduced the growth potential of trees on these sites; a fully stocked timber stand of this age and size class would typically have between 250 to 400 trees per acre.

As a result, an Action Alternative and mitigation measures were developed which, if implemented, would:

- Limit operations within Section 19 to less than 30 operating days or schedule operations only during the grizzly bear denning period.
- Relocate Fish Lake Road away from Fish Lake and accommodate vehicle access to the lake with several short spur roads.
- Reclaim portions of the existing Fish Lake Road to provide for foot traffic.
- Reduce tree densities and reduce the hazardous forest fuel levels within proposed harvest areas.
- Continue to provide hiding cover, nesting sites, and important habitat components for wildlife.
- Improve timber stand health and strive to meet the desired forest conditions in regard to tree species occupying the project area.
- Remove deteriorating log-sill culvert crossings and upgrade the roads to meet BMPs.

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

### **Details**

Under this alternative, the silvicultural and harvest treatments would:

- harvest approximately 1.5 to 2 million board feet of timber from approximately 505 acres;
- regenerate new stands of healthy trees on approximately 207 acres through seed tree with reserves treatments, site scarification, and natural regeneration; and
- improve the vigor and growth on 297 acres through intermediate treatments such as commercial thins, improvement cuts, and overstory removal harvest treatments.

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

The road work associated with this project would:

- Construct approximately 1.8 miles of new system road;
- Construct approximately 2.1 miles of new temporary road which would be covered with slash and debris following use, thereby keeping the area free of future motorized use;
- Reclaim approximately 1.7 miles of road and create a foot trail on part of the existing road;

- Reconstruct approximately 3.5 miles of existing road; and
- Perform road maintenance and BMP improvements on approximately 5.9 miles of road.

### III. IMPACTS ON THE PHYSICAL ENVIRONMENT

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

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

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

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

- *Ground based harvest techniques can displace and compact soils which can adversely affect the hydrologic function, soil structure and long-term productivity of the impacted area.*
- *Removal of both coarse and fine woody material off-site during timber harvest operations can reduce nutrient pools required for future forest stands and can affect the long-term productivity of the site.*

This analysis will qualitatively assess the risk of negative effects to soils from erosion, compaction, and displacement from each alternative.

#### **EXISTING CONDITIONS**

The analysis area, which is where timber harvesting and road construction/reconstruction are proposed, contains 4 landtypes (26C-8, 321, 353, and 55).

Past harvesting operations in the project area and analysis area include harvests in the 1920's through the 1980's, although the majority of harvesting occurred in the 1920's and 1950's. A list of harvesting in the project area can be found in the project file. Cumulative effects from past and current forest management in the proposed harvest units are as a result of skid trails and landings. Average impacts due to displacement, erosion, or severe compaction from similar landtypes on past DNRC harvests shows an average of 11.1% of the area was impacted (DNRC 2011). Impacts from past harvests on the same areas that are proposed for harvesting in this Checklist EA are estimated to be between 5 to 7 percent. These skid trails do not appear to be eroding more than the surrounding un-trailed areas, but reduced tree densities and vigor is present on these areas. The average amount of coarse woody debris found within proposed harvest areas is 5.8 tons per acre while the recommended levels range from 7 to 24 tons per acre (*Graham et al, 1994*).

#### **ENVIRONMENTAL EFFECTS**

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

Since no additional activities would occur under this alternative, skid trails from past harvesting would continue to recover from compaction. Coarse woody debris would gradually increase over time. No additional cumulative effects would occur.

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

As BMPs and mitigations are applied (see *Attachment VI - Stipulations and Specifications*), the extent of expected impacts would be similar to those reported in the DNRC Soil Monitoring Report (*DNRC, 2005*) or approximately 11.1 percent of the harvested units. Road construction would remove approximately 10.3 acres from production. Erosion would potentially result from implementation of the project, but the magnitude and

area would remain low and duration of erosion would be short. Due to BMP implementation, the risk of unacceptable adverse impacts to physical soil properties would be low. Because coarse woody debris would be left on site in amounts recommended by Graham (1994) and fine debris would be maintained as much as practicable, the risk of measureable adverse impacts to nutrient cycling would be low. Cumulatively, by designing the proposed harvesting operations with soil-moisture and season of use restrictions, and utilizing the correct method of harvesting, the risk of unacceptable long-term impacts to soil productivity from compaction, displacement and nutrient pool losses would be low.

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

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## **5. WATER QUALITY, QUANTITY AND DISTRIBUTION:**

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

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

- *Timber harvesting and road construction has the potential to increase water yield, which in turn may affect erosive power, sediment production and stream channel stability.*
- *Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.*
- *Timber-harvesting activities may affect water quality and fisheries habitat by:*
  - *reducing shade and recruitable woody debris in the Riparian Management Zone (RMZ)*
  - *increasing stream temperatures, and*
  - *affecting habitat connectivity at road crossings.*

### **Existing Conditions**

Designated beneficial water uses within the project area include cold-water fisheries, aquatic life support, and recreational use in the streams, wetlands, and lakes in the surrounding area. Water rights for surface water exist within three miles downstream of the project area in the Stillwater River watershed for domestic use, fish and wildlife propagation and lawn/garden use.

There are 3 watersheds analyzed for in this project area:

- **Fish Lake, Bull Lake and tributaries** – two perennial streams flow into Fish Lake and the lake is not connected to surface flow downstream. There are no perennial streams into Bull Lake and generally, Bull Lake is not connected to downstream bodies of water except when high water conditions occur during spring. The estimated sediment delivery within this watershed is 11.6 tons per year from existing roads. In-channel sediment sources are very limited within this watershed; sources of in-channel sediment are limited to outcurves and constrictions of channels that produce slightly higher velocity flows. No unstable banks were noted during field review. The water yield and cumulative effects show that since 1928, 184 acres have been harvested, equating to 7 percent of the watershed.
- **Spring Creek** – the main channel of Spring Creek flows into South Spring Lake which is approximately 3 acres in size and less than 5 feet deep. The south lake is connected to North Spring Lake which is about 5 acres, 35 feet deep and does sustain fisheries. The watershed is not connected to other bodies of water via surface flow. The estimated potential sediment delivery from non-point sources at this site is approximately 0.1 tons per year. This occurs on a site designed for a temporary bridge crossing; low to moderate ATV use occurs at this site thereby causing some of this sediment source. The conditions for in-channel sediment sources are similar to those mentioned in the Fish Lake, Bull Lake and tributaries watershed. Approximately 88 acres have been harvested in this 1,140 acre watershed, or 8.2 percent.

- **Stillwater River** – the river is about 79 miles long and the portion that is immediately downstream of the project area is between 8 and 12 miles from the headwaters of the river. This portion of the river is a Rosgen A channel, with a bankfull width estimated at nearly 40 feet. Limited sediment sources were identified on haul roads in this watershed but the estimated potential sediment delivery is approximately 0.9 tons per year. Due to the limited proposed harvest adjacent to or near the Stillwater River, no sediment source inventory of the river banks was conducted. This is within the upper Stillwater watershed, which is 22,670 acres. Given the size of the watershed compared to the proposed harvest of 131 acres, it is very unlikely that a measurable impact would result from this level of harvest. Therefore, the Stillwater River will not be further addressed for water yield.

## ENVIRONMENTAL EFFECTS

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

Within all 3 watersheds the existing potential sediment sources would continue until repaired by another project or funding source. In-channel sources of sediment would continue to exist and erode as natural events dictate. No increase in water yield would be associated with this alternative.

Cumulatively, the potential for sediment delivery from roads on the proposed haul routes would remain as would the in-channel sediment sources described in *EXISTING CONDITIONS*. No increase in water yield would be associated with this alternative. As vegetation continues toward preharvest conditions, annual water-yield increases would gradually reduce to preharvest levels.

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

Applying drainage improvements and BMP upgrades would be expected to reduce the potential sediment delivery to Fish Lake from the road surface. While the road improvements included in this alternative would be expected to reduce the potential sediment delivery to bodies of water, a short-term increased risk of sediment delivery would occur at crossing locations. Because vegetative filters take a couple of years to develop, short-term BMP measures such as slash filter windrow, sediment fence and wattles would be employed at locations where sediment delivery to streams may occur. TABLE 5-1: ESTIMATED POTENTIAL SEDIMENT DELIVERY shows the modeled potential sediment delivery for the project area watersheds.

**TABLE 5-1: ESTIMATED POTENTIAL SEDIMENT DELIVERY (tons/year)**

| Watershed                           | Existing Estimated Potential Sediment Delivery | 0 to 2 years after implementation | 3+ years after implementation  |
|-------------------------------------|------------------------------------------------|-----------------------------------|--------------------------------|
| Fish Lake/Bull Lake and Tributaries | 11.6                                           | 2.3<br>(9.3 tons/yr reduction)    | 1.8<br>(9.8 tons/yr reduction) |
| Stillwater River                    | 0.9                                            | 0.3<br>(0.6 tons/yr reduction)    | 0.3<br>(0.6 tons/yr reduction) |
| Spring Creek                        | 0.1                                            | 0.1                               | 0.1                            |
| <b>Total</b>                        | <b>12.6</b>                                    | <b>2.7</b>                        | <b>2.2</b>                     |

Due to the dispersed proposed harvest in tributaries across the watersheds and the discontinuous nature of streams in the project area, a low risk of increasing in-stream sediment would result from this alternative. Existing in-channel sources of sediment would be expected to continue to contribute sediment at the current rate.

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.

Cumulatively, a long-term reduction in direct sediment delivery may occur due to major and minor drainage improvements including converting the lakeshore road into a trail. A short-term increase in sediment

delivery potential could occur with the replacement and installation of new stream crossing structures. A cumulative increase in sediment delivery as a result of timber harvesting and roadwork would have a low risk of occurring because of the BMP application and adequate stream buffers to filter potential displaced soil. In-channel sources of sediment would continue to exist and erode as natural events dictate with a low risk of affecting beneficial uses. As a result of the activities proposed and the mitigation measures recommended, a reduction in long-term sediment delivery to water bodies in the project area would be expected. The cumulative annual harvest since 1928 would be approximately 16.4 percent in the Fish Lake/Bull Lake and tributaries watershed and 18 percent in the Spring Creek watershed. This level of harvest would not be expected to result in adverse cumulative impacts. Therefore, while the cumulative water yield would increase very slightly, and because the water yield levels would remain low, a low degree of risk to water quality would result from the implementation of this alternative.

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

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## **6. AIR QUALITY:**

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

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

Under this alternative, no timber harvest or related activities would occur. No dust associated with log hauling traffic and no burning of slash piles would occur from this proposed action.

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

The project is located in both Airsheds 1 and 2. Some particulate matter may be introduced into the airsheds from the burning of logging slash. Slash burning would be conducted when conditions favor good to excellent smoke dispersion; therefore, impacts are expected to be minor and temporary. Burning would be conducted during times of adequate ventilation and according to existing rules and regulations. Thus, direct, indirect, and cumulative effects to air quality are expected to be 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 Condition**

The Forest Management Rules direct DNRC to promote biodiversity by taking a coarse-filter approach that favors an appropriate mix of stand structures and composition on state lands (ARM 36.11.404). The four cover types present within the proposed harvest units are western larch/Douglas-fir (67 acres), subalpine fir (78 acres), mixed conifer (198 acres), and lodgepole pine (162 acres). The desired future cover type for these stands, based on Stand Level Inventory (SLI) data or professional judgement, is western larch/Douglas-fir (399 acres) and lodgepole pine (106 acres).

As the result of a major fire in 1926, the majority of the stands in the project area are in the 40- to 99-year age class (approximately 75%).

The major insects and diseases present are spruce budworm, older *Scolytus* beetle attacks on grand fir, and minor amounts of mountain pine beetle in the lodgepole pine.

Following the fire, the regeneration of western larch and lodgepole pine was very dense; those areas that have not been harvested are still very dense but with sapling to small sawlog-sized trees. Although these stands do not support very high levels of large diameter downed woody material, they contain continuous fuel loads of small diameter standing trees.

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

This project area does not have any old-growth stands within it.

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***

Neither cover types nor age class distributions would be directly or indirectly affected.

Stocking levels of shade-tolerant trees and downed woody debris would increase within those stands over time. Various factors, such as insects, diseases, and weather events, would eventually cause more snags to occupy portions of the stands. This, in turn, would increase the potential and/or severity of a wildfire, and in the event that one was ignited, would make it harder to suppress.

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 increase. Weed seed is primarily introduced via motor vehicle use; open roads could continue to be the pathway for new weeds to become established. Established infestations of noxious weeds are being addressed through herbicide spraying along the open roads but not behind road closures.

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

Under the proposed action:

- 143 acres would be converted from mixed conifer cover type to western larch/Douglas-fir cover type
- 39 acres would be converted from subalpine fir cover type to western larch/Douglas-fir cover type
- 21 acres would be converted from lodgepole pine cover type to western larch/Douglas-fir cover type
- 37 acres would be converted from western larch/Douglas-fir cover type to mixed conifer cover type

In most circumstances these cover type conversions would move towards DNRC's Desired Future Conditions (DFC) with the exception of proposed Unit 11 where a healthy mix of species regenerated following a seedtree harvest in 1998. The removal of the larch overstory trees would increase the growth and vigor of the established mixed conifer regeneration. Cumulatively across the Stillwater Unit, the trend has been to apply silvicultural prescriptions to move cover types toward the DFC.

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

The spread of noxious weeds from the use of mechanized equipment and ground disturbance would be minimized, but not completely eliminated, by the washing of equipment before entering the site, sowing grass seed on roads after road construction and harvesting (ARM 36.11.445), and applying herbicide on spots of weed outbreaks along approximately 10 miles of roadway including areas behind road closures.

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

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

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

### A. TERRESTRIAL AND AVIAN LIFE AND HABITATS

#### Existing Condition

The project area provides habitat for a variety of wildlife species, including a host of species that require mature forests and/or use snags and coarse woody debris. Old-growth forest habitat is not present within the proposed project area. A large stand-replacement/mixed-severity fire that burned through the project area in 1926 has largely shaped the current composition and relative abundance of existing wildlife habitat. Within the project area, approximately 1,569 acres of densely stocked, mainly pole-sized stands are interspersed with 669 acres of scattered mature forest ( $\geq 100$  years old). Deer, elk, and moose likely use the project area much of the year. Big game winter range and security habitats are present.

#### Environmental Effects

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

Under this alternative, no timber harvesting or related activities would occur. Thus, no appreciable changes to existing wildlife habitat would be anticipated.

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

Under the Action Alternative, approximately 505 acres of subalpine fir, Douglas-fir/western larch, lodgepole pine, and mixed-conifer forest habitat would be harvested. Regeneration and overstory removal silviculture prescriptions on 207 acres would lead to young, open stands likely not suitable for forest interior species. An additional 297 acres would receive intermediate harvest treatments that would reduce canopy cover and create scattered openings, but could provide suitable habitat for some species using a mosaic of open and dense forest patches. This Action Alternative would decrease habitat for wildlife species requiring interior forest conditions, while creating habitat for species preferring more open stands of younger forest. Habitat quality of big game winter range and security habitat would be affected by the removal of crown closure. Present and future deadwood material would be altered during the proposed timber harvesting; however, snags, snag recruits, and coarse woody debris would be retained in all proposed harvest units. Overall, minor adverse direct, indirect, and cumulative effects would be anticipated on terrestrial and avian wildlife habitats.

Refer to *ATTACHMENT IV - WILDLIFE ANALYSIS* for in-depth evaluation of wildlife habitat and notes pertaining to species potentially present in the project area.

### B. AQUATIC LIFE AND HABITATS

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

- *Timber-harvesting activities may affect water quality and fisheries habitat by*
  - *reducing shade and recruitable woody debris in the Riparian Management Zone (RMZ)*
  - *increasing stream temperatures, and*
  - *affecting habitat connectivity at road crossings.*

The analysis area for fisheries habitat parameters is the RMZ along Class 1 streams in the Fish Lake/Bull Lake and tributaries watershed, and the RMZ adjacent to proposed harvest units in Section 19, T34N, R24W.

Bull trout are found in Stillwater River; westslope cutthroat trout are abundant in Stillwater River, Bull Lake and potentially Fish Lake (*MFISH 2012*). The large tributary near the south end of Fish Lake also contributes year-round surface flow and also provides fishery habitat. The fish species that inhabit this stream are assumed to be similar to the species in Fish Lake. Stocking records from DFWP shows that westslope cutthroat trout are planted in Bull Lake. Fish species present in the Stillwater River between Highway 93 and the project area

include bull trout, westslope cutthroat trout, eastern brook trout, and slimy sculpin (*MFISH 2012*). This portion of the Stillwater River is considered as critical bull trout habitat (*USFWS 2010*).

### **FISH HABITAT PARAMETERS**

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

While no quantitative woody debris data is available for the streams in the project area, woody debris was observed in moderate to high levels in all of the streams within the Fish Lake/Bull Lake and tributaries watershed. Although evidence of timber harvest was observed in riparian stands along the streams, canopy coverage was very dense throughout the watershed.

#### **➤ Stream Temperature**

No temperature data for streams in the project area is available except for some spot stream temperature readings in a non-fish bearing tributary. Riparian canopy along streams, except for the Stillwater River, is very dense and provides continuous shade for the streams throughout the day. Therefore, stream temperature is likely within the natural range of variation for these streams.

#### **➤ Fish Passage**

One culvert is located on fish-bearing streams in the project area. This site is adjacent to the boat launch on Fish Lake. The existing culvert provides passage to adult eastern brook trout at low flows, but passage for all other life stages is restricted. No changes to fish connectivity—in the form of stream crossings—are proposed for any alternative, and will not be discussed further.

### **ENVIRONMENTAL EFFECTS**

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

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

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

##### **➤ Stream Temperature**

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

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

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

Although no harvest is proposed within 50 feet of any Class 1 stream (except for a road crossing on a non-fish bearing stream), approximately 3.0 acres of RMZ harvest is proposed. Approximately 0.8 acres of the RMZ harvest would be along potentially fish-bearing streams and the majority of the recruitable woody debris and all submerchantable vegetation would be retained. This level of harvest in the RMZ would be expected to have a low risk of adverse impacts to fish habitat. This proposal would result in low risk of adverse cumulative impacts to recruitable woody debris.

##### **➤ Stream Temperature**

The RMZ buffer is effective in maintaining the majority of stream shading as noted in the DNRC Forested Trust Lands Habitat Conservation Plan Final EIS (DNRC 2010). Therefore, stream shading post project would be sufficient to maintain a low risk of increasing stream temperatures due to timber harvesting. There is also a low risk of cumulative temperature increases that would result from the implementation of this alternative.

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

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

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

### **Existing Condition**

Bull Trout are listed as a Montana Animal Species of Concern and also listed as 'threatened' by the US Fish and Wildlife Service under the Endangered Species Act. Bull trout are found in Stillwater River although no direct impacts are anticipated. For more information please refer to *ATTACHMENT V – Water Resources Analysis*.

Suitable habitat for grizzly bear and Canada lynx is abundant and well connected in the project area. Both of these species likely use the proposed project area, and have been documented in their respective cumulative effects analysis areas in the past. Year-round and seasonally open roads are located within the area; serving as a source of disturbance for these species (should they be present).

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

### **Environmental Effects**

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

Under this alternative, no timber harvesting or related activities would occur. Thus, no appreciable changes to disturbance levels or existing grizzly bear, Canada lynx, or sensitive species' habitat conditions would be anticipated.

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

Under the Action Alternative, harvesting would reduce habitat quality for grizzly bears on 505 acres and Canada lynx on 432 acres. Forest stands receiving intermediate harvest treatments would experience less of a reduction in habitat quality and recover previous levels of suitability more rapidly than stands receiving regeneration treatments. Connectivity of suitable habitat would not be expected to be appreciably altered. Short-term increases in open roads and potential disturbance would be expected. A long-term increase in motorized vehicle disturbance would occur along 0.9 miles of new, permanently-open road. Where harvest units would be directly adjacent to permanently open roads, visual screening along open roads (where present) would be maintained; reducing disturbance risk to bears and lynx. Overall, minor adverse direct, indirect, and cumulative effects would be anticipated that could affect grizzly bear and lynx.

Under the Action Alternative, suitable habitat for Common Loon, Fisher, Flammulated Owl, Gray Wolf and Pileated Woodpecker would be altered. The proposed logging would remove trees, some snags, and reduce forest cover. The proposed activities could temporarily (1-4 years) disturb or displace these sensitive species should they be present in close proximity to harvest units. Mitigations and vegetation treatments outlined by the Action Alternative would minimize effects to these wildlife species and meet forest management goals. Minor adverse effects to common loons, fishers, gray wolves and pileated woodpeckers in the project area would be anticipated. Minor beneficial effects to flammulated owl habitat would be anticipated.

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## 10. HISTORICAL AND ARCHAEOLOGICAL SITES:

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

Within the areas that would likely be affected by the project, no documented cultural resource sites have been found by DNRC's Cultural Resource Specialist. DNRC has also conducted shovel testing on several locations within the project area; these efforts did not result in the location of additional cultural resource sites.

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 short-term changes in views would occur.

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

The project area is not located on a prominent topographic area or visible from a densely populated area but portions of the project's harvest units and new road construction would be visible from open roads within the project area. Following harvest and road construction, landings and slash would be visible in the foreground views. Forest improvement work and burning of slash piles and landings would be planned within a year of harvest and road construction; this would speed up the recovery of the vegetation that would eventually mitigate the impacts of logging.

Overall, timber sale design would minimize visual impacts from foreground and background views by randomly spacing the leave trees in the units and leaving additional trees along unit boundaries and open roads.

Increased noise would occur during short periods of time within the operating season. Operations may be active 12 to 16 months on the timber sale, and less for the timber permits that would also result as a part of this project. Thus, direct, indirect, and cumulative effects to aesthetics are expected to be minimal.

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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.*

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

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

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

- Butcher Stewart Checklist Environmental Assessment (CEA) (October 2011)
- Highway 93 Corridor CEA (November 2011)
- Proposed Mystery Fish Environmental Assessment (EA) (March 2012)
- Proposed Upper Whitefish CEA (Winter 2012)
- Final HCP/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.*

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#### 14. HUMAN HEALTH AND SAFETY:

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

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

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

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

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

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

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

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

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

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

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

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#### 18. DEMAND FOR GOVERNMENT SERVICES:

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

Log trucks hauling to the purchasing mill would result in temporary increases in traffic on U.S. Highway 93. This increase is a normal contributor to the activities of the local community and would not be considered a new or increased source of traffic; therefore additional government service would not be required.

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

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

In 1996, the Land Board approved the Record of Decision (ROD) for the State Forest Land Management Plan (SFLMP). The SFLMP provides philosophical basis, consistent policy, technical rationale, and guidance for the management of forested state trust lands. In 2003, DNRC adopted the Administrative Rules for Forest Management (*Forest Management Rules; ARM 36.11.401 through 456*). The Forest Management Rules are

the specific legal resource management standards and measures under which DNRC implements the SFLMP and subsequently its forest management program. The SFLMP outlines the management philosophy, and the proposal will be implemented according to the Forest Management Rules. The philosophy is:

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

In December 2011, the Land Board approved the ROD for the Montana Forested State Trust Lands Habitat Conservation Plan (HCP). Approval of the ROD was followed by the issuance of an Incidental Take Permit (Permit) by the U.S. Fish and Wildlife Service (USFWS). The HCP is a required component of an application for a Permit which may be issued by the U.S. Fish and Wildlife Service or National Marine Fisheries Service to state agencies or private citizens in situations where otherwise lawful activities might result in the incidental take of federally-listed species. The HCP is the plan under which DNRC intends to conduct forest management activities on select forested state trust lands while implementing specific mitigation requirements for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout, and Columbia redband trout.

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

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

### **Existing Conditions**

The Stillwater River Road, off of Highway 93, is a main tributary road into the northern portion of the Stillwater State Forest and is used as access for huckleberry picking, hunting, fishing, as well as accessing Mount Marston Lookout, Upper Whitefish Lake and areas in the North Fork of the Flathead River drainage.

Currently there is vehicular access to the east side of Fish Lake and the southern end of Bull Lake. The road along Fish Lake and continuing on to Bull Lake is not maintained and is deeply rutted; generally only vehicles with high clearance are able utilize this roadway.

Two boat launch access points are along Fish Lake; several public-made campsites are also located there. One boat launch access point is located on the southern end of Bull Lake and one public-made campsite is located near that boat launch site.

### **Environmental Effects**

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

A moderate increase in use over time would occur, consistent with the area's population growth. The road along Fish Lake would continue to contribute sediment to the lake until funding is located to improve the road drainage problems.

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

The Action Alternative would increase the amount of traffic, particularly truck traffic along the Stillwater River Road. The relocation of Fish Lake Road would improve the standard of the road, thereby increasing the types of vehicles able to access both of the lakes. All other existing road closures would remain in place. Temporary closures of the existing Fish Lake Road may occur when the relocation/ reclamation work is being done.

Depending upon funding from outside sources, the campsites may be improved and more sites located. A foot trail would be designed on the location of the existing Fish Lake Road. Minimum BMPs would be implemented during this reclamation as well as to the boat ramps to reduce sediment delivery to the lake. If additional

funding is available, more improvements to these sites would be beneficial for camping experiences (such as fire pits and picnic tables as well as weed control).

Mitigations proposed to reduce the effects on recreation include:

- 1) DNRC would assure contractors working on state lands would follow speed limits, apply dust abatement to the road if hauling during dusty periods of the year, place caution and warning signs on the truck haul routes, and
- 2) DNRC would provide informational signs if road closures are necessary during roadwork phase of the timber sale.

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

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

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

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

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

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

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

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

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

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

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

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

No revenue would be generated for the Common Schools Trust 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 \$35,500 for the Common Schools Trust and approximately \$44,000 in Forest Improvement (FI) fees would be collected for FI projects. This is based on a stumpage rate of \$2.92 per ton, multiplied by the estimated volume of tons. This stumpage rate was derived by comparing attributes of the proposed timber sale with the attributes and results of other DNRC timber sales recently advertised for bid. Costs related to the administration of the timber sale program are only tracked at the Northwestern Land Office (NWLO) and Statewide level. DNRC does not track project-level costs for individual timber sales. An annual cash flow analysis is conducted on the DNRC forest product sales program. Revenue and costs are calculated Statewide and by the NWLO. From 2006 through 2010, revenue-to-cost ratio of the Northwestern Land Office was 2.51. This means that, on average, for every \$1.00 spent in costs, \$2.51 in revenue was generated. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return.

|                                  |                                                                    |              |
|----------------------------------|--------------------------------------------------------------------|--------------|
| <b>EA Checklist Prepared By:</b> | <b>Name:</b> Michael McMahon, Chris Forristal, Marc Vessar         | <b>Date:</b> |
|                                  | <b>Title:</b> Management Forester, Wildlife Biologist, Hydrologist |              |

**V. FINDING**

25. ALTERNATIVE SELECTED:

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

EIS     
  More Detailed EA     
  No Further Analysis

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

**Attachment I:**  
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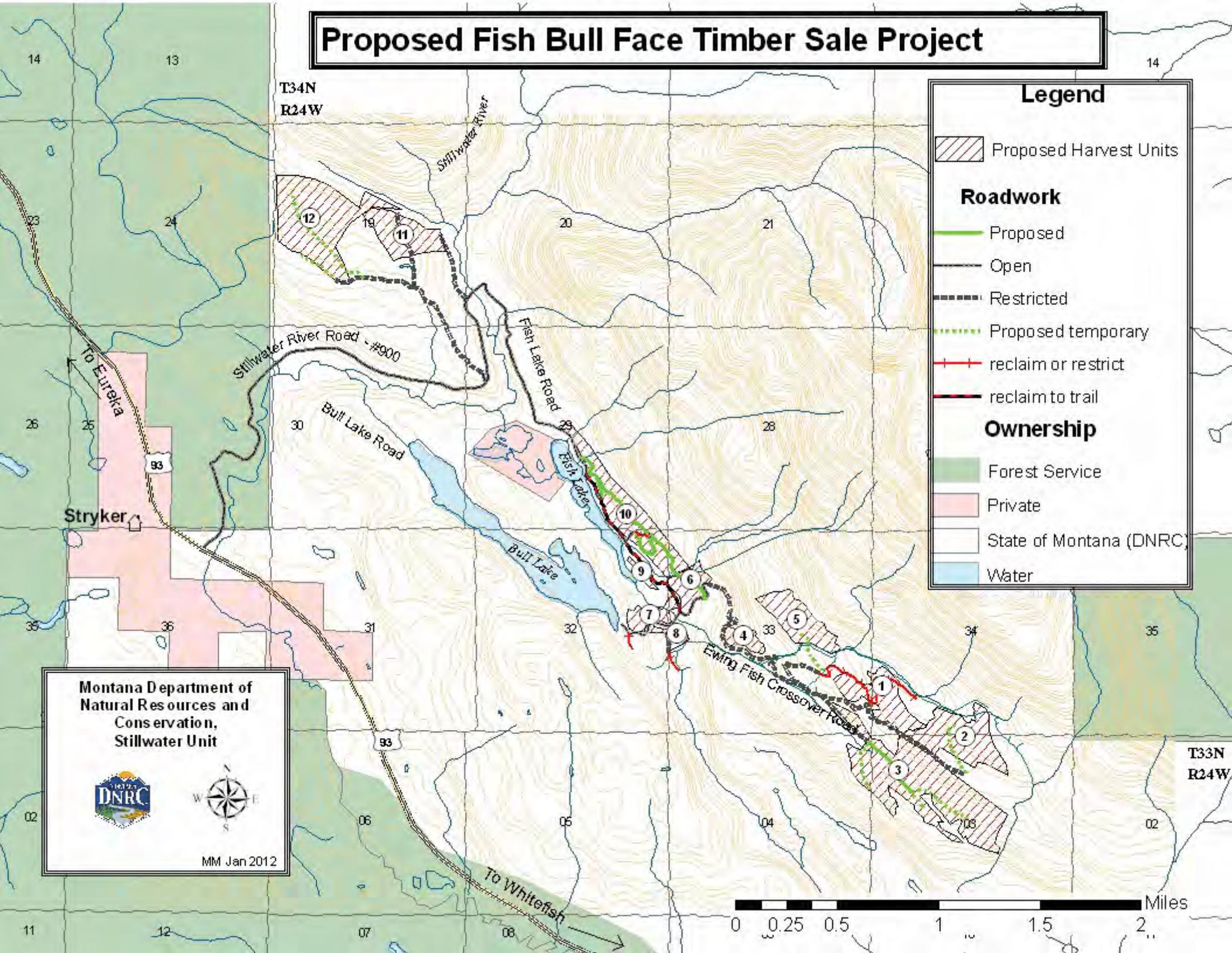
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# Proposed Fish Bull Face Timber Sale Project



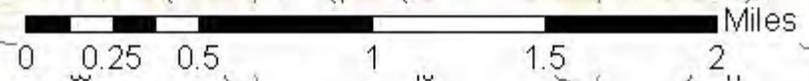
### Legend

-  Proposed Harvest Units
- Roadwork**
-  Proposed
-  Open
-  Restricted
-  Proposed temporary
-  reclaim or restrict
-  reclaim to trail
- Ownership**
-  Forest Service
-  Private
-  State of Montana (DNRC)
-  Water

Montana Department of Natural Resources and Conservation, Stillwater Unit




MM Jan 2012



**Attachment III:  
FISH BULL FACE TIMBER SALE PRESCRIPTIONS TABLE**

| Unit number | Est. Acres | Prescription                                                                                 | Marking guides                                                                                                                                                                                                                                                                                              | Particulars involved in unit                                                                                                                                                                                                                                                                                                          |
|-------------|------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1           | 39         | Commercial thin/<br>improvement cut                                                          | <b>Cut by Description:</b> <ul style="list-style-type: none"> <li>Species designated to cut = LPP, SAF and GF</li> <li>Leave all trees &gt; 18" dbh</li> <li>Spacing on all other sawlog species shall be 25 feet</li> </ul>                                                                                | <ul style="list-style-type: none"> <li>ERZs exist around steep draw areas and springs;</li> <li>SMZs - there will be no harvest within the Class 2 stream;</li> <li>Jump up road required to landing;</li> <li>Trample slash in with excavator or dozer;</li> <li>Plan to pull 2 cmp's off of old road.</li> </ul>                    |
| 2           | 52         | Seedtree w/<br>reserves                                                                      | <ul style="list-style-type: none"> <li>Mark 6-12 seedtrees per acre</li> <li>Keep up to 4 TPA &gt;21</li> <li>Mark about 10 additional TPA that are displaying good vigor, etc.</li> </ul>                                                                                                                  | <ul style="list-style-type: none"> <li>There will be a temp road going into the unit;</li> <li>Mark RMZ along Class 1 stream, approx 300 feet long x 97 feet wide;</li> <li>Dozer and excavator pile;</li> <li>Plan for natural regeneration.</li> </ul>                                                                              |
| 3           | 133        | 50% commercial thin; 50% regeneration <u>cut through Seedtree with reserves prescription</u> | <b>Cut by Description:</b> <ul style="list-style-type: none"> <li>Species Designated to cut = LPP, SAF and GF</li> <li>Leave all trees &gt; 18" dbh</li> <li>Spacing on all other sawlog species shall be 25 feet.</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>ERZ's exist around steep areas and springs;</li> <li>SMZs – interior SMZ marked with "Xs", cut tree mark to SMZ specifications for Class 2 stream and retain minimum of 40% canopy coverage;</li> <li>Dozer and excavator pile and scarify;</li> <li>Plan for natural regeneration.</li> </ul> |
| 4           | 10         | Regeneration <u>through</u> clearcut with reserves <u>prescription</u>                       | <b>Cut by Description:</b> <ul style="list-style-type: none"> <li>Species Designated to cut = LPP, SAF and GF</li> <li>Leave all trees &gt; 18" dbh</li> </ul>                                                                                                                                              | <ul style="list-style-type: none"> <li>Excavator pile;</li> <li>Plan for natural regeneration.</li> </ul>                                                                                                                                                                                                                             |
| 5           | 36         | 40% commercial thin; <u>60% regeneration cut through Seedtree with reserves prescription</u> | <b>Cut by Description:</b> <ul style="list-style-type: none"> <li>Species Designated to cut = LPP, SAF and GF</li> <li>Leave all trees &gt; 20" dbh unless marked to cut</li> <li>Spacing on trees 12 to 20" dbh shall be 60 feet</li> <li>Spacing on all other sawlog species shall be 25 feet.</li> </ul> | <ul style="list-style-type: none"> <li>No scarification required;</li> <li>Plan for natural regeneration;</li> <li>Construct and reclaim temporary road - use log sill crossing and reclaim crossing site.</li> </ul>                                                                                                                 |
| 6           | 18         | 100% commercial thin                                                                         | <ul style="list-style-type: none"> <li>Retain average 60 sq ft of sawlogs/acre above proposed road; favor western larch.</li> <li>Harvest nonsawlog volume only below proposed road.</li> </ul>                                                                                                             | <ul style="list-style-type: none"> <li>SMZ and RMZ (97 feet) on Class 1 stream – no harvest within 50 feet of stream and retain 50% of trees between 50 and 97 feet;</li> <li>Several interior SMZs are in place on top of unit; mark to SMZ law;</li> <li>Excavator pile if needed.</li> </ul>                                       |

| Unit number | Est. Acres | Prescription                             | Marking guides                                                                                                                                                                                                                                                                                                                                        | Particulars involved in unit                                                                                                                                                                                                                                                                                                    |
|-------------|------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7           | 13         | Seedtree with reserves                   | <b>Cut by Description:</b> <ul style="list-style-type: none"> <li>Species Designated to cut=GF, SAF &amp; LPP.</li> <li>All other species will be cut tree marked with Blue band.</li> <li>Retain 6 to 12 seedtrees per acre</li> <li>Keep 2 snags and 2 recruits &gt;21" dbh but may need to leave more 21"+ trees when not enough snags.</li> </ul> | <ul style="list-style-type: none"> <li>- 100-foot buffer along open road;</li> <li>- ERZ for steep area;</li> <li>- Excavator scarify.</li> </ul>                                                                                                                                                                               |
| 8           | 7          | Seedtree with reserves                   | <ul style="list-style-type: none"> <li>Mark 6-12 seedtrees per acre</li> <li>Keep up to 4 TPA &gt;21</li> </ul>                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>- 100-foot buffer along open road where topography doesn't limit viewing distance;</li> <li>- SMZ required on Class 2 stream;</li> <li>- Excavator pile.</li> </ul>                                                                                                                      |
| 9           | 3          | Commercial thin                          | <ul style="list-style-type: none"> <li>Retain 60 square feet of basal area per acre of primarily western larch</li> </ul>                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>- The Class 1 SMZ crosses back and forth over the existing Fish Bull Road, which is to be reclaimed to a trail;</li> <li>- Class 1 SMZ along Fish Lake and unnamed Class 1 stream have an associated RMZ required between 50 and 97 feet; retain 50% of sawlogs in this area.</li> </ul> |
| 10          | 63         | Commercial thin and improvement cuttings | <ul style="list-style-type: none"> <li>Estimate 50% of the area can feasibly be harvested, thinned and have fuels reduction completed.</li> <li>Harvesting in most of these areas would be accomplished with timber permits.</li> </ul>                                                                                                               | <ul style="list-style-type: none"> <li>- Identify areas along the new proposed Fish Lake Road where we can do some improvement cutting and commercial thinning, as well as, fuels reduction;</li> <li>- Pile and burn slash</li> </ul>                                                                                          |
| 11          | 37         | Overstory Removal Harvest                | <ul style="list-style-type: none"> <li>Mark to leave 4 of the largest trees per acre for snag recruitment.</li> <li>Retain all snags</li> </ul>                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>- Remove overstory trees on stocked stand of regeneration;</li> <li>- Harvest within 30 days or within Grizzly Bear denning period;</li> <li>- No site preparation required.</li> </ul>                                                                                                  |
| 12          | 94         | Improvement cut                          | <b>Cut by Description:</b> <ul style="list-style-type: none"> <li>Species Designated to cut = LPP, SAF and GF</li> <li>Leave all trees &gt; 18" dbh</li> <li>Spacing on all other sawlog species shall be 25 feet.</li> </ul>                                                                                                                         | <ul style="list-style-type: none"> <li>- ERZ's exist around steep areas and springs;</li> <li>- No site preparation required;</li> <li>- Harvest within 30 days or within Grizzly Bear denning period .</li> </ul>                                                                                                              |

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

## Attachment IV: Wildlife Analysis

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### INTRODUCTION

This analysis discloses the existing condition of relevant wildlife resources, and displays the anticipated effects that may result from each alternative of this proposal. Considerations and concerns raised by DNRC specialists, and public comments received during initial scoping for the proposed project, led to the following list of issues:

- The proposed activities could decrease forested cover, which may reduce habitat connectivity and suitability for wildlife species associated with mature forests.
- The proposed activities could reduce abundance of snags and coarse woody debris, which could lower habitat quality for species that depend on these structural attributes, and could alter their ability to survive and/or reproduce.
- The proposed activities could alter grizzly bear (*Ursus arctos*) cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats and/or increase risk of human-caused bear mortality.
- The proposed activities could result in the modification of habitat preferred by Canada lynx (*Felis lynx*) and decrease the area's suitability for lynx.
- Timber harvesting and associated activities could disturb and displace common loons (*Gavia immer*) from nest sites and preferred feeding areas, which could result in reduced recruitment of chicks.
- The proposed activities could decrease habitat suitability for fishers (*Martes pennanti*) by decreasing canopy cover in mature forest stands, decreasing abundance of snag and coarse woody debris, and by increasing roads, which could elevate risk of trapping mortality.
- The proposed activities could alter the structure of flammulated owl (*Otus flammeolus*) preferred habitat types, which could reduce habitat suitability for flammulated owls.
- The proposed activities could displace gray wolves (*Canis lupus*) from the vicinity of the project area, particularly denning and rendezvous sites, and/or alter big game prey availability, which could adversely affect gray wolves.
- The proposed activities could negatively affect pileated woodpecker (*Dryocopus pileatus*) habitat suitability by removing canopy cover and snags used for foraging and nesting, and by creating disturbance.
- Timber harvesting and associated activities could reduce habitat quality for big game, especially during the fall hunting and winter seasons, by removing forest cover, increasing roads in secure areas, and disturbing animals.

The following sections disclose the anticipated direct, indirect, and cumulative effects to these wildlife resources in the analysis areas from the proposed actions. Past and current activities on all ownerships in each analysis area, as well as known planned future agency actions, have been taken into account for the cumulative effects analysis.

## ***ANALYSIS AREAS***

The discussions of existing conditions and environmental effects will focus on two different spatial scales. The first scale will be the "project area," which was used to assess direct and indirect effects to wildlife species and their habitats. The "project area," totaling 3,144 acres, consists of an area surrounding the proposed timber harvest units and it is the area where all proposed new road construction would occur. Elevation within the project area ranges between 3,440 and 5,480 feet. The proposed project area contains a variety of slope aspects and wildlife habitats.

The second scale is the "cumulative effects analysis area," which refers to the surrounding landscape for assessing cumulative effects to wildlife species and their habitat. Cumulative effects were primarily analyzed on the project area and the adjacent surrounding sections. This area totals 6,181 acres. The spatial scale of the cumulative effects analysis area (CEAA) is larger for certain species discussed and is described in the applicable section of this document. In general, CEAs were delineated to approximate the size of a focal species' home range or to approximate a surrounding landscape in which the proposed activities could most likely have measureable cumulative effects to wildlife habitat. See *FIGURE W-1-WILDLIFE ANALYSIS AREAS* for a map showing the project and cumulative effects analysis areas.

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

## ***ANALYSIS METHODS***

DNRC attempts to promote biodiversity by taking a coarse-filter approach, which favors a mix of stand structures and compositions on state lands (*ARM 36.11.404*). Appropriate stand structures are based on ecological characteristics (e.g., landtype, habitat type, disturbance regime, unique characteristics). A coarse-filter approach assumes that if landscape patterns and processes are maintained similar to those with which the species evolved, the full complement of species would persist and biodiversity would be maintained. This coarse-filter approach supports diverse wildlife populations by managing for a variety of forest structures and compositions that approximate historic conditions across the landscape. DNRC cannot assure that the coarse-filter approach will adequately address the full range of biodiversity; therefore, DNRC also employs a fine-filter approach for threatened, endangered, and sensitive species (*ARM 36.11.406*). The fine-filter approach focuses on a single species' habitat requirements.

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

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

Various legal documents dictate management criteria for the management of wildlife and their habitat on state lands. The documents most pertinent to this project include:

- *DNRC Forest Management Rules*
- *DNRC Forested Trust Lands Final Environmental Impact Statement and Habitat Conservation Plan*
- *Endangered Species Act*
- *Migratory Bird Treaty Act*
- *Bald and Golden Eagle Protection Act*

## **COARSE FILTER WILDLIFE ANALYSIS**

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

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

#### **Introduction**

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

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

#### **Analysis Area**

Direct and indirect effects were analyzed on the project area (3,144 acres). Cumulative effects were analyzed on the surrounding sections directly adjacent to the proposed project area sections (CEAA = 6,181 acres, see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale of analysis would be large enough to support a diversity of species that use mature forested habitat and/or require connected forested habitats, and centers evaluation of cumulative effects on those areas most likely to be affected by the proposed action.

## Analysis Methods

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

## Existing Environment

The project area currently contains approximately 669 acres (21.3%) of mature subalpine fir, Douglas-fir/western larch, lodgepole pine, and mixed-conifer stands that have a reasonably well developed canopy ( $\geq 40\%$  crown closure). Mature forested stands are scattered within the proposed project area, with 15 patches present averaging 45 acres in size (range 0.5 to 247 acres, see FIGURE W-2 - MATURE FORESTED HABITAT AND LANDSCAPE CONNECTIVITY). Old-growth forest, as defined by Green et al. (1992), is not present within the proposed project area. Within the last century, wildfires have largely influenced the abundance and configuration of mature forest within the proposed project area.

Approximately 1,569 acres (50%) of the project area has very dense pole-sized trees that regenerated after a 1926 stand-replacement and mixed-severity wildfire. Some of these areas average 3,000 trees per acre. A fully stocked timber stand of similar age would typically have between 250 and 400 trees per acre. While crown closure of these stands is generally over 60%, they were not considered mature forested habitat in this analysis due to young age and small live tree diameters. However, because of their dense stocking and canopy levels, these 60 to 85-year-old stands likely provide suitable travel habitat for a number of wildlife species that prefer interior forest conditions. With the additional consideration of these dense pole-timber stands, patch size within the project area increases to a single 2,238 acre patch (71%). Approximately 443 acres (14.1%) of recently (<20 years) harvested stands within the project area consist of widely scattered mature trees and young, short (<40 feet) regenerating trees. Roads are currently present within the project area, with a total road density of 2.7 miles of road per square mile. Roads that can be legally accessed by the general public make up a smaller portion of the total roads. Under the Stillwater Block Transportation Plan, approximately 6.0 miles (1.2 miles/sq. mile) of open DNRC roads exist in the project area (see TABLE W-2 – ROAD MANAGEMENT AND CONSTRUCTION). Another 0.8 miles of road exists on privately-owned land within the project area. Approximately 2.3 road miles within the project area are accessible by motorized vehicles during average winter conditions, while snow machines are able to access the rest of the roads. Wildfire history, past harvesting, and two large lakes (>30 acres) have influenced habitat abundance and connectivity for species using older (100+ years), undisturbed forest within the project area (see FIGURE W-2 - MATURE FORESTED HABITAT AND LANDSCAPE CONNECTIVITY CORRIDORS).

Similar to the proposed project area, stands of mature forest are scattered and moderately connected in the CEAA. Presently, approximately 24.9 percent (1,540 acres) of the cumulative effects analysis area is comprised of mature forest stands with >40% crown closure. Average patch size of mature forest is 73 acres (21 patches, range 2 to 541 acres). When including dense pole-sized stands, patch size increases to a single, 3,997 acre patch (65%). Given these assessments, landscape connectivity of mature forest stands

within the CEAA is fair. Streams run through many of the existing patches of mature forest and offer an additional level of linear connectivity within the CEAA. A portion of the CEAA (13.1%, 810 acres) has been harvested within the last 20 years and generally consists of young, regenerating forest with large scattered trees. Land ownership within the CEAA is 97% DNRC, 2% lakes, and 1% private. Open roads are present within the CEAA (8.8 miles, density open roads = 0.9 miles/sq. mile) and are primarily used for recreation and to access adjacent Forest Service lands and private residences.

### Environmental Effects

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

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

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

Under the Action Alternative, approximately 62 acres (2.0%) of mature forest would undergo harvesting (see TABLE W-1 – MATURE FORESTED HABITAT). Approximately 54 acres of mature forest would receive regeneration treatments; removing over-mature and diseased or suppressed/intermediate trees and leaving 10 to 20 mature trees per acre. Crown closure on these 54 acres would be reduced from >40% to 5 to 15%. Species that rely on these mature forested habitats would experience a reduction in habitat for 50 to 80 years. Of the 62 mature forest acres proposed for harvest, 8 acres of mature forest would receive a commercial thinning treatment. Under this silvicultural prescription, healthy seral species (e.g. western larch, Douglas-fir) and all trees over 18" dbh would be retained. Habitat suitability for wildlife species using mature forest would likely be reduced on these 8 acres, but would recover much more rapidly than mature stands receiving regeneration treatments. Mature forest patch size would be reduced from 45 acres to 36 acres (17 patches, range 0.5 to 174 acres). Proposed harvesting on 406 acres (12.9%) of dense, pole-sized stands within the project area would further reduce habitat and connectivity for species preferring interior forest conditions. Approximately 607 acres of mature forest in the project area would remain unharvested and could provide suitable habitat for species utilizing smaller patches of mature forest. All of these mature patches would remain connected to 1,163 acres of unharvested dense, pole-sized stands within the project area, increasing effective patch size to an average of 443 acres (4 patches, range 2 to 1,760 acres). After harvesting, the project area would continue to provide a variety of forested habitat conditions for wildlife, but the proportions of these habitats would change. In general, under this alternative, habitat conditions would improve for species adapted to more open forest conditions with seral species, while reducing habitat quality for species that prefer dense, mature forest habitats.

**TABLE W-1 – MATURE FORESTED HABITAT.** Existing acres, proposed harvest acres, and percentages of mature forested habitat within the analysis areas.

| Analysis Area               | Total Analysis Acres | Mature Forested Habitat Present (% area) | Proposed Harvest Under Action Alternative (% area) | Mature Forested Habitat Post-Harvest (% area) |
|-----------------------------|----------------------|------------------------------------------|----------------------------------------------------|-----------------------------------------------|
| Project Area                | 3,144                | 669<br>(21.3%)                           | 62<br>(2.0%)                                       | 607<br>(19.3%)                                |
| Cumulative Effects Analysis | 6,181                | 1,540<br>(24.9%)                         | 62<br>(1.0%)                                       | 1,478<br>(23.9%)                              |

Table W-2 – ROAD MANAGEMENT AND CONSTRUCTION displays how roadwork proposed in the Action Alternative affects road management and accompanying road densities during harvesting activities and following the project.

**TABLE W-2 – ROAD MANAGEMENT AND CONSTRUCTION.** Miles (and density [miles/sq.mile]) of existing road and new road that would be used in the project area under the proposed Action Alternative.

| Road Types         | Existing Condition | During Proposed Activities | After Proposed Activities |
|--------------------|--------------------|----------------------------|---------------------------|
| Open               | 6.0 (1.2)          | 12.1 <sup>a</sup> (2.5)    | 6.9 (1.4)                 |
| Restricted Road    | 7.0 (1.4)          | 2.0 (0.4)                  | 6.3 (1.3)                 |
| Hiking Trail       | N/A                | 0 (0)                      | 0.8 <sup>b</sup> (0.2)    |
| Temporary Road     | N/A                | 2.1 <sup>a</sup> (0.4)     | 0 (0)                     |
| <b>Total Roads</b> | 13 (2.7)           | 16.2 (3.3)                 | 13.2 (2.7)                |

<sup>a</sup> These 14.2 miles of road would be functionally open during activities, but only 6.0 miles would be open for public motorized access.

<sup>b</sup> Value not counted in sum of total roads.

Consistent with the Stillwater Block Transportation Plan, approximately 1.8 miles of new permanent road and 2.1 miles of temporary road would be constructed with the proposed Action Alternative. Of the 1.8 miles of new permanent road, 1.5 miles would be open to public motorized use. Approximately 0.2 miles of existing restricted road would be opened to public motorized use. Approximately 0.8 miles of existing open road would be closed and reclaimed into a foot trail. Thus, total net open road gain within the proposed project area would be 0.9 miles. These open road changes are a result of the closing of the existing damaged Fish Lake access road and construction of a new access road that reduces risk of sediment delivery to the lake. During harvest activities, up to 14.2 miles of road (open, restricted, and temporary) within the project area could receive elevated traffic levels. Public access would be restricted on 0.3 miles of the new permanent road after harvesting, while 0.8 miles of existing restricted road would be reclaimed and closed to all motorized access. All temporary roads would be reclaimed and closed to

all motorized vehicles following use. At the conclusion of the proposed project, the total amount of roads and overall road density would not appreciably change.

Thus, minor adverse direct and indirect effects to mature forested habitat connectivity and suitability in the project area would be expected since: 1) harvesting would appreciably reduce tree density and existing cover on roughly 62 acres (9.3%) of existing mature stands, 2) connectivity of mature forest would be altered with an increase in the number of patches from 15 to 17 and a decrease in patch size from 45 to 36 acres, and 3) long-term open road density would increase from 1.2 miles/sq. mile to 1.4 miles/sq. mile while total road density would remain at 2.7 miles/sq. mile.

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

Under this alternative no timber harvesting activities would occur. Past and ongoing forest management projects not associated with the proposed Fish Bull Face Timber Sale have affected mature forest wildlife habitat in the project area, and other proposed projects could affect mature forest habitat in the future. No additional cumulative effects to mature forested habitat connectivity and suitability are expected to result from the No-Action Alternative that could affect wildlife in the CEAA since: 1) no changes to existing stands would occur; 2) no further changes to the suitability of mature forested cover or connectivity would be anticipated; and 3) no changes to wildlife use would be expected.

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

Proposed harvesting would remove 62 acres (1.0%) of mature forest stands within the CEAA (see TABLE W-1). Reductions in mature forested habitats associated with this alternative (4.0% of available mature habitat in CEAA) would be additive to losses associated with past harvesting activities and any ongoing activities within the CEAA. Across the CEAA, 23.9% of mature forested habitats would remain and landscape connectivity would be minimally altered given the existing condition of the surrounding forested landscape (average patch size = 67 acres, range 1.7-520 acres). Existing landscape connectivity would be altered, as the number of mature forest patches would increase from 21 to 22. Harvesting would alter an additional 406 acres (6.6%) of dense, pole-sized forest stands providing travel habitat for some mature forest species. Combined mature and dense poletimber forest patches within the CEAA would change from a single patch of 3,997 acres to 7 patches averaging 505 acres each, (range 4 to 3,539 acres). Habitat for interior forest species and species associated with dense, mature stands would be reduced in the CEAA; however, the remaining habitat would be expected to persist in the absence of large-scale disturbance or timber harvest. Wildlife species using and preferring young forest stands in the CEAA would benefit from increases in the project area for 10 to 20 years post-harvest. Proposed harvesting and associated activities could temporarily (up to 4 years) increase open road density within the cumulative effects analysis area from 0.9 miles/sq. mile to 1.5 miles/sq. mile. After project completion, open road density would decrease to 1.0 miles/sq. mile, but would remain higher than existing levels due to the proposed reroute of the Fish Lake access road. Thus, minor adverse cumulative effects to mature forested habitat suitability and connectivity for wildlife would be expected in the cumulative effects analysis area since: 1) harvesting would remove 62 acres (4.0%) of existing mature forest in the CEAA; 2) current availability of mature, closed canopy habitat would remain virtually unchanged and minor cumulative changes to wildlife use would be expected; 3) mature forest patch size, abundance, and configuration would be minimally altered; and 4) the proposed increase in long-term open road density associated with this Action would not be expected to appreciably change wildlife use or alter current levels of connectivity.

## SNAGS AND COARSE WOODY DEBRIS

**Issue:** The proposed activities could reduce abundance of snags and coarse woody debris, which could lower habitat quality for species that depend on these structural attributes, and could alter their ability to survive and/or reproduce.

### Introduction

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

Snags and defective trees (e.g. partially dead, spike top, broken top) are used by a variety of wildlife species for nesting, denning, roosting, feeding, and cover. Snags and defective trees may be the most valuable individual component of Northern Rocky Mountain forests for wildlife species (*Hejl and Woods 1991*). The quantity, quality, and distribution of snags affect the presence and abundance of many wildlife species relying upon them. Snags provide foraging sites for insectivorous species and provide structures used by primary cavity-nesting species to excavate nests. The cavities created by primary excavators (i.e. woodpeckers) provide habitat for secondary cavity users, including other birds and small to mid-sized mammals. Snags and defective trees can also provide nesting sites for secondary cavity users where cavities are formed by broken tops and fallen limbs. Large, tall snags tend to provide nesting sites, while short snags and stumps tend to provide feeding sites (*Bull et al. 1997*). Many species that use small-diameter snags will also use large snags; however, the opposite is not true. Typically, old stands will have greater numbers of large snags. Finally, the density of snags is another important indicator of habitat quality for some cavity-nesting species. Species such as the black-backed woodpecker tend to nest and forage in areas where snag densities are high, using one snag for nesting and others nearby for foraging and roosting.

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

### Analysis Area

Direct and indirect effects were analyzed within the project area (3,144 acres). Cumulative effects were analyzed within the surrounding sections directly adjacent to the proposed project area (6,181 acres, see *FIGURE W-1 – WILDLIFE ANALYSIS AREAS*). Wildlife species associated with snags and coarse woody debris found in the CEAA would be those most likely to be influenced by cumulative effects associated with nearby activities and proposed habitat alteration on the project area.

### Analysis Methods

The abundance of snags and coarse woody debris were quantitatively estimated in the proposed project area using 20 systematically placed plots containing a single, 100-foot long sampling transect. Factors considered in the analysis included the level of proposed harvesting, past timber harvest, number of snags, and weight in tons of coarse woody debris.

## Existing Environment

Analysis of sampling plots and field observations indicated snags within the project area occurred at a density of 3.5 snags per acre (range 0-19.8). The average diameter of all snags >8" dbh was 11.5" dbh (range 8 to 20"); and snag species composition was diverse, with the most abundant snag species being Douglas-fir and western larch. No snags >21" dbh were observed within project area sampling plots. Snags were generally distributed unevenly; with some areas containing higher densities than others. The lack of large, high-quality snags within the project area can be partially attributed to wildfire and harvest history. Approximately 6.0 miles of open roads in the project area facilitate firewood gathering, however the majority of the project area is inaccessible for firewood cutting due closed roads and steep, heavily vegetated terrain. Evidence of snag use for feeding and/or cavity building was observed in snags that were present. Coarse woody debris levels were also variable across the project area, averaging ~9.3 tons per acre (range 0 to 31.9 tons per acre). Similar to snags, downed logs were generally small diameter (5.1" at transect line, range 3 to 24"), although some larger logs were observed. Thus, habitat quality for wildlife utilizing snags and/or coarse woody debris is likely low to moderate within the project area.

Overall, snags exist at current levels to meet DNRC's minimum-retention thresholds (*ARM 36.11.411*), although size classes are smaller than preferred. Large diameter (>21" dbh) snags and snag recruits are generally absent from the project area and CEAA due to wildfire history and resulting forest structure. Coarse woody debris in the majority of the project area is present in appropriate amounts for the current existing habitat types (*Graham et al. 1994*). Similar to unaltered forested landscapes, snags and coarse woody debris are not distributed evenly across the project area (*Harris, 1999*). Snags and coarse woody debris are frequently collected for firewood near open roads in the CEAA. Abundance and distribution of snags and coarse woody debris within the CEAA is likely similar to patterns observed on project area sampling plots. Within the CEAA, past harvesting on 810 acres (13.1%) has altered snags, snag recruits, and coarse woody debris levels. On these acres of harvested land within the cumulative effects analysis area, snag and downed wood abundance is likely lower than levels in unharvested areas.

## Environmental Effects

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

No direct changes in the abundance or distribution of snags and downed logs would be expected. Existing snags would continue to provide wildlife habitat, and new snags would be recruited as trees die. No direct and indirect effects would be expected to affect wildlife species requiring snags and coarse woody debris since: 1) no harvesting would occur that would alter present or future snag or coarse woody debris concentrations, 2) no changes to human access for firewood gathering would occur, and 3) no change in habitat quality would be expected that could affect wildlife species' ability to survive and/or reproduce.

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

Existing snags, live recruitment trees and coarse woody debris would be altered due to timber harvesting on 505 acres in the proposed project area. Most harvested areas would likely undergo a reduction in snags. Coarse woody debris amounts would likely remain similar to existing levels in harvest units under the proposed action. Harvest prescriptions call for retention of 2 snags and 2 large snag recruits per acre greater than 21 inches dbh where they exist, otherwise the next largest size class; additional large-diameter recruitment trees would be left if sufficient large snags are not present, and 4 to 25 tons (depending upon habitat type of coarse woody debris per acre retention in the proposed harvest areas). While some snags and/or recruit trees could be lost due to safety and operational concerns, replacements

would be identified to comply with *ARM 36.11.411 and LY-HB2 (USFWS and DNRC 2010, Vol. II, p. 2-48)*. Although current snags present in the project area are generally small diameter, ample large live trees/snag recruits exist within proposed harvest units. Future snag quality in the harvested areas would be enhanced with proposed silvicultural prescriptions that should lead to increased tree growth, larger tree diameters, and the reestablishment of shade-intolerant species like western larch that provide high-quality structures important for nesting and foraging. The potential future risk for snag and coarse woody debris loss due to firewood gathering would increase with the proposed action, as long-term open road amounts would increase by 0.9 miles. Thus, minor adverse direct and indirect effects to snags and coarse woody debris would be anticipated that would affect habitat quality of wildlife species requiring these habitat attributes since: 1) harvesting would alter snags, snag recruitment trees, and coarse woody debris on 505 acres (16.1%), but levels of these habitat attributes in unharvested areas (69.9%) would remain unaltered; 2) snags and future recruitment trees would be retained in all proposed treatment areas; 3) open road access for firewood gathering would increase in the long-term by 0.9 miles; and 4) minor changes in habitat quality would be expected that could impact survival and/or reproduction of species associated with dead wood.

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

Snags and coarse woody debris would not be altered in the project area under this alternative. Past and ongoing forest management projects not associated with the proposed Fish Bull Face Timber Sale have affected snag and coarse woody debris used by wildlife in the project area, and other proposed projects could affect these habitat attributes in the future. No additional cumulative effects to habitat quality for wildlife species that utilize snags and downed woody debris are expected to result from the No-Action Alternative. Thus, no cumulative effects to wildlife associated with snags and coarse woody debris would be anticipated since: 1) no further harvesting would occur that could affect existing snag and coarse woody debris abundance; 2) no changes to human access for firewood gathering would occur, and 3) no change in habitat quality would occur that could affect wildlife species ability to survive and/or reproduce.

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

Some snags could be removed from the project area, whereas coarse woody debris material would remain similar. Lands within the cumulative effects analysis area have experienced different management policies through time, and snags and coarse woody debris have received different levels of consideration; in general, past harvesting on 810 acres (13.1% of the CEAA) has likely reduced these attributes. The reduction of snags associated with this alternative would be additive to the losses associated with past harvesting and any ongoing harvesting within the CEAA. However, the project requirements to retain 2 large snags and 2 large snag recruits per acre (greater than 21 inches dbh or next largest size class), and 4 to 25 tons of coarse woody debris per acre (depending upon habitat type) would mitigate additional cumulative effects associated with this project. Approximately 4,866 acres (78.7%) within the CEAA have not been recently harvested and likely contain moderate levels of snags and coarse woody debris. Under the Action Alternative, long-term open road amounts would increase by 0.9 miles; thus, risk of potential loss of snags and coarse woody debris resulting from firewood gathering would increase slightly. Wildlife species that rely on snags and coarse woody debris in the CEAA would be expected to persist at similar levels, albeit slightly lower numbers in proposed units following treatment. Thus, minor adverse effects to habitat quality for wildlife requiring snags and coarse woody debris would be anticipated that would affect the survival and/or reproduction of these species in the cumulative effects analysis area for 30 to 100 years since: 1) 505 acres of the CEAA would be harvested reducing snags and snag-recruit trees while coarse woody debris levels would not appreciably change; 2)

much of the CEAA (78.7%) would continue to provide snags and downed wood habitat attributes; 3) a minor increase in public access and associated firewood gathering would be anticipated; and 4) there would be increased representation of shade-intolerant tree species that could become high-quality snags in the long term.

## FINE-FILTER WILDLIFE ANALYSIS

In the fine-filter analysis, individual species of concern are evaluated. These species include those listed as threatened or endangered under the Endangered Species Act of 1973, species listed as sensitive by DNRC, and animals managed as big game by Montana DFWP. TABLE W-4 – FINE FILTER summarizes how each species considered was included in the following analysis or removed from further consideration, since either suitable habitat did not occur within the project area, or proposed activities would not affect their required habitat components.

**TABLE W-4 – FINE FILTER.** *Species considered in the fine-filter analysis for this proposed project.*

|                                   | SPECIES/HABITAT                                                                                                          | DETERMINATION – BASIS                                                                                                                                                                                                                                     |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Threatened and Endangered Species | Grizzly bear ( <i>Ursus arctos</i> )<br>Habitat: Recovery areas, security from human activity                            | <b>Included</b> – The proposed project area occurs in the Stryker and Krinklehorn Subunits of the Northern Continental Divide Ecosystem (NCDE) Recovery Area (USFWS 1993).                                                                                |
|                                   | Canada lynx ( <i>Felis lynx</i> )<br>Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zones    | <b>Included</b> – Potential lynx habitat types occur within the project area.                                                                                                                                                                             |
| Sensitive Species                 | Bald eagle ( <i>Haliaeetus leucocephalus</i> )<br>Habitat: Late-successional forest less than 1 mile from open water     | <b>No further analysis conducted</b> – There are no known nest territories in the vicinity of the project area. Thus, no direct, indirect, or cumulative effects to bald eagles would be expected to occur as a result of either alternative.             |
|                                   | Black-backed woodpecker ( <i>Picoides arcticus</i> )<br>Habitat: Mature to old burned or beetle-infested forest          | <b>No further analysis conducted</b> – No recently (less than 5 years) burned areas are in the project area. Thus, no direct, indirect, or cumulative effects to black-backed woodpeckers would be expected to occur as a result of either alternative.   |
|                                   | Coeur d'Alene salamander ( <i>Plethodon idahoensis</i> )<br>Habitat: Waterfall spray zones, talus near cascading streams | <b>No further analysis conducted</b> – No moist talus or streamside talus habitat occurs in the project area. Thus, no direct, indirect, or cumulative effects to Coeur d'Alene salamanders would be expected to occur as a result of either alternative. |

|                                                                                                                                             |                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Columbian sharp-tailed grouse (<i>Tympanuchus Phasianellus columbianus</i>)<br/>Habitat: Grassland, shrubland, riparian, agriculture</p> | <p><b>No further analysis conducted</b> – No suitable grassland communities occur in the project area. Thus, no direct, indirect, or cumulative effects to Columbian sharp-tailed grouse would be expected to occur as a result of either alternative.</p> |
| <p>Common loon (<i>Gavia immer</i>)<br/>Habitat: Cold mountain lakes, nest in emergent vegetation</p>                                       | <p><b>Included</b> – Loons have nested on Bull Lake and used Fish Lake in the past. Three proposed harvest units are within 500 feet of Fish and/or Bull lakes.</p>                                                                                        |
| <p>Fisher (<i>Martes pennanti</i>)<br/>Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian</p>               | <p><b>Included</b> – Potential fisher habitat occurs within the project area.</p>                                                                                                                                                                          |
| <p>Flammulated owl (<i>Otus flammeolus</i>)<br/>Habitat: Late-successional ponderosa pine and Douglas-fir forest</p>                        | <p><b>Included</b> – Potentially suitable dry Douglas-fir stands exist in the project area.</p>                                                                                                                                                            |
| <p>Gray Wolf (<i>Canis lupus</i>)<br/>Habitat Features: Ample big game populations, security from human activities</p>                      | <p><b>Included</b> – Wolf packs have used the vicinity of the proposed project area in the past and future wolf use of the area is likely.</p>                                                                                                             |
| <p>Harlequin duck (<i>Histrionicus histrionicus</i>)<br/>Habitat: White-water streams, boulder and cobble substrates</p>                    | <p><b>No further analysis conducted</b> – No suitable high-gradient stream or river habitats occur in the project area. No direct, indirect or cumulative effects to harlequin ducks would be expected to occur as a result of either alternative.</p>     |
| <p>Northern bog lemming (<i>Synaptomys borealis</i>)<br/>Habitat: Sphagnum meadows, bogs, fens with thick moss mats</p>                     | <p><b>No further analysis conducted</b> – No suitable sphagnum bogs or fens occur in the project area. Thus, no direct, indirect, or cumulative effects to northern bog lemmings would be expected to occur as a result of either alternative.</p>         |
| <p>Peregrine falcon (<i>Falco peregrinus</i>)<br/>Habitat: Cliff features near open foraging areas and/or wetlands</p>                      | <p><b>No further analysis conducted</b> – No suitable cliffs/rock outcrops occur in the project area. Thus, no direct, indirect, or cumulative effects to peregrine falcons would be anticipated as a result of either alternative.</p>                    |
| <p>Pileated woodpecker (<i>Dryocopus pileatus</i>)<br/>Habitat: Late-successional ponderosa pine and larch-fir forest</p>                   | <p><b>Included</b> – Potential suitable mature stands exist within the proposed project area.</p>                                                                                                                                                          |

|                  |                                                                                                  |                                                                                                                                                                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Townsend's big-eared bat<br>( <i>Plecotus townsendii</i> )<br>Habitat: Caves, caverns, old mines | <i>No further analysis conducted</i> – No suitable caves or mine tunnels are known to occur in the project area. Thus, no direct, indirect or cumulative effects to Townsend's big-eared bats are anticipated as a result of either alternative. |
| Big Game Species | Elk ( <i>Cervus canadensis</i> )                                                                 | <i>Included</i> – Year-round use by deer, elk, and moose is possible. Big game security habitat and winter range exist in the project area.                                                                                                      |
|                  | Moose ( <i>Alces americanus</i> )                                                                |                                                                                                                                                                                                                                                  |
|                  | Mule Deer ( <i>Odocoileus hemionus</i> )                                                         |                                                                                                                                                                                                                                                  |
|                  | White-tailed Deer ( <i>Odocoileus virginianus</i> )                                              |                                                                                                                                                                                                                                                  |

## THREATENED AND ENDANGERED SPECIES

### GRIZZLY BEAR

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

#### Introduction

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

#### Analysis Areas

Direct and indirect effects were analyzed for activities conducted within the 3,144-acre project area. Cumulative effects were analyzed in a 41,188-acre area (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS) that encompasses the project area and approximates the the home range size of a female grizzly bear in northwest Montana (*Mace and Roberts 2011*).

#### Analysis Methods

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

considered within this cumulative effects analysis area include availability of timbered stands for hiding cover, level of human disturbance, and miles of open, restricted, and temporary roads.

### Existing Environment

The proposed project area occurs in the Stryker and Krinklehorn subunits of the NCDE Recovery Area (USFWS 1993). There are 290 acres of Stillwater Block Class A lands within the proposed project area that are managed as "quiet areas" requiring special management under the DNRC HCP (USFWS and DNRC 2010). Grizzly bears have been observed in the vicinity of the project area in the past and continued use by bears is anticipated. The proposed project area contains habitat that grizzly bears would likely use during the non-denning period. Grizzly bear hiding cover is abundant within the proposed project area. The abundance of vegetative cover likely provides security for bears to freely move within the project area. Most stands harvested within the last 20 years (443 acres, 14.1%) within the project area contain scattered patches of dense regenerating conifers that currently break up sight distances and provide a limited amount of hiding cover for grizzly bears.

Managing human access is a major factor in management of grizzly bear habitat. Presently, open road density in the proposed project area is approximately 1.2 miles/sq. mile and total road density is 2.6 miles/sq. mile. Several occupied residences exist within the project area that could increase the possibility of human-bear interactions and subsequent management actions. Due to abundant hiding cover and low density of open roads, appreciable use of the project area by grizzly bears is possible.

The CEAA (Stryker Subunit) is a relatively intact, mostly undeveloped forested area with a variety of preferred grizzly bear habitats (avalanche chutes, berry fields, riparian areas). Ownership of the Stryker Subunit is 81% DNRC, 18% USDA Forest Service, and 1% private. Forest stands that provide hiding cover persist on over half of the CEAA (>20,500 acres). Forest habitats across the cumulative effects analysis area are a combination of age classes, ranging from recently harvested stands to mature stands. Roughly 11% of the CEAA (4,617 acres) has been harvested within the last 40 years and consists of young stands with regenerating trees. Ongoing timber sale projects within the CEAA (i.e. Duck to Dog and Olney Urban Interface) are sources of disturbance and are currently altering grizzly bear habitat. The proposed Mystery Fish Timber Sale project could also reduce hiding cover, increase open road densities, and elevate temporary disturbance levels within the CEAA. Reductions in vegetative cover, such as those associated with timber harvest, can lower effective bear use of habitat and render bears more vulnerable to human-caused mortality (Seroheen *et al.* 1999). Human disturbance levels and level of forest harvesting are both closely tied to road access. Open road density within the CEAA is approximately 0.9 miles/sq. miles. Roads present in the cumulative effects analysis area are primarily a result of past timber management activities, but also include roads used to access USDA Forest Service and privately-owned lands.

### Environmental Effects

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

No direct effects to grizzly bears would be expected. No changes in open-road densities or hiding cover described under existing conditions would be anticipated. No changes to the level of disturbance to grizzly bears would be anticipated. Thus, since no changes in available habitats or level of human disturbance would be anticipated, no direct or indirect effects to grizzly bear displacement or mortality risk would be anticipated.

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

Grizzly bear hiding cover would be reduced for 10 to 20 years on approximately 505 acres (16.1%) under the Action Alternative. Harvesting associated with the Action Alternative would increase sight distances within proposed harvest units, particularly within 251 acres of harvest units that would receive regeneration silvicultural prescriptions. Existing dense patches of regenerating conifers, neighboring mature forest patches, and topographic breaks would be maintained in such a manner that no point in any harvest unit would be greater than 600 feet to screening cover. Some hiding cover would likely remain present in 254 acres of harvest units with intermediate treatment prescriptions, although at a reduced level. Current levels of patchy cover in the form of brush, shrubs, and sub-merchantable trees would be retained where present and feasible in 505 acres of harvest units. Existing riparian cover along 12.2 miles of Class 1 and 2 streams would be largely protected and offer movement corridors as well as hiding cover for bears in this preferred habitat. Approximately 117 acres of Stillwater Block Class A lands would undergo harvest; harvesting would occur for less than 30 days during the non-denning season to decrease disturbance to grizzly bears, should any be present in the area. Visual screening along open roads would be maintained (where present) to reduce the likelihood of bear detection or accidental/intentional bear mortality. Levels of hiding cover would be expected to recover within 10-20 years following proposed treatments as shrub and tree regeneration proceeds. Should grizzly bears be present in the area at the time of harvest operations, they could be affected by increased road traffic, noise, and human activity, and by altered amounts of hiding cover and forage resources. Proposed activities in grizzly bear habitats would reduce grizzly bear security, possibly resulting in increased stress and/or energy expenditure to endure the disturbance or to move from the area, should they be present. These disturbances would only occur during harvesting operations (1 to 4 years). Contract requirements would assist in mitigating bear-human conflict risk by specifying that contractors are not permitted to carry firearms on the work site and that unnatural attractants must be kept/disposed of in a bear-resistant manner. Restrictions on motorized use in spring and commercial harvest restrictions would apply to 401 acres of proposed harvest, which would minimize bear disturbance during the spring period (April 1 to June 30). Commercial harvest on the remaining acres would be regulated by soil moisture contract stipulations, which would likely limit harvest activities during most or all of the same seasonal period.

Motorized activities associated with the Action Alternative, such as the use of restricted roads and the construction of new roads, could affect grizzly bears by temporarily (1-4 years) displacing them from previously secure areas. See TABLE W-2 – ROAD MANAGEMENT AND CONSTRUCTION for road summaries. Approximately 1.5 miles of permanently open road would be built, 0.2 miles of existing restricted road would be permanently opened, and 0.8 miles existing open road would be closed under the Action Alternative, for a net open road gain of 0.9 miles. The use of 4.0 miles of existing restricted roads and construction of 2.1 miles of new temporary road would increase motorized vehicle activity during the non-denning season for up to 4 years. Functionally, the use of existing and new restricted roads and temporary roads would contribute to open road density in the short term (1 to 4 years); increasing potential for disturbance to grizzly bears. All 4.3 miles of restricted roads (both existing and new), that would be used temporarily for 1 to 4 years to complete proposed project activities, would be closed in a manner to prohibit public motorized access during and after the proposed activities. Including temporary roads, functional open road amounts could increase temporarily from 6.0 miles (density 1.2 miles/sq. mi.) up to 14.2 miles (density 2.9 mi./sq. mi.) during project operations. Public motorized access would only be allowed on the 6.0 miles of existing open road during proposed activities and 6.9 miles of open road following proposed activities.

Thus, low to moderate adverse direct or indirect effects to grizzly bears in the project area would be expected since: 1) low to moderate levels of temporary (1 to 4 years) disturbance and displacement would

be anticipated; 2) hiding cover on 505 acres (16.1%) would be reduced in the short term, but would be expected to recover fairly rapidly; 3) reductions in hiding cover would be mitigated through vegetation retention patches within units, vegetation retention along riparian corridors, and visual screening along open roads; 4) commercial harvest and motorized activities would be restricted during the spring period; 5) commercial harvest and motorized activities would occur less than 30 days during the nondenning period in affected Class A Lands; and 6) short-term increases in functional open road densities from 1.2 miles/sq. mi. to 2.9 miles/sq. mi. would be anticipated and long-term open road density would increase from 1.2 miles/sq. mi. to 1.4 miles/sq. mi.

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

No cumulative effects to grizzly bears would be expected. No cumulative changes to the level of disturbance to grizzly bears or secure areas would be anticipated. No cumulative changes in open-road densities or hiding cover from the existing conditions would be anticipated. Past and ongoing forest management projects not associated with the proposed Fish Bull Face Timber Sale have affected grizzly bear habitat in the project area, and other proposed projects (e.g. Mystery Fish Timber Sale) could alter grizzly bear habitat and/or disturb bears in the future. Thus, since no additional changes in available habitats or level of human disturbance would be anticipated as a result of the No-Action Alternative, no cumulative effects to grizzly bear displacement or effects involving mortality risk would be anticipated.

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

The increased use of road systems during the proposed project would temporarily increase human disturbance and displacement risk for grizzly bears within a portion of the cumulative effects analysis area, should they occur near portions of the project area where activities would occur. Collectively, short-term (1 to 4 years) increases in human disturbance would be anticipated in the area, but contract requirements would lessen risk of human-bear conflicts during active harvest operations (i.e. proper storage/disposal of unnatural attractants, prohibit possession of firearms etc.). Reductions in forest cover on 505 acres (1.2%) and anticipated elevated disturbance levels would be additive to past timber harvesting that has affected approximately 4,617 acres (11.2%), and currently proposed harvest projects (i.e. Mystery Fish Timber Sale). Harvesting and road building within the last 40 years in the cumulative effects analysis area has altered grizzly bear cover and habitat connectivity, however 32.0% (13,176 acres) of the area would remain in mature forest possessing  $\geq 40\%$  canopy cover in the overstory. Continued use of the cumulative effects analysis area by grizzly bears would be anticipated. Mature stands and young, fully stocked stands that likely provide hiding cover make up approximately 24,589 acres (59.7%) of the CEAA. Early successional stages of vegetation occurring in harvest units provide foraging opportunities that do not exist in some mature stands across the cumulative effects analysis area. A short-term increase in open road density would occur, increasing from 0.8 mi/sq. mi. to 1.0 miles/sq. mile. Long-term open road densities would change from 0.8 mi/sq. mi. to 0.9 mi/sq. mi. with the proposed reroute of the Fish Lake access road. Long-term density of all roads within the CEAA would increase from 1.91 miles/sq. mile to 1.92 miles/sq. mile. Disturbance associated with temporarily accessed roads would be additive to that occurring on roads used for other ongoing forest management projects (e.g. Duck to Dog and Olney Urban Interface) and the proposed Mystery Fish Timber Sale within the CEAA. Within the CEAA, high-risk factors for bears (i.e. pets, livestock, garbage, etc.) would continue to be present at relatively low levels. Thus, since: 1) short-duration (1 to 4 year) increases in human disturbance levels would be expected within the cumulative effects analysis area, 2) hiding cover would be removed in the short-term (~10 years) on a small portion (1.2%) of the CEAA, but would be expected to recover fairly rapidly, 3) a large portion (>50%) of the CEAA contains hiding cover, and 4) a minor increase in long-term open road density would occur; minor adverse cumulative effects to grizzly bear displacement or effects involving mortality risk would be expected in the short term (1-4 years) and long term (10-20 years).

## CANADA LYNX

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

### Introduction

Canada lynx are listed as "threatened" under the Endangered Species Act. Canada lynx are associated with subalpine fir forests, generally between 4,000 to 7,000 feet in elevation in western Montana (Ruediger et al. 2000). Lynx abundance and habitat use are strongly associated with snowshoe hare populations; thus, activities which decrease habitat quality for snowshoe hares can reduce the availability of prey for lynx. Lynx habitat in western Montana consists primarily of stands that provide habitat for snowshoe hares including dense, young and mature coniferous stands (Squires et al. 2010). Forest type, stem densities, natural disturbance history, and time since harvesting play important roles in shaping the suitability of young foraging habitat for lynx. Mature subalpine fir stands with abundant horizontal cover and coarse woody debris also provide structure important for foraging, denning, travel, and security. These conditions are found in a variety of habitat types (Pfister et al. 1977), particularly within the subalpine fir types. Historically, northwest Montana contained a variety of stand types with differing fire regimes. This variety of stand types combined with patchy elevation and snow-depth gradients preferred by lynx, likely formed a non-continuous mosaic of lynx and non-lynx habitats (Fischer and Bradley 1987, Ruggiero et al. 1999, Squires et al. 2010). Forest management considerations for lynx include providing a mosaic of young and mature lynx habitats that are well connected across the landscape..

### Analysis Areas

Direct and indirect effects were analyzed for activities conducted within the 3,144-acre project area. The cumulative effects analysis area consisted of the 39,240 acre Stillwater West Lynx Management Area (see FIGURE W-1- WILDLIFE ANALYSIS AREAS), which approximates the home range size of a Canada lynx. Lynx Management Areas (LMA) are designated portions of DNRC land "where resident lynx populations are known to occur or where there is a high probability of periodic lynx occupancy over time," (USFWS and DNRC 2010, Vol. II, p. 2-46).

### Analysis Methods

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

### Existing Environment

Approximately 2,362 acres (75.1%) of potential lynx habitat occurs in the 3,144 acre project area. Of this habitat, 2,075 (87.8%) are currently providing suitable habitat (TABLE W-5 – LYNX HABITAT). Suitable lynx habitat within the project area is defined as the sum of the summer foraging, winter foraging, and

other suitable lynx habitat categories. In the project area, winter foraging habitat is the most abundant type of suitable habitat (*TABLE W-5 – LYNX HABITAT*). Amounts of coarse woody debris were quantitatively assessed within the project area and found to be generally appropriate for the habitat types present (see *SNAGS AND COARSE WOODY DEBRIS* section of this analysis for further detail). Additionally, riparian areas are present within the proposed project area that provide a number of potential travel corridors for lynx, should they be present in the area. Past harvesting of 442 acres (14.1%) within the proposed project area has altered lynx habitat, however many of these acres (208 acres) received intermediate treatments or have regenerated enough to become suitable habitat for lynx. Throughout the project area, habitat and connectivity conditions are favorable for potential lynx use.

Canada lynx have been documented within the cumulative effects analysis area in the past (*DNRC unpublished data, and MNHP 2011*). Land owners in the CEAA are DNRC (99%) and various private owners (1%). Habitat types preferred by lynx are abundant within the CEAA (*TABLE W-5 – LYNX HABITAT*). The distribution of the various lynx habitat elements on DNRC-managed lands is the result, primarily, of past natural disturbances, past timber harvesting and the general lack recent wildfire. The lack of recent fire disturbance in the CEAA (influenced by modern-day fire suppression) has likely led to a smaller proportion of young foraging habitat and a greater proportion of mature foraging habitat or forested travel/other habitats on DNRC lands than what was typically present pre-European settlement (*Losensky 1997*). Suitable habitat is well connected within the CEAA. Timber harvesting on 7,209 acres (18.4%) within the CEAA in the last 40 years has altered lynx habitat, however those harvest units older than 20 years are now providing suitable summer foraging or other suitable habitat.

**TABLE W-5 – LYNX HABITAT.** Estimates of existing lynx habitat and habitat that would persist post-harvest on DNRC lands in the project area and cumulative effects analysis area. Percent refers to the percent of the lynx habitat category of the total potential habitat<sup>a</sup> present on DNRC-managed lands.

| LYNX HABITAT<br>CATEGORY         | Acres of lynx habitat<br>(percent of DNRC lynx habitat) |                    |                                  |                     |
|----------------------------------|---------------------------------------------------------|--------------------|----------------------------------|---------------------|
|                                  | Project Area                                            |                    | Cumulative Effects Analysis Area |                     |
|                                  | Existing                                                | Post-Harvest       | Existing                         | Post-Harvest        |
|                                  | OTHER SUITABLE                                          | 301.8<br>(12.8%)   | 519.8<br>(22%)                   | 4,127.7<br>(11.6%)  |
| SUMMER FORAGE                    | 816.1<br>(34.5%)                                        | 643.1<br>(27.2%)   | 6,486.1<br>(18.3%)               | 6,313.1<br>(17.8%)  |
| TEMP NON-SUITABLE                | 287.6<br>(12.2%)                                        | 400.6<br>(17%)     | 4,590.7<br>(12.9%)               | 4,703.7<br>(13.2%)  |
| WINTER FORAGE                    | 957.2<br>(40.5%)                                        | 799.2<br>(33.8%)   | 20,334.0<br>(57.2%)              | 20,176.0<br>(56.8%) |
| TOTAL - Suitable Lynx<br>Habitat | 2,075.1<br>(87.8%)                                      | 1,962.1<br>(83.0%) | 30,947.8<br>(87.1%)              | 30,834.8<br>(86.8%) |

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

### Environmental Effects

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

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

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

Approximately 375 acres (18.1%) of suitable lynx habitat would be subject to harvesting with this alternative. Activities associated with active logging operations could temporarily displace any lynx using the area for 1 to 4 years. Proposed regeneration harvest prescriptions on 113 acres of suitable lynx habitat would decrease mature tree abundance to 6 to 25 trees per acre and reduce overstory crown

closure to <15%. These 113 acres of suitable lynx habitats inside harvest units would be converted to temporary non-suitable habitat (TABLE W-5 – LYNX HABITAT) for the next 10 to 20 years. Approximately 262 acres of suitable lynx habitats within harvest units receiving intermediate treatments (i.e. commercial thin) would be converted to, or remain as, “other suitable” lynx habitat. In the short term, lynx would likely avoid the 113 acres of regeneration harvested area, whereas 262 acres undergoing intermediate harvest prescriptions could receive potential use by lynx as travel/other habitat. Where operationally feasible, existing patches of shade-tolerant regenerating and sub-mechantable conifers would be retained. The total area of these patches would not be expected to comprise more than 10% of the acres proposed for harvest. Growth of retained mature trees and patches of sapling to pole-sized conifers, combined with post-harvest conifer regeneration following harvest, would lessen the time logged stands would be temporarily unsuitable for lynx. Following proposed logging in the project area, 1,962 acres (83.0%) of suitable lynx habitat would remain within the project area. Summer forage and winter forage habitats would decrease by 7.3% and 6.7% respectively, while stands in the other suitable habitat class would increase by 9.2% (TABLE W-5 – LYNX HABITAT). Suitable lynx habitat would be largely retained along perennial streams in the project area, and thus provide habitat connectivity from the lower elevation portions of the project area up to the crest of Stryker Ridge. Changes in lynx habitat suitability in the project area would not be expected to appreciably alter lynx movement patterns, should lynx be present. In the proposed harvest units, 4 to 25 tons/acre of coarse woody debris would be retained to provide horizontal cover and security structure for lynx and lynx prey, although lynx would not be expected to use regeneration-treated harvest units appreciably for 10-20 years. Collectively, since: 1) the amount of existing suitable lynx habitat in the project area would be reduced by 4.8%, nonetheless the majority (83.0%) would remain suitable (TABLE W-5 – LYNX HABITAT); 2) suitable lynx habitats would likely develop in the next 10 to 20 years in the project area; 3) coarse woody debris and patches of regenerating conifers would be retained to promote forest structural complexity in harvest units, expediting their growth back into suitable lynx habitat; and 4) moderate levels of landscape connectivity would persist despite an overall slight reduction in landscape connectivity, minor adverse direct and indirect effects to habitat suitability for Canada lynx would be expected.

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

No appreciable change in lynx habitats would occur under this No-Action Alternative and no further changes in landscape connectivity would be anticipated. Past and ongoing forest management projects not associated with the proposed Fish Bull Face Timber Sale have affected lynx habitat in the project area, and other proposed projects (e.g. Mystery Fish Timber Sale) could alter lynx habitat in the future. No additional cumulative effects to suitable lynx habitat are expected to result from the No-Action Alternative that could affect lynx habitat suitability in the CEAA. Thus, no cumulative effects to lynx habitat suitability would be expected to occur.

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

Under the Action Alternative, approximately 505 acres (1.3%) of the 39,240-acre cumulative effects analysis area would be altered by harvesting. Of these acres, harvesting would affect 375 acres of currently suitable lynx habitat. Following proposed harvesting, the CEAA would contain 30,835 acres (86.8%) of suitable lynx habitat (TABLE W-5 – LYNX HABITAT). Minor expected reductions in suitable lynx habitat and increases in temporary nonsuitable habitat in the proposed harvest units would not be expected to appreciably alter lynx use of the CEAA, particularly given that habitat suitability is high in the surrounding landscape. Following treatments, connectivity of suitable lynx habitat would also be maintained along riparian areas and features frequently used by lynx during daily movements (i.e. forested saddles, ridges etc.). Suitable lynx habitat within the CEAA is being altered by the ongoing

Duck to Dog, and Olney Urban Interface, Lupfer 3, and Highway 93 timber sales, and could be altered within next 5 years by the proposed Mystery Fish Timber Sale. Increased levels of motorized activities associated with the Action Alternative would be additive to current and proposed timber sales, which could temporarily displace lynx should they be present near the proposed project area and associated roads. Thus, since: 1) overall baseline habitat suitability and connectivity for lynx would remain high; 2) existing suitable lynx habitat on DNRC lands would be reduced by 0.3% in the cumulative effects analysis area and those areas would remain unsuitable for at least 10 years, but stands converted to temporary non-suitable habitat in old logging units would also continue maturing and developing into suitable habitat within the CEAA in the absence of natural disturbance; 3) habitat connectivity within the CEAA would be minimally affected by proposed activities, and 4) lynx could be temporarily displaced by logging activities in the CEAA, minor adverse cumulative effects to lynx habitat suitability would be expected as a result of proposed activities.

## SENSITIVE SPECIES

When conducting forest-management activities, the SFLMP directs DNRC to give special consideration to sensitive species. These species may be sensitive to human activities, have special habitat requirements, are associated with habitats that may be altered by timber management, and/or, could become listed under the *Federal Endangered Species Act* if management activities result in continued adverse impacts. Because sensitive species usually have specific habitat requirements, consideration of their needs serves as a useful 'fine filter' for ensuring that the primary goal of maintaining healthy and diverse forests is met. A search of the *Montana Natural Heritage Database* was used to locate historical records of sensitive species (as shown in TABLE W-4 – FINE FILTER) in the vicinity of the project area.

## COMMON LOON

**Issue:** Timber harvesting and associated activities could disturb and displace common loons from nest sites and preferred feeding areas, which could result in reduced recruitment of chicks.

### Introduction

The common loon is a large, aquatic bird that preys primarily on fish, but will also consume frogs, salamanders, snails, leeches, and aquatic insects. Loons are highly territorial, and typically only one pair nests on a small to mid-size lake. Nests can be located on small islands, partially submerged logs, or on floating mats of herbaceous vegetation. Loons are poorly adapted to living out of the water; therefore nests are generally located where they can slip directly from the nest into the water. Loons are sensitive to human disturbance and are usually associated with water bodies influenced by low levels of human activity. Human disturbance during the nesting and early chick-rearing period (mid-April thru mid-July) could lead to nest failures if the adults are disturbed and leave the nest unattended for even short periods of time. Adverse impacts that can affect reproduction of loons include direct loss of nesting and nursery habitat, and loss of young to avian predators such as bald eagles. However, loon reproduction can be seriously affected by recreational disturbance caused by humans (*Paugh 2006, Kelly 1992, Croskery 1991, Titus and VanDruff 1981*).

### Analysis Area

Direct, indirect, and cumulative effects were analyzed within a 500-ft buffer of the shoreline of Bull and Fish lakes (319 acres, FIGURE W-1- WILDLIFE ANALYSIS AREAS). Since loons are almost exclusively dependent upon water, this area is capable of supporting 1 to 2 pairs of loons.

### Analysis Methods

Effects were analyzed using a combination of field evaluations and aerial photograph interpretation. Factors considered include level of shoreline disturbance, relative level of recreational pressure on the lakes, and available nesting habitat.

### Existing Conditions

Bull Lake is 107 acres in size and entirely surrounded by DNRC land. Fish Lake is 32 acres in size and surrounded by DNRC land on three sides and private land on one side. Approximately 16.3 acres of private land are situated within 500 feet of the northwest portion of Fish Lake, including roughly 1,323 feet of shoreline. Common loons have been documented on Bull and Fish lakes in the past. Historically, these two lakes combined have contained 1 to 2 pairs of loons and breeding loons have been consistently recorded nesting on Bull Lake. Loon nesting on Bull Lake has typically occurred on an artificial floating nest platform installed in the southern half of the lake. No loon nesting has been documented on Fish Lake in recent years; the breeding pair at Bull Lake has been observed using Fish Lake as an additional foraging lake (*Christie Ferruzzi, USFS, pers. comm., Feb. 2012*). Nesting loons at Bull Lake have been generally successful at fledging young.

As both of these lakes have relatively undeveloped shorelines, recreationalists (primarily anglers) are likely the greatest risk factor causing disturbance of breeding loons. Shoreline recreation is limited by thick vegetation and steep shores in most places. People fishing from boats on Fish and Bull lakes may periodically disturb loons, although cooperators and volunteers (e.g. USFS, Montana Loon Society) place signage on these lakes asking recreationalists to keep their distance from nesting areas. The existing Fish Lake access road, which also provides access to the southern end of Bull Lake, is currently in poor condition and likely discourages access by recreationists that do not have high-clearance 4-wheel drive vehicles. Development on private land next to Fish Lake has altered approximately 6.5 acres (2.0%) within 500 feet of the lake and 340 feet of shoreline.

### Environmental Effects

#### **Direct, Indirect and Cumulative Effects of the No-Action Alternative on Common Loons**

No direct, indirect, or cumulative effects that would affect loon disturbance levels or their productivity would be expected. Past forest management projects not associated with the proposed Fish Bull Face Timber Sale may have affected loons in the project area, and other proposed projects could affect loon habitat and/or disturbance levels in the future. Human disturbance along the shoreline would continue at similar levels. No changes in human access or recreational use would be anticipated. Thus, no direct, indirect, or cumulative effects to common loons would be anticipated in the project area since: 1) no changes in shoreline disturbance would be anticipated; 2) levels of human recreational use of available loon habitats would not change; and 3) no changes to available loon nesting habitat or productivity would be expected.

#### **Direct, Indirect, and Cumulative Effects of the Action Alternative on Common Loons**

Proposed harvest operations would harvest up to 34.1 acres (11.0%) of uplands within 500 feet of Fish and Bull lakes. Proposed harvest could increase sight distances and the associated potential for disturbance to loons, however harvest units would not be placed within 200 feet of the Bull Lake shoreline or 70 feet of the Fish Lake shoreline. Limited harvesting would occur within 70 feet of Fish Lake for a very short length of shoreline, otherwise harvest units would be situated more than 100 feet from the shoreline. Proposed harvesting would alter approximately 3.1 acres of forest within 500 feet of

Bull Lake and 31 acres within 500 feet of Fish Lake, primarily using partial harvest commercial thinning treatments. Thus, vegetation along the lakeshores and potential nesting habitat would not be appreciably altered. Prescribed tree retention levels would not likely affect potential nesting habitats on these lakes as retention levels would be fairly high and would minimize the potential for sediment delivery to the lake. For the duration of the project, construction of permanent roads or structures and mechanized activity within 500 feet of nest sites would be restricted from April 15 to July 15 each year to protect loons (*ARM 36.11.441*). Proposed harvesting would occur more than 0.5 miles from the most recently used nest site, and future nesting would be monitored to determine if the pair moves their nest closer to the proposed units. Most of the existing Fish Lake access road would be reclaimed to a foot trail, and a new usable road prism would be rerouted 150 to 600 feet away from Fish Lake to reduce the risk of sediment delivery. New construction and reconstruction of the rerouted Fish Lake access road would move the majority of this open road farther away from the shoreline of Bull Lake, however existing points of access for launching small boats on both Fish and Bull lakes would be maintained. Under the Action Alternative, the newly constructed Fish Lake access road would be suitable for vehicle types (not only 4 wheel drive) and could increase human access to the lake and potential disturbance to loons by recreationists. No permanent roads or developments would occur within 500 feet of any known nest sites. Should a pair of loons establish a nest closer to the proposed units or proposed permanent road location, additional mitigation measures would be developed prior to harvesting to minimize effects to nesting loons. Disturbance levels and recreational use of Bull Lake associated with private land at the north end of Bull Lake would persist. The proposed activities under this action would be additive to any future timber management within the CEAA and sources of disturbance originating from private land. Thus, minor direct and indirect effects to common loons in the project area would be anticipated since: 1) short-term disturbance would occur within 500 feet of Bull and Fish Lakes, however no appreciable changes in shoreline disturbance or vegetation would be anticipated; 2) the current loon nest location is over 0.5 miles from proposed harvest units; 3) no changes to available nesting habitat would be expected; 4) levels of human recreational use of available loon habitats could increase with an improved road system; and 5) additional mitigations would be enacted to reduce disturbance should loon nesting occur within 500 feet of proposed harvest units.

## **FISHER**

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

### **Introduction**

Fishers are generalist predators that prey upon a variety of small mammals and birds, as well as snowshoe hares and porcupines. They also eat carrion and seasonally available fruits and berries (*Foresman 2001*). Fishers use a variety of successional stages, but are disproportionately found in low to mid elevation mature stands with dense canopies (*Powell 1982, Johnson 1984, Jones 1991, Heinemeyer and Jones 1994*), and they avoid openings or young forested stands (*Buskirk and Powell 1994*). However, some use of openings does occur for short hunting forays or if sufficient overhead cover (shrubs, saplings) is present. Fishers appear to be highly selective of stands that contain resting and denning sites and tend to use areas within 150 feet of water (*Jones 1991*). Resting and denning sites are found in cavities of live trees and snags, downed logs, brush piles, mistletoe brooms, squirrel and raptor nests, and holes in the ground. Forest management considerations for fisher involve maintaining legacy snags and coarse

woody debris and providing for resting and denning habitats near riparian areas while maintaining travel corridors.

### *Analysis Areas*

Direct and indirect effects were analyzed for activities conducted within the 3,144-acre project area. Cumulative effects for fisher habitat were analyzed on the Stryker grizzly BMU Subunit and 330 acres of adjacent DNRC lands, for a total CEAA of 41,188 acres (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS).

### *Analysis Methods*

To assess potential fisher habitat and travel cover on DNRC managed lands in the cumulative effects analysis area, sawtimber stands within preferred fisher cover types (ARM 36.11.403(60)) below 6,000 feet in elevation with 40 percent or greater canopy closure were considered potential fisher habitat. DNRC manages preferred fisher cover types within 100 feet of Class 1 and 50 feet of Class 2 streams, so that 75 percent of the acreage (trust lands only) would be in the sawtimber size class in moderate to well-stocked density (ARM 36.11.440(1)(b)(i)). Fisher habitat was further divided into upland and riparian-associated areas depending upon the proximity to Class 1 and Class 2 streams (ARM 36.11.403(15) and (16)). Direct and indirect effects were analyzed using field evaluations and GIS analysis of potential habitat. Cumulative effects were analyzed using field evaluations, GIS analysis of potential habitat, and aerial photograph interpretation of potential habitat on all other lands within the CEAA. Potential suitable fisher habitat on non-DNRC lands was considered to be mature forest with  $\geq 40\%$  crown closure generally below 6,000 feet in elevation. Snags and coarse woody debris were assessed using sampling plot data, site visits and by reviewing past DNRC harvesting information. Factors considered within by this analysis include the level of harvesting, number of snags, relative amounts of coarse woody debris, and risk level of firewood harvesting and trapping mortality.

### *Existing Environment*

The proposed project area ranges from 3,440 and 5,480 feet in elevation. The proposed project area contains roughly 824 acres (26.2%) of suitable fisher habitat. Approximately 50 acres of suitable fisher habitat are within 100 feet of Class 1 streams and 33 acres are within 50 feet of Class 2 streams. Snags and coarse woody debris were quantified at sampling plots within proposed harvest units and were generally found to be within levels recommended by Graham et al. (1994) for the habitat types present (see WILDLIFE- SNAGS AND COARSE WOODY DEBRIS). Suitable fisher habitat that provides good habitat connectivity occurs along most of the perennial streams in the project area. Within uplands on the project area, suitable fisher habitat is scattered, but provides structural features necessary for use as fisher travel habitat. Open roads facilitate firewood gathering, which can affect the abundance of snags and coarse woody debris used by fishers. Roads near streams can also offer trappers convenient access to forested riparian areas, which increase trapping risk to fishers should they be using the area. There are 6.0 miles of open road (1.2 miles per square mile) within the project area. Because of steep terrain and dense forest conditions, gathering of snags and coarse woody debris by firewood cutters is likely limited to within 200 feet of open roads. Open roads cross 6 perennial streams containing fisher habitat, although snow machines could be required to access 4 crossings during typical winter conditions. The majority of stream miles within the proposed project area are  $>300$  feet from open roads and are on steep terrain; discouraging trapper access and decreasing the risk of trapping mortality. Overall, fisher habitat suitability and connectivity within the project area is moderate and risk factors are low.

There is a single historical record of fisher occurring in the cumulative effects analysis area within the last 50 years (MNHP 2011). Several additional occurrences of fisher have been recorded within 3 miles of the CEAA. Within the CEAA on 33,233 acres of DNRC lands, there are 10,274 acres (30.9%) of moderately or well-stocked suitable fisher cover types (TABLE W-6 – FISHER HABITAT). Of this habitat, approximately 1,028 acres (10.0%) would be considered riparian fisher habitat. Approximately 68 miles of Class 1 and 70 miles of Class 2 streams occur on lands within the CEAA. Mature forested areas adjacent to these streams within non-DNRC lands (234 acres) could contribute to the total riparian fisher habitats in the cumulative effects analysis area (1,262 acres total). Approximately 234 acres of mature, forested habitat with >40% crown closure are within 100 feet of perennial streams and 50 feet of intermittent streams on non-DNRC lands in the CEAA, while the remaining stream reaches are located in recently harvested, mature open-canopy forest, or non-forested (i.e. burned, rock/scree) areas. The majority of Class 1 and 2 streams within the CEAA (below 6,000 feet elevation) have accompanying riparian vegetation that would facilitate fisher travel, and contribute to habitat suitability and connectivity. Roughly 809 acres (1.9%) of mature (>40% canopy) forest on non-DNRC lands within the CEAA provide additional upland fisher habitats, however it is possible that some of these acres are in cover types not preferred by fishers. Including riparian and upland habitat, potential suitable fisher habitat within the CEAA totals approximately 14,606 acres (35.5%). Within the CEAA, past harvesting has influenced mature crown closure, snags and coarse woody debris levels on about 4,617 acres (11.2%). Within the cumulative effects analysis area there is a network of existing open roads (0.9 mi/sq. mile) that facilitates trapper access, although most are not plowed, which limits motorized vehicle use during typical winter conditions. Collectively, habitat suitability for fishers within the CEAA is moderate.

### Environmental Effects

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

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

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

Approximately 198 acres of the 824 acres (24.0%) of suitable fisher habitat in the project area occurs in proposed harvest units (TABLE W-6 – FISHER HABITAT). All of these acres possess structural attributes necessary to be considered potentially suitable habitat for fishers. Approximately 73 acres of suitable upland fisher habitat within the project area harvest units would receive regeneration treatments that would likely yield stands too sparsely forested for appreciable fisher use for 50-80 years. An additional 122 acres of upland fisher habitat would receive intermediate silvicultural prescriptions that would reduce crown closure, snags, and woody debris. These 122 acres would not likely receive appreciable fisher use for 10 to 30 years. Adjacent to Class 1 and 2 streams, no harvesting in riparian areas would occur within 50 feet of the stream. Outside of this 50 foot buffer, up to 50% of trees by size and species would be harvested on 3 acres (3.7%) of existing suitable fisher riparian habitat. These three acres of riparian fisher habitat would undergo a minor reduction in habitat suitability. Approximately 79 acres (96.4%) of riparian fisher habitat would remain unharvested in the project area. In all areas, harvest prescriptions call for retention of 2 snags and 2 snag recruits per acre (>21 in. dbh) where they exist, otherwise the next largest size class. Also 4 to 25 tons of coarse woody debris per acre would be planned

for retention within the proposed units. While the proposed harvest may reduce density of snags and their recruits in the near future, the sustainability of snags in the area will be maintained by retention of appreciable numbers of leave trees and snag recruitment trees. Prescriptions call for retention of large, dominant trees in the project area; further improving the development and sustainability of large snags. These large snags and trees could be a source for fisher denning and resting sites in the future when intensively harvested stands regenerate and develop mature stand characteristics (40-80 years).

Approximately 608 acres of riparian and upland preferred fisher cover types that currently do not provide ample structural attributes found in suitable fisher habitat would continue maturing and could provide suitable habitat in the next 15 to 40 years. Proposed alterations to roads within the project area would increase long-term open road density from 1.2 to 1.4 miles/sq. mile, however the reroute of the Fish Lake access road and reclamation of the existing open road would reduce motorized access directly adjacent to 1,200 feet of Class 1 stream in suitable fisher habitat. As a result of these proposed road changes, fisher mortality risk due to trapping would be expected to decrease and negligible reductions of snags/coarse woody debris due to firewood gathering would be anticipated. Thus since: 1) harvesting would remove a minor amount of suitable riparian (2.1%) and upland (26.3%) fisher habitat in the project area, 2) minor reductions in habitat connectivity would occur and riparian fisher habitat would be maintained, and 3) overall risk factors associated with motorized human access levels would not appreciably change, minor adverse direct and indirect effects would be anticipated that would affect fisher habitat suitability in the project area.

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

No effects to riparian or upland fisher habitats on DNRC-managed lands would be expected as no timber harvesting activities would occur under the No-Action Alternative. Also, no changes to landscape connectivity within the cumulative effects analysis area would be expected. Past and ongoing forest management projects not associated with the proposed Fish Bull Face Timber Sale have affected fisher habitat in the project area, and other proposed projects (e.g. Mystery Fish Timber Sale) could alter fisher habitat suitability in the future. No additional cumulative effects are expected to result from the No-Action Alternative that could affect fisher habitat suitability in the CEAA. Thus, no further cumulative effects to fisher habitat suitability would be anticipated in the cumulative effects analysis area since: 1) no changes to existing habitats on DNRC ownership would occur; 2) landscape connectivity afforded by the stands on DNRC ownership would not change; 3) no changes to canopy cover, snags, snag recruits, or coarse woody debris levels would be expected; and 4) no changes to human access or potential for trapping mortality would be anticipated..

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

Approximately 198 acres (1.9%) of 10,274 acres of suitable fisher habitat in the 41,188-acre CEAA would be harvested. Of these proposed acres, 3.0 (0.3%) of 1,028 acres of suitable fisher riparian habitat would be harvested. These reductions would be additive to the losses associated with past and current timber harvesting in the cumulative effects analysis area, including the Duck to Dog, Olney Urban Interface, and proposed Mystery Fish timber sales. Future harvest operations on non-DNRC ownerships could affect fisher habitat on the larger landscape. Approximately 10,075 acres of the 41,188-acre CEAA (24.5%) would remain in suitable habitat (TABLE W-6 – FISHER HABITAT). Negligible reductions in landscape connectivity within the cumulative effects analysis area would occur; suitable forest stands along the majority of riparian areas would persist. Human access and potential trapping mortality would be minimally influenced and would be expected to return to pre-harvest levels following treatment. Thus, minor adverse cumulative effects would be anticipated that would affect fisher habitat suitability within the CEAA since: 1) harvesting would alter tree density and structure in stands in a minor amount (1.9%) of suitable fisher cover types within the cumulative effects analysis area, 2) minor changes to fisher

habitat associated with the riparian areas (0.3%) in the CEAA would be anticipated, 3) negligible reductions in landscape connectivity for fishers would be anticipated, and 4) negligible changes to motorized public access would occur..

**TABLE W-6 – FISHER HABITAT.** Estimates of existing and post-harvest acreages of fisher habitat within the project area and cumulative effects analysis area. Values in parentheses refer to the percentage of the fisher habitat in a category of the total area within the corresponding analysis area.

| Fisher Habitat Category                                        | Existing                    |                      | Post-Harvest                |                      |
|----------------------------------------------------------------|-----------------------------|----------------------|-----------------------------|----------------------|
|                                                                | Project Area<br>3,144 acres | CEAA<br>41,188 acres | Project Area<br>3,144 acres | CEAA<br>41,188 acres |
| Upland Fisher Habitat (DNRC)                                   | 742<br>(23.6%)              | 9,246<br>(22.4%)     | 547<br>(17.4%)              | 9,051<br>(22%)       |
| Upland Fisher Habitat (non-DNRC)                               | N/A*<br>(0%)                | 810<br>(2%)          | N/A*<br>(0%)                | 810<br>(2%)          |
| Riparian Fisher Habitat (DNRC)                                 | 82<br>(2.6%)                | 1,028<br>(2.5%)      | 79<br>(2.5%)                | 1,025<br>(2.5%)      |
| Riparian Fisher Habitat (non-DNRC)                             | N/A*<br>(0%)                | 234<br>(0.6%)        | N/A*<br>(0%)                | 234<br>(0.6%)        |
| Total Suitable Fisher Habitat (DNRC)                           | 824<br>(26.2%)              | 10,274<br>(24.9%)    | 626<br>(19.9%)              | 10,076<br>(24.5%)    |
| Total Suitable Fisher Habitat<br>(DNRC lands & non-DNRC lands) | 824*<br>26.2%               | 11,318<br>27.5%      | 626*<br>19.9%               | 11,120<br>27.0%      |

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

## FLAMMULATED OWL

**Issue:** The proposed activities could alter the structure of flammulated owl preferred habitat types, which could reduce habitat suitability for flammulated owls.

### Introduction

The flammulated owl is a small insectivorous species that is migratory and inhabits old, open stands of warm-dry ponderosa pine and cool-dry Douglas-fir forests in the western United States (McCallum 1994). Flammulated owls are secondary cavity nesters, typically nesting in 12 to 25 inch dbh aspen, ponderosa pine, or Douglas-fir cavities excavated by pileated woodpeckers or northern flickers (*Colaptes auratus*). Forest management considerations for flammulated owls include providing open, dry stands of ponderosa pine and Douglas-fir with scattered dense sapling thickets, and retaining snags for nesting.

### Analysis Area

Direct and indirect effects were analyzed for activities conducted within the 3,144-acre project area. For cumulative effects, the surrounding sections and the project area were used as the scale of the analysis, for a total CEAA comprised of 6,181 acres (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale

includes sufficient area to support multiple pairs of flammulated owls if ample suitable habitat is present (McCallum 1994).

### *Analysis Methods*

Analysis methods include field evaluations, aerial photograph interpretation, and GIS analysis of available habitats. SLI data were used to identify preferred flammulated owl habitat types (*ARM 36.11.403(28)*). Snags were assessed during site visits using 20 systematically placed plots in the proposed project area and reviewing past DNRC harvesting information. Canopy cover, trees/acre, and cover type were considered in the analysis of flammulated owl habitat availability and structure. Factors considered in the analysis include: 1) the degree of harvesting, and 2) the availability and structure of flammulated owl preferred habitats.

### *Existing Conditions*

The stands in the project area are largely lodgepole pine, Douglas-fir, western larch, and subalpine fir. Within the project area there are approximately 529 acres (16.8%) of potential flammulated owl habitat. Of these potential acres, the majority (>70%) currently contain dense forest conditions likely unsuitable for foraging by flammulated owls. Site-specific growing conditions and wildfires have largely influenced the abundance and distribution of flammulated owl habitat and large snags within the proposed project area. Much of the project area is generally too cold and moist to support open forests of ponderosa pine or Douglas-fir, preferred flammulated owl breeding habitat. Additionally, approximately 50% of the project area has very dense pole-sized trees that regenerated in 1926 following a stand-replacement and mixed-severity wildfire. Some of these areas average 3,000 trees per acre. A fully stocked timber stand of similar age would typically have between 250 and 400 trees per acre. Recent harvesting of 25.8 acres of suitable flammulated owl habitat has created more open forest canopy conditions preferred by foraging flammulated owls. This harvesting likely reduced the availability of suitable large snags used for nesting. During field visits, approximately 3.5 variably-spaced snags per acre were observed in the project area, however snag diameters were generally too small (average 11.5" dbh) to be suitable for nesting flammulated owls. Vegetation plots within proposed harvest units did not locate any snags in the >21" dbh class and only two snags >15" dbh. Although their abundance was not captured in vegetation plots, some snags over 21" dbh were observed in the project area.

The CEAA contains approximately 971 acres (15.7%) of suitable flammulated owl cover types. Similar to the project area, the majority of these acres (>80%) contain dense stocking and canopy levels not preferred by flammulated owls. Suitable flammulated owl habitat within the CEAA is primarily limited by the abundance of non-preferred cover types and dense forested conditions. Currently, habitat suitability for flammulated owls within the CEAA is low.

### *Environmental Effects*

#### **Direct and Indirect Effects of the No-Action Alternative on Flammulated Owls**

None of the proposed forest management activities would occur. Timber harvest would not occur in flammulated owl habitat on lands in the project area. Thus, since there would be no change in availability or structure of preferred flammulated owl habitats, no direct or indirect effects to habitat suitability for flammulated owls would be anticipated as a result of the No-Action Alternative.

### **Direct and Indirect Effects of the Action Alternative on Flammulated Owls**

Timber harvest would occur on 81 of the 529 acres (15.3%) of suitable flammulated owl cover types available in the project area. The proposed activities on suitable flammulated owl cover types would open stands to 20% to 40% canopy cover, improving stand structure suitability for flammulated owls in harvest units. Additionally, the proposed harvest prescription would favor leaving large diameter Douglas-fir and western larch, and all trees over >18" dbh. Some snags could be removed by the proposed harvest, but at least 2 large snag and 2 large snag recruitment tree per acre (>21 inches dbh, or largest available) would be retained (*ARM 36.11.411*). Proposed harvesting in suitable flammulated owl habitat would occur in the fall and winter between October 15 and March 31. Flammulated owls are tolerant of human disturbance (*McCallum 1994*), however disturbance associated with harvesting could temporarily displace flammulated owls should they be present in the project area after October 15. Flammulated owls would not be displaced by activities occurring in the winter months when the birds have migrated to their winter range. Thus, minor beneficial direct and indirect effects to flammulated owl habitat suitability would be anticipated as a result of the Action Alternative since: 1) no change in the availability of preferred flammulated owl habitat would occur, 2) proposed harvesting would alter a minor (15.3%) of existing suitable cover types; and 3) changes in forest structure and cover type caused by harvesting would generally increase flammulated owl habitat suitability.

### **Cumulative Effects of the No-Action Alternative on Flammulated Owls**

None of the proposed forest management activities would occur. Flammulated owl habitat availability and structure would remain the same in the project area, but may change on some DNRC lands and other ownerships in the CEAA as a result of other projects. Past and ongoing forest management projects not associated with the proposed Fish Bull Face Timber Sale have affected flammulated owl habitat in the project area, and other proposed projects could alter flammulated owl habitat in the future. Thus, since no additional change in the availability or structure of preferred flammulated owl habitats would occur, no cumulative effects to habitat suitability for flammulated owls would be anticipated as a result of the No-Action Alternative.

### **Cumulative Effects of the Action Alternative on Flammulated Owls**

Timber harvest would occur on 81 of the 971 acres (8.3%) of suitable flammulated owl cover types available in the project area. The proposed activities would open stands to 20% to 40% canopy cover, improving the suitability of stand structure for flammulated owls in harvest units. Additionally, the proposed harvest prescription would favor leaving large diameter Douglas-fir and western larch, and all trees over >18" dbh. Some snags could be removed by the proposed harvest, but at least 2 large snag and 2 large snag recruitment tree per acre (>21 inches dbh, or largest available) would be retained (*ARM 36.11.411*). Proposed harvesting in suitable flammulated owl habitat would occur in the fall and winter between October 15 and March 31. Flammulated owls are tolerant of human disturbance (*McCallum 1994*), however disturbance associated with harvesting could temporarily displace flammulated owls should they be present in the project area after October 15. Flammulated owls would not be displaced by activities occurring in the winter months when the birds have migrated to their winter range. Thus, minor beneficial direct and indirect effects to flammulated owl habitat suitability would be anticipated as a result of the Action Alternative since: 1) no change in the availability of preferred flammulated owl habitats would occur, and 2) changes in structure and cover type would generally increase flammulated owl habitat suitability.

## GRAY WOLF

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

### Introduction

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

Wolves are wide-ranging opportunistic carnivores that frequently take vulnerable prey (including young individuals, older individuals, and individuals in poor condition). In general, wolf densities are positively- correlated to prey densities (*Oakleaf et al. 2006, Fuller et al. 1992*). Wolves prey primarily on white-tailed deer, and, to a lesser extent, elk and moose, in northwest Montana (*Kunkel et al. 2004*). However, some studies have shown that wolves may prey upon elk more frequently during certain portions of the year (particularly winter) or in areas where elk numbers are higher (*Arjo et al. 2002, Kunkel et al. 2004, Garrott et al. 2006*). Thus, reductions in big game populations and/or winter range productivity could indirectly be unfavorable to wolf populations.

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

### Analysis Area

Direct and indirect effects were analyzed for activities conducted within the 3,144-acre project area. Cumulative effects were analyzed on a 41,188 acre CEAA around the project area (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale approximates an area large enough to support a wolf pack (based upon DFWP wolf pack home range data, 2010).

### Analysis Methods

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

### Existing Conditions

The annual home range of the Murphy Lake wolf pack has been in the vicinity (approximately 1.2 miles outside) of the proposed project area over the last 10 years. No denning or rendezvous sites were ever recorded in the project area (*Kent Laudon, DFWP, personal comm. 2011*). However, landscape features commonly associated with denning and rendezvous sites, including meadows and other openings near

water and in gentle terrain, are present within the project area. In late 2010, five out of the six known members of the Murphy Lake pack were destroyed by federal officials due to livestock depredations (Sime *et al.* 2011). Location and status of any remaining individuals is unknown, as no more radio collars exist on this pack (Kent Laudon, DFWP, personal comm. February 28, 2011). However, given the area's long-term history of wolf use, their current or future presence is likely.

In northwest Montana, wolf population levels and habitat use generally track those of their ungulate prey: primarily white-tailed deer, moose, and elk. The proposed project area contains summer habitat for the aforementioned prey species, as well as winter range habitat for white-tailed deer, mule deer, elk, and moose (see WILDLIFE – BIG GAME HABITAT). Signs of summer use by deer, elk, and moose were observed during field visits. The proposed project area contains 6.0 miles of open roads and 7 miles of restricted roads that could serve as a source of disturbance and mortality for both wolves and big game (see TABLE W-2 – ROAD MANAGEMENT AND CONSTRUCTION).

Within the larger CEAA, white-tailed deer winter range is relatively limited (10.4%), while elk (44.2%) and moose (80%) winter range areas are more abundant. Landscape features commonly associated with denning and rendezvous sites, including meadows, and openings near water, and gentle terrain, occur within the CEAA. Past harvesting on all ownerships in the cumulative effects analysis area has altered big game and wolf habitat (4,617 acres, 11.2%). Harvesting has reduced the amount of mature forest within the cumulative effects analysis area, reducing the amount of thermal cover and snow intercept available to big game. Current and proposed harvesting (i.e. proposed Mystery Fish Timber Sale) could continue to alter big game and wolf habitat. However, the CEAA contains 13,239 acres (32.1%) of mature forest that likely provide these important winter range characteristics. The CEAA contains an extensive network of restricted and open roads (total road density 1.9 miles/sq mile), which, has increased human access and the potential for wolf-human interactions. Increasing access to these areas can elevate risk of wolf/human encounters and increase the vulnerability of their ungulate prey, especially during the hunting season. Open roadways and a small number of human dwellings mainly situated within 0.5 miles of Highway 93 in the cumulative effects analysis area pose additional risk for wolves. Pets and livestock associated with homes likely pose the greatest risk to wolves should they use the area due to the heightened potential for associated conflicts. Wolf and big game habitat within CEAA remain largely intact and undeveloped and wolf use of the area is expected.

### Environmental Effects

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

Additional disturbance to wolves would not be anticipated based on this alternative. No changes in big game habitat, including no changes to forested cover on white-tailed deer or elk winter range would be expected during the short-term. Therefore, no changes in wolf prey availability would be anticipated. No changes in the ability for wolves to use the project area would be expected. Thus, since: 1) no additional changes in human disturbance levels would occur, and 2) no changes to the vegetation on big game winter ranges would occur, no direct and indirect effects would be expected to affect gray wolf displacement risk, or big game prey availability that could subsequently affect wolves.

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

Wolves using the area could be temporarily disturbed by harvesting activities; however, they are most sensitive at den and rendezvous sites, which are not known to occur within the project area. In the short term (approximately 1 to 4 years), activities associated with the proposed harvest could displace wolves and/or big game, should they be present in the area. Additionally, the resulting open stand conditions

could increase the probability of a wolf or big game species being observed and harvested during future hunting seasons. Currently closed roads would be opened for harvest activities for no more than four consecutive years. Following harvest, the majority of existing restricted and newly constructed roads used to conduct project activities would be closed to motorized use by the public. Temporary roads would be reclaimed following use associated with the project. After timber harvesting, motorized disturbance levels would increase on 0.9 miles of new open road, and non-motorized human use could slightly increase on 0.3 miles of newly constructed restricted roads. Potential for any wolf use of the project area for denning and rendezvous sites would likely revert to pre-harvest levels following operations. Harvest would result in the reduction of thermal cover on 505 acres (16%) of big game winter range within the project area. These minor reductions in cover on big game winter range could result in slight shifts in prey availability for wolves. Additional impacts to big game winter range are discussed in more detail in the WILDLIFE – BIG GAME HABITAT section of this wildlife analysis. Thus, minor adverse direct and indirect effects to wolf prey availability and minor adverse direct and indirect effects affecting gray wolf displacement risk would be expected since: 1) no known wolf den and/or rendezvous sites are within the project area, 2) there would be minimal reductions in habitat quality of big game winter range that could alter wolf prey availability, and 3) there would be short-term increases in motorized disturbance and an increase in long-term motorized use on 0.9 miles of road.

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

No additional disturbance of gray wolves, their prey, or their habitat would occur under this alternative as no timber harvesting activities would occur. Past and ongoing forest management projects not associated with the proposed Fish Bull Face Timber Sale have affected wolf prey availability in the project area, and other proposed projects (e.g. Mystery Fish Timber Sale) could displace wolves and/or alter wolf prey availability in the future. No additional cumulative effects to wolves associated with displacement or prey availability would be expected to result from the No-Action Alternative within the CEAA.

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

In the CEAA, temporary displacement of big game and wolves is possible, should they occur in the area within close proximity to proposed timber harvest and hauling activities. Disturbance associated with the Action Alternative would be additive to ongoing and proposed forest management activities within the CEAA (i.e. Olney Urban Interface Timber Sale, Duck to Dog Timber Sale, proposed Mystery Fish Timber Sale). Reductions in cover may cause slight decreases in use by deer, moose, and elk; however, no appreciable changes in deer and elk distribution or abundance would be expected at the scale of the CEAA (see WILDLIFE – BIG GAME HABITAT). Cover would be reduced on 505 (1.2%) acres on big game winter range. Reductions in cover would be additive to losses of 4,617 acres (11.2%) from past timber-harvesting activities in the CEAA. The reductions that would occur under this alternative to big game winter range would not be expected to affect the overall use of the CEAA by wolves. Under this alternative, an additional 0.9 miles of road would be open for public motorized use, which could increase overall recreational use of the CEAA and associated hunting mortality risk to wolves and big game. All temporary roads and new restricted roads used to conduct project-related work would be closed to motorized public use following harvest activities. Other minor risks within the CEAA, such as pets and livestock on private land, would continue to pose risks to wolves in this area because of the potential for conflicts and resulting management actions. No substantive change in long-term potential for wolf use of the cumulative effects analysis area would be expected. Thus, minor adverse cumulative effects to gray wolf displacement risk and minimal changes to big game prey availability would be expected under the Action Alternative since: 1) localized, temporary disturbance would occur due to logging activities in the

area; 2) winter range habitat quality and carrying capacity of wintering areas would not be appreciably reduced within the CEAA; and 3) there would be a minor, long-term increase in public motorized access.

## **PILEATED WOODPECKER**

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

### **Introduction**

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

### **Analysis Area**

Direct and indirect effects were analyzed for activities conducted within the 3,144-acre project area. For cumulative effects, the surrounding sections and the project area were used as the scale of the analysis, for a total CEAA comprised of 6,181 acres (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale includes sufficient area to support multiple pairs of pileated woodpeckers if enough suitable habitat is present (*Bull and Jackson 1995*).

### **Analysis Methods**

Analysis methods include field evaluation, aerial photograph interpretation, and GIS analysis of available habitats. SLI data were used to identify preferred pileated woodpecker habitat (*ARM 36.11.403(58)*). Direct and indirect effects as well as cumulative effects were analyzed using a combination of field evaluation, aerial photograph interpretation, and mapped potential habitat. To assess potential pileated woodpecker habitat on DNRC managed lands in the cumulative effects analysis area, sawtimber stands  $\geq 100$  years old within preferred pileated cover types (*ARM 36.11.403(58)*) with 40 percent or greater canopy closure were considered potential pileated woodpecker habitat. Factors considered included the amount of potential habitat, degree of harvesting, and the amount of continuous mature forested habitat.

### **Existing Conditions**

In the project area, there are approximately 199 acres (6.3%) of potential pileated woodpecker habitat. Current potential pileated habitat consists of mature Douglas-fir, western larch, mixed conifer, and subalpine fir stands in four separate patches. Of these patches, 3 out of the 4 stands are part of larger suitable pileated habitat patches outside of the project area. Large-scale disturbance, primarily in the form of a 1926 wildfire, has resulted in an abundance of young, overstocked stands and cover types not

suitable for pileated woodpeckers. Snags and coarse woody debris within the proposed project area are present at levels generally appropriate for the existing habitat types (see SNAGS AND COARSE WOODY DEBRIS). Pileated woodpecker foraging evidence was not readily observed during field visits. Past harvesting has altered mature stands, snags, and coarse woody debris on roughly 443 acres (14.1%) of the project area. Open roads (6.0 miles) have facilitated firewood gathering resulting in a reduction of snags and downed logs valuable as woodpecker nesting and foraging substrates within a small portion of the project area. Because of difficult terrain and vegetation along open roads within the project area, firewood gathering has been largely restricted to areas immediately adjacent (<200 feet) to these roads. Given these observed existing habitat conditions, pileated woodpecker habitat suitability is currently low to moderate within the project area.

The CEAA contains approximately 672 acres (10.9%) of potential pileated woodpecker habitat. These acres are distributed among 12 patches. Presently, 19.5 percent (1,004 acres) of the CEAA is not suitable for use by pileated woodpeckers due to permanent non-forested areas (e.g. meadows, lakes), road building and past harvesting. Most of the remaining 4,247 acres (67.8%) within the CEAA consist of young, dense, forested stands and/or less preferred cover types that are not likely providing habitat for pileated woodpeckers, should any be using the area. Thus, habitat quality and availability within the CEAA is also currently low to moderate.

### Environmental Effects

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

No timber harvesting activities would occur under this alternative. Thus, no adverse direct and indirect effects associated with disturbance levels or habitat suitability for pileated woodpeckers in the project area would be expected since: 1) no changes in the amount of continuously forested habitat would be anticipated, 2) no changes to existing pileated woodpecker habitat would be anticipated, and 3) no additional disturbance would take place.

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

Harvesting prescriptions on suitable pileated woodpecker habitat within the project area would reduce forested habitat for pileated woodpeckers and create younger-aged stands with widely scattered mature trees. Approximately 16 acres (8.1%) of available potential pileated woodpecker habitat in the project area would be altered with regeneration-type treatments and would be too open to be considered habitat following logging. Approximately 183 acres of suitable pileated habitat would remain unharvested within the project area. In the stands proposed for treatment, suitable pileated habitat would be removed for 50-80 years. Snags important for nesting pileated woodpeckers would be retained in the proposed harvest areas (see SNAGS AND COARSE WOODY DEBRIS), however the abundance of snags and snag recruitment trees would be reduced. Since pileated woodpecker density is positively correlated with the amount of dead and/or dying wood in a stand (*McClelland 1979*), pileated woodpecker habitat quality in the project area would be expected to be reduced on 16 acres. Overall patch size of contiguous pileated habitat would decrease from 28 acres to 26 acres, although pileated habitat within the single patch affected by harvesting would remain >100 acres in size. Silvicultural prescriptions in harvest units would retain healthy western larch and Douglas-fir in low densities (6 to 10 per acre) while promoting the regeneration of many of these same species, which would benefit pileated woodpeckers in the future by providing high-quality nesting, roosting, and foraging habitats. Low-quality habitat associated shade-tolerant tree species would likely be converted to a more desirable forest type, although it would take about 50 to 80 years to mature into pileated habitat. Pileated woodpeckers tend to be tolerant of human-

caused disturbance (*Bull and Jackson 1995*), but they could be temporarily displaced by the noise and activity associated with the proposed harvesting. Thus, minor adverse direct and indirect effects would be anticipated that would affect pileated woodpeckers in the project area since: 1) 8.1% of available suitable habitat would be harvested; 2) the amount of contiguous suitable pileated woodpecker habitat would be reduced by 16 acres but the affected patch would remain >100 acres in size; 3) some snags and snag recruits would be removed, however, mitigation measures to retain a minimum of 2 snags per acre and 2 snag recruits per acre in harvest areas would be included; 4) harvest prescriptions would retain and promote seral tree species in all proposed harvest areas; and 5) temporary levels of potential disturbance would increase, but long-term disturbance would be unchanged.

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

No timber harvesting activities would occur under this alternative. Past and ongoing forest management projects not associated with the proposed Fish Bull Face Timber Sale have affected pileated woodpecker habitat in the project area, and other proposed projects could disturb pileated woodpecker and/or alter habitat suitability in the future. No additional cumulative effects to pileated woodpeckers associated with disturbance risk or habitat suitability are expected to result from the No-Action Alternative that could affect pileated woodpeckers in the CEAA since: 1) no changes in the amount of continuously forested habitat would be anticipated, 2) no changes to existing pileated woodpecker habitat would be anticipated, and 3) no additional disturbance would take place.

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

Under this alternative, pileated woodpecker habitat would be reduced on 16 acres (2.4%) of the 672 acres existing in the CEAA. Forest canopy on 16 acres of treatments would be too open for appreciable use by pileated woodpeckers and would be more similar to other recently harvested stands that comprise 809 acres (13.1%) within the CEAA. Snags, coarse woody debris, and potential nesting trees would be retained in the project area according to forest management ARM 36.11.41; however, snags and snag recruitment trees would be reduced from existing levels in all of the proposed harvest units. Recent harvesting in the cumulative effects analysis area has reduced the quality and abundance of pileated woodpecker habitat; reductions associated with this Action Alternative would be additive to those reductions. However, the overall habitat suitability of the CEAA to pileated woodpeckers would not be expected to appreciably change. Firewood gathering along open roads would continue to limit the abundance of snags and woody debris within certain areas of the CEAA. In the long term, maturation of stands across the cumulative effects analysis area would increase suitable pileated woodpecker habitats through time. Thus, minor cumulative effects to habitat suitability for pileated woodpeckers would be anticipated since: 1) a minor amount (2.4%) of suitable pileated woodpecker habitat currently present within the CEAA would be altered; 2) existing baseline level of pileated woodpecker habitat suitability is low; 3) some snags and snag recruits per acre would be removed in the proposed harvest areas for operational and human safety purposes; however, mitigation measures would retain 2 large snags and 2 large recruitment trees in harvested areas; and 4) disturbance and firewood gathering would not appreciably change in the long-term.

## BIG GAME HABITAT

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

### Introduction

Timber harvesting can increase big game (e.g. elk) vulnerability by changing the size, structure, juxtaposition, and accessibility of areas that provide security during times of hunting pressure (*Hillis et al. 1991*). As visibility and accessibility increase within forested landscapes, elk and deer have a greater probability of being observed and, subsequently, harvested by hunters. Because the female segments of the elk and deer populations are normally regulated carefully during hunting seasons, primary concerns are related to a substantial reduction of the male segment and resulting decrease in hunter opportunity. Large ( $\geq 250$  acres) heavily forested patches at least  $\frac{1}{2}$  mile from an open road that would limit visibility of elk (and subsequently deer) and hunter accessibility (*Hillis et al. 1991*) are considered security cover. *Hillis et al. (1991)* also recommended that  $>30\%$  of a fall elk herd home range area should contain cover patches meeting these criteria to provide adequate security for elk. It is expected that when elk security is substantially compromised, effects to deer can also be expected (albeit to a lesser degree than for elk).

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

### Analysis Area

Direct and indirect effects were analyzed for activities conducted within the 3,144-acre project area. Cumulative effects were analyzed on a 41,188 acre CEAA (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale of analysis approximates an area capable of supporting an elk herd home range in fall.

### Analysis Methods

To assess big game habitat on the project area, SLI data were used to identify stands with cover types and forest structure ( $\geq 40$  crown closure) that could provide thermal and/or hiding cover for big game species. Direct, indirect, and cumulative effects were analyzed using a combination of field evaluation, aerial photograph interpretation, and a GIS analysis of available habitats.

To determine levels of elk security habitat, existing open roads were buffered 0.5 mile and those areas identified as areas not meeting elk security habitat criteria (*Hillis et al. 1991*). Within the cumulative effects analysis area, recent timber harvest activities and permanent non-forest openings (i.e. lakes, rock scree) were taken into account as they likely reduce the amount of secure habitat for elk. Additionally, elk security habitat patches need to be large forested blocks ( $>250$  acres) with adequate cover ( $\geq 40\%$

crown closure) to afford elk security during the general big game hunting season, so areas failing to meet this criteria were also removed, leaving patches that were distant enough from open roads, were large enough to meet the minimum acreage criteria, and had adequate forest cover density to provide elk security habitat (Hillis *et al.* 1991).

Factors considered in the analysis include the amount of security and winter range habitat available, the extent of past and proposed harvesting, and level of human access for recreational hunting.

### Existing Environment

Although the proposed project area contains a number of open roads, 1,068 acres (34.0%) of elk security habitat occurring in two patches (1,013 acres, 55 acres) is present in the project area. These two patches of habitat within the project area contribute to a 7,964-acre block and a 2,651-acre block of contiguous security habitat, respectively, within the CEAA. Total elk security habitat within the CEAA is roughly 19,436 acres (47.2%). Additionally, hiding cover, which is inherently a component of elk security habitat, is abundant in the project area and CEAA. Moderate levels of hunter access exist in the project area, with 6.0 miles of open roads and some non-motorized access opportunities on closed roads. The CEAA also likely receives moderate levels of hunter access, especially in areas where roads, both open and restricted, are more numerous.

Portions of the proposed project area have been identified by DFWP as white-tailed deer, mule deer, moose and elk winter range. The entire project area (3,144 acres) is mapped as moose and elk winter range. Approximately 1,277 acres (40.6%) and 2,963 acres (94.2%) are considered white-tailed deer and mule deer winter range, respectively. Evidence of summer/fall moose, elk, and deer use was observed during field visits to the project area. The project area contains approximately 1,845 acres (58.7%) of habitat that are currently providing year-round cover and visual screening for big game. These acres also provide moderate to high amounts of thermal cover and snow intercept for wintering big game. Due to past forest management, 443 acres (14.1%) of the project area have forested stands that are too open to be considered high-quality thermal cover or cover that would appreciable intercept snow. However, existing patches of scattered, dense conifer regeneration supply limited (<10% of area) additional cover capable of ameliorating the influences of cold and snow.

Approximately 32,966 (80.0%) and 18,188 acres (44.2%) of the CEAA were identified as moose and elk winter range, respectively. Presently, approximately 22,755 acres (55.2%) within the CEAA are providing usable thermal cover and snow intercept for big game. These forest patches are currently well-distributed throughout big game winter range occurring within the CEAA. In the last 20 years, harvesting has reduced thermal cover and snow intercept on winter range within the CEAA. These recent harvests have reduced the quality and quantity of usable cover on winter range within the area, but they may have increased forage quality and quantity by opening up the forest overstory canopy. However, forage occurring in forest openings is often not available to wintering animals during appreciable portions of the winter due to deep, crusted snow conditions. Encroachment of noxious weeds into recently logged areas has also likely offset some of the potential gain in forage production. Ongoing and future harvesting (i.e. Duck to Dog Timber Sale, proposed Mystery Fish Timber Sale) could continue to reduce cover attributes on winter range and temporarily displace big game within the CEAA.

## Environmental Effects

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

No changes in big game habitat would be expected as no timber harvesting activities would occur. Existing cover would continue to contribute to winter range quality and security habitat would not be altered. Thus, no direct or indirect effects to big game habitat in the project area would be anticipated since: 1) no changes to existing thermal cover would be anticipated and continued maturation of forest cover would improve thermal cover and snow intercept, and 2) the level of human access would remain unchanged.

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

Under the Action Alternative, approximately 505 acres of big game habitat would be harvested. Of these acres, roughly 272 acres (25.5%) of existing elk security habitat would be harvested. The reroute of Fish Lake access road and resulting new road construction would have long-term effects on 51 acres of security habitat currently between 0.5 and 0.6 miles from the existing open road. Changes in elk security habitat could also affect deer in a similar manner. Regeneration harvest prescriptions on 241 acres of harvest units would result in areas too open to effectively function as security cover, thermal cover or snow intercept. Forest vegetation capable of providing these big game habitat attributes would require 40 to 60 years for suitable sized trees (>40 ft. tall) to develop in harvested stands. Intermediate harvest prescriptions on 264 acres would remove some tree canopy and mature trees, however small portions of these units would likely have patches of vegetation that could continue providing limited amounts of hiding cover, thermal cover or snow intercept. Proposed logging would increase sight distances in harvest units and could increase risk of hunting mortality. Some short-term (1 to 4 years) displacement of big game would be expected as a result of the proposed motorized logging disturbance. A long-term change in the amount of open roads would occur; increasing from 6.0, miles to 6.9 miles of road (TABLE W-2 – ROAD MANAGEMENT AND CONSTRUCTION). Approximately 4 miles of existing restricted roads would be temporarily opened in combination with 3.9 miles of new permanent and temporary road construction within the project area. New construction of 0.3 miles of permanent, restricted road could result in an increase in non-motorized public use within a small portion of the existing security habitat in the project area. During all phases of the project, existing restricted roads and new restricted roads opened with project activities would be restricted from use by the general public and closed after completion of project activities, except for 0.2 miles of currently restricted road that would be converted to permanently open road. Collectively, since: 1) minor percentages of security habitat (25.5%) and effective thermal cover/snow intercept (14.9%) in the project area would be altered, 2) considerable amounts of unaltered security habitat (796 acres) and winter range would remain, 3) sight distances would increase on 505 acres, which could increase big game vulnerability and associated hunting mortality risk, 4) relatively short-term (1 to 4 years) logging activities would create disturbance in this area, 5) there would be minor long-term changes in open road density, minor adverse direct and indirect effects to big game security habitat and winter range habitat quality would be expected for the next 40 to 60 years.

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

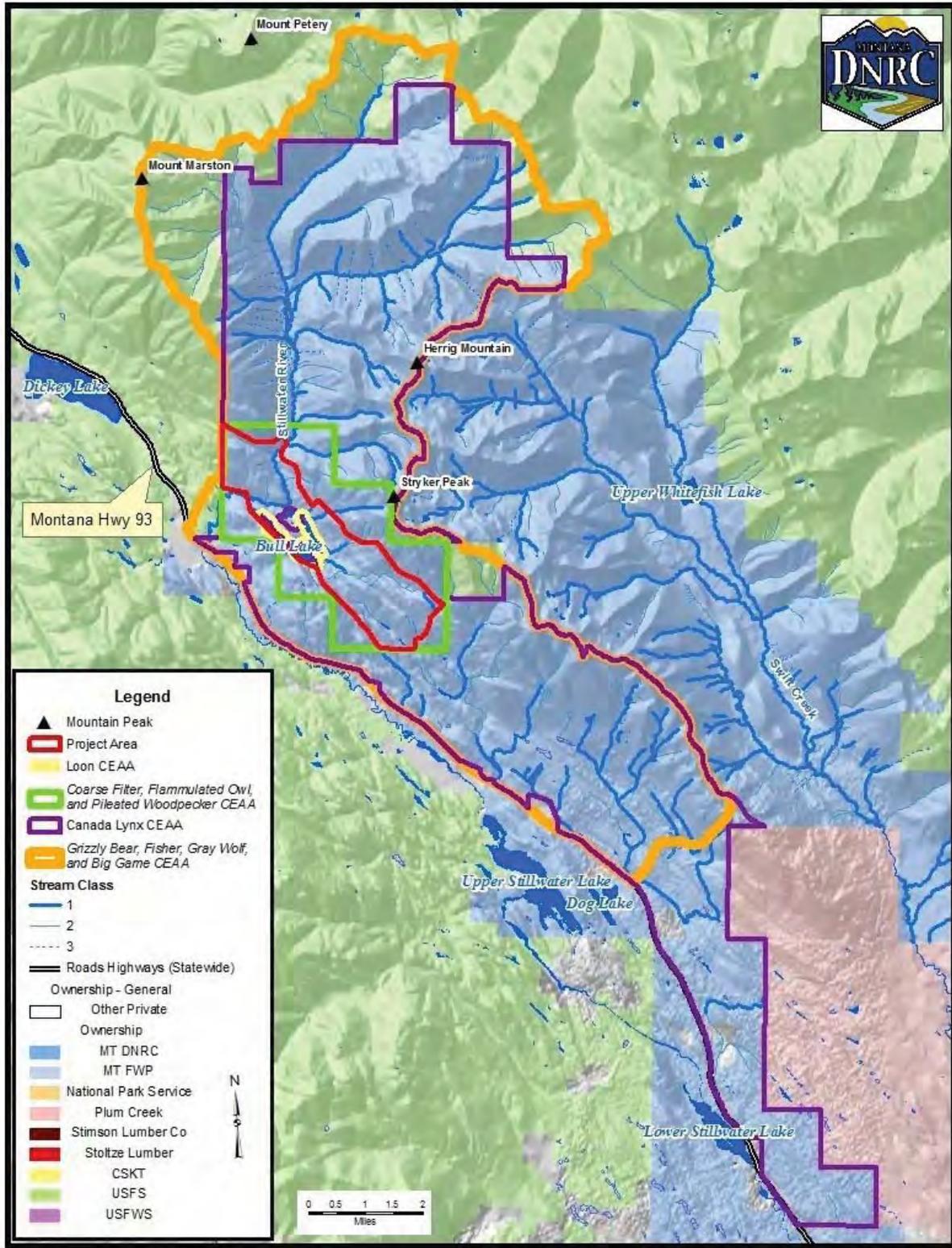
No changes in big game habitat would be expected as no timber harvesting activities would occur. Existing levels of cover would persist. Past and ongoing forest management projects not associated with the proposed Fish Bull Face Timber Sale have affected big game habitat in the project area, and other proposed projects could disturb big game species and/or alter habitat quality in the future. No additional

cumulative effects to big game habitat quality are expected to result from the No-Action Alternative that could affect big game species in the CEAA since: 1) no big game habitat would be altered and continued maturation of forest cover would improve thermal cover and snow intercept, and 2) the level of human access would remain unchanged.

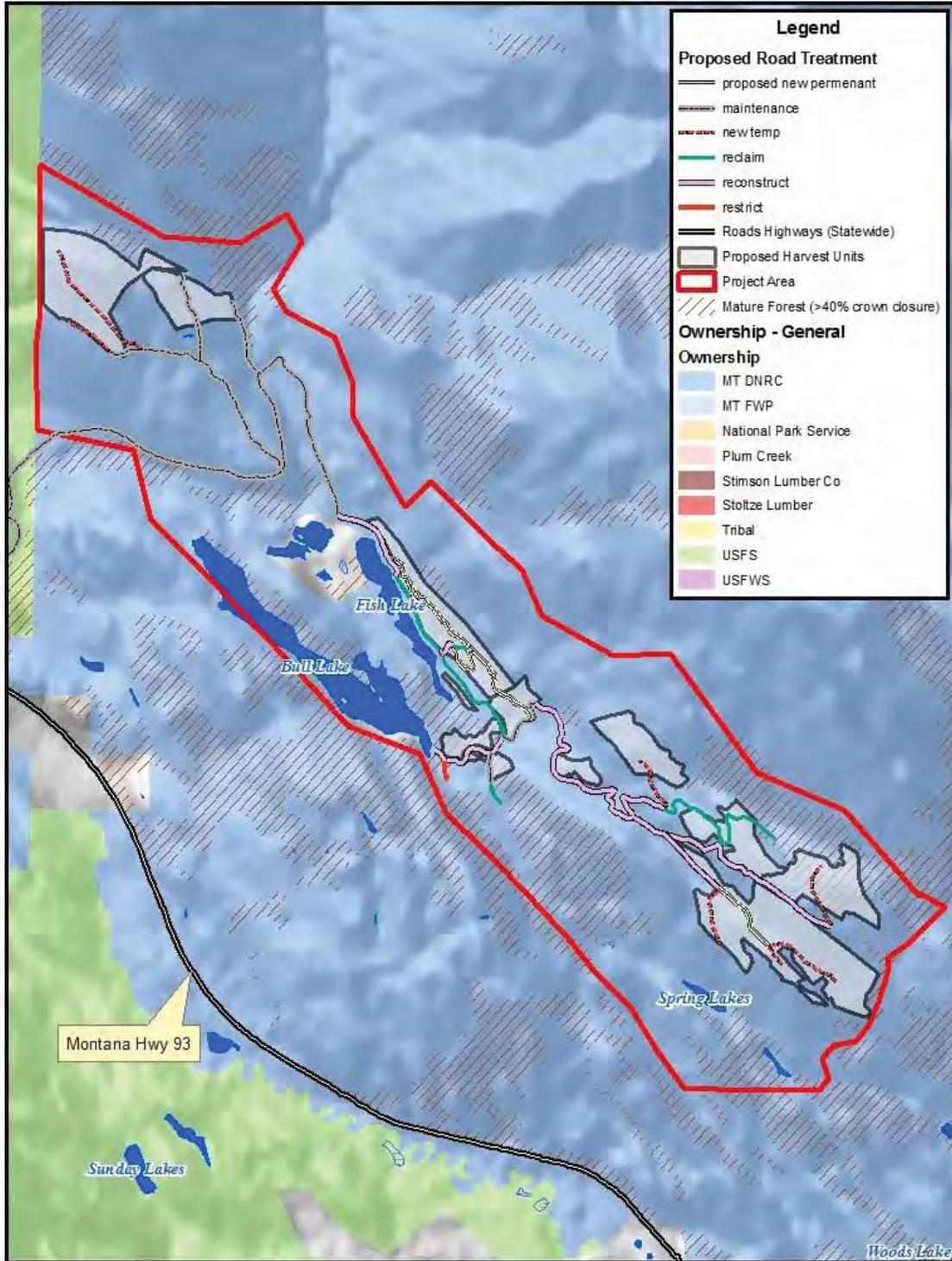
### **Cumulative Effects of the Action Alternative on Big Game Habitat**

Forest stands providing suitable thermal cover and snow intercept would be removed from approximately 505 acres (1.2%) of winter range within the CEAA (41,188 acres). Elk security cover across 272 acres (0.7%) would also be reduced within the CEAA. Approximately 51 acres (0.3%) of current security habitat would be affected by new permanent open roads. This reduction in security habitat, thermal cover and snow intercept would be additive to past reductions within the CEAA due to forest management. No appreciable changes in big game habitat quality within the larger winter range would be expected. Harvesting and motorized disturbance within the CEAA associated with the proposed project would displace wintering big game and reduce cover on winter range. Displacement associated with this alternative would be additive to any displacement associated with ongoing timber harvesting (i.e., Duck to Dog Timber Sale, Olney Urban Interface Timber Sale, and proposed Mystery Fish Timber Sale). Continued maturation of previously harvested stands within the cumulative effects analysis area would improve hiding cover and partially offset these current losses within 20 to 40 years. Under the Action Alternative, existing restricted roads and new road construction used for harvesting activities could temporarily increase access and disturbance on 8.2 miles of roads and result in a temporary increase in open road density from 0.6 miles/sq. mile to 1.5 miles/sq. mile within the CEAA. After harvesting, open road density would be 0.7 mi/sq. mile in the CEAA and continue to facilitate hunter access. Thus, minor adverse cumulative effects to big game winter range and elk security habitat would be expected since: 1) harvesting would reduce overall levels of cover on 505 acres (1.2%) of winter range and 272 acres (0.7%) of elk security habitat, 2) existing thermal cover and snow intercept on winter range in the cumulative effects analysis area would be altered, 3) overall habitat quality within the larger winter range would not be appreciably altered, 4) logging activities would create temporary disturbance lasting 1-4 years, and 5) long-term open road densities would undergo a minor increase.

**FIGURE W-1 – WILDLIFE ANALYSIS AREAS.** Areas used to assess effects of the Action and No-Action Alternatives on wildlife and wildlife habitat.



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



**Attachment V:  
WATER RESOURCES ANALYSIS**

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## **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, issues were identified regarding water-quality, water-quantity, and fisheries resources. After reviewing the public and internal comments, DNRC developed the following issue statements regarding the potential effects of the proposed timber harvesting:

- *Timber harvesting and road construction has the potential to increase water yield, which, in turn, may affect erosive power, sediment production and stream channel stability.*
- *Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.*
- *Timber-harvesting activities may affect water quality and fisheries habitat by
  - *reducing shade and recruitable woody debris in the Riparian Management*
  - *increasing stream temperatures, and*
  - *Affecting habitat connectivity at road crossings.**

These issues can best be evaluated by analyzing the anticipated effects of sediment delivery and water yield on the water quality of streams in the project area, and also evaluating the potential effects of reducing forest vegetation near streams.

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.

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

- miles of new road construction and road improvements, including stream crossings on fish-bearing streams
- potential for sediment delivery to streams
- increases in the Equivalent Clearcut Acre (ECA)
- increases or decreases in recruitable woody debris and shade-providing riparian vegetation

## 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. Data collected during 2011 was used to quantify sediment delivery from roads using procedures adapted from the *Washington Forest Practices Board (Dube, Megahan and McCalmon 2004; Callahan 2000)*. 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. While annual water yield is typically modeled to assist in disclosing potential impacts, the discontinuous characteristic of streams in the project area coupled with the proposed dispersed harvest severely diminishes the potential impacts. Nonetheless, proposed levels of Equivalent Clearcut Area (ECA) will be disclosed for each watershed to give the reader an idea of the magnitude of the harvest intensity for each watershed.

The ECA calculation method is outlined in *Forest Hydrology, Part II (Haupt et al, 1976)*. ECA is a function of total area roaded, harvested, or burned; percent of crown or canopy removed during harvesting or wildfire; and amount of vegetative recovery that has occurred in the harvested or burned areas. As live trees are removed, the water that would have evaporated and transpired either saturates the soil or is translated to runoff.

### *Fish Habitat Parameters*

Expected effects to fisheries habitat will be addressed qualitatively using the current condition as a baseline and disclosing the expected changes due to the alternatives proposed. The analysis method for woody debris recruitment will evaluate the potential reduction in available woody debris and shading due to timber-harvesting activities in the riparian management zone (RMZ) of the project area. Stream temperature will be addressed by evaluating the risk of stream temperature increases due to reduced shading from existing vegetation. Connectivity of habitat through stream-road crossings will be addressed by comparing the proposed actions with the current fish passage status.

## 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 and Cumulative Effects*

The water-yield analysis areas for this project will be (1) Fish Lake/Bull Lake and tributaries; (2) Spring Creek; and (3) Stillwater River. This will include all of the unnamed perennial and intermittent tributaries to Fish Lake and Bull Lake. ECA will be disclosed for each watershed; however, the potential impacts to individual streams will be discussed qualitatively due to many of the streams being intermittent and/or discontinuous. Additional harvest is also proposed in the Summit Creek watershed, tributary to Dickey Lake; however, due to the limited harvest proposed and the lack of surface water within at least 700 feet of the proposed harvest, the potential increases in water yield (direct, indirect or cumulative) would not be measurable and therefore will not be further addressed.

### *Fisheries Habitat Parameters*

The analysis area for fisheries habitat parameters is the RMZ along Class 1 streams in the Fish Lake/Bull Lake and tributaries watershed and the RMZ adjacent to proposed harvest units in section 19, T34N, R24W. Fish passage will be addressed by reviewing the current status of passage potential along the haul route and comparing it to the changes from each alternative.

## **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 as well as operation and maintenance procedures. Appropriate practices may be applied before, during, or after completion of activities that could create their own impacts.

### **WATER QUALITY LIMITED WATERBODIES**

The project area is within the Stillwater River watershed. This portion of the Stillwater River is not a water quality limited water body on the DEQ 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 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 the Stillwater River watershed for domestic use, fish and wildlife propagation and lawn/garden use.

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

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

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

Bull trout are also listed as a Montana Animal Species of Concern, with the same ranking as westslope cutthroat trout; however bull trout are also listed as ‘threatened’ by the US Fish and Wildlife Service under the Endangered Species Act. DNRC is a signatory to the

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

2000 (interagency) Restoration Plan for Bull Trout in the Clark Fork River Basin and Kootenai River Basin, Montana.

Bull trout are found in Stillwater River; westslope cutthroat trout are abundant in Stillwater River, Bull Lake and potentially Fish Lake (MFISH, 2012).

## EXISTING CONDITION

### GENERAL DESCRIPTION

#### ► *Fish Lake, Bull Lake and tributaries*

Fish Lake is located in sections 29 and 32 of T34N, R24W. Ownership surrounding the lake is predominately State of Montana; however the northwest portion of the lake is in private, non-industrial ownership. Fish Lake covers approximately 32 surface acres and has a maximum depth of about 23 feet (MFISH, 2012). This lake is not connected via surface flow to downstream waterbodies. Two perennial streams contribute surface flow to Fish Lake within the approximately 2,750 acre watershed shown in FIGURE WR1: FISH-BULL-FACE WATERSHEDS. All other streams in the watershed are either intermittent or discontinuous; meaning they do not contribute surface flow to a downstream waterbody, in this case, mainly Fish Lake or Bull Lake. A very small tributary at the north end of Fish Lake contributes year-round flow; however, this tributary does not contain any fish (Bower, 2011). The large tributary near the south end of the lake also contributes year-round surface flow and supports nonnative eastern brook trout.

Bull Lake is located in sections 29, 30 and 32, T34N, R24W. Ownership surrounding the lake is entirely State of Montana. Bull Lake is approximately 107 surface acres and has a maximum depth of about 88 feet (MFISH, 2012). Generally, the lake is not connected to downstream bodies of water, however at high flow events it may connect to the Stillwater River via surface flow. No perennial tributaries to Bull Lake were observed during field reconnaissance. Bull Lake provides habitat for reidside shiners, kokanee salmon, pumpkinseeds, rainbow trout and westslope cutthroat trout. Kokanee salmon and westslope cutthroat trout are were last stocked in Bull Lake in 2009 and 2003 respectively. Eastern brook trout were last stocked in Bull Lake in 1927; therefore the species may inhabit the lake, although none have been observed in the recent past (Deleray, pers. comm.).

#### ► *Spring Creek*

The Spring Creek watershed above the Spring Lakes (sometimes referred to as North and South Spring Lakes) is approximately 1,140 acres. The main channel flows in a general northeast-to-southwest direction to South Spring Lake located in section 3, T33N, R24W. South Spring Lake is comprised of approximately three surface acres and has a maximum depth of less than five feet (Deleray, 2012). This lake does not

sustain fish and no fish were found in the stream above the lake during presence/absence surveys.

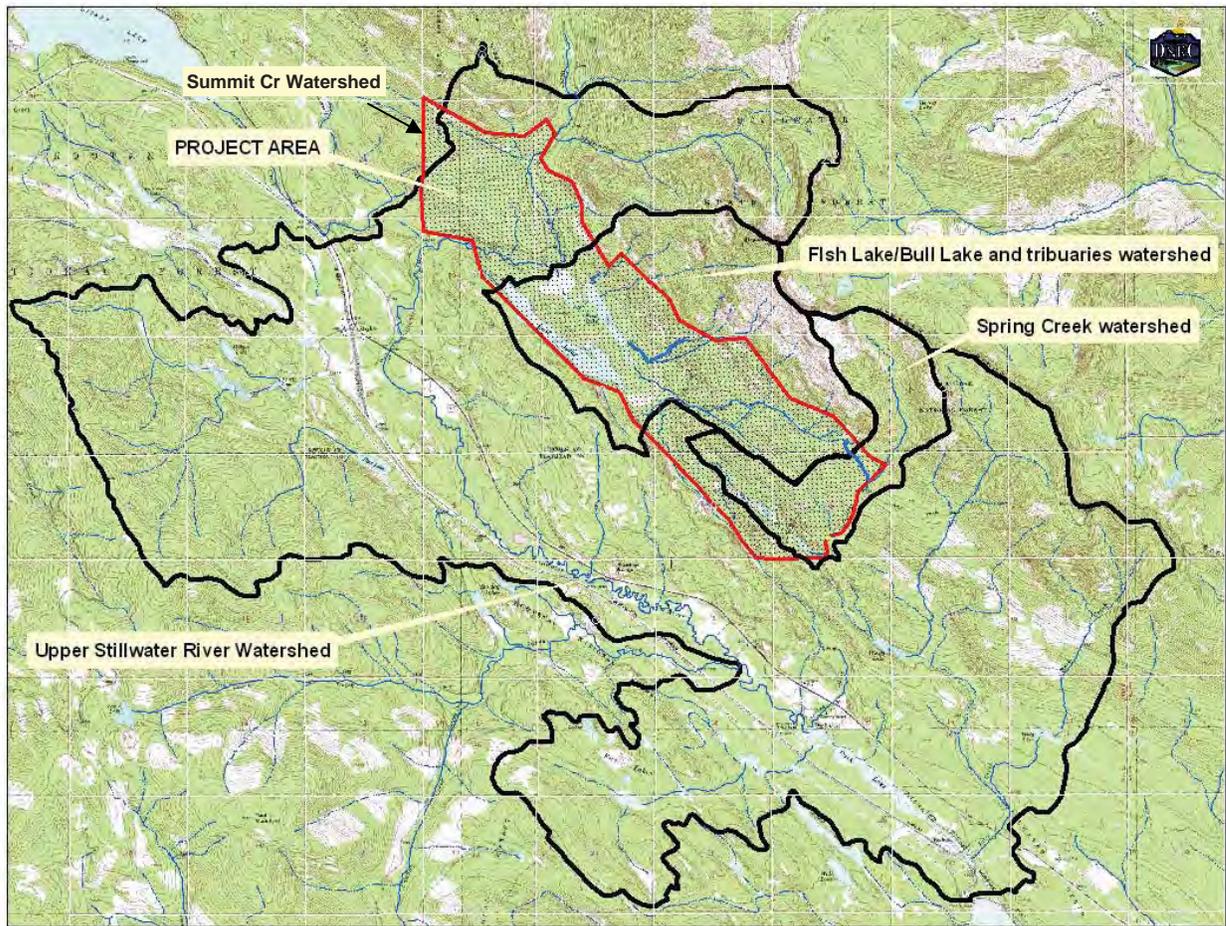
North Spring Lake (located in sections 3 and 4, T33N, R24W) is connected to South Spring Lake primarily by ground water. North Spring Lake covers approximately five acres and has a maximum depth of about 35 feet. Stocking records from DFWP shows that westslope cutthroat trout are planted in this lake approximately every two years. It is unknown whether fish are naturally sustainable in North Spring Lake. This lake is not connected to other bodies of water via surface flow.

► ***Stillwater River***

The Stillwater River is the main channel that carries water from this area towards Flathead Lake. The total channel is approximately 79 miles long from its headwaters in the Whitefish Range to its termination at the Flathead River south of Kalispell, Montana. The portion of the Stillwater River within and immediately downstream of the project area is contained within river miles 67 to 71. River mile 67 is near Stryker, Montana where US Highway 93 crosses the Stillwater River.

This portion of the Stillwater River is a Rosgen A channel (*Rosgen 1996*) with a bankfull width estimated at nearly 40 feet. Fish species present in this reach of the Stillwater River include bull trout, westslope cutthroat trout, eastern brook trout, and slimy sculpin (*MFISH 2012*). This portion of the Stillwater River is considered as critical bull trout habitat (*USFWS 2010*).

**FIGURE WR 1: FISH-BULL-FACE WATERSHEDS**



***SEDIMENT DELIVERY***

➤ ***Fish Lake, Bull Lake and tributaries***

The majority of roads built in this watershed area were built in the late 1920's with very few upgrades or improvements until the 1950's and 1960's. The main road that was constructed adjacent to Fish Lake has numerous deep potholes that could contribute sediment to the lake due to the close proximity of the road to the lake. After a field review to identify potential sediment delivery and modeling of data using methods described above, the estimated sediment delivery in the Fish Lake, Bull Lake and tributary watershed is 11.6 tons per year from existing roads. This includes approximately 20 different locations.

In-channel sediment sources are very limited in the project area streams. Sources of in-channel sediment are limited to outcurves and constrictions of channels that can produce slightly higher velocity flows that are more erosive. No unstable banks that are prone to mass-wasting were detected in the tributaries during field review.

► *Spring Creek*

The Spring Creek watershed has one location where a road is designed to cross a stream. This site was designed for use during the Spring/Rock Timber Sale (DNRC 1997) as a temporary bridge site. The temporary bridge has been removed and the site is impassable to highway vehicles. Evidence at the site suggests light-to-moderate ATV use. The estimated potential sediment delivery from non-point sources at this site is approximately 0.1 tons per year.

Sources of in-channel sediment are limited to outcurves and constrictions of channels that can produce slightly higher velocity flows that are more erosive. No unstable banks that are prone to mass-wasting were detected in the tributaries during field review.

► *Stillwater River*

During field review, limited sediment sources were identified on haul roads in the Stillwater River watershed. Most of the road has been brought up to meet BMPs with previous timber sales and road maintenance projects. Three sites were identified as potential sediment sources with a total estimated potential sediment delivery of approximately 0.9 tons per year.

Due to the limited proposed harvest adjacent to or near the Stillwater River, no sediment source inventory of the river banks was conducted.

## **FISH HABITAT PARAMETERS**

► **Large Woody Debris**

Large woody debris recruitment to streams is important to maintain channel form and function and as a component of fish habitat. According to *ARM 36.11.425*, DNRC will establish a RMZ '*...when forest management activities are proposed ...on sites that are adjacent to fish bearing streams and lakes.*' One reason for the RMZs is to retain adequate levels of large woody debris recruitment to the stream channel. Site potential tree height (SPTH) is the method used to identify RMZ width according to *ARM 36.11.425 (5)*. Data collection for site potential tree height in the project area resulted in SPTH of 97 feet.

While no quantitative woody debris data is available for the streams in the project area (except for Stillwater River with 11 pieces per 1000 ft), woody debris was observed in adequate levels to maintain stream form and function in all of the streams within the Fish Lake/Bull Lake and tributaries watershed. Although evidence of timber harvest was observed in riparian stands along the streams, canopy coverage was very dense throughout the watershed.

➤ **Stream Temperature**

No temperature data for streams in the project area is available except for a few spot temperatures. Riparian canopy along streams, except for the Stillwater River, is very dense and provides continuous shade for the streams throughout the day. Therefore, stream temperature is likely within the natural range of variation for these streams.

**Fish Passage**

One culvert is located on fish-bearing streams in the project area. This site is adjacent to the boat launch on Fish Lake. The existing culvert provides passage to adult eastern brook trout at low flows, but passage for all other life stages is restricted. Because no changes to connectivity—in the form of crossing structures on fish-bearing streams—is proposed in either alternative, this parameter will not be discussed further.

**WATER YIELD AND CUMULATIVE EFFECTS**

While much of the Fish Lake/Bull Lake and tributaries watershed burned in 1926 and was harvested in 1927-28, the area has nearly fully recovered, although the roads constructed are still present today and are used heavily by recreationists, firewood cutters and local residents.

A field review of the streams in the watersheds showed that most of the streams are discontinuous, stable channels with limited impacts typically associated with high annual water yields such as excessive bank erosion, mid-channel bars and channel downcutting. A brief look at the harvest history since 1927-28 shows that 184 acres have been harvested in the Fish Lake/Bull Lake and tributaries watershed. This equates to less than 7 percent of the watershed.

In the Spring Creek watershed, approximately 88 acres have been harvest in this 1,140 acre watershed. This equates to approximately 8.2 percent of the watershed.

The Stillwater River watershed is split into several smaller watersheds called 6<sup>th</sup> Hydrologic Unit Codes (HUC). The upper Stillwater HUC is approximately 22,670 acres. Given the size of the watershed compared to the proposed harvest of 131 acres, it is very unlikely that a measurable impact would result from this level of harvest. Therefore, the Stillwater River will not be further addressed for water yield.

## 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*

Twelve units totaling approximately 505 acres would be commercially harvested under this alternative. Approximately 207 acres would be regeneration harvest while the remaining 297 acres would be an intermediate harvest. Site preparation on the regeneration harvest would be completed with excavators or dozers depending upon slope. All units would be harvested using conventional ground-based equipment. No harvesting would occur within 50 feet of any Class 1 stream, except for a new road crossing; limited harvest is proposed within SMZs of Class 2 and 3 streams.

Approximate miles of road activities include:

- 1.8 miles of new construction
- 3.5 miles of reconstruction
- 2.1 miles of temporary road construction
- 1.7 miles of road reclamation
- 5.9 miles 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. The existing potential sediment sources would continue until repaired by another project or funding source. In-channel sources of sediment would continue to exist and erode as natural events dictate.

#### Fish Habitat Parameters

- *Large Woody Debris Recruitment*

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

– *Stream Temperature*

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

**Water Yield**

No increase in water yield would be associated with 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 2004). 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 2004). By minimizing displacement, less erosion would likely occur compared to other harvest methods with more extensive disturbance (Clayton 1987 *in* DNRC 2004).

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

Existing roads would have drainage improvements and BMP upgrades implemented under this alternative. Proposed major improvements to the road system include converting the road adjacent to Fish Lake into a recreation trail and constructing a new road away from the lake. Minor drainage improvements include reshaping drain dips, cleaning ditch-relief culvert catchbasins, as well as installing ditch-relief culverts. This would be expected to reduce the potential sediment delivery to Fish Lake from the road surface.

New stream crossings would be installed in five locations where the current crossing structure is failing or undersized. In addition, one new crossing structure would be installed on a permanent road in a non-fish bearing reach of a perennial stream. A temporary crossing would be placed on a Class 2 stream and removed immediately after use. The proposed crossing structure would bridge across the stream to minimize impacts to the channel while allowing access. This site would be restored immediately after use.

While the road improvements included in this alternative would be expected to reduce the potential sediment delivery to bodies of water, a short-term increased risk of sediment delivery would occur at crossing locations. Because vegetative filters take a couple of years to develop, short-term BMP measures such as slash filter windrow,

sediment fence and wattles would be employed at locations where sediment delivery to streams may occur. TABLE WR1: ESTIMATED POTENTIAL SEDIMENT DELIVERY shows the modeled potential sediment delivery for the project area watersheds. The modeled impacts have been stratified into three time periods to account for the delayed vegetation establishment at road activity locations, however both post-project time periods show a reduced potential sediment delivery.

**TABLE WR1: ESTIMATED POTENTIAL SEDIMENT DELIVERY (tons/year)**

| <b>Watershed</b>                           | <b>Existing Estimated Potential Sediment Delivery</b> | <b>0 to 2 years after implementation</b> | <b>3+ years after implementation</b>  |
|--------------------------------------------|-------------------------------------------------------|------------------------------------------|---------------------------------------|
| <b>Fish Lake/Bull Lake and Tributaries</b> | <b>11.6</b>                                           | <b>2.3</b><br>(9.3 tons/yr reduction)    | <b>1.8</b><br>(9.8 tons/yr reduction) |
| <b>Stillwater River</b>                    | <b>0.9</b>                                            | <b>0.3</b><br>(0.6 tons/yr reduction)    | <b>0.3</b><br>(0.6 tons/yr reduction) |
| <b>Spring Creek</b>                        | <b>0.1</b>                                            | <b>0.1</b>                               | <b>0.1</b>                            |
| <b>Total</b>                               | <b>12.6</b>                                           | <b>2.7</b>                               | <b>2.2</b>                            |

Due to the dispersed proposed harvest in tributaries across the watersheds and the discontinuous nature of streams in the project area, a low risk of increasing in-stream sediment would result from this alternative. Existing in-channel sources of sediment would be expected to continue to contribute sediment at the current rate.

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 due or beneficial uses due to increased sediment would be low.

**Fish Habitat Parameters**

*- Large Woody Debris Recruitment*

Although no harvest is proposed within 50 feet of any Class 1 stream, approximately 3.0 acres of RMZ harvest is proposed. The proposed harvest in the RMZ would remove up to 50 percent of the merchantable trees in the RMZ, but outside of the SMZ. Approximately 0.8 acres of the RMZ harvest would be along potentially fish-bearing streams. While this proposal would reduce the recruitable woody debris for these reaches, a majority of the recruitable woody debris and all submerchantable vegetation would be retained. This level of harvest in the RMZ would be expected to have a low risk of adverse impacts to fish habitat.

- *Stream Temperature*

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

**Water Yield**

TABLE WR2: ACRES OF HARVEST AND ECA BY WATERSHED displays the harvest for Fish Lake/Bull Lake and tributaries as well as for Spring Creek. Both watersheds would have less than 10 percent of their area harvested under this alternative. This level of harvest would not be expected to result in a statistically significant change in water yield (Troendle et al. 2007). Therefore, this level of harvest would have a low risk of adverse impacts to channel stability.

**TABLE WR2: ACRES OF HARVEST AND ECA BY WATERSHED**

| <b>Watershed</b>                    | <b>Watershed size (acres)</b> | <b>Acres</b> | <b>ECA</b> | <b>Percent of watershed</b> |
|-------------------------------------|-------------------------------|--------------|------------|-----------------------------|
| Fish Lake/Bull Lake and tributaries | 2,750                         | 267          | 211        | 9.7%                        |
| Spring Creek                        | 1140                          | 107          | 88         | 9.3%                        |

**CUMULATIVE EFFECTS**

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

**Sediment Delivery**

The potential for sediment delivery from roads on the proposed haul routes would remain, as would the in-channel sediment sources described in *EXISTING CONDITION*. The existing direct sediment-delivery sources would continue until repaired by another project or funding source. In-channel sources of sediment would continue to exist and erode as natural events dictate.

**Fish Habitat Parameters**

- *Large Woody Debris Recruitment*

No reduction in recruitable large woody debris would result from the implementation of this alternative. Recruitable large woody debris would be retained at an adequate level to maintain stream form and function. Past impacts

to recruitable woody debris would continue to ameliorate as existing harvest units revegetate and grow.

- *Stream Temperature*

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

**Water Yield**

No increase in water yield would be associated with this alternative. As vegetation continues toward mature forest conditions, annual water-yield increases would gradually reduce.

• *Cumulative Effects Summary – No-Action Alternative*

Because no timber harvesting or associated activities would occur under this alternative, cumulative effects would be limited to the existing condition. Sediment sources would continue unless repaired under a separate project. Although some past harvesting in riparian zones is present, conditions would continue to provide adequate levels of large woody debris recruitment and shade retention. Conditions would continue to support fish-habitat parameters and provide adequate levels of large woody debris and shade. Under this alternative, fisheries habitat quality variables described in this assessment would be maintained at their current level.

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

**Sediment Delivery**

Under this alternative, the proposed timber-harvesting and road-construction activities would occur. A long-term reduction in direct sediment delivery would be expected due to major and minor drainage improvements, including converting the lakeshore road into a trail. A short-term increase in sediment delivery potential could occur with the replacement and installation of new stream crossing structures. A cumulative increase in sediment delivery as a result of timber harvesting and roadwork would have a low risk of occurring because of the BMP application and adequate stream buffers to filter potential displaced soil. In-channel sources of sediment would continue to exist and erode as natural events dictate with a low risk of affecting beneficial uses. As a result of the activities proposed and the mitigation measures recommended, a reduction in long-term sediment delivery to water bodies in the project area would be expected.

**Fish Habitat Parameters**

- *Woody debris recruitment*

While evidence of past riparian harvest was found during field review and this project would harvest approximately 3.0 acres of timber within one SPTH of Class 1 streams, the large majority of the stands within 1 SPTH of Class 1 streams are

intact. This proposal would result in low risk of adverse cumulative impacts to recruitable woody debris.

– *Stream temperature*

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

**Water Yield**

The cumulative annual harvest since 1928 would be approximately 16.4 percent in the Fish Lake/Bull Lake and tributaries watershed, and 18 percent in the Spring Creek watershed. This level of harvest would not be expected to result in adverse cumulative impacts. Therefore, while the cumulative water yield would increase very slightly and because the water yield levels would remain low, a low degree of risk to water quality would result from the implementation of this alternative.

• *Cumulative Effects Summary – Action Alternative*

Because all timber-harvesting activities would follow BMPs as required by *ARM 36.11.422* and the direct and indirect effects would have a low risk of impacts, a low risk of additional adverse cumulative effects would be expected to occur under this alternative. This expectation includes the results of (1) a slight decrease in the recruitable woody debris in the RMZ along Class 1 streams; (2) a long term decrease in potential sediment delivery from the haul route; and (3) a minor increase in ECA in each watershed.

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

## **Attachment VI: STIPULATIONS AND SPECIFICATIONS**

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

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

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

### **Aesthetics**

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- 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.
- The temporary roads and all jump-ups would be reclaimed after harvesting.
- Where possible, the new road construction would be located where cut and fill would be minimized thus making the new construction less visible.

### **Air Quality**

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- To minimize cumulative effects during burning operations, burning would be done in compliance with the Montana Airshed Group, reporting regulations and any burning restrictions imposed in Airsheds 1 and 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**

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

### **Fisheries**

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- Apply all applicable Forestry Best Management Practices (BMPs), including the Streamside Management Zone (SMZ) Law and Rules, HCP commitments, and Forest Management Rules for fisheries, soils, and watershed management (*ARMs 36.11.425 and 36.11.426*).
- Apply the SMZ Law and Rules to all streams and lakes.
- 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.
- The existing Fish Lake road would be reclaimed to a walking trail and BMPs would be applied to provide for drainage and filtration of that drainage between the trail and Fish Lake.

### **Noxious Weed Management**

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

### **Recreation**

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- Information would be disseminated to the public through signage related to road restrictions due to logging and road construction.

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

## **Soils**

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### ***Soil Compaction and Displacement***

- Logging equipment would not operate off forest roads unless:
  - Soil moisture is less than 20 percent, frozen, or snow-covered to minimize soil compaction and rutting, and maintain drainage features, or
  - Soil is snow-covered to a depth that would prevent compaction, rutting, or displacement.
- 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.
- Conventional ground-based skidding equipment would not be operated on steep slopes (greater than 40 percent). Soft-tracked yarders are suitable on slopes up to 55 percent with less impact than conventional tractor skidding. Cable yarding would be used on steeper slopes.
- Piling and scarification may be completed with an excavator where slopes are gentle enough to permit. Steeper slopes and even gentler slopes would have slash treatment and site preparation done with an excavator. A majority of all feasible fine litter and 10 to 15 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 steeper slopes.
- Roads used by the purchaser would be reshaped and the ditches redefined following use to reduce surface erosion.
- Drain dips and gravel would be installed on roads as needed to improve road drainage and reduce maintenance needs and erosion.
- Some road sections would be repaired to upgrade the roads to design standards that reduce erosion potential and maintenance needs.
- Certified weed-free grass seed and fertilizer would be applied in a prompt and timely manner to all newly constructed road surfaces, cutslopes, and fillslopes. These applications would also be applied to any existing disturbed cutslopes, fillslopes, and landings immediately

adjacent to open roads. Seeding to stabilize soils and to reduce or prevent the establishment of noxious weeds would include:

- Seeding all road cuts and fills concurrent with construction.
  - Applying “quick-cover” seed mix within 1 day of work completion at culvert installation sites involving stream crossings.
  - Seeding all road surfaces and reseeding culvert installation sites when the final blading is completed for each specified road segment.
- Based on ground and weather conditions, water bars, logging-slash barriers and, in some cases, temporary culverts would be installed on skid trails where erosion is anticipated, and as directed by the Forest Officer. These erosion-control features would be periodically inspected and maintained throughout the contract period or extensions thereof.

## **Vegetation**

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- All harvest areas shall have a minimum of 2 snags and 2 snag-recruits over 21 inches dbh, or the next largest size class available. Additional large-diameter recruitment trees may be left if sufficient large snags are not present. These snags and recruitment trees may be clumped or evenly distributed throughout the harvest units.
- Certain portions of the harvest areas would be left uncut; these areas may include large healthy trees, snag patches, small healthy trees, rocky outcrops, SMZs, small wetlands, etc.

## **Watershed**

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- Planned erosion-control measures include:
  - grade breaks on roads,
  - surface water-diverting mechanisms on roads,
  - slash-filter windrows, and
  - grass seeding.
- Details for these control measures would be included in *ATTACHMENT B* of the *TIMBER SALE AGREEMENT*.
- 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**

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- If a threatened or endangered species is encountered, consult a DNRC biologist and develop additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (*ARM 36.11.428 through 36.11.435*).
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while on duty as per GB-PR2 (*USFWS AND DNRC 2010, Vol. II p. 2-5*).
- Contractors 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 posted 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 Transportation Plan) to reduce disturbance to grizzly bears from April 1- June 15 during the Spring Period as per GB-NR3 (*USFWS AND DNRC 2010, Vol. II pp. 2-11, 2-12*).
- In a portion of harvest units not undergoing broadcast burn site preparation, 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 ponderosa pine, western larch and Douglas-fir. Emphasize the retention of downed logs  $\geq 15$  inches dbh where they occur as per LY-HB2 (*USFWS AND DNRC 2010, Vol. II p. 2-48*).
- 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 VII: Glossary

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

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

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

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

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

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

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

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

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

**Class A Lands:** Large tracts of Stillwater Block lands situated near federal lands designated as security core that are managed as quiet, secure areas for grizzly bears. Allowable commercial management occurs on a schedule of 4 years of

management and 8 years of rest. Low-intensity forest management activities and short-term (<31 operating days) commercial forest management activities are permitted within rested areas during the grizzly bear non-denning period (April 1 – November 15). All forest management activities are permitted within rested Class A lands during the grizzly bear denning period (November 16 – March 31), when bears are typically inactive.

**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*.

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

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

**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. Restrictions may be man-made or naturally occurring.

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

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

wheel-drive passenger car or two-wheel-drive pickup.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Stocking:** The degree of occupancy of land by trees as measured by basal area or number of trees, and as compared to a stocking standard (which is an estimate of either the basal area) or the number of trees per acre required to fully use the growth potential of the land.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Attachment VIII: Preparers and Contributors

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# Acronyms

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

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