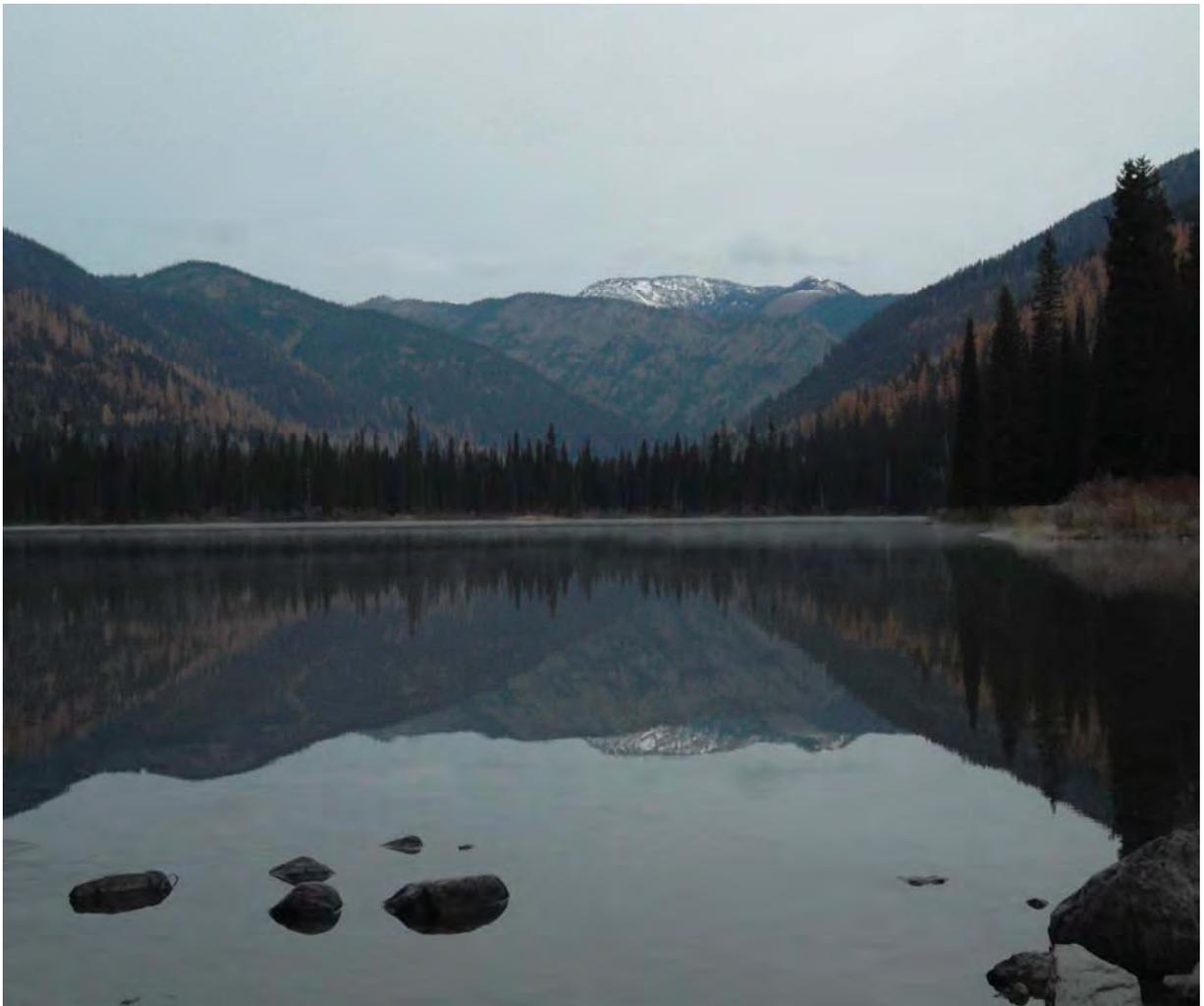


UPPER WHITEFISH LAKE TIMBER SALE

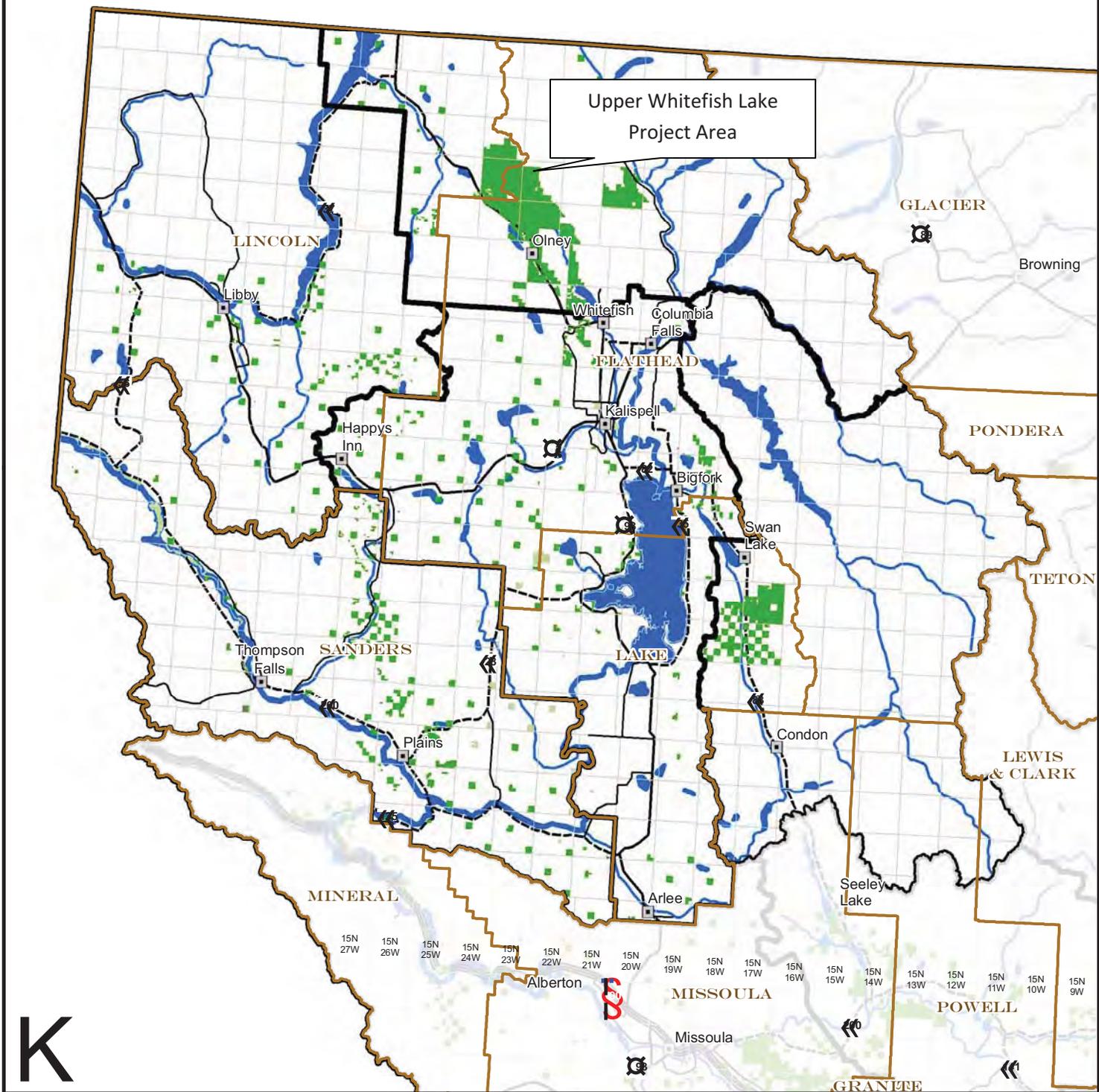
Checklist Environmental Assessment

March 2012



DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
Northwestern Land Office—Stillwater Unit
Olney, Montana

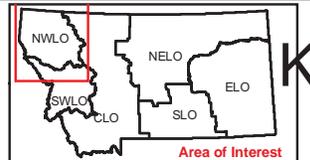
Proposed Upper Whitefish Lake Timber Sale Project Vicinity Map



Upper Whitefish Lake
Project Area

K

	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

Project Name:	Upper Whitefish Timber Sale
Proposed Implementation Date:	Spring 2012
Proponent:	Montana Department of Natural Resources (DNRC), Northwestern Land Office, Stillwater Unit
Location:	Sections 8, 16, 17, 21, & 28, Township 34 north, Range 23 west; and Section 3, Township 33 north, Range 23 west
County:	Flathead

I. TYPE AND PURPOSE OF ACTION

Montana Department of Natural Resources and Conservation (DNRC), Stillwater Unit, proposes to harvest approximately 1 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 also includes the clearing of 5 sites (less than 0.1 acre each) in the Upper Whitefish Lake Campground for future development of campsites. This project would produce an estimated \$132,000 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) and associated Record of Decision (ROD), 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 July 2011, DNRC solicited public participation on the Upper Whitefish Timber Sale Project. Scoping notices were advertised in the Daily InterLake, Whitefish Pilot, and at the Olney Post Office, and 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 in Olney, Montana.

The public comment period for the Initial Proposal was open for 30 days. DNRC received one letter, one email, and one phone call with comments. One party returned a form stating they did not have any concerns or comments at this time but would like to stay involved. The comments received raised concerns of potential impacts to bull trout and westslope cutthroat trout in the East Fork of Swift Creek and Upper Whitefish Lake, potential impacts of further development of campsites at Upper Whitefish Lake, and a question about whether or not a cultural resource inventory had been done in the proposed project area. The comments were reviewed by the ID Team to identify issues that were within the scope of the project, and were analyzed in individual sections to which they pertained.

In September 2011, the Interdisciplinary (ID) Team began to compile issues based on the comments received and to gather information related to current conditions. Soils, wildlife, vegetative, hydrological, and visual concerns were identified by DNRC resource specialists and field foresters as elements to be addressed on this project. 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 through project design and/or mitigation measures.

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 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.

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 removal of a culvert on a stream crossing and the removal/installation of a bridge near Upper Whitefish Campground.

U.S. Fish and Wildlife Service (USFWS)

In December 2011, the USFWS issued DNRC an Incidental Take Permit (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.

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***

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. 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.

- **Action Alternative**

Development of the Action Alternative is based on analyses of current forest and resource conditions within the project area and cumulative effects areas. Such conditions include connectivity of mature timber stands, timber stand health, fuel load levels, old-growth, and viability of access. Reconnaissance of the project area discovered numerous additional stream courses and steep slopes where road construction would be difficult. The following issues related to forest conditions show:

- an on-going spruce budworm outbreak has continued to infest host tree species due to favorable conditions for that species,
- current cover type does not match DNRC's desired future condition for some stands;
- and overstory tree growth and vigor has diminished due to overcrowding and in-growth of shade-tolerant species.

As a result, an Action Alternative and mitigation measures were developed which, if implemented, would improve timber stand health, avoid road construction on steep slopes and minimize management along many stream courses in the project area. A more detailed description of mitigation measures can be found in *Attachment VII - Stipulations and Specifications*.

Under this alternative, the DNRC would:

- commercially harvest approximately 1.5 million board feet of timber from approximately 166 acres,
- regenerate new stands of healthy trees on 87 acres through seed tree with reserves treatments and natural and planted regeneration,
- Improve the vigor and growth on 79 acres through intermediate treatments such as single tree select,
- Interplant western white pine on 135 acres,
- plant spruce on 14 acres,
- clear 5 sites (less than 0.1 acres each) for future development of campsites,
- reconstruct 0.6 miles of road,
- and perform road maintenance and Best Management Practices (BMP) improvements on approximately 17 miles of road.

Detailed descriptions of the harvesting methods and silvicultural prescriptions can be found in *Attachment II – PROJECT MAP and Attachment III – PRESCRIPTIONS*.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

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

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 productivity of the site over the long term.*

Existing Conditions

The *Soil Survey of Flathead National Forest Area, Montana (Martinson and Basko, 1998)* combines landform and soil information with habitat types to inventory and map soils in the project area. Thirteen landtypes were

identified in the project area. A brief description of the landtypes within the project area can be found in the project file.

Past monitoring on DNRC timber sales from 1988 to 2010 has shown an average of 11.3 percent soil impacts across all parent materials. Stratifying the results by soil texture that are similar to the majority of the proposed harvesting shows an average of approximately 13.5 percent of the harvest areas impacted from erosion, displacement or severe compaction (DNRC 2010).

Cumulative effects from past and current forest management in the proposed harvest units are as a result of skid trails and landings. While records show evidence of harvest dating as early as 1948, the majority of the harvest occurred during the period of 1963 through 1972. Other forest product removals include fence posts and rails, firewood, and individual and commercial Christmas tree harvests throughout the last 70 years. Impact from skid trails and landings from this time period have been reduced through freeze-thaw cycles and root mass penetrating the soil. While many of the impacts have ameliorated over time, a few skid trails are still visible in the proposed harvest units. Ocular estimate of impacts from past harvest is less than five percent of the proposed harvest areas.

During field reconnaissance, 19 transects were used to estimate coarse woody debris in the project area; 10 transects were located in proposed units. The method for quantifying the coarse woody debris is described in the *Handbook for Inventorying Downed Woody Material* (Brown, 1974). TABLE III-1 – COARSE WOODY DEBRIS AMOUNTS displays the average, minimum, maximum and median levels of coarse woody debris within transects in the project area and the proposed units. The median is the point with half the transects showing more and half the transects showing less.

TABLE III-1: COARSE WOODY DEBRIS AMOUNTS

	Number of transects	Average	Minimum	Maximum	Median
		tons per acre			
Project Area	19	14.4	0.7	44.7	11.2
Within proposed units	10	16.4	2.2	44.7	13.4

These results are within the recommendations in *Managing Coarse Woody Debris in Forests of the Rocky Mountains* (Graham et al., 1994) on similar habitat types post timber harvest. Subalpine fire habitat types are recommended to have a level of coarse woody debris in the range of 7 to 24 tons per acre to maintain forest productivity. Currently, three of the 10 transects located in proposed units were below the recommendations, three were above the recommendation, and 4 were within the recommended levels.

Environmental Effects

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

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

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

The comparison of the soil type map, field reconnaissance notes, and topographic map features with the proposed harvest unit map, indicates that ground-based skidding would occur on slopes of up to 45 percent. The extent of expected impacts would likely be similar to those reported in the *DNRC SOIL MONITORING REPORT* (DNRC, 2004), or approximately 13.5 percent of the harvest area for ground-based operations during summer conditions. Monitoring data shows that cable yarding averages an impact of approximately 6.3 percent. Downhill cable yarding has the potential for higher impacts than standard uphill yarding operations due to increased drag. Therefore, the impacts from this proposal are estimated to be approximately 7 to 10 percent. TABLE III-2 – EXPECTED ACRES OF IMPACT TO SOIL FROM COMPACTION AND DISPLACEMENT summarizes the expected impacts to soils within harvest units.

TABLE III-2 - EXPECTED ACRES OF IMPACT TO SOIL FROM COMPACTION AND DISPLACEMENT

HARVEST METHOD AND SEASON	NO-ACTION ALTERNATIVE	ACTION ALTERNATIVE
Ground based - summer harvest (121 acres with impacts up to 13.5 percent of the harvest area)	0 16.0	acres
Cable yarding— (45 acres with impacts of 7 to 10 percent of the harvest area)	0	3 to 5 acres
Total area of impacts	0	19 to 21 acres
Total harvest	0 166	acres
Percent of area impacted in harvest units	0	11.4 to 12.6 percent

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

Coarse woody debris would be left on site in volumes recommended to help maintain soil moisture and forest productivity, generally in the 10 to 20 tons per acre range for habitat types found in the harvest locations (Graham et al. 1994). Because coarse woody debris would be left on site in amounts recommended by scientific literature, and fine debris removal would be maintained as much as practicable, the risk of measureable adverse direct or indirect impacts to nutrient cycling would be low.

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

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

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

A list of mitigation measures and relevant BMPs can be found in the project file.

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 and Channel Migration zones,*
 - ✓ *increasing stream temperature, and*
 - ✓ *affecting habitat connectivity at road crossings.*

Existing Conditions

East Fork Swift Creek is a C4 channel type (*Rosgen 1996*) immediately above Upper Whitefish Lake. The stream is strongly influenced by beaver dams and has multiple channels. The floodplain in this portion of the stream is quite wide and several old relic channels were found during field reconnaissance in 2011. Due to the relic channels present, Private Forestry Assistance personnel from DNRC visited the site to determine if the area was considered as an adjacent wetland. The conclusion was that the area is not considered as an adjacent wetland under the SMZ law (*Moore 2011*).

Stream stability is generally good throughout the DNRC managed lands, although some bank erosion was noted in the project area during 2001, 2009, and 2011.

Approximately 1.5 to 2 miles of East Fork Swift Creek is dry during a portion of the year. This is a natural condition due to geology of the watershed and a fault located in the valley bottom (*USGS 1955*). Tributaries to East Fork Swift Creek are generally 'A' channels (*Rosgen 1996*) on the upper slopes and transition into 'B' channels on the lower slopes. Most of the tributaries are steep and much incised with little accessible fish habitat. The majority of these streams are intermittent, however a few of the tributaries are small perennial, spring fed streams and are fish-bearing on the more gentle lower slopes (generally less than 25 percent). Swede Creek, adjacent to the proposed harvest unit, exhibits a 'B' channel type. Stability is good with limited bank erosion.

The majority of roads found within the project area are main system roads that are reviewed regularly for maintenance needs. During field reconnaissance in 2011, potential sediment sources to stream channels were cataloged. These sites include the following:

- Direct delivery of surface water from a road ditch into Upper Whitefish Lake.
- A plugged 30-inch CMP on a brushed-in road in NW1/4, section 21, T34N, R23W.
- Unvegetated banks at a failed native log crossing on a brushed-in road in SW1/4, section 21, T34N, R23W.

In-channel sediment sources are very limited in the project area streams. In 2001 approximately 99 percent of the banks along East Fork Swift Creek were stable with 2 identified mass wasting sites. The observed area of mass wasting was estimated at less than one-half acre. More recent channel condition observations estimated up to 16 percent eroding banks in some areas above Upper Whitefish Lake, although reach condition were noted as 'natural and the channel is stable' (*Watershed Consulting 2009*). Other natural sources of in-channel sediment are limited to outcrops 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. During field review, no substantial sediment sources were identified on haul roads in the Swede Creek watershed.

Bull trout are found in Swift, East Fork Swift and Swede creeks; westslope cutthroat trout are present in Swift Creek, East Fork Swift Creek, and unnamed streams that are tributary to East Fork Swift Creek.

While no woody debris data is available for the tributaries of East Fork Swift Creek, the latest woody debris counts in East Fork Swift Creek show an average of 55 pieces per 1000 feet of channel. This amount of woody debris is within the range of variation for similar reference reach sites on 'C' channels and slightly below the reference range for 'B' channels (*Bower, 2004*). Site potential tree height (SPTH) is the method used to identify RMZ width according to *ARM 36.11.425 (5)*. The SPTHs for streams in the project area are as follows:

- East Fork Swift Creek – 112 feet
- Swede Creek – 111 feet
- Unnamed tributaries to East Fork Swift Creek – 92 feet

Approximately 167 acres is encompassed within one SPTH of East Fork Swift Creek and its fish-bearing tributaries. An estimated 23 percent (38 acres) of this area has been impacted by roads and timber management. In addition to the RMZ widths derived from SPTHs in the project area, the channel migration zone (CMZ) width was measured for East Fork Swift Creek within a proposed unit location. The CMZ extended

approximately 275 feet from the edge of the channel. Approximately 35 acres of RMZ is located within one SPTH (111 feet) of Swede Creek. The estimated RMZ area impacted by past road construction is approximately 0.4 acres (1 percent).

East Fork Swift Creek temperature data indicates water temperatures below the threshold shown to adversely affect bull trout and cutthroat trout. No data is available for stream temperature in Swede Creek.

Two non-bridge crossing structures (CMPs) are located on the haul route. One was reviewed in 2011 and concluded that it is providing full passage to all life stages of salmonids due to streambed simulation. The second CMP likely is a barrier to juvenile fish; however a technical survey is necessary for confirmation.

The current annual water yield for East Fork Swift Creek is 2.1 percent and for Swede Creek is 0.1 percent.

Environmental Effects

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

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. No reduction in recruitable large woody debris would result from the implementation of this alternative. No increases in stream temperature from a reduction in stream shading would be expected under this alternative. No changes to fish passage would occur. No increase in water yield would be associated with this alternative.

Because no timber harvesting or associated activities would occur under this alternative, cumulative effects would be limited to the existing condition. Conditions would continue to support fish-habitat parameters and provide adequate levels of large woody debris and shade to maintain a natural range of water temperatures.

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

Under this alternative, no new road construction would occur and reconstruction would commence away from streams on soils that are suitable for road construction (*Kuennen and Nielsen–Gerhardt, 1995*). Because revegetation may be slow to establish on the road fill, erosion may occur, but due to the distance from streams, sediment delivery and subsequent water-quality impacts would not likely occur.

Existing roads would have drainage improvements and BMP upgrades implemented under this alternative. 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 Upper Whitefish Lake from the road ditch. Removal of the plugged CMP on an unnamed tributary would also reduce the potential for sediment delivery to the stream although a short-term increase in sediment would result from the removal of the CMP. The short-term sediment risk would remain until the site revegetates, which would take approximately 2 years.

Because postharvest water-yield levels under this alternative would remain below the threshold where adverse impacts would be expected, only a low risk of increased in-channel sediment would result from this alternative. In-channel sources of sediment would be expected to continue to contribute sediment at the current rate because the water-yield increase would remain below the recommended threshold.

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 would be low.

Approximately 2 acres of RMZ (1% of total RMZ for East Fork Swift Creek) would have reduced recruitable woody debris. Approximately 0.1 acres of RMZ (<1 percent of total RMZ for the tributaries) would have reduced recruitable woody debris. Approximately 0.5 acres of RMZ (1 percent of total RMZ for Swede Creek) would have reduced recruitable woody debris. The level of retention at each stream should adequately provide for future recruitment into the channels to provide fisheries habitat complexity with a low degree of risk.

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. In addition, the CMZ along East Fork Swift Creek would have at least 50 percent of the trees retained. Therefore,

stream shading post-project would be sufficient to maintain a low risk of increasing stream temperatures due to timber harvesting.

No changes to fish passage along the haul route are proposed. Therefore, no direct or indirect effects would result to fish passage or connectivity.

The annual water yield in East Fork Swift Creek would increase by approximately 0.7 percent; the annual water yield in Swede Creek watershed would increase by approximately 0.3 percent.

A cumulative increase in sediment delivery as a result of timber harvesting would have a low risk of occurring because of the BMP application and adequate stream buffers to filter potential displaced soil. 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 percent of harvested RMZ of East Fork Swift Creek would be 24 percent. The cumulative percent of harvested RMZ of Swede Creek would be approximately 1 percent. Due to the limited amount of canopy removed in the RMZ of Class 1 streams, a low risk of cumulative temperature increases above naturally-occurring ranges would result from the implementation of this alternative.

Cumulatively, no changes to fish passage or connectivity are part of this alternative; the potential barrier identified on the unnamed stream would remain.

East Fork Swift Creek cumulative annual water yield increase would be 2.8 percent and the Swede Creek cumulative annual water yield increase would be 0.4 percent. Therefore, while the cumulative water yield would increase very slightly, because the levels would remain below the threshold set in accordance with *ARM 36.11.425(g)*, a low degree of risk to water quality would result from the implementation of this 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 large woody debris in the RMZ along fish-bearing streams; (2) a short-term increase and long term decrease in potential sediment delivery from the haul route, and (3) a minor increase in modeled annual water-yield estimates.

Because the annual water-yield increases would remain below the thresholds of concern 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 fisheries habitat) would be low.

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 Airshed 2. Some particulate matter may be introduced into the Airshed 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 as unacceptable, the application of dust abatement, such as magnesium chloride, may be required.

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

Cover type refers to the dominant tree species that currently occupy a forested area. Current cover type doesn't match DNRC's desired future condition for some stands. The four cover types present within the proposed harvest units are Douglas-fir (2 acres), subalpine fir (60 acres), mixed conifer (71 acres), and western white pine (33 acres). The desired future cover type for these stands, based on Stand Level Inventory (SLI) data or professional judgement, is western white pine (141 acres) and mixed conifer (25 acres).

Age class distributions are another important characteristic for determining trends on a landscape level. Current age class distributions do not match DNRC's desired future condition for some stands. The majority of the stands in the project area are in the 150+ year age class (approximately 95%). Historical data for the Upper Flathead Valley suggests that the Stillwater Unit should have more area in the 0-to-39-year and 100-to-150-year age classes.

Based on Stand Level Inventory (SLI) data and field surveys across the Stillwater Unit, approximately 10.7 percent (12,528 acres) of the Stillwater Unit analysis area can be classified as old growth using definitions by Green et al. (*Old-Growth Forest Types of the Northern Region, 1992*). Fifty-one acres of medium-attribute old-growth are within a proposed harvest unit. Old-growth attributes include characteristics such as density of large diameter and older age trees per acre, diversity of age classes and canopy levels (stand structure), and amount of decadence (dead and downed woody debris).

The major insects and diseases present are spruce budworm, white pine blister rust, Douglas-fir bark beetle, and western larch mistletoe. 2011 is the second year of the widespread spruce budworm outbreak, primarily affecting subalpine fir. Douglas-fir bark beetle has led to mortality in clumps of over-mature Douglas-fir, and white pine blister rust (sometimes in conjunction with mountain pine beetle) has caused damage or mortality to most of the western white pine in the project area.

Fisher and Bradley (Fire Ecology of Western Montana Habitat Types, 1987) described fire ecology of habitat-type groups in Montana. The entire project area is in the moist lower subalpine fir habitat types (Fire Group 9). Fire Group 9 habitat types are in the subalpine fir and spruce climax series and fire history studies are limited but generally indicate infrequent, mixed severity fires. An average of 16.4 tons per acre of coarse woody debris greater than 3 inch diameter was inventoried, which is somewhat low for these habitat types (*Graham et al., 1994*).

Noxious weeds are present in the project area, mainly located along roads and the Upper Whitefish Lake Campground; these include oxeye daisy, spotted knapweed, and orange hawkweed.

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

Environmental Effects

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

Timber harvesting would not occur at this time. Neither cover types nor age class distributions would be directly or indirectly affected. Over time, lacking substantial disturbances such as timber harvests or wildfires, the proportion of seedling/sapling-size stands would gradually decrease.

Stocking levels 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 an ongoing program of site-specific herbicide spraying along roads and in small areas of infestations.

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

Under the proposed Action Alternative, 60 acres of subalpine fir, 46 acres of mixed conifer, and 2 acres of Douglas-fir cover type would be converted to a western white pine cover type for a total of 108 acres; this would meet DNRCs desired future condition related to cover type. Thirty-three acres of western white pine cover type and 25 acres of mixed conifer would also be harvested but the cover type would remain unchanged. Seven acres of 40-to-99-year and seven acres of 150+ year age classes would be converted to 0-to-39-year age class. No other notable change in age class would occur due to the amount of older-aged trees being retained. Fifty-one acres of medium-attribute old-growth would receive an old-growth maintenance treatment that maintains the stand as old-growth as defined by DNRC. These 51 acres would be converted to low-attribute old-growth due to the removal of most of the lower canopy level of the stand. Cumulatively, no changes would occur to old growth amounts or distributions on the Stillwater Unit analysis area.

Mortality from insects and diseases would decrease as susceptible tree species are removed from the stand and as more resistant tree species are regenerated. The proposed prescriptions would emulate natural fires that historically occurred. Ladder fuels to crowns would be removed in the proposed harvest units.

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, and applying herbicide along roadsides and on spots of weed outbreaks.

Additional information can be found in the Project File: Vegetation

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.

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 present within the proposed project area. Mature forest is abundant and well-connected within the project and cumulative effects analysis areas.

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 166 acres of western larch, subalpine fir, Douglas-fir, and Engelmann spruce forest habitat would be harvested. Regeneration silviculture prescriptions on 87 acres would lead to younger, more-open stands likely not suitable for forest interior species. An additional 79 acres would receive intermediate, old-growth maintenance, or group selection treatments which would reduce canopy cover

but could provide suitable (but lower quality) habitat for some species preferring mature forest. A portion of old-growth forest would be harvested, but would retain tree densities and size classes to remain old growth as defined by DNRC. This Action Alternative would alter habitat for wildlife species requiring mature forests, while creating habitats for species using more open stands of younger forest. Present and future deadwood material would be reduced during the proposed timber harvesting; however, several snags and snag recruits would be retained in all the units where available. Overall, minor adverse direct, indirect, and cumulative effects would be anticipated on terrestrial and avian wildlife habitats.

Refer to *Attachment V - WILDLIFE ANALYSIS* for more detailed information.

Potential effect to aquatic life and habitats is discussed in section 5 above. For more information on existing aquatic habitat and potential effects refer to *Attachment IV – WATER RESOURCE ANALYSIS*.

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.

A. TERRESTRIAL

Existing Condition

Suitable potential habitat for grizzly bear and Canada lynx is present in the project area. Suitable habitat is abundant and well-connected. Both of these species have been documented in their respective cumulative effects analysis areas in the past. Year-round and seasonal open roads are present 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: bald eagles, fisher, harlequin ducks, and pileated woodpeckers.

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 and Canada lynx on 166 acres. Forest stands receiving intermediate, old-growth maintenance, or group selection harvest treatments would experience less of a reduction in habitat quality and recover previous levels of suitability faster than stands receiving regeneration treatments. Suitable habitat connectivity would not be expected to be appreciably altered. Short-term increases in open roads and potential disturbance would be expected. Most harvest units would be directly adjacent to existing open roads, visual screening along open roads (where present) would be maintained, and no new open roads would be built; minimizing disturbance 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 bald eagles, fisher, harlequin ducks, and pileated woodpeckers would be altered. The proposed logging would remove trees, some snags, and reduce forest cover. The proposed activities could temporarily (up to 21 months over 3 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 affects to these wildlife species and meet forest management goals. Minor adverse effects to bald eagles, fisher, harlequin ducks, and pileated woodpeckers in the project area would be anticipated.

Refer to *Attachment V - WILDLIFE ANALYSIS* for more detailed information.

B. FISHERIES

Bull Trout

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. Fisheries habitat for Bull trout is discussed in sections 5 and 8 above.

Westslope Cutthroat Trout

DNRC has identified westslope cutthroat trout as a sensitive species (*Administrative Rule of Montana (ARM) 36.11.436*). Fisheries habitat for westslope cutthroat trout is discussed in sections 5 and 8 above.

See *Attachment IV – WATER RESOURCE ANALYSIS* for more information.

10. HISTORICAL AND ARCHAEOLOGICAL SITES:

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

The DNRC has no record of cultural resources within the proposed project's area of potential effect; however, a professional inventory of cultural resources has not been conducted of these locales. If previously unknown cultural or paleontological materials are identified during project related activities, all work will cease until a professional assessment of such resources can be made.

11. AESTHETICS:

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

- ***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***

Portions of the project would be visible from open roads within the project area. The project area is not located on a prominent topographic area or visible from a densely populated area, and is not visible from the Upper Whitefish Lake campground. A potential for reduced screening between campsites associated with the clearing of 5 new sites could occur. Timber sale design would minimize visual impacts by randomly spacing retention trees in the units and leave additional trees along unit boundaries and open roads. Increased noise would occur in the short term during the operating season. Thus, direct, indirect, and cumulative effects to aesthetics are expected to be minimal.

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.

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)
- Final HCP/EIS (USFWS/DNRC) (September 2010)
- Proposed Mystery Fish Environmental Assessment (EA) (Spring 2012)
- Proposed Fish Bull Face CEA (Spring 2012)

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

14. HUMAN HEALTH AND SAFETY:

Identify any health and safety risks posed by the project.

No unusual safety considerations are associated with the proposed timber sale.

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.

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.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

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

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

18. DEMAND FOR GOVERNMENT SERVICES:

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

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.

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 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.

In December 2011, the Land Board approved the ROD for the Montana DNRC 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 USFWS. The HCP is a required component of an application for a Permit which may be issued by the USFWS 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.

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

This project area encompasses the designated campground at Upper Whitefish Lake. Currently, the campground consists of 8 improved campsites. Improvements associated with the campsites and the campground include: fire rings and grates, wooden picnic tables, a gravel boat launch, and 2 vaulted toilets. Maintenance of the campground has been historically completed by the Stillwater Unit fire crew. An existing loop road, accessed from the west side of Upper Whitefish Lake Road, accesses 5 of the campsites located adjacent to the lake. Another existing loop road (the East Campground Loop Road) accesses a vaulted toilet and one campsite (see *Attachment VI – CAMPGROUND MAP*).

Recreational opportunities associated with the campground include; fishing, hiking, camping, swimming and boating. The campground is heavily used throughout the summer and into hunting season. Currently, the use associated with the campground exceeds the carrying capacity.

Environmental Effects

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

A moderate increase in dispersed recreational use over time would occur, consistent with the area's population growth. As funds become available, recreational improvements to the existing developed campsite would continue. It is probable that there could be a corresponding risk of increased noxious weed-spread, littering and garbage problems, and human-caused fires.

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

The Action Alternative would have effects on approximately 6 acres in and adjacent to the existing campground. Effects would include: noise disturbance, traffic disturbance on the Upper Whitefish Road, a potential for reduced screening between campsites, and possible temporary closures of campsites and one vaulted toilet during logging operations along the East Campground Loop Road. The proposed treatment

prescription for the harvest unit in and adjacent to the campground includes fuels reduction, single tree selection for the removal of trees with heavy defect around campsites, and group select openings.

Mitigations proposed to reduce the effects on recreation include:

- 1) Restrict the logging activity of Unit B1 until after September 15th. This would allow for unrestricted use of the campground and surrounding area during the peak season. This would also reduce the number of recreationalists that would be affected by the noise level during active logging.
- 2) If logging activity would require a temporary closure of the campground, temporary closures signs would be posted at the main kiosk located at the Stillwater Unit office, Upper Whitefish Road kiosk and the Lower Whitefish Road kiosk to notify the public of the closure. The temporary signs would include information of the location, date, and duration of the closure.

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.

22. SOCIAL STRUCTURES AND MORES:

Identify potential disruption of native or traditional lifestyles or communities.

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

23. CULTURAL UNIQUENESS AND DIVERSITY:

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

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

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

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

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

No revenue would be generated for the 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 \$132,000 for the Common Schools Trust and approximately \$52,000 in Forest Improvement (FI) fees would be collected for FI projects. This is based on a stumpage rate of \$15.74 per ton, multiplied by the estimated volume of tons. This stumpage rate was derived by comparing attributes of the proposed timber sale with the attributes and results of other DNRC timber sales recently advertised for bid. Costs related to the administration of the timber sale program are only tracked at the Northwestern Land Office (NWLO) and Statewide level. DNRC does not track project-level costs for individual timber sales. An annual cash flow analysis is conducted on the DNRC forest product sales program. Revenue

and costs are calculated Statewide and by Land Office. From 2006 through 2010, revenue-to-cost ratio of the NWLO was 2.51. This means that, on average, for every \$1.00 spent in costs, \$2.51 in revenue was generated. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return.

EA Checklist Prepared By:	Name: Jason Parke, Chris Forristal, Marc Vessar	Date: 3/23/2012
	Title: Management Forester, Wildlife Biologist, Hydrologist	

V. FINDING

25. ALTERNATIVE SELECTED:

An Interdisciplinary team (ID Team) has completed the Environmental Analysis Checklist (EAC) for the proposed Upper Whitefish Timber Sale Project. Following a thorough review of the EAC, project file, public correspondence, and Department policies and rules, the decision has been made to select the Action Alternative.

The Action Alternative meets the intent of the project objectives as stated in Section I – *Type and Purpose of Action*. Specifically the project would:

- Clear 5 sites (less than 0.1 acre each) in the Upper Whitefish Lake Campground for potential future development of campsites.
- Reduce mortality from insects and diseases as susceptible tree species are removed from the stand and as more resistant tree species are regenerated. The proposed prescriptions would emulate natural fires that historically occurred. Ladder fuels to crowns would be removed in the proposed harvest units.
- This project would produce an estimated \$132,000 in revenue for the Common Schools Trust.
- Existing roads would have drainage improvements and BMP upgrades implemented under this alternative. 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 Upper Whitefish Lake from the road ditch. Removal of the plugged CMP on an unnamed tributary would also reduce the potential for sediment delivery to the stream, although a short-term increase in sediment would result from the removal of the CMP. 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.

DNRC is required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run (*Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X Section 11; and, 77-1-212 MCA*). The action alternative was designed to be in full compliance of 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) and associated Record of Decision (ROD), as well as other applicable state and federal laws.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

The identified resource management concerns have been fully addressed in the environmental analysis that was conducted. Specific project design features and various recommendations of the resource management specialists have been implemented to ensure that this project will fall within the limits of acceptable environmental change. Taken individually and cumulatively, the proposed activities are common practices, and no project activities will be conducted on important fragile or unique sites. I find there will be no significant impacts to the human environment as a result of implementing the Action Alternative. In summary, I find that the identified adverse impacts will be controlled, mitigated, or avoided by the design of the project to the extent that the impacts are not significant.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

EIS More Detailed EA No Further Analysis

EA Checklist Approved By:	Name: Brian Manning
	Title: Unit Manager
Signature: /s/ <i>Brian Manning</i>	Date: 3/23/201 2

Attachment I: REFERENCES

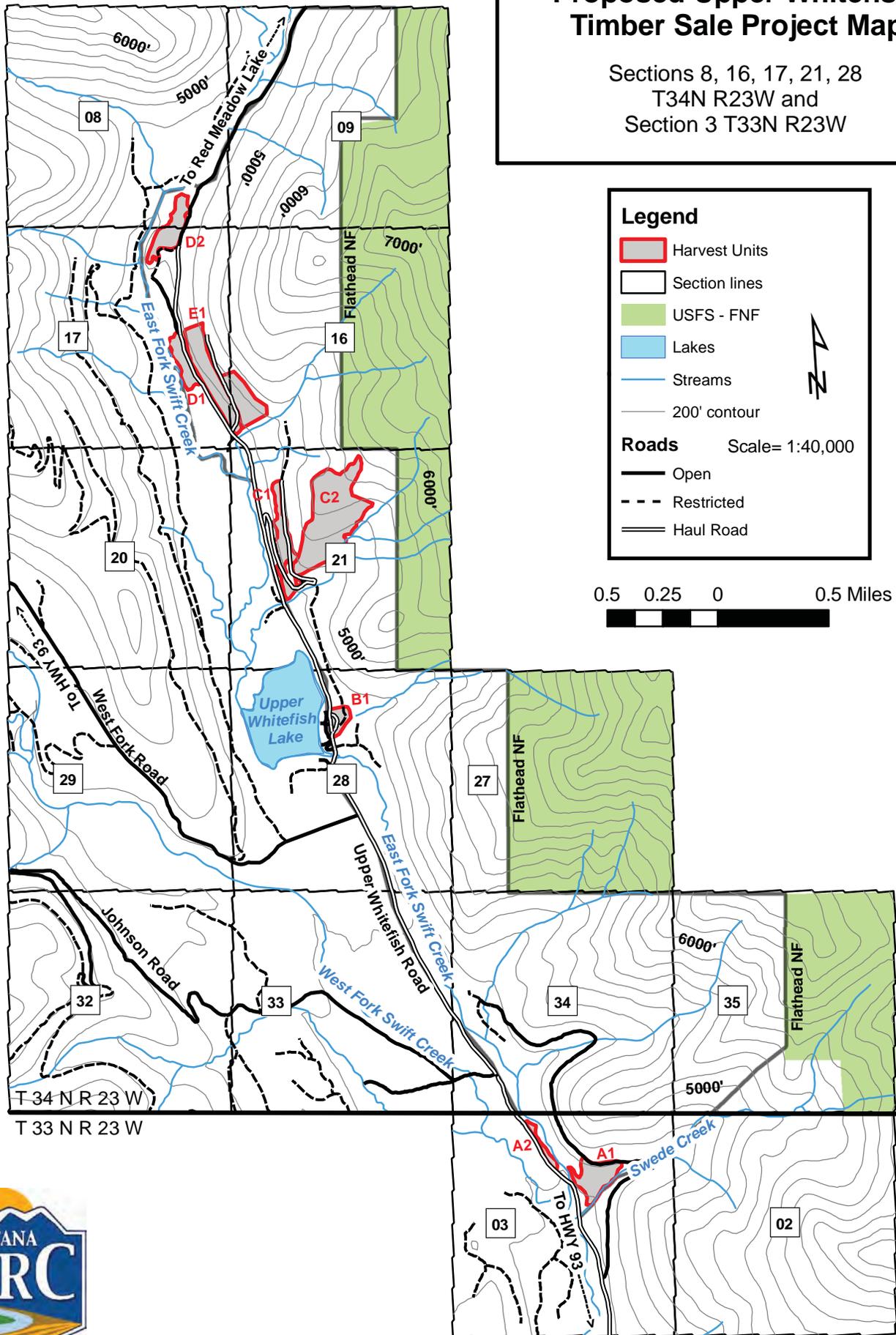
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Proposed Upper Whitefish Timber Sale Project Map

Sections 8, 16, 17, 21, 28
T34N R23W and
Section 3 T33N R23W



Legend

- Harvest Units
- Section lines
- USFS - FNF
- Lakes
- Streams
- 200' contour
- Roads** Scale= 1:40,000
- Open
- Restricted
- Haul Road



Attachment III: Prescriptions

UPPER WHITEFISH TIMBER SALE STAND PRESCRIPTION

Name: J. Parke **Date:** 10/07/2011
Unit Number (s): A1 **Location:** T33N – R23W - S3 **Acres:** 16
Elevation: 4300 **Slope:** 10-35% **Aspect(s):** SW
Habitat type: ABLA/CLUN-XETE (624)
Soils: Alluvial Fans

Description of stand(s):

This stand is located at the bottom 1/3 of the slope along the north side of Swede Creek. This stand is a mixed conifer cover type. Species composition is primarily western larch and subalpine fir. Spruce, Douglas-fir, western white pine, and western red cedar also occupy the stand in lesser amounts. Regeneration is composed of suppressed subalpine fir, spruce, and occasional western white pine. This stand is moderately stocked in the sawtimber size class and is multi-storied with multiple age classes. Overstory trees are in the 150+ year old age class.

Historically, this stand would see infrequent mixed-severity fire with stand replacement occurring at long intervals (several hundred years). The last entry in the stand was a white pine salvage (Swede Creek TS, 1996-97). The primary forest health issues are spruce budworm, white pine blister rust, and diminished growth of the overstory larch due to competition.

Treatment Objectives:

The desired future condition based on SLI 2009 is western white pine. The primary objective will be to regenerate western larch and western white pine.

Prescribed Treatment:

Seed Tree. Leave approximately 8-12 seed trees per acre. Western larch, Douglas-fir, and western white pine are preferred leave tree species. Ground based harvest system. Slash stagnant subalpine fir saplings (average 75 TPA). Excavator piling and scarification for site preparation. Interplant western white pine at approximately 16 foot spacing. Leave 8-12 tons of coarse woody debris for soil nutrient cycling.

Purchaser-do Forest Improvement:

None.

State-do Forest Improvement:

Burn piles, slashing, excavator piling and scarification, plant western white pine.

Anticipated Future Treatments:

Evaluate for overstory removal when regeneration has been established and timber stand inventory (TSI) in 15-25 years.

UPPER WHITEFISH TIMBER SALE STAND PRESCRIPTION

Name: J. Parke **Date:** 10/07/2011
Unit Number (s): A2 **Location:** T33N – R23W - S3 **Acres:** 3
Elevation: 4200 **Slope:** 5-10% **Aspect(s):** Flat
Habitat type: ABLA/CLUN-CLUN (621)
Soils: Alluvial Fans

Description of stand(s):

This stand is located between the East Fork Swift Creek and the Upper Whitefish Road. This stand is a mixed conifer cover type. Species composition is primarily western larch and subalpine fir. Spruce, Douglas-fir, and western white pine also occupy the stand in lesser amounts. Regeneration is composed of suppressed subalpine fir, spruce, and occasional western white pine. This stand is moderately stocked in the sawtimber size class and is multi-storied with multiple age classes. Overstory trees are in the 150+ year old age class.

Historically, this stand would see infrequent mixed severity fire with stand replacement occurring at long intervals (several hundred years). The last entry in the stand was a white pine salvage (Swede Creek Timber Sale, 1996-97). The primary forest health issues are spruce budworm, white pine blister rust, and diminished growth of the overstory larch due to competition.

Treatment Objectives:

The desired future condition based on SLI 2009 is western white pine. The primary objective will be to harvest subalpine fir and spruce and regenerate western white pine. A secondary objective is to maintain aesthetic value and visual screening by protecting submerchantable trees and shrubs along the open road and leaving the majority of the large western larch.

Prescribed Treatment:

Intermediate treatment. Cut all merchantable subalpine fir and spruce and leave other species at a variable spacing of 15 to 45 feet. Western larch, Douglas-fir, and western white pine are preferred leave tree species. Ground based harvest system. Slash stagnant subalpine fir saplings (average 50 TPA). Excavator piling and scarification for site preparation. Interplant western white pine in openings at approximately 16 foot spacing. Leave 8-12 tons of coarse woody debris for soil nutrient cycling.

Purchaser-do Forest Improvement:

None.

State-do Forest Improvement:

Burn piles, slashing, excavator piling and scarification, plant western white pine.

Anticipated Future Treatments:

Evaluate for re-entry and TSI in 15-25 years.

UPPER WHITEFISH TIMBER SALE STAND PRESCRIPTION

Name: J. Parke

Date: 10/07/2011

Unit Number (s): B1

Location: T34N – R23W – S28

Acres: 6

Elevation: 4400

Slope: 5-10% **Aspect(s):** Flat

Habitat type: ABLA/CLUN-MEFE (625)

Soils: Alluvial Fans

Description of stand(s):

This stand is on the east side of the Upper Whitefish Road adjacent to the existing campsites along Upper Whitefish Lake. This stand is a mixed conifer cover type. Species composition is primarily spruce and subalpine fir. Western Larch, Douglas-fir, and western white pine also occupy the stand in lesser amounts. Regeneration is composed of suppressed subalpine fir. This stand is moderately stocked in the sawtimber size class and is multi-storied with multiple age classes. Overstory trees are in the 150+ year old age class.

Historically, this stand would see infrequent mixed severity fire with stand replacement occurring at long intervals (several hundred years). The primary forest health issues are spruce budworm, white pine blister rust, and damage to trees by campsite users. Firewood cutting of dead or blown down trees by campsite users is ongoing. The established campsites see extensive use in the summer/early fall season and are sometimes overcrowded, leading to dispersed camping in un-established areas.

Treatment Objectives:

The desired future condition based on SLI 2009 is western white pine. The primary objective will be to establish five new campsites along the East Campground Loop Road (see Attachment VI – Campground Map) to minimize impacts to other areas due to overcrowding at the existing sites. Other objectives include improving the East Campground Loop Road, hazard reduction, public safety, and maintaining aesthetic value and visual screening. Forest health and timber management are tertiary objectives.

Prescribed Treatment:

Single tree and group selection. Establish five new campsites at an estimated size of no more than 0.1 acres each. Within each site, remove primarily subalpine fir trees while leaving spruce and some subalpine fir for shade and aesthetics. Prune up leave trees and clear all brush and submerchantable trees in each site. Remove hazard trees (such as trees with dead tops, snags, or damaged trees) for public safety. Leave submerchantable trees and brush for visual screening between campsites.

Purchaser-do Forest Improvement:

None.

State-do Forest Improvement:

Slash disposal (either by burning or removal from site).

Anticipated Future Treatments:

Monitor for hazard trees and hazard reduction in the interest of public safety.

UPPER WHITEFISH TIMBER SALE STAND PRESCRIPTION

Name: J. Parke **Date:** 10/07/2011
Unit Number (s): C1 **Location:** T34N – R23W – S21 **Acres:** 16
Elevation: 4600 **Slope:** 35-50% **Aspect(s):** West
Habitat type: ABLA/CLUN-XETE (624)
Soils: Kettles, kames, terraces

Description of stand(s):

This stand is located at the bottom 1/3 of the slope about 1/2 mile north of Upper Whitefish Lake. This stand is a mixed conifer cover type. Species composition is primarily western larch, subalpine fir, and spruce. Douglas-fir and western white pine also occupy the stand in lesser amounts. Regeneration is composed of suppressed subalpine fir, spruce, and occasional western white pine. This stand is moderately stocked in the sawtimber size class and is multi-storied with multiple age classes. Overstory trees are in the 150+ year old age class.

Historically, this stand would see infrequent mixed severity fire with stand replacement occurring at long intervals (several hundred years). The primary forest health issues are spruce budworm, white pine blister rust, and diminished growth of the overstory trees due to competition.

Treatment Objectives:

The desired future condition based on SLI 2009 is western larch/Douglas-fir. Remnant western white pine, both live and dead suggest the desired future condition should be western white pine, therefore the primary objective will be to regenerate western larch and western white pine.

Prescribed Treatment:

Seed Tree. Leave approximately 8-12 seed trees per acre. Western larch, Douglas-fir, and western white pine are preferred leave tree species. Combination cable and ground based harvest system. Slash stagnant subalpine fir saplings (average 75 TPA). Broadcast burn if there is enough slash or apply herbicide for site preparation. Interplant western white pine at approximately 16 foot spacing. Leave 8-12 tons of coarse woody debris for soil nutrient cycling.

Purchaser-do Forest Improvement:

None.

State-do Forest Improvement:

Burn piles, slashing, broadcast burn or herbicide, plant western white pine.

Anticipated Future Treatments:

Evaluate for overstory removal when regeneration has been established and TSI in 15-25 years.

UPPER WHITEFISH TIMBER SALE STAND PRESCRIPTION

Name: J. Parke **Date:** 10/07/2011
Unit Number (s): C2 **Location:** T34N – R23W – S21 **Acres:** 59
Elevation: 5100 **Slope:** 30-45% **Aspect(s):** South
Habitat type: ABLA/CLUN-XETE (624)
Soils: Glaciated mountain slopes

Description of stand(s):

This stand is located at the bottom 1/3 of the slope about 1/2 mile north of Upper Whitefish Lake. This stand is a subalpine fir cover type. Species composition is primarily western larch, Douglas-fir, and subalpine fir. Spruce and western white pine also occupy the stand in lesser amounts. Regeneration is composed of suppressed subalpine fir, and occasional western white pine. This stand is well stocked in the sawtimber size class and is multi-storied with multiple age classes. Overstory trees are in the 150+ year old age class. 51 acres of this stand is old growth.

Historically, this stand would see infrequent mixed severity fire with stand replacement occurring at long intervals (several hundred years). The primary forest health issues are spruce budworm, white pine blister rust, and diminished growth of the overstory trees due to competition.

Treatment Objectives:

The desired future condition based on SLI 2009 is western white pine. The primary objectives will be to harvest the declining subalpine fir, maintain the stands old-growth status, and regenerate western larch and western white pine.

Prescribed Treatment:

Old-growth Maintenance. Leave all trees over 21 inches dbh and additional trees to a minimum of 80 square feet of basal area per acre. Seed tree openings of less than one acre are acceptable with where few 21 inch dbh trees occur. Western larch, Douglas-fir, and western white pine are preferred leave tree species. Ground based harvest system. Interplant western white pine in openings at approximately 16 foot spacing. Leave 8-12 tons of coarse woody debris for soil nutrient cycling.

Purchaser-do Forest Improvement:

None.

State-do Forest Improvement:

Burn piles, plant western white pine.

Anticipated Future Treatments:

Evaluate for re-entry when overstory is at risk of mortality and TSI in 15-25 years.

UPPER WHITEFISH TIMBER SALE STAND PRESCRIPTION

Name: J. Parke **Date:** 10/07/2011
Unit Number (s): D1 **Location:** T34N – R23W – S17 **Acres:** 10
Elevation: 4400 **Slope:** 0-5% **Aspect(s):** Flat
Habitat type: ABLA/CLUN-MEFE (625) **Soils:** Aquepts, stream bottoms

Description of stand(s):

This stand is located between the East Fork Swift Creek and Upper Whitefish Road 1.5 miles north of Upper Whitefish Lake. This stand is mostly within the channel migration zone (CMZ) of the East Fork Swift Creek and several old (inactive) channels are located within the stand. This stand is a mixed conifer cover type. Species composition is primarily spruce and subalpine fir. Regeneration is composed of suppressed subalpine fir and spruce. This stand is moderately stocked in the sawtimber size class and is multi-storied with multiple age classes. Overstory trees are in the 150+ year old age class.

Historically, this stand would see infrequent mixed severity fire with stand replacement occurring at long intervals (several hundred years). The primary forest health issues are spruce budworm and diminished growth of the overstory trees due to competition. This stand was last entered approximately 50 years ago to salvage large spruce trees.

Treatment Objectives:

The desired future condition based on SLI 2009 is mixed conifer. The primary objectives will be to harvest the declining subalpine fir and spruce, minimize impacts to the CMZ of the East Fork Swift Creek, and regenerate spruce and subalpine fir.

Prescribed Treatment:

Single tree selection. The prescription is designed to meet the commitments in the *Aquatics – Riparian Management* section of the *Projects in Progress Checklist* of the Habitat Conservation Plan for native fish species. In short, the commitment states that there will be 50% retention in the stand. Based on the soil type and this commitment, tree selection will be based on harvesting trees susceptible to windthrow and trees declining in health and vigor while leaving suitable seed trees for natural regeneration. Spruce is the major seral and is the preferred leave tree species; protection of residuals will be of great importance to prevent root damage and infections resulting from mechanical damage. Ground based harvest system when soil moisture is less than 18% oven dry weight, otherwise cable yarding will be required. Excavator piling and scarification for site preparation when soil moisture is less than 18% oven dry weight. Leave 8-12 tons of coarse woody debris for soil nutrient cycling.

Purchaser-do Forest Improvement:

None.

State-do Forest Improvement:

Burn piles, excavator piling and scarification.

Anticipated Future Treatments:

Evaluate for re-entry when stocking levels or insects and diseases deem it necessary.

UPPER WHITEFISH TIMBER SALE STAND PRESCRIPTION

Name: J. Parke **Date:** 10/07/2011
Unit Number (s): D2 **Location:** T34N – R23W – S8 & 17 **Acres:** 14
Elevation: 4600 **Slope:** 0-20% **Aspect(s):** Flat **Habitat type:** ABLA/CLUN-MEFE (625)
Soils: Alluvial Fans

Description of stand(s):

There are two different stands within this unit, composing approximately 7 acres each. These stands are located between the East Fork Swift Creek and Upper Whitefish Road, two miles north of Upper Whitefish Lake. These stands are composed of mixed conifer (50%) and subalpine fir (50%) cover types. Species composition is primarily spruce and subalpine fir. Douglas-fir also occupies the stand in lesser amounts. Regeneration is composed of suppressed subalpine fir and spruce. These stands are moderately stocked in the sawtimber size class. The south half is multi-storied with multiple age classes and the north half is a two-storied stand with a few scattered remnant spruce above a stratum of closed canopy subalpine fir and spruce. Overstory trees are in the 150+ year old age class (50%) and the 40-99 year old age class (50%).

Historically, this stand would see infrequent mixed severity fire with stand replacement occurring at long intervals (several hundred years). The primary forest health issues are spruce budworm and diminished growth of the overstory trees due to competition. The south half was last entered approximately 50 years ago to salvage large spruce trees and north half originated from either a clearcut or severe burn occurring the 1920's.

Treatment Objectives:

The desired future condition (DFC) based on SLI 2009 and field reconnaissance is mixed conifer. SLI 2009 suggests the north half of the stand be a subalpine fir DFC but based on forester's judgment, subalpine fir should not be the primary species managed for on this site since the spruce is well suited for the site and longer-lived than subalpine fir. The primary objectives will be to harvest the declining subalpine fir and spruce and regenerate spruce and a minor mix of other species.

Prescribed Treatment:

Clearcut with reserves. The two largest live trees per acre, snags, cull trees, and any Douglas-fir shall be left. Ground based harvest system. Slash stagnant subalpine fir saplings (average 75 TPA). A dense brush component of *menziesia ferruginea*, *vaccinium globulare*, *alnus sinuata*, and other shrubs occupy the south half and will require excavator site preparation or herbicide treatment. Since no suitable seed sources occur adjacent to the stands, regeneration will have to be accomplished by planting spruce at approximately a 12 foot spacing. Leave 8-12 tons of coarse woody debris for soil nutrient cycling.

Purchaser-do Forest Improvement:

None.

State-do Forest Improvement:

Burn piles, excavator piling and scarification or herbicide (south half only), plant spruce.

Anticipated Future Treatments:

Evaluate for TSI in 15-25 years.

UPPER WHITEFISH TIMBER SALE STAND PRESCRIPTION

Name: J. Parke

Date: 10/07/2011

Unit Number (s): E1

Location: T34N – R23W – S16,17

Acres: 41

Elevation: 4600

Slope: 10 - 65% **Aspect(s):** SW

Habitat type: ABLA/CLUN-MEFE (625) and ABLA/CLUN-XETE (624)

Soils: Aquepts, stream bottoms and kettles, kames, terraces

Description of stand(s):

This stand is located at the bottom 1/3 of the slope about 1.5 miles north of Upper Whitefish Lake. This stand is a western white pine cover type. Species composition is primarily western larch, subalpine fir, Douglas-fir, and spruce. Western white pine also occupies the stand in lesser amounts. Regeneration is composed of suppressed subalpine fir and occasional western white pine. This stand is moderately stocked in the sawtimber size class. This stand is multi-storied with multiple age classes. Overstory trees are in the 150+ year old age class.

Historically, this stand would see infrequent mixed severity fire with stand replacement occurring at long intervals (several hundred years). The primary forest health issues are spruce budworm, white pine blister rust, and diminished growth of the overstory trees due to competition. The stand was last entered approximately 50 years ago to salvage large spruce trees.

Treatment Objectives:

The desired future condition based on SLI 2009 is western white pine. The primary objectives will be to regenerate western larch and western white pine.

Prescribed Treatment:

Seed Tree. Leave approximately 8-12 seed trees per acre. Western larch, Douglas-fir, and western white pine are preferred leave tree species. Combination cable and ground based harvest system; the portion above the spur road is downhill cable yarding. Slash stagnant subalpine fir saplings (average 75 TPA). Broadcast burn if there is enough slash or apply herbicide for site preparation. Interplant western white pine at approximately 16 foot spacing. Leave 8-12 tons of coarse woody debris for soil nutrient cycling.

Purchaser-do Forest Improvement:

None.

State-do Forest Improvement:

Burn piles, slashing, broadcast burn or herbicide, plant western white pine.

Anticipated Future Treatments:

Evaluate for overstory removal when regeneration has been established and TSI in 15-25 years.

Attachment IV: WATER RESOURCES ANALYSIS

INTRODUCTION

This analysis is designed to disclose the existing condition of the hydrologic and fisheries resources and display 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 and Channel Migration zones,*
 - ✓ *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 by also evaluating the potential effects of reducing forest canopy and recruitable woody debris 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
- potential for sediment delivery to streams
- increases in the Equivalent Clearcut Acre (ECA) and annual water yield
- increases or decreases in riparian vegetation that provide shade and woody debris

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 sources of introduced sediment from existing and proposed roads. Potential sediment delivery from harvest units will be evaluated from a risk assessment. This risk assessment will use the soil information provided in the *SOILS ANALYSIS* section and the results from soil monitoring on past DNRC timber sales. In-channel sources of sediment were reviewed during field review; the risk of increasing in-channel sediment sources will be addressed as an impact of annual water yield.

Water Yield

Annual water yield will be disclosed as a cumulative effect in the *EXISTING CONDITIONS* portion of this report because the existing condition is a result of all past harvesting and associated activities. Annual water yield refers to the gross volume of water in a watershed that is contributed to a stream or other surface water feature. In the *ENVIRONMENTAL EFFECTS* portion of this report, water-yield increases as a result of this project will be disclosed as a direct effect. The cumulative water-yield increase as predicted under each alternative will be disclosed as a cumulative effect.

The annual water-yield increase for watersheds in the project area was estimated using the ECA method as outlined in *Forest Hydrology, Part II (Haupt et al, 1974)* or by incorporating previous water yield analysis from other agencies.

In order to evaluate the potential effects of water-yield increases, a threshold of concern for each watershed was established per *ARM 36.11.423*. Thresholds were established based on evaluating the acceptable risk level, resources value, and watershed sensitivity. Increased annual water yields above the threshold of concern result in an increased risk of in-channel erosion and degradation of fisheries habitat.

ECA is a function of total area roaded, harvested, or burned; percent of crown 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. This method also estimates the recovery of these increases as new trees revegetate the site and move toward preharvest water use.

Fish Habitat Parameters

Expected effects to fisheries habitat will be addressed qualitatively using the current condition as a baseline, 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) and channel migration zone (CMZ) 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 on project area streams.

Water Yield and Cumulative Effects

Two separate water-yield analysis areas will be included in this project: East Fork Swift Creek and Swede Creek watersheds. This is selected as the appropriate scale of analysis due to the size of the project versus the watershed size and the potential for impacts.

The CMZ is defined as the width of the floodprone area at an elevation twice the maximum bankfull depth. (Rosgen, 1996)

Fisheries Habitat Parameters

The analysis area for fisheries habitat parameters is the RMZ along streams adjacent to proposed harvest units. 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. The CMZ along East Fork Swift Creek within proposed harvest units will also be reviewed for potential impacts to recruitable woody debris.

WATER USES AND REGULATORY FRAMEWORK

WATER QUALITY STANDARDS

This portion of the Flathead River basin, including the Whitefish River and its tributaries, is classified as A-1 by the DEQ, as stated in the ARM 17.30.608. The water quality standards for protecting beneficial uses in A-1 classified watersheds are located in ARM 17.30.622. Water in A-1 classified waterways is suitable for drinking, culinary and food processing purposes (after conventional treatment), bathing, swimming and recreation, growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers, and agricultural and industrial water supply. State water quality regulations prohibit any increase in sediment above naturally occurring concentration in water classified A-1. Naturally occurring means, condition or materials present from runoff or percolation over which man has no control or from developed land where all reasonable land, soil and water conservation practices have been applied [ARM 17.30.602 (17)]. Reasonable land, soil and water conservation practices include, “methods, measures or practices that protect present and reasonably anticipated beneficial uses...” [ARM 17.30.602 (21)]. The State of Montana has adopted Best Management Practices (BMPs) through its non-point source management plan (MDEQ, 2007) as the principal means of meeting the Water Quality Standards.

WATER QUALITY LIMITED WATERBODIES

The project area is within the East Fork Swift Creek watershed, which is not a water quality limited water body. However, the East Fork Swift Creek drains into Swift Creek, which is listed as a water quality limited water body in the 2010 303(d) list for not fully supporting aquatic life and cold water fisheries. The listed probable cause in 2010 was total phosphorous with silviculture listed as the probable source. The 2010 assessment record for Swift Creek states that the “fishery data demonstrates the support of cold water fishery beneficial uses.” The 2010 assessment record also notes that the macroinvertebrate composition and the “observed versus expected” model suggests no impairment. Swift Creek is *not* listed in the 2012 DRAFT 303(d) for any impairments.

STREAMSIDE MANAGEMENT ZONE LAW (SMZ)

All rules and regulations pertaining to the SMZ Law will 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

In 2003, DNRC drafted Administrative Rules for Forest Management (*Forest Management Rules*). The portion of those rules applicable to watershed and hydrology resources include ARM 36.11.422 through 426. 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

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.

ensure adequate recruitable coarse woody debris is maintained and channel migration zone implementation.

WATER RIGHTS AND BENEFICIAL USES

No water rights for surface water exist within three miles downstream of the project area in the Swift Creek watershed.

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

Bull trout are found in Swift, East Fork Swift and Swede creeks; westslope cutthroat trout are present in Swift, East Fork Swift creeks and unnamed streams that are tributaries to East Fork Swift Creek.

EXISTING CONDITION

GENERAL DESCRIPTION

➤ *East Fork Swift Creek and tributaries*

East Fork Swift Creek watershed is approximately 10,060 acres. The main channel flows in a north-to-south direction through Upper Whitefish Lake to its confluence with West Fork Swift Creek. Precipitation ranges from 42 to 70 inches per year, mostly in the form of snow. Elevation ranges from approximately 4,200 feet at the confluence with West Fork Swift Creek to approximately 7,445 on the Whitefish Range near Diamond Peak. Ownership within the watershed is comprised DNRC-managed lands (53 percent), and USFS-managed lands (47 percent).

East Fork Swift Creek is a C4 channel type (*Rosgen 1996*) immediately above Upper Whitefish Lake. The stream is strongly influenced by beaver dams and has multiple channels. The floodplain in this portion of the stream is quite wide and several old relic channels were found during field reconnaissance in 2011. Due to the relic channels present, Private Forestry Assistance personnel from DNRC visited the site to determine if the area was considered as an adjacent wetland. The area is not considered as an adjacent wetland under the SMZ law (*Moore 2011*). In section 17, T24N, R23W, the stream changes to a B3/B4 channel type and continues in this form to the Stillwater State Forest boundary (*DNRC, 2001*). Stream stability is generally good throughout the DNRC managed lands, although some bank erosion was noted in the project area during 2001, 2009 and 2011.

Approximately 1.5 to 2 miles of East Fork Swift Creek is dry during a portion of the year. This is a natural condition due to geology of the watershed and a fault located in the valley bottom (*USGS 1955*).

Tributaries to East Fork Swift Creek are generally 'A' channels (*Rosgen 1996*) on the upper slopes and transition into 'B' channels on the lower slopes. Most of the tributaries are steep and much incised with little accessible fish habitat. The majority of these streams are intermittent, however a few of the tributaries are small perennial, spring fed streams and are fish-bearing on the more gentle lower slopes (generally less than 25 percent).

➤ **Swede Creek**

The Swede Creek watershed is second-order drainage encompassing approximately 1,020 acres. Precipitation ranges from 46 to 60 inches per year, mostly in the form of snow. Swede Creek flows in a northeast-to-southwest direction to its confluence with Swift Creek a short distance downstream of the East Fork/West Fork confluence. Elevations in this watershed range from 4,180 feet at its confluence with Swift Creek to approximately 7,220 feet on the watershed divide. Ownership within the watershed is comprised of DNRC-managed lands (73 percent), and USFS-managed lands (27 percent).

Swede Creek, adjacent to the proposed harvest unit, exhibits a 'B' channel type. Stability is good with limited bank erosion.

SEDIMENT DELIVERY

➤ **East Fork Swift Creek and tributaries**

The majority of roads found within the project area are main system roads that are reviewed regularly for maintenance needs. Maintenance needs are prioritized by the potential for impacting water quality. A concerted effort to address BMP issues on main road in the East Fork Swift watershed was implemented in 2005. At this time, several undersized stream crossings were replaced and surface drainage was improved. This effort combined with the 2004 removal of a failing log bridge across the East Fork Swift Creek and the replacement of the bridge at the outlet of Upper Whitefish Lake remediated the majority of sediment delivery issues on the proposed haul route. During field reconnaissance in 2011, potential sediment sources to stream channels were cataloged. These sites include the following:

- Direct delivery of surface water from a road ditch into Upper Whitefish Lake
- A plugged 30-inch CMP on a brushed-in road in NW1/4, section 21, T34N, R23W.
- Unvegetated banks at a failed native log crossing on a brushed-in road in SW1/4, section 21, T34N, R23W.

In-channel sediment sources are very limited in the project area streams. The *R1/R4 Fisheries Habitat Standard Inventory (Overton et al 1997)* conducted in 2001 noted that approximately 99 percent of the banks along East Fork Swift Creek were stable with 2 identified mass wasting sites. The observed area of mass wasting was estimated at less than one-half acre. More recent channel condition observations estimated up to 16 percent eroding banks in some areas above Upper Whitefish Lake, although reach condition were noted as 'natural and the channel is stable' (*Watershed Consulting 2009*). Other natural 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.

➤ **Swede Creek**

During field review, no substantial sediment sources were identified on haul roads in the Swede Creek watershed. This watershed has very little road (0.6 miles) and less than 1 percent of the watershed has been harvested. The main haul route (Upper Whitefish Road) crosses Swede Creek in section 3, T33N, R23W. This stream crossing was replaced in

2010 to facilitate fish passage. No sediment delivery was observed during 2011 in this watershed.

FISH HABITAT PARAMETERS

➤ **Large Woody Debris**

While no woody debris data is available for the tributaries of East Fork Swift Creek, the latest woody debris counts in East Fork Swift Creek show an average of 55 pieces per 1000 feet of channel. This amount of woody debris is within the range of variation for similar reference reach sites on 'C' channels and slightly below the reference range for 'B' channels (Bower, 2004). 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 riparian management zone (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)*. Past data collection for site potential tree height in the Stillwater State Forest has resulted in SPTH up to 112 feet. Additional data for SPTH was collected along Swede, East Fork Swift and unnamed creeks in the project area. The SPTHs for stream in the project area are as follows:

- East Fork Swift Creek—112 feet
- Swede Creek -- 111 feet
- Unnamed tributaries to East Fork Swift Creek—92 feet

Approximately 167 acres is encompassed within one SPTH of East Fork Swift Creek and its fish-bearing tributaries. An estimated 23 percent (38 acres) of this area has been impacted by roads and timber management. The current condition of the impacted RMZ varies from a fully forested condition to scattered saplings intermixed with brush.

In addition to the RMZ widths derived from SPTHs in the project area, the channel migration zone (CMZ) width was measured for East Fork Swift Creek within a proposed unit location. The CMZ extended approximately 275 feet from the edge of the channel.

Swede Creek is largely an unharvested watershed except for occasional firewood removal near open roads. Approximately 35 acres of RMZ is located within one SPTH (111 feet) of Swede Creek. Two roads cross Swede Creek; the Upper Whitefish and Swede Creek road. The right of way clearing for these roads constitutes the only documented RMZ harvest for Swede Creek. The estimated RMZ area impacted by past road construction is approximately 0.4 acres (1 percent). The current condition of the RMZ away from the roads is fully forested condition.

➤ **Stream Temperature**

East Fork Swift Creek temperature data indicates water temperatures below the threshold shown to adversely affect bull trout and cutthroat trout. DNRC data from 2001 through 2007 shows a maximum 7-day average temperature range of 10.8 to 13.0 degrees centigrade (*DNRC, 2007*).

No data is available for stream temperature in Swede Creek.

➤ **Fish Passage**

Two culvert stream crossing structures are located on the haul route. One was reviewed in 2011 and concluded that it is providing full passage to all life stages of salmonids due to streambed simulation. The second CMP likely is a barrier to juvenile fish; however a technical survey is necessary for confirmation.

WATER YIELD AND CUMULATIVE EFFECTS

After reviewing the beneficial uses, existing channel conditions, and existing watershed condition per *ARM 36.11.423*, the threshold of concern for the East Fork Swift and Swede creek watersheds was set at 11.0 percent over a fully forested condition. These threshold values expect a low to moderate degree of risk of adverse impacts to beneficial uses due to water-yield increases as described in *ARM 36.11.423(f)(iv)*. The current estimated annual water yield increase for East Fork Swift is 2.1 percent and for Swede Creek is 0.1 percent.

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***

Eight units totaling approximately 166 acres would be commercially harvested under this alternative. Approximately 121 acres would be harvested using conventional ground-based equipment and approximately 45 acres would be harvested using cable yarding methods. Road activities include approximately 0.6 miles of reconstructed road and approximately 17 miles of road would be maintained or have drainage improvements installed as necessary to protect water quality. A bridge on an unnamed tributary within the Upper Whitefish Lake campground would be replaced to alleviate structural needs. Post-harvest site preparation (burning, machine scarification or spot herbicide treatment) would be implemented on approximately 100 acres.

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.

- ***Fish Passage***

No changes to fish passage would occur.

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*).

No harvesting would occur within the 50 feet of any stream. As per administrative rules (*ARM 36.11.304*), no equipment would be operated within the 50- or 100-foot SMZ.

During a review of BMP effectiveness, including stream buffer effectiveness, *Raskin et al* 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*).

No new road construction would occur and reconstruction would commence away from streams on soils that are suitable for road construction (*Kuennen and Nielsen-Gerhardt, 1995*). Because revegetation may be slow to establish on the road fill, erosion may occur, but due to the distance from streams, sediment delivery and subsequent water-quality impacts would not likely occur.

Existing roads would have drainage improvements and BMP upgrades implemented under this alternative. 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 Upper Whitefish Lake from the road ditch. Removal of the plugged CMP on an unnamed tributary would also reduce the potential for sediment delivery to the stream although a short-term increase in sediment would result from the removal of the CMP. The short-term sediment risk would remain until the site revegetates, which would take approximately 2 years. The bridge on an unnamed intermittent stream in Upper Whitefish Lake campground would be replaced. Currently, there is no direct sediment delivery at this location. The bridge replacement would have a moderate risk of minor amounts of sediment entering the dry stream channel during and shortly after construction even though mitigation measures would be employed. Current maintenance activities would continue to provide drainage to area roads.

Because postharvest water-yield levels under this alternative would remain below the threshold where adverse impacts would be expected, only a low risk of increased in-channel sediment would result from this alternative. In-channel sources of sediment would be expected to continue to contribute sediment at the current rate because the water-yield increase would remain below the recommended threshold.

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 would be low.

Fish Habitat Parameters

- Large Woody Debris Recruitment

Along East Fork Swift Creek, the SPTH is 112 feet; however the RMZ width would be extended to approximately 275 feet for the CMZ. While no harvest would occur in the 50 feet nearest the stream, approximately 50 percent of the merchantable trees in the remaining 225 feet of the CMZ would be harvested. Approximately 2 acres of RMZ (1 percent of total RMZ for East Fork Swift Creek) would have reduced recruitable woody debris.

Along East Fork Swift tributaries, the RMZ is 92 feet from the stream. While no harvest would occur in the 50 feet nearest the stream, a few trees would be selected for harvest in the outer 42 feet of the RMZ. Approximately 0.1 acres of RMZ (<1 percent of total RMZ for the tributaries) would have reduced recruitable woody debris.

Along Swede Creek, the RMZ is 111 feet from the stream. While no harvest would occur in the 50 feet nearest the stream, approximately 50 percent of the merchantable trees in the outer 62 feet of the RMZ would be harvested. Approximately 0.5 acres of RMZ (1 percent of total RMZ for Swede Creek) would have reduced recruitable woody debris.

The level of retention at each stream should adequately provide for future recruitment into the channels to provide fisheries habitat complexity with a low degree of risk of impacts to recruitable woody debris. A thorough discussion of riparian buffer effectiveness for providing recruitable woody debris using these RMZ harvest prescriptions can be found in the Montana DNRC Forested Trust Lands Habitat Conservation Plan Final EIS (DNRC 2010).

- Stream Temperature

As discussed in the Montana DNRC Forested Trust Lands Habitat Conservation Plan Final EIS (DNRC 2010), a no-harvest buffer of at least 50 feet is effective in maintaining the existing stream shading that would adequately protect against stream temperature increases. 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 extended RMZ (for channel migration) width. Therefore, stream shading post project would be sufficient to maintain a low risk of low impact to stream temperatures.

- Fish Passage

No changes to fish passage along the haul route are proposed. Therefore, no direct or indirect affects would result to fish passage or connectivity.

Water Yield

If this alternative were selected, approximately 166 acres would be harvested using conventional ground-based and cable yarding methods. Approximately 127 ECA would be generated in the in all watersheds from these activities. Most of the ECA would be generated in East Fork Swift Creek watershed (117 ECA); with the remainder generated in Swede Creek (10 ECA). The annual water yield in East Fork Swift Creek would increase by approximately 0.7 percent; the annual water yield in Swede Creek watershed would increase by approximately 0.3 percent. These estimated increases would not be expected to result in detrimental effects because the cumulative annual water yield increase would remain well below the recommended threshold.

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 CONDITIONS*. 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. Natural stream temperatures would be expected to continue to be within the range described in the *EXISTING CONDITIONS*.

- ***Fish Passage***

No changes to fish passage would occur under this alternative. The assumed barrier at the unnamed tributary to East Fork Swift Creek would remain.

Water Yield

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.

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 to maintain a natural range of water temperatures. Under this alternative, fisheries habitat quality would be maintained at its current level.

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

Sediment Delivery

The proposed timber-harvesting and road-construction activities would occur. A long-term reduction in direct sediment delivery may occur due to minor drainage improvements and removal of the plugged CMP. A short-term increase in sediment delivery potential would occur with the replacement of a bridge and removal of a plugged CMP. A cumulative increase in sediment delivery as a result of timber harvesting 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

– Large woody debris recruitment

Cumulative impacts to RMZ in East Fork Swift Creek watershed, including all unnamed tributaries, would increase by approximately 2 acres. The cumulative percent of harvested RMZ would increase from 23 percent to 24 percent. In Swede Creek watershed, the cumulative acres of RMZ impacts would increase by 0.5 acres. The cumulative percent of harvested RMZ would be approximately 1 percent. While a reduction in available woody debris would result from the implementation of this alternative, the scope of the reduction is very minor in relation to the watershed sizes. The risk of a measureable cumulative impact that differs from the existing condition would be very low.

– Stream temperature

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

– Fish Passage

No changes to fish passage or connectivity are part of this alternative; the potential barrier identified on the unnamed stream would remain.

Water Yield

The cumulative annual water-yield increase in East Fork Swift Creek and Swede Creek watersheds would remain below the recommended threshold of 11 percent if this alternative were selected. East Fork Swift Creek cumulative annual water yield increase would be 2.8 percent and the Swede Creek cumulative annual water yield increase would be 0.4 percent. Therefore, while the cumulative water yield would increase very slightly, because the levels would remain below the threshold set in accordance with *ARM 36.11.425(g)*, 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 large woody debris in the RMZ along fish-bearing streams; (2) a short-term increase and long term decrease in potential sediment delivery from the haul route, and (3) a minor increase in modeled annual water-yield estimates.

Because the annual water-yield increases would remain below the thresholds of concern, 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 fisheries habitat, would be low.

Attachment V: WILDLIFE ANALYSIS

INTRODUCTION

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

- **Mature forest cover and connectivity.** The proposed activities could decrease mature forested cover, which could reduce habitat connectivity and suitability for wildlife species associated with mature forest.
- **Snags and coarse woody debris.** The proposed activities could reduce the availability of snags and coarse woody debris, and increase human access for firewood harvesting, which could adversely affect the quality of wildlife habitat.
- **Old-growth forests.** The proposed activities could affect wildlife species associated with old-growth forests by reducing the acreage of habitat and increasing fragmentation.
- **Canada lynx.** The proposed activities could reduce landscape connectivity and the availability of suitable Canada lynx habitat (i.e., summer foraging, winter foraging, other suitable, temporary non-suitable), reducing the ability of the area to support Canada lynx.
- **Grizzly bears.** The proposed activities could alter grizzly bear cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats and/or by increasing risk of human-caused bear mortality.
- **Bald eagles.** The proposed activities could remove large trees and snags, and could increase disturbance to bald eagles, which could reduce the quality of bald eagle habitats.
- **Fishers.** The proposed activities could reduce the availability and connectivity of preferred fisher habitats, and increase human access, which could reduce habitat suitability and increase trapping mortality.
- **Harlequin ducks.** The proposed activities could remove riparian vegetation, increase sedimentation, and increase disturbance to harlequin ducks, which could reduce harlequin duck habitat suitability.
- **Pileated woodpeckers.** The proposed activities could reduce tree density and alter the structure of mature forest stands, which could reduce habitat suitability for pileated woodpeckers.

ANALYSIS AREAS

Direct and Indirect Effects

The direct and indirect effects of the proposed activities on all species/issues were analyzed within the project area (FIGURE W-1 –ANALYSIS AREAS) which consists of 2,770 acres of DNRC-managed lands. Proposed harvest units occur in section 3, T33N, R23W and sections 8, 16, 17, 21, and 28, T34N, R23W.

Cumulative Effects

The cumulative effects analysis area refers to a broad surrounding landscape scale and varies according to the issue or wildlife species being discussed. Cumulative effects analysis areas (CEAAs) are named according to the size of the area or the wildlife species being analyzed and are summarized in TABLE W-1 –ANALYSIS AREAS, and are depicted in FIGURE W-1 –ANALYSIS AREAS, and FIGURE W-2 –BALD EAGLES. Cumulative effects analysis areas include the project area as well as lands managed by other agencies and private landowners. Detailed descriptions of each analysis area are located in the **Existing Conditions** section for each issue or species being discussed (e.g., snags and coarse woody debris, grizzly bears).

TABLE W-1 -- ANALYSIS AREAS. Descriptions of the project area and cumulative effects analysis areas.

ANALYSIS AREA NAME	DESCRIPTION	TOTAL ACRES	ISSUE(S)/SPECIES ANALYZED
Project Area	Section 3, T33N, R23 and sections 8, 16, 17, 21, and 28, T34N, R23W.	2,770	direct & indirect effects for all issues/species
Medium Cumulative Effects Analysis Area	The Swift Creek Headwaters Subwatershed.	11,022	pileated woodpeckers
Large Cumulative Effects Analysis Area	The Upper Whitefish Grizzly Bear Subunit, which includes the Swift Creek Headwaters Subwatershed and portions of the West Fork Swift Creek and Swift Creek-Antice Creek Subwatersheds.	32,201	mature forested habitats and connectivity, snags and coarse woody debris, grizzly bears, fishers, harlequin ducks
Lynx Cumulative Effects Analysis Area	The Stillwater East Lynx Management Area (<i>USFWS and DNRC 2010: Vol. II, pp. 2-46</i>)	36,819	Canada lynx
Bald Eagle Cumulative Effects Analysis Area	The home range of a bald eagle pair that nests on Upper Whitefish Lake as defined in <i>Upper Whitefish Lake Bald Eagle Territory Site-specific Management Guidelines (Paige 1997)</i> .	17,440	bald eagles

ANALYSIS METHODS

Analysis methods are based on DNRC State Forest Land Management Rules, which are designed to promote biodiversity. Biodiversity is promoted by taking a coarse-filter approach as well as a fine-filter approach. The coarse-filter approach favors an appropriate mix of stand structures and compositions on state lands (*ARM 36.11.404*), and assumes that if landscape patterns and processes are maintained, then a full complement of species would persist and biodiversity would be maintained. Because the coarse-filter approach may not adequately address the full range of biodiversity on DNRC lands, DNRC also employs a complementary fine-filter approach, which addresses the habitat requirements of threatened, endangered, and sensitive species (*ARM 36.11.406*).

The coarse-filter wildlife analysis section includes analyses of direct, indirect and cumulative effects of the proposed alternatives on: 1) mature forested habitat and landscape connectivity, 2) snags and coarse woody debris, and 3) old-growth forests. Specific analysis methods are discussed in each section.

The fine-filter wildlife analysis section includes analyses of the direct, indirect and cumulative effects of the proposed alternatives on: 1) species listed as threatened or endangered under the Endangered Species Act of 1973, 2) species listed as sensitive by DNRC, and 3) species managed as big game by

Department of Fish, Wildlife and Parks (DFWP). Specific analysis methods are discussed in the sections pertaining to each species.

Existing conditions are described for each relevant species or issue and were assessed with the following techniques: field visits, scientific literature consultation, Montana Natural Heritage Program (MNHP) data queries, DNRC Stand Level Inventory (SLI) data analysis, aerial photograph analysis, and consultation with professionals.

Analyses of road densities use the Stillwater Block Transportation Plan as the basis for all analyses that address road use and access (*USFWS and DNRC 2010:Vol. II, Appendix C, pp. C-9*). 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 DNRC's 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 cumulative effects analysis areas, 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: Vol. 1. Ch.4*). This effects assessment tiers to the detailed analyses contained in those documents.

Cumulative effects analyses account for known past and current activities, as well as planned future agency actions. Recent projects that could contribute to cumulative effects include:

- DNRC 2012 (ongoing) Swedish Chicken Timber Sale – Harvest on approximately 376 acres within sections 3, 10, 11, 13, 14, and 24, in T33N, R23W. The “large” and “lynx” CEAs include approximately 267 harvested acres.
- DNRC (2010) SE Stryker Ridge Timber Sale – Harvest on approximately 499 acres within sections 4, 5, 8, 10, 15, 16, 21, 22, and 23, T33N, R23W, and sections 32 and 33 within T34N, R23W. The “large” and “lynx” CEAs include approximately 397 harvested acres.
- DNRC (2009) Chicken/Antice Timber Sale – Harvest on approximately 109 acres within sections 14, 15, and 23 of T33N, R23W. The “large” and “lynx” CEAs include approximately 92 harvested acres.
- DNRC 612 Permits (2009) – The “large” and “lynx” CEAs include approximately 91 harvested acres.

Changes to forest structure resulting from all past DNRC projects have been accounted for in SLI data used for this analysis.

RELEVANT AGREEMENTS, LAWS, PLANS, RULES, AND REGULATIONS

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, the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act.*

COARSE-FILTER WILDLIFE ANALYSIS

MATURE FORESTED HABITATS AND CONNECTIVITY

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

Introduction

Mature forests characterized by large diameter trees and dense canopy cover provide many wildlife species with food, shelter, breeding sites, and travel corridors. Historically, the spatial configuration of

mature forested habitats in the western United States was shaped by natural disturbance events, primarily wildfire, blowdown, and pest outbreaks. Natural disturbance events resulted in a mosaic-like spatial configuration of forest patches varying in age, species composition and development. Spatial configuration, including patch size and connectivity of forested habitats, is important for many wildlife species. Patch size may affect the distribution of wildlife species that are attracted to, or avoid forest edges. Additionally, connectivity of mature forested habitats may facilitate movements of wildlife species that avoid openings in canopy cover, or inhibit movements of species that are attracted to openings in canopy cover. For example, discontinuous mature forested habitats would negatively affect movements of fisher, which avoid large openings in canopy cover.

Timber harvest, like wildfire and blowdown, is a disturbance event that often creates open patches of young, early-successional habitats. Consequently, timber harvest may negatively affect wildlife species dependent on mature forests by reducing the amount and connectivity of these habitats. Conversely, wildlife species adapted to early-successional habitats may benefit from timber harvests and similar natural disturbance events. The following analysis discloses existing conditions and the anticipated direct, indirect, and cumulative effects of the proposed activities on mature forested habitats and connectivity.

Analysis Area

The analysis area for direct and indirect effects is the 2,770-acre project area (*FIGURE W-1 – ANALYSIS AREAS*). The analysis area for cumulative effects is the 32,201-acre large cumulative effects area described in *TABLE W-1 – ANALYSIS AREAS* (see also *FIGURE W-1 – ANALYSIS AREAS*). The large cumulative effects analysis area represents an area large enough to support a diversity of species that use mature forested habitats and/or require connected forested habitats.

Analysis Methods

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

Existing Conditions

The project area currently contains approximately 1,737 acres of mature stands composed primarily of western larch, subalpine fir, Douglas-fir, and Engelmann spruce (62.7% of project area) (*TABLE W-2 – MATURE FOREST*). Average patch size is relatively large (average: 347 acres, range: 6-1,412 acres) and the majority of mature forested habitat is continuous (*FIGURE W-1 – ANALYSIS AREAS*). Mature canopy cover ranges from low (40%) to high (100%) throughout the project area and the project area likely provides suitable habitat for species requiring connected and/or mature habitats. The project area does not occur in any particular area of documented importance for habitat connectivity; however, riparian habitat in the project area associated with Class 1 (4.3 miles), Class 2 (7.2 miles), and Class 3 streams (0.1 miles) (as defined in *ARM 36.11.403(15)(16)(17)*) likely facilitates wildlife movements between the project area and adjacent stands of mature forested habitat. The network of open and restricted roads in the project area has reduced some landscape connectivity. Open road density and total road density in the project area are moderate (open and seasonally restricted road density: 1.6 miles/square mile, total road density: 2.4 miles/square mile).

The large cumulative effects analysis area contains 14,118 acres of mature stands with $\geq 40\%$ canopy cover (>9 inches dbh average) (*TABLE W-2 – MATURE FOREST*). An additional 17,626 acres (54.7% analysis area) in the large CEAA consist of young regenerating stands due in part to the history of timber harvests. The remaining acres consist of non-forested habitat including lakes and steep, high-elevation slopes. Across, the large cumulative effects analysis area, landscape connectivity has largely been

retained. Mature forested habitat exists in large, fairly continuous patches (FIGURE W-1 –ANALYSIS AREAS). Across the analysis area, riparian areas including the East Fork of Swift Creek, West Fork of Swift Creek, Swift Creek, and additional smaller streams provide wildlife travel corridors. The network of open roads has reduced some landscape connectivity. Open and seasonally restricted road density in the large CEAA is low (1.0 miles/square mile) and total road density is moderate (2.6 miles/square mile).

TABLE W-2 -MATURE FOREST. Average patch size and acreage of mature forested habitat (≥40% canopy cover, >9 inches dbh) existing in the project area and large cumulative effects analysis area for the Upper Whitefish Lake Timber Sale. Percent of the total corresponding analysis area is in parentheses.

ANALYSIS AREA	EXISTING AVERAGE PATCH SIZE	EXISTING MATURE FOREST
Project Area -- 2,770 Acres (% of area)	347	1,737 (62.7%)
Large Cumulative Effects Analysis Area -- 32,201 Acres (% of area)	352	14,118 (43.8%)

Environmental Effects

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

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

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

The proposed activities would occur in 146 (8.4%) of the 1,737 acres of mature stands available in the project area. Regeneration treatments (i.e., seed tree) proposed for approximately 72 acres would reduce canopy cover to <40%. An additional 74 acres would receive intermediate, old-growth maintenance or group selection treatments, which would reduce canopy cover (proposed units A2, B1, C2, D1). However, these stands would continue providing some habitat for species that require mature forested habitat, although the habitat would be lower quality post-harvest. No additional roads are proposed for construction. Approximately 14 acres of riparian habitat associated with stream Riparian Management Zones (RMZs) in the project area would be harvested, but vegetation retention measures would apply. Along Class 1 streams no trees would be harvested within 50 feet of the stream, and ≥40% canopy cover would be retained within at least 100 feet of the stream within the established RMZ, including retention of all saplings and shrubs. Within 50 feet of Class 2 and 3 streams in the project area at least 50% of the existing mature trees would be retained, and all shrubs and saplings would be maintained (*USFWS and DNRC 2010: Vol. II, pp. 2-75 and 2-84*). See Attachment IV -- WATER RESOURCES in this document for additional information. Connectivity of upland mature canopy forest within the proposed project area would not be appreciably altered. Thus, since: 1) the abundance of mature forested habitat would decrease by 72 acres (4.1% of existing mature forest); 2) the quality of mature forested habitat would decrease in 74 acres (4.3% of existing mature forest); 3) no additional roads are proposed for construction; and 4) approximately 14 acres of riparian habitats that may provide wildlife travel corridors would be harvested, but retention measures would apply; minor direct or indirect

effects to mature forested habitat abundance, suitability, or connectivity would be anticipated as a result of the Action Alternative.

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

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

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

The proposed activities would affect 146 acres of the 14,118 acres (1.0%) of mature forested habitat available in the large cumulative effects analysis area. The proposed activities would open the timber stands in 72 acres to <40% canopy cover and reduce the quality of mature stands in an additional 74 acres. Reductions in the availability of suitable mature forested habitat would be additive to harvest activities that are proposed or ongoing in the large CEAA (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The Swedish Chicken Timber Sale is expected to affect 376 acres of mature forested habitat and is likely to occur concurrently with the Upper Whitefish Timber Sale. No roads are proposed for construction in the project area, but harvesting of up to 14 acres is proposed within the riparian habitat in the project area, which may reduce the quality of habitat suitable for providing connectivity. In the project area, along Class 1 streams no trees would be harvested within 50 feet of the stream, and $\geq 40\%$ canopy cover would be retained within approximately 100 feet of the stream within the established RMZ, including retention of all saplings and shrubs. Within 50 feet of Class 2 and 3 streams in the project area, at least 50% of the existing mature trees would be retained, and all shrubs and saplings would be maintained (*USFWS and DNRC 2010: Vol. II, pp. 2-75 and 2-84*). See *Attachment IV -- WATER RESOURCES* in this document for additional information. Overall, connectivity of upland mature forest within the large CEAA would not be appreciably altered. Thus, minor adverse cumulative effects to mature forested habitat abundance, suitability, or connectivity would be anticipated as a result of the Action Alternative since: 1) the abundance and/or suitability of mature forested habitat in the large cumulative effects analysis area would decrease by 1.0%; 2) no additional roads are proposed for construction; and 3) approximately 14 acres of harvest would occur in riparian habitats that may provide wildlife travel corridors, but vegetation retention measures would apply.

SNAGS AND COARSE WOODY DEBRIS

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

Introduction

Snags and coarse woody debris are important components of forest ecosystems that provide the following functions: 1) increase structural diversity, 2) alter the canopy microenvironment, 3) promote biological diversity, 4) provide important habitat substrates for wildlife, and 5) act as storehouses for nutrient and organic matter recycling agents (*Parks and Shaw 1996*). Snags and defective trees (i.e., partially dead, spike top, broken top) are used by a wide variety of wildlife species for nesting, roosting, and cover. Primary cavity users (i.e., woodpeckers) excavate nesting and roosting cavities in snags. These cavities are used as nesting, roosting, and resting sites by a variety of secondary cavity users, such as small mammals and birds, which are unable to excavate their own cavities. Snags also provide foraging opportunities for insectivorous wildlife species. Habitat value of snags for wildlife varies according to tree species, diameter, and snag density. Thick-barked species (e.g., western larch and ponderosa pine) tend to provide high-quality snag habitat. Snag diameter is important because many species that nest in smaller diameter snags will also use large snags; however, the opposite is not true.

Coarse woody debris is used by a variety of wildlife species for foraging, shelter, lookout sites, and food storage. Additionally, coarse woody debris provides forest-dwelling amphibians and reptiles with a stable environment (i.e., moisture and temperature). Coarse woody debris habitat value varies according to size, length, decay, and distribution of the material. Single, scattered downed trees may provide access under the snow for small mammals and weasels, while log piles may provide secure areas for snowshoe hares. Timber harvest may affect the abundance and spatial distribution of snags and coarse woody debris by direct removal for commercial value or human safety purposes, or indirectly by increasing human access for firewood harvesting.

Analysis Area

The analysis area for direct and indirect effects is the 2,770-acre project area (*FIGURE W-1 – ANALYSIS AREAS*). The analysis area for cumulative effects is the 32,201-acre large cumulative effects analysis area described in *TABLE W-1 – ANALYSIS AREAS* and depicted in *FIGURE W-1 – ANALYSIS AREAS*. The large CEAA represents an area large enough to support a diversity of species that use coarse woody debris and snags.

Analysis Methods

The abundance of snags was quantitatively estimated in the project area using 19 systematically-placed fixed plots (each 100 feet x 66 feet), to estimate coarse woody debris amounts. Factors considered in the analysis include: 1) the level of harvesting, 2) availability of snags and coarse woody debris, and 3) risk of firewood harvesting.

Existing Conditions

Snags and Coarse Woody Debris

During field assessments, 14.6 snags/acre \geq 8 inches dbh were observed (range: 0-59 snags/acre) and only 3 snags $>$ 21 inches dbh were observed. Wildlife use of snags was observed throughout the project area. The majority of snags observed were subalpine fir and Engelmann spruce. Coarse woody debris levels ranged from 0.7 to 44.7 tons/acre across the project area, but averaged 14.4 tons/acre. Firewood harvesting has likely reduced the availability of coarse woody debris and snags along open roads in the project area. Overall, firewood cutting risk is currently low due to limited accessibility of the project area (1.6 miles/square mile open and seasonally restricted road density, 2.4 miles/square mile total road density).

In the large cumulative effects analysis area, snag and coarse woody debris levels on surrounding parcels vary widely depending on ownership, motorized access, harvest history, and natural disturbance history. Snag and coarse woody debris levels are likely somewhat limited on 4,412 acres (6.8%) of recent timber harvest within the CEAA. Snags and coarse woody debris are frequently collected for firewood in the large CEAA, especially near open roads. Overall, road density in the large CEAA is low (1.0 miles/square mile open and seasonally restricted road density, 2.5 miles/square mile total road density) and provides limited accessibility for firewood cutting.

Environmental Effects

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

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

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

Some existing snags and snag recruits would be removed from 166 acres within project area due to timber felling operations. Additional recruitment trees and snags may also be lost following timber harvest due to windthrow. Given operability and human safety constraints, existing non-merchantable

snags would be left standing where possible on DNRC lands. Across the project area, at least 2 large snags and 2 large recruitment tree (>21 inches dbh) per acre would be retained on DNRC harvest units (ARM 36.11.411). If such large trees and snags are absent, the largest available snags and/or recruitment trees would be retained. Additionally, coarse woody debris would be retained according to DNRC Forest Management Rules (ARM 26.11.414), and residual amounts would be expected to change little following logging, and would likely resemble amounts currently existing in the project area. Firewood cutting risk in the project area would not change following the proposed harvest. No additional roads are proposed for construction and accessibility to the area for firewood cutting would not change. Thus, since: 1) proposed actions would remove some snags and minimally influence the amount of coarse woody debris on 166 acres, 2) accessibility for firewood harvesting would not change, and 3) snags and coarse woody debris would be retained to meet DNRC Forest Management Rules (ARM 36.11.411, ARM 26.11.414), minor adverse direct and indirect effects to snags and coarse woody debris availability associated with wildlife habitat quality would be anticipated as a result of the Action Alternative.

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

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

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

Some existing snags and snag recruits would be removed from the 166 acres (0.5% of analysis area) proposed for harvest within the large cumulative effects analysis area, but retention measures would apply (ARM 36.11.411, ARM 26.11.414). Reductions in the availability of coarse woody debris and snags would be additive to any forest management activities occurring in the cumulative effects analysis area (see **ANALYSIS METHODS** section of the Introduction for a detailed description of recent projects). Firewood cutting risk in the large CEAA would not change due to DNRC activities under the Action Alternative because no additional roads are proposed for construction. Thus, since: 1) proposed actions would be additive to any ongoing and proposed activities that would remove snags, snag recruits, and coarse woody debris; 2) accessibility for firewood harvesting would not change; and 3) snags and coarse woody debris would be retained in amounts required to meet DNRC Forest Management Rules (ARM 36.11.411, ARM 26.11.414); minor cumulative effects to snags and coarse woody debris availability associated with wildlife habitat quality would be anticipated as a result of the Action Alternative.

OLD-GROWTH FORESTS

Issue: *The proposed activities could affect wildlife species associated with old-growth forests by reducing the acreage of habitat and increasing fragmentation.*

Introduction

Old-growth forests are an important component of biological diversity. They are old forest stands that typically contain various combinations of large old trees, abundant snags and downed logs, and multiple canopy layers, which are typically not found in young forests. These attributes provide structures used by a diversity of wildlife species. The diversity of species and the complexity of interactions between them can be different than in earlier successional stages (Warren 1990).

When considering the effects of forest management on species associated with old-growth forests, evaluating changes in the amount of old-growth habitats is important, as well as the size and spatial juxtaposition of these habitats. Smaller patches may be unsuitable for wildlife species with large home ranges. Additionally, small, less-mobile species may be at greater risk of local extinction in small

patches/habitat islands. Of the 48 old-growth associated species occurring in the Northern Rockies, about 60% may require stands larger than 80 acres (*Harger 1978*).

Analysis Area

The analysis area for direct and indirect effects is the 2,770-acre project area (*FIGURE W-1 – ANALYSIS AREAS*). The analysis area for cumulative effects is the 32,201-acre large cumulative effects analysis area described in *TABLE W-1 – ANALYSIS AREAS* and depicted in *FIGURE W-1 – ANALYSIS AREAS*. The large CEAA represents an area large enough to support a diversity of species that use old-growth forest habitats, is centered on the project area, and provides a reasonable scale of analysis for wildlife species that inhabit old-growth forests that could be influenced by project-related activities

Analysis Methods

Old-growth forest patches were identified as described in the **VEGETATION ANALYSIS** section. Patch sizes and shapes were assessed using *ArcGIS 9.3*. Changes in the total acres of old-growth, as well as the number of patches greater than 80 acres, were assessed. Factors considered in the analysis include: 1) the level of harvesting, 2) the abundance of old-growth, and 3) the abundance of patches >80 acres.

Existing Environment

The project area contains approximately 252 acres (14.5% of project area) of stands meeting the definition of old-growth (*Green et al. 1992*). Old-growth stands in the project area average 42 acres, and one old-growth patch is >80 acres. However, all of the old-growth patches in the project area share portions of their boundaries with mature, dense forests with ≥40% canopy cover and average tree diameters >9 inches dbh. Thus, the effective patch size for old-growth associated species is likely larger than the 42-acre average.

The large cumulative effects analysis area contains 4,413 acres (13.7% of large CEAA) of old-growth stands on DNRC-managed lands. Old-growth stands in the large cumulative effects analysis area average 45 acres, and 18 old-growth patches are >80 acres. Across the project area, periodic reductions of some structural attributes, such as large trees, snags, and downed logs, occurred during past timber sales. Thus, habitat quality has been reduced in some areas for some wildlife species associated with structurally diverse forest conditions. However, the majority of old-growth patches are located adjacent to mature forested habitat and the structural diversity of most of the old growth situated in the large CEAA has been maintained.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Old-Growth Forests

No changes to the amounts, quality, or spatial arrangement of old-growth would occur under this Alternative. Thus, no direct and indirect effects associated with the abundance or fragmentation of old-growth forests would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative to Old-growth Forests

Approximately 44 acres (17.6%) of the 252 acres old-growth forest in the project area would receive an old-growth maintenance treatment. Most trees >21 inches dbh would be retained and declining subalpine fir would be removed. Overall, old-growth structural attributes would be maintained and the old-growth status of these stands would not change post-harvest (see **VEGETATION ANALYSIS**), and they would continue to meet the minimum threshold definitions described by *Green et al. (1992)*. Logging would alter some structural attributes on all of the acres of old-growth proposed for treatment and could adversely affect some old-growth-associated species using those stands, particularly those preferring dense forest stands; however the sustainability of the stands treated using maintenance treatments would be enhanced for the next several decades. Patch size of old-growth forest would not be affected by the proposed treatment. Thus, since 1) the abundance of old-growth would not change; 2) stand density would decrease on 17.6% of existing old-growth stands, which may affect wildlife species that prefer dense old-growth stands; and 3) the abundance of patches >80 acres would not change; minor direct and

indirect effects associated with the abundance or fragmentation of old-growth forests would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative to Old-Growth Forests

None of the proposed forest management activities would occur. Ongoing and proposed forest management activities may change the amount, quality, or spatial arrangement of old-growth in the large cumulative effects analysis area; however, no additional cumulative effects to the availability or connectivity of old-growth habitat are expected under the No-Action alternative. Thus, no cumulative effects associated with the abundance or fragmentation of old-growth forests would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative to Old-Growth Forests

Approximately 44 acres (1.0%) of the 4,413 acres of estimated old-growth habitat in the large cumulative effects analysis area would receive an old-growth maintenance treatment. Most trees >21 inches dbh would be retained and declining subalpine fir would be removed. Old-growth structural attributes would be retained (e.g., large trees, coarse woody debris) and the old-growth status of these stands would not change post-harvest (See VEGETATION ANALYSIS). The proposed treatment would reduce stand density, potentially adversely affecting wildlife species that prefer dense old-growth stands. Patch size would not be affected by the proposed treatment. Changes in structural attributes of old-growth would be additive to ongoing forest management activities in the large CEAA (see **ANALYSIS METHODS** section of the Introduction for a detailed description of recent projects). The Swedish Chicken Timber Sale is ongoing and treating 89 acres with an old-growth maintenance treatment, which is not expected to affect the old-growth status of those stands. Thus, since: 1) the abundance of old-growth would not change; 2) stand density would decrease on 44 acres, which may affect wildlife species that prefer dense old-growth stands; and 3) the abundance of patches >80 acres would not change; minor cumulative effects associated with the abundance or fragmentation of old-growth forests would be anticipated as a result of the Action Alternative.

FINE-FILTER WILDLIFE ANALYSIS

The fine-filter wildlife analysis discloses the existing conditions of wildlife resources and the anticipated direct, indirect, and cumulative effects that may result from the No-Action and Action alternatives. Wildlife species considered include: 1) species listed as threatened or endangered under the Endangered Species Act of 1973, 2) species listed as sensitive by DNRC, and 3) species managed as big game by DFWP. TABLE W-3 –FINE-FILTER describes how each species was either included in the following analysis, or removed for further analysis. Species were not analyzed further if suitable habitat was not present in or near the project area, or if proposed activities would not affect their required habitat components.

TABLE W-3 –FINE-FILTER. Status of species considered in the fine-filter wildlife analysis and basis for inclusion or exclusion from further analysis in the DNRC Upper Whitefish Lake Timber Sale.

	SPECIES/HABITAT	DETERMINATION – BASIS
Threatened and Endangered Species	<p>Canada lynx (<i>Felis lynx</i>)</p> <p>Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zones</p>	<p>Included – The project area contains 2,342 acres of suitable lynx habitat.</p>
	<p>Grizzly bear (<i>Ursus arctos</i>)</p> <p>Habitat: Recovery areas, security from human activity</p>	<p>Included – The project area lies within the Upper Whitefish Grizzly Bear Subunit, of the Northern Continental Divide Ecosystem (<i>USFWS, 1993</i>).</p>
Sensitive Species	<p>Bald eagles (<i>Haliaeetus leucocephalus</i>)</p> <p>Habitat: Late-successional forest less than 1 mile from open water</p>	<p>Included – A bald eagle nest is located on Upper Whitefish Lake approximately 0.2 miles from the project area.</p>
	<p>Black-backed woodpeckers (<i>Picoides arcticus</i>)</p> <p>Habitat: Mature to old burned or beetle-infested forest</p>	<p>No further analysis conducted – No recently (<5 years) burned areas occur in the project area. Thus, no direct, indirect, or cumulative effects to black-backed woodpeckers would be expected to occur as a result of either alternative.</p>
	<p>Coeur d'Alene salamanders (<i>Plethodon idahoensis</i>)</p> <p>Habitat: Waterfall spray zones, talus near cascading streams</p>	<p>No further analysis conducted – 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>
	<p>Columbian sharp-tailed grouse (<i>Tympanuchus Phasianellus columbianus</i>)</p> <p>Habitat: Grassland, shrubland, riparian, agriculture</p>	<p>No further analysis conducted – 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>

Sensitive Species (cont'd.)	<p>Common loons (<i>Gavia immer</i>)</p> <p>Habitat: Cold mountain lakes, nest in emergent vegetation</p>	<p>No further analysis conducted – Upper Whitefish Lake is located adjacent to the project area and approximately 200 feet from proposed harvest unit B1. Single loons have been observed on the lake, but reproduction has not been documented since 2003 (<i>MNHP data</i>). The harvest proposed for this area would create 5 new 0.1 acre openings within the Upper Whitefish Lake Campground (for a total of 13 tent and trailer sites and an open road). In the past, loons have nested on the northwest shore of the lake approximately 0.3 miles from the campground and boat launch, and are not likely to nest within 500 feet of the proposed harvest unit due to the high level of recreational use. However, the lakeshore would be surveyed for nesting loons prior to implementation of mechanized activities, and if documented within 500 feet of the proposed project area, appropriate mitigation measures would be developed according to <i>ARM 36.11.441</i>. Thus, given the light harvest occurring adjacent to Upper Whitefish Lake, negligible direct, indirect or cumulative effects to common loons would be expected to occur as a result of either alternative.</p>
	<p>Fishers (<i>Martes pennanti</i>)</p> <p>Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian</p>	<p>Included – Approximately 1,395 acres of suitable fisher habitat occur within the project area.</p>
	<p>Flammulated owls (<i>Otus flammeolus</i>)</p> <p>Habitat: Late-successional ponderosa pine and Douglas-fir forest</p>	<p>No further analysis conducted – No suitable flammulated owl habitats occur within the project area. Thus, no direct, indirect or cumulative effects to flammulated owls would be expected to occur as a result of either alternative.</p>
	<p>Gray wolves (<i>Canis lupus</i>)</p> <p>Habitat: Ample big game populations, security from human activities</p>	<p>No further analysis conducted – No known wolf packs are located within 10 miles of the project area (<i>Hanauska-Brown et al. 2012</i>). Thus, no direct, indirect or cumulative effects to gray wolves would be expected to occur as a result of either alternative.</p>
	<p>Harlequin ducks (<i>Histrionicus histrionicus</i>)</p> <p>Habitat: White-water streams, boulder and cobble substrates</p>	<p>Included – Harlequin ducks have been documented on East Fork Swift Creek and Swift Creek (<i>MNHP data, 2012</i>).</p>

Sensitive Species (cont'd.)	<p>Northern bog lemmings (<i>Synaptomys borealis</i>)</p> <p>Habitat: Sphagnum meadows, bogs, fens with thick moss mats</p>	<p>No further analysis conducted – 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 falcons (<i>Falco peregrinus</i>)</p> <p>Habitat: Cliff features near open foraging areas and/or wetlands</p>	<p>No further analysis conducted – No suitable cliffs/rock outcrops for nest sites occur in the project area or within 0.5 miles of 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 woodpeckers (<i>Dryocopus pileatus</i>)</p> <p>Habitat: Late-successional ponderosa pine and larch-fir forest</p>	<p>Included – Approximately 1,246 acres of suitable pileated woodpecker habitat occur in the project area.</p>
	<p>Townsend's big-eared bats (<i>Plecotus townsendii</i>)</p> <p>Habitat: Caves, caverns, old mines</p>	<p>No further analysis conducted – No suitable caves or mine tunnels are known to occur in the project area. Thus, no direct, indirect or cumulative effects to Townsend's big-eared bats would be expected to occur as a result of either alternative.</p>
Big Game Species	<p>Elk (<i>Cervus canadensis</i>)</p>	<p>No further analysis conducted – The project area does not contain winter range habitat identified by DFWP as elk, mule deer, or white-tailed deer habitat (DFWP 2008). No additional road construction would be proposed that would reduce security for big game animals. However, minor short-term disturbance and displacement of these species associated with proposed logging activities could occur for individuals that may be present in the vicinity of the project area. Thus, minimal direct, indirect or cumulative effects to big game would be expected to occur as a result of either alternative.</p>
	<p>Mule Deer (<i>Odocoileus hemionus</i>)</p>	
	<p>White-tailed Deer (<i>Odocoileus virginianus</i>)</p>	

THREATENED AND ENDANGERED SPECIES

CANADA LYNX

Issue: *The proposed activities could reduce landscape connectivity and the availability of suitable Canada lynx habitat (i.e., summer foraging, winter foraging, other suitable, temporary non-suitable), reducing the ability of the area to support Canada lynx.*

Introduction

Canada lynx are listed as “Threatened” under the *Endangered Species Act*. Canada lynx are medium-size cats that prey primarily on snowshoe hares and occupy a mosaic of young and mature forests that provide hunting and denning habitats (Ruediger et al. 2000). Lynx foraging habitat in western Montana consist of young coniferous stands and dense, mature forested stands, which provide snowshoe hare habitat (Squires et al. 2010). Lynx denning habitat typically consists of mature forests with abundant coarse woody debris, which provides hiding cover for kittens (Squires et al. 2008). Additionally, lynx typically avoid large openings in the winter; hence, densely forested cover is important for travel and security (Squires et al. 2010). Forest management considerations for lynx include providing a mosaic of young and mature lynx habitats and well-connected large patches of mature forested cover occurring in vegetation types preferred by lynx.

Analysis Area

The analysis area for direct and indirect effects is the 2,770-acre project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the 36,819-acre lynx cumulative effects analysis area described in TABLE W-1 –ANALYSIS AREAS and depicted in FIGURE W-1 –ANALYSIS AREAS. The lynx cumulative effects analysis area is the “Stillwater East” Lynx Management Area (LMA), which is a designated portion of DNRC land where resident lynx populations are known to occur or where there is a high probability of periodic lynx occupancy over time (USFWS and DNRC 2010: Vol. II, pp. 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 classes: 1) winter foraging, 2) summer foraging, 3) other suitable, and 4) temporary non-habitat. Habitats were classified according to DNRC lynx habitat mapping protocols (USFWS and DNRC 2010: Vol. II, Appendix B, pp. B-5 to B-19) 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 etc.). Other suitable lynx habitat is habitat that has the potential to provide connectivity and lower quality foraging habitat, but does not contain the necessary attributes to be classified as winter or summer foraging habitat classes. The temporary non-habitat category consists of non-forest and open forested stands that are not expected to be used by lynx until suitable horizontal and vertical cover develops. Factors considered in the analysis include: 1) the level of harvesting, 2) the availability of suitable lynx habitat classes, and 3) landscape connectivity.

Existing Conditions

The project area contains 2,342 acres of suitable lynx habitat (TABLE W-4 –LYNX HABITAT). The remaining 428 acres consists primarily of stands that are not preferred lynx cover types, stands that do not contain suitable structure for lynx use, and non-forested areas composed of lakes and high-elevation steep slopes. Riparian habitat associated with streams in the project area likely provides some habitat connectivity for lynx (see **MATURE FORESTED COVER AND CONNECTIVITY** in the coarse filter analysis section for further information). Additionally, some saddles and ridge tops occur in the project area that likely facilitates landscape connectivity.

The lynx cumulative effects analysis area contains a total of 29,483 acres of suitable lynx habitats (80.0% of lynx cumulative effects analysis area). The remaining 7,336 acres consists primarily of stands that are not preferred lynx cover types, stands that do not contain suitable structure for lynx use, and non-forested areas composed of lakes and steep high-elevation slopes. Approximately 2,182 acres in the lynx cumulative effects analysis area (0.6%) have been harvested in the last 20 years and account for a

portion of habitat that is currently considered temporary non-suitable lynx habitat. In the vicinity of the project area and in surrounding lands, connectivity of lynx habitats is high, likely enabling lynx travel throughout the lynx cumulative effects analysis area (see **MATURE FORESTED COVER AND CONNECTIVITY** in the coarse filter analysis section for further information).

TABLE W-4 –LYNX HABITAT. Estimates of existing lynx habitat and lynx habitat that would remain post-harvest on DNRC lands in the project and cumulative effects analysis areas. Percent refers to the percent of the total lynx habitat each habitat category represents on DNRC-managed lands.

LYNX HABITAT CATEGORY	ACRES OF LYNX HABITAT (percent of DNRC lynx habitat)			
	Project Area		Cumulative Effects Analysis Area	
	Existing	Post-Harvest	Existing	Post-Harvest
Summer Forage	82.5 (3%)	80.7 (3%)	2,584.2 (7.5%)	2,582.5 (7.5%)
Winter Forage	2,041.2 (74.9%)	1,892.0 (69.4%)	24,275.3 (70.5%)	24,126.1 (70.1%)
Other Suitable	218.0 (8%)	284.6 (10.4%)	2,623.8 (7.6%)	2,690.3 (7.8%)
Temporary Non-Habitat	384.0 (14.1%)	468.3 (17.2%)	4,940.9 (14.4%)	5,025.3 (14.6%)
Grand Total - Suitable Lynx Habitat	2,341.7 (85.9%)	2,257.3 (82.8%)	29,483.3 (85.6%)	29,399.0 (85.4%)

Environmental Effects

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

None of the proposed forest management activities would occur. Existing lynx habitat present in the project area would persist and connectivity would remain high. Thus, since: 1) no changes to existing lynx habitat would occur, and 2) no changes to landscape connectivity would occur, no adverse direct or indirect effects to Canada lynx associated with landscape connectivity and suitable habitat type availability would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Canada Lynx

The proposed activities would affect 157 acres (6.7%) of the 2,342 acres of suitable lynx habitats. Of these 157 acres, 153 acres are winter foraging habitat, representing 6.3% of the existing winter foraging habitat in the project area (**TABLE W-4 –LYNX HABITAT**). After harvest, 84 acres (3.6%) of existing suitable lynx habitat, including 82 acres of winter forage habitat, would be reclassified as temporary non-habitat due to lack of canopy cover in the understory and overstory. The remaining 73 acres of suitable lynx habitat undergoing harvest would be expected to retain adequate understory and overstory canopy cover, allowing these acres to continue to meet the structural conditions suitable for use by lynx. To ensure that forest structural attributes preferred by snowshoe hares remain following harvest, dense patches of advanced regeneration would be retained where possible, especially within lynx winter forage habitat. Additionally, coarse woody debris would be retained in accordance with DNRC Forest Management Rules (**ARM 36.11.414**) and retention of downed logs ≥ 15 inch diameter would be emphasized. Landscape connectivity would remain high post-harvest. Riparian harvest would occur in approximately 14 acres of potential lynx travel corridors located within RMZs, but vegetation retention measures would apply through the implementation of the HCP aquatic riparian timber harvest

conservation strategy. Along Class 1 streams no trees would be harvested within 50 feet of the stream, and $\geq 40\%$ canopy cover would be retained within at least 100 feet of the stream within the established RMZ, including retention of all saplings and shrubs. Within 50 feet of Class 2 and 3 streams in the project area at least 50% of the existing mature trees would be retained, and all shrubs and saplings would be maintained (*USFWS and DNRC 2010: Vol. II, pp. 2-75 and 2-84*). See *Attachment IV -- WATER RESOURCES* in this document for additional information. Additionally, some harvest would occur along forested ridgelines, but habitat conditions in these areas would remain suitable for use by lynx. If present in the vicinity of the project area, lynx could be temporarily displaced by forest management activities for up to 21 months over 3 years due to disturbance caused by mechanized activities. Thus, since: 1) lynx suitable habitat availability would be reduced by 91 acres; 2) winter forage habitat would be altered on 153 acres, but 69.4% of this habitat type would remain in the project area; 3) patches of advanced regeneration would be retained where feasible, especially in winter foraging habitat; and 4) landscape connectivity would be reduced, but vegetation retention measures would apply within riparian lynx travel corridors; minor adverse direct and indirect effects to Canada lynx associated with landscape connectivity and availability of suitable habitat would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Canada Lynx

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

Cumulative Effects of the Action Alternative on Canada Lynx

The proposed activities would affect 157 acres (0.4%) of the 29,483 acres of suitable lynx habitat available in the lynx cumulative effects analysis area. Of these 157 acres, 153 acres are winter foraging habitat, which would be altered, representing 0.6% of the existing winter foraging habitat in the lynx CEAA. After harvest, 84 acres (0.3%) of existing suitable lynx habitat including 82 acres of winter forage habitat, would be considered temporary non-habitat due to lack of canopy cover in the understory and overstory. The remaining 73 acres of suitable lynx habitat would be expected to retain greater amounts of understory and overstory canopy cover and would continue to meet the structural conditions suitable for use by lynx. Additionally, dense patches of advanced regeneration would be retained where possible, especially within lynx winter foraging habitat. Coarse woody debris would be retained in accordance with DNRC Forest Management Rules (*ARM 36.11.414*) and retention of downed logs ≥ 15 inch diameter would be emphasized. Lynx habitat connectivity is expected to remain high post-harvest. Approximately 14 acres of riparian harvest would occur, but measures that would retain riparian vegetation would be applied, which would maintain threshold levels of cover suitable to facilitate travel and daily movements of lynx. Along Class 1 streams no trees would be harvested within 50 feet of the stream, and $\geq 40\%$ canopy cover would be retained within at least 100 feet of the stream within the established RMZ, including retention of all saplings and shrubs. Within 50 feet of Class 2 and 3 streams in the project area at least 50% of the existing mature trees would be retained, and all shrubs and saplings would be maintained (*USFWS and DNRC 2010: Vol. II, pp. 2-75 and 2-84*). See *Attachment IV -- WATER RESOURCES* in this document for additional information. Additionally, some harvest would occur along forested ridgelines, but habitat conditions in these areas would remain suitable for use by lynx. Changes to lynx habitat type availability and habitat connectivity would be additive to any proposed or ongoing projects (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The Swedish Chicken Timber Sale is likely to occur concurrently with the proposed Upper Whitefish Lake Timber Sale. Lynx could be temporarily displaced by forest management activities associated with the proposed Upper Whitefish Lake Timber Sale for up to 21 months over 3 years in addition to any displacement associated with the Swedish Chicken Timber Sale. Thus, since: 1) lynx suitable habitat availability would be reduced by 84 acres, or 0.3% of the suitable habitat within the cumulative effects analysis area; 2) winter foraging habitat would be altered on 153 acres, but 70.1% of this type would

remain in the lynx CEEA; 3) patches of advanced regeneration would be retained where feasible, especially in winter foraging habitat; and 4) landscape connectivity would be reduced, but vegetation retention measures would apply within riparian lynx travel corridors; minor adverse cumulative effects to Canada lynx associated with landscape connectivity and availability of suitable habitat would be anticipated as a result of the Action Alternative.

GRIZZLY BEAR

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

Introduction

Grizzly bears are opportunistic omnivores that inhabit a variety of habitats in Montana. Preferred grizzly bear habitats include avalanche chutes, fire-mediated shrub fields, and riparian areas, all of which provide seasonal food sources (Servheen 1983, McLellan and Hovey 2001). Grizzly bears are currently listed as "Threatened" under the *Endangered Species Act of 1973* and primary threats are related to human-bear conflicts and long-term habitat loss associated with human development (Mace and Waller 1997). Forest management considerations for grizzly bears include providing visual screening along open roads, minimizing access and the construction of new roads, and reducing disturbance levels during the non-denning season, especially in the spring period when grizzly bears are nutritionally stressed.

Analysis Area

The analysis area for direct and indirect effects is the 2,770-acre project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the 32,201-acre large cumulative effects analysis area, which is the Upper Whitefish Lake Grizzly Bear Subunit as described in TABLE W-1 –ANALYSIS AREAS and depicted in FIGURE W-1 –ANALYSIS AREAS. Grizzly bear subunits were created to approximate the home range size of a female grizzly bear in northwest Montana (USFS 1995:136).

Analysis Methods

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

Existing Conditions

The project area occurs in the Upper Whitefish Grizzly Bear Subunit of the Northern Continental Divide Ecosystem (NCDE) Recovery Area (USFWS 1993). There are 1,084 acres of Stillwater Block Class A lands within the project area, which are located adjacent to USFS lands. Class A lands have special management restrictions and they provide relatively secure, quiet areas for grizzly bears (USFWS and DNRC 2010:Vol.II. p. 2-20). The project area does not contain areas located above 6,300 feet elevation that grizzly bears would be likely to use for denning. Approximately 1,267 acres (45.7% project area) on the project area possess cover in amounts capable of providing visual screening for grizzly bears. Existing amounts of visual screening cover likely allow grizzly bears to move freely throughout the project area. Riparian habitat can provide important foraging habitat for bears, especially in the spring (Servheen 1983). Such riparian habitat associated with Class 1 (4.3 miles), Class 2 (7.2 miles), and Class 3 (0.1 miles) streams is available in the project area (ARM 36.11.403(16)(17)). Other important grizzly bear habitats including fire-mediated shrub fields and avalanche chutes are not present in proposed harvest units located within the project area. Under the Stillwater Block Transportation Plan, the density of roads open to year-round public motorized use is 1.2 miles/square mile and the maximum density of open roads

including all open roads and seasonally restricted roads is 1.6 miles/square mile from Jul 1- Sept 15 when all seasonally restricted roads are open. Total road density in the project area is 2.4 miles/square mile (USFWS and DNRC 2010: Vol. II, Appendix C, p. C-9).

The large cumulative effects analysis area contains a variety of forested and non-forested habitats, several of which are preferred by grizzly bears (avalanche chutes, berry fields, riparian areas, etc.). There are 4,592 acres of Stillwater Block Class A lands within the large CEAA, which are located adjacent to USFS lands that provide grizzly bear security core areas. Forest habitats across the large cumulative effects analysis area consist of a combination of age classes, ranging from recently harvested stands to mature stands. Roughly 6.8% of the area (2,182 acres) has been harvested within the last 40 years and consists of young stands with regenerating trees. A total of 17,968 acres (55.0% of large CEAA) provide visual screening for grizzly bears, of which 16,788 acres are on DNRC-managed lands and 910 acres are on other neighboring ownerships. Under the Stillwater Block Transportation Plan, the density of roads open to public motorized use year-round is 0.4 miles/square mile, and the maximum density of open roads including all open roads and seasonally restricted roads is 1.0 miles/square mile from Jul 1- Sept 15 when all seasonally restricted roads are open. Total road density in the cumulative effects analysis area is 2.5 miles/square mile (USFWS and DNRC 2010: Vol. II, Appendix C, p. C-9).

Environmental Effects

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

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

Direct and Indirect Effects of the Action Alternative on Grizzly Bears

Grizzly bear hiding cover would be reduced for 10 to 20 years on approximately 111 acres (8.7%) of the 1,267 acres of visual screening available in the project area. Harvesting associated with the Action Alternative would increase sight distances within proposed harvest units. However, retained patches of regenerating conifers, mature forest patches, and topographic breaks, would be designed in a manner that would ensure that no point in any harvest unit would be greater than 600 feet to screening cover. Additionally, up to 100 feet of vegetation or topographic breaks would provide visual screening along open roads adjacent to clearcut or seed tree cutting units to reduce the likelihood of bear detection or accidental/intentional bear mortality (applies to proposed units A1, C1, E1, D2). Approximately 14 acres of riparian harvest within established RMZs would occur, but vegetation retention measures would apply. Along Class 1 streams no trees would be harvested within 50 feet of the stream, and ≥40% canopy cover would be retained within approximately 100 feet of the stream within the established RMZ, including retention of all saplings and shrubs. Within 50 feet of Class 2 and 3 streams in the project area at least 50% of the existing mature trees would be retained, and all shrubs and saplings would be maintained (USFWS and DNRC 2010: Vol. II, pp. 2-75 and 2-84). See Attachment IV -- WATER RESOURCES in this document for additional information. Proposed harvesting would temporarily (1-3 years) increase traffic on approximately 1.4 miles of currently restricted road, however access by the general public would remain restricted along these road miles during and after project activities. No additional roads are proposed for construction and spring travel restrictions would apply during the spring period (April 1 – June 30) on restricted roads to minimize disturbance to bears and reduce risk of displacement from spring habitat. Additionally, 0.6 miles of restricted roads associated with the units E1 and the north portion of unit C1 would have a 30-day timing restriction to provide additional security for grizzly bears in this area. Approximately 28 acres of Stillwater Block Class A lands would undergo harvest (unit C2), but activities would occur for <30 operational days during the non-denning season to reduce risk associated with displacement and mortality of grizzly bears. If present in the vicinity of the project area, grizzly bears could be displaced by forest management activities for up to 21 months over 3 years. Thus, since: 1) canopy cover and shrubs providing visual screening and hiding cover would be removed, but visual

screening would be retained; 2) temporary mechanized disturbance would increase on 1.4 miles of currently restricted road; 3) no new road construction would occur and mechanized access would be restricted during the spring (April 1- June 30) on restricted roads and additional roads would have a 30-day timing restriction to reduce risk of displacement in these areas; 4) riparian harvest would occur and bears could be temporarily displaced from these areas, but vegetation retention measures would apply; and 5) commercial harvest and mechanized activities would occur for less than 30 operational days during the non-denning period on Stillwater Block Class A Lands, which would help maintain areas of security; minor adverse direct or indirect effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Grizzly Bears

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the cumulative effects analysis area could change visual screening and open road density. No additional cumulative effects to visual screening, secure areas, risk of displacement, or road densities are expected to result from the No-Action Alternative. Thus, since: 1) no timber harvesting would alter existing visual screening cover, 2) risk of displacement from important habitat would not increase, 3) no existing secure areas would be affected, and 4) no changes to open or restricted road density would occur, no cumulative effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Grizzly Bears

The proposed activities would affect 111 acres (0.6%) of the 17,968 acres of visual screening available in the large cumulative effects analysis area. Harvesting associated with the Action Alternative would increase sight distances within proposed harvest units. However, retained patches of regenerating conifers, mature forest patches, and topographic breaks, would be designed in a manner that would ensure that no point in any harvest unit would be greater than 600 feet to screening cover. Additionally, topographic breaks and up to 100 feet of vegetation would be used provide visual screening along open roads adjacent to clearcut or seed tree cutting units to reduce the likelihood of bear detection or accidental/intentional bear mortality (applies to proposed units A1, C1, E1, D2). Approximately 14 acres of riparian harvest within established RMZs would occur, but vegetation retention measures would apply. Along Class 1 streams no trees would be harvested within 50 feet of the stream, and $\geq 40\%$ canopy cover would be retained within approximately 100 feet of the stream within the established RMZ, including retention of all saplings and shrubs. Within 50 feet of Class 2 and 3 streams in the project area at least 50% of the existing mature trees would be retained, and all shrubs and saplings would be maintained (*USFWS and DNRC 2010: Vol. II, pp. 2-75 and 2-84*). Proposed harvesting would temporarily (1-3 years) increase traffic on approximately 1.4 miles of currently restricted road, however access by the general public would remain restricted along these road miles during and after project activities. No additional roads are proposed for construction and spring travel restrictions would apply during the spring period (April 1 – June 30) on restricted roads to minimize disturbance to bears. Additionally, 0.6 miles of restricted roads associated with unit E1 and the north portion of unit C1 would have a 30-day timing restriction to provide additional security for grizzly bears in this area. Approximately 28 acres of Stillwater Block Class A lands would undergo harvest (unit C2), but activities would occur for <30 operational days during the non-denning season to reduce risk associated with displacement and mortality of grizzly bears. Reductions in visual screening and riparian habitat would be additive to any proposed or ongoing projects (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The Swedish Chicken Timber Sale is expected to have a minor adverse effect on grizzly bears and is likely to occur concurrently with the proposed Upper Whitefish Lake Timber Sale. Grizzly bears could be temporarily displaced by forest management activities associated with the proposed Upper Whitefish Lake Timber Sale for up to 21 months over 3 years in addition to any displacement associated with the Swedish Chicken Timber Sale. Thus, since: 1) canopy cover and shrubs providing visual screening would be removed, but visual screening would be retained; 2) temporary mechanized disturbance would increase on 1.4 miles of currently restricted road; 3) no road construction would occur and motorized access would be restricted during the spring (April 1- June 30) on restricted roads and additional roads would have a 30-day timing restriction; 4) riparian harvest would occur but vegetation retention measures would apply; and 5) commercial harvest and mechanized activities would occur for less than 30

operational days during the non-denning period on Stillwater Block Class A Lands, which would help maintain areas of security; minor adverse cumulative effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the Action Alternative.

SENSITIVE SPECIES

BALD EAGLES

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

Introduction

Bald eagles are diurnal raptors associated with sizable bodies of water, such as rivers, lakes, and coastal zones. The diet of the bald eagle consists primarily of fish and waterfowl, but may also include carrion and items taken from other birds of prey. Bald eagles generally require large snags or mature trees for nest construction and hunting perches; however, eagles may also construct nests on cliffs. Forest-management considerations for bald eagles include restricting disturbance during the breeding season and retaining large trees and snags within bald eagle territories. The project area is located 0.2 miles from an active bald eagle nest, which occurs near the south shore of Upper Whitefish Lake.

Analysis Area

The analysis area for direct and indirect effects is the 2,770-acre project area (*FIGURE W-2 –BALD EAGLES*). A bald eagle home range area delineated for this nest by Paige (1997) was used as the analysis area for cumulative effects. This home range is the 17,440-acre bald eagle cumulative effects analysis area described in *TABLE I – ANALYSIS AREAS* and depicted in *FIGURE W-2 –BALD EAGLES*.

Analysis Methods

Analysis methods include field evaluations, aerial photograph interpretation, and Geographical Information System (GIS) analysis of bald eagle management zones including nest site areas, primary use areas, and home ranges (*ARM 36.11.429*). For this nest, these areas were delineated by Paige (1997), and were based on observed habitat use by bald eagles. Nests were considered active if they had been active within the preceding 5 years (*ARM 36.11.403(2)*). Factors considered in the analysis include 1) the degree of harvesting, 2) the location of known bald eagle nests, 3) bald eagle habitat characteristics, and 4) disturbance levels, including the proximity of bald eagle habitats to open roads and harvest units.

Existing Conditions

The project area is located 0.2 miles from an active bald eagle nest located near the south shore of Upper Whitefish Lake. The territory was known to be occupied during the 2007, 2009, and 2010 nesting seasons. No data was available for 2011. It is not known if the pair fledged chicks in any of the years that it was occupied (*Montana DNRC, unpublished data*). Land ownership of bald eagle management zones is summarized in *TABLE W-5 –BALD EAGLE*. Habitat that is likely associated with an important flight path between Upper Whitefish Lake and Red Meadow Lake along the East Fork of Swift Creek occurs on the west side of the project area (*Paige 1997*) (*FIGURE W-2 –BALD EAGLES*). Within the project area, only 3 snags >21 inches dbh were observed, thus there may be limited snags available to bald eagles for perching and roosting. The nest is located 0.2 miles from the Upper Whitefish Lake Campground (8 existing and 5 proposed tent and trailer sites) and noise associated with the campground and boats on the lake may disturb nesting eagles; however, vegetative screening is present between the lake and the nest, which may reduce the impact of this disturbance.

The bald eagle cumulative effects analysis area contains 11,303 acres (64.8% analysis area) of DNRC-managed land and 6,138 acres of USFS-managed lands (*TABLE W-5 –BALD EAGLE*). The majority of breeding activities are likely to occur on nest site habitat and primary use habitat, which are managed by DNRC. Within all bald eagle management zones, Upper Whitefish Lake and Red Meadow Lake provide important foraging habitat (*Paige 1997*) (*FIGURE W-2 –BALD EAGLES*). Important perch and roosting sites are located on the west and north shores of Upper Whitefish Lake, near the East Fork of Swift

Creek, and on the shore of Red Meadow Lake (*Paige 1997*). The Upper Whitefish Lake Campground (8 existing and 5 proposed tent and trailer sites) and noise associated with the campground and boats may disturb nesting eagles (especially boats and pedestrians, *Paige 1997*); however, vegetative screening is present between the lake and the nest, which may reduce the impact of disturbance.

TABLE W-5 –BALD EAGLE. Acreage of three bald eagle management zones by ownership for the DNRC Upper Whitefish Lake Timber Sale.

OWNERSHIP	BALD EAGLE BREEDING MANAGEMENT ZONES		
	NEST SITE AREA	PRIMARY USE AREA	HOME RANGE
Montana DNRC	90	232	11,303
USFS	0	0	6,138
Total	90	232	17,441

Environmental Effects

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

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

Direct and Indirect Effects of the Action Alternative on Bald Eagles

The proposed timber harvest would affect one acre of bald eagle habitat within the primary use area, and an additional 163 acres of bald eagle habitat within the home range area (total habitat: 164 acres, 5.9% of bald eagle habitat in the project area). Within the primary use area, moderate harvest creating 0.1 acre openings would occur, and would focus primarily on removal of subalpine fir, but overall structure and ecological integrity of the habitat would be maintained (*ARM 36.11429(1)(d)(ii)*). Within bald eagle home range habitat, some harvest is proposed for habitat that is likely part of a bald eagle flight path associated with the East Fork of Swift Creek (*Paige 1997*). The harvest is proposed for 14 acres of riparian habitat, but vegetation retention measures would apply and at least 2 large snags and 2 large snag recruitment trees per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). Along Class 1 streams no trees would be harvested within 50 feet of the stream, and ≥40% canopy cover would be retained within approximately 100 feet of the stream within the established RMZ, including retention of all saplings and shrubs. Within 50 feet of Class 2 and 3 streams in the project area at least 50% of the existing mature trees would be retained, and all shrubs and saplings would be maintained (*USFWS and DNRC 2010: Vol. II, pp. 2-75 and 2-84*). See *Attachment IV -- WATER RESOURCES* in this document for additional information. Considering the small area proposed for harvest and retention mitigations that would be applied, adverse effects to eagles would likely be minimal. Truck traffic associated with the timber harvest would elevate traffic levels on approximately 7 miles of roads located within the bald eagle home range area, but no additional roads are proposed for construction. The proposed activities would occur in the project area for up to 21 months over 3 years. Harvest and other forest management activities would be prohibited within primary use habitat during the breeding season, unless the territory is documented as inactive from February 1 – August 15 (*ARM 36.11429(1)(c)(i)*). Thus, since: 1) no harvest would occur

within the most sensitive zone (i.e., nest site area); 2) proposed harvests would maintain the structure and ecological integrity of bald eagle primary use habitats; 3) limited harvest of riparian habitat that is likely a part of a bald eagle flight path would occur, but vegetation retention measures would apply; 4) some large trees or snags may be removed within bald eagle breeding habitats, but retention measures would apply (*ARM 36.11.411*); 5) disturbance levels would increase for up to 21 months over 3 years due to increased logging traffic; 6) harvest would be prohibited in bald eagle primary use habitat during eagle breeding season, from February 1 – August 15 (*ARM 36.11429(1)(c)(i)*); minor direct and indirect effects to bald eagle eagles associated with nesting habitat quality or disturbance risk would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Bald Eagles

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

Cumulative Effects of the Action Alternative on Bald Eagles

The proposed timber harvest would remove some important bald eagle habitat attributes (i.e., large snags, large emergent trees) within bald eagle habitat. These attributes would be affected on one acre in the bald eagle primary use area, and 163 acres in the home range area. Overall, 0.9% of the bald eagle cumulative effects analysis area would be affected. The overall structure and ecological integrity of habitat within the primary use area would be maintained consistent with requirements of DNRC forest management rules (*ARM 36.11429(1)(c)(ii)*, *ARM 36.11429(1)(d)(ii)*), and harvest between February 1 – August 15 would be prohibited in this area, unless the nest is documented as inactive (*ARM 36.11429(1)(c)(i)*). Disturbance levels would increase during harvest due to increased traffic levels on approximately 7 miles of roads. Riparian harvest is proposed for 14 acres of riparian habitat associated with the East Fork of Swift Creek, which is likely a part of an eagle flight path (*Paige 1997*), but vegetation retention measures would apply. Along Class 1 streams no trees would be harvested within 50 feet of the stream, and $\geq 40\%$ canopy cover would be retained within approximately 100 feet of the stream within the established RMZ, including retention of all saplings and shrubs. Within 50 feet of Class 2 and 3 streams in the project area at least 50% of the existing mature trees would be retained, and all shrubs and saplings would be maintained (*USFWS and DNRC 2010: Vol. II, pp. 2-75 and 2-84*). See *Attachment IV - WATER RESOURCES* in this document for additional information. Additionally, across the project area, at least 2 large snags and 2 large recruitment trees per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). The proposed harvest would be additive to proposed and ongoing harvests, although DNRC is unaware of specific future plans at this time. The proposed activities would occur in the project area for up to 21 months over 3 years. Thus, since: 1) no harvest would occur within the most sensitive zone (i.e., nest site area); 2) proposed harvests would maintain the structure and ecological integrity of bald eagle primary use habitats; 3) limited harvest of riparian habitat that is likely a part of a bald eagle flight path would occur, but vegetation retention measures would apply; 4) some large trees or snags may be removed within bald eagle breeding habitats, but retention measures would apply (*ARM 36.11.411*); 5) disturbance levels would increase for up to 21 months over 3 years due to increased logging traffic; and 6) harvest would be prohibited in bald eagle primary use habitat from February 1 – August 15 (*ARM 36.11429(1)(c)(i)*); minor cumulative effects to bald eagle eagles associated with nesting habitat quality or disturbance risk would be anticipated as a result of the Action Alternative.

FISHERS

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

Introduction

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

Analysis Area

The analysis area for direct and indirect effects is the 2,770-acre project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the 32,201-acre large cumulative effects analysis area described in TABLE W-I –ANALYSIS AREAS and depicted in FIGURE W-1 –ANALYSIS AREAS. The large cumulative effects analysis area is defined according to geographic features (e.g. ridgelines), which are likely to influence movements of fishers in the vicinity of the project area, providing a reasonable analysis area for fishers that could be influenced by project-related activities.

Analysis Methods

Analysis methods include field evaluations, aerial photograph interpretation, and Geographical Information System (GIS) analysis of travel corridors, preferred fisher cover type availability (ARM 36.11.403(60)), and fisher habitat structure. Preferred fisher cover type classifications considered in the analysis include: 1) upland fisher habitat, and 2) riparian fisher habitat. Classification of these two habitat classes depends upon proximity to streams. DNRC's Forest Management ARMs address fisher habitat associated with riparian zones by considering habitat located within 100 feet of Class 1 streams or within 50 feet of Class 2 streams (ARM 36.11.440(b)). Remaining stands in preferred fisher cover types situated away from riparian areas are considered upland fisher habitat. Important habitat attributes for fishers include stands of sawtimber (≥ 9 inches dbh) with 40-100% crown density. Potential fisher habitat (riparian, upland) on other ownerships was identified by examining mature forested habitat ($\geq 40\%$ cover, > 9 inches dbh average) below 6,000 feet elevation and the proximity of mature forested habitat to perennial and intermittent streams. Factors considered in the analysis include: 1) the degree of harvesting, 2) availability and structure of preferred fisher habitats (upland, riparian), 3) landscape connectivity, and 4) human access.

Existing Conditions

The project area contains 1,733 acres of preferred fisher cover types including 150 acres of riparian fisher habitat associated with Class 1 and 2 streams. Approximately 1,395 acres (50.4%) of these preferred fisher cover types in the project area are sawtimber stands possessing 40-80% crown density, and are considered suitable fisher habitat. Mature forested habitat present on 62.7% of the project area is fairly continuous, and connectivity within the project area is high. Riparian habitat associated with Class 1 (4.3 miles), Class 2 (7.2 miles), and Class 3 (0.1 miles) streams likely provide suitable travel corridors (ARM 36.11.403(16)(17)). Road density is moderate (1.6 miles/square mile open and seasonally restricted road density, 2.4 miles/square mile total road density); thus, there is moderate level of access that could facilitate trapping.

The large cumulative effects analysis area contains approximately 14,969 acres of fisher habitat (46.5% of analysis area), including 10,957 acres of suitable fisher habitat on DNRC-managed lands and an additional 390 acres of mature forested habitat below 6,000 feet elevation on Forest Service land. Of these acres of potential fisher habitat, approximately 1,387 acres are riparian fisher habitat. The remaining 17,232 acres in the large CEAA consist primarily of young stands in harvest units logged in the past that are unsuitable for use by fishers, mature stands that are not preferred fisher cover types, and

non-forested areas composed primarily of lakes and high-elevation steep slopes. In the vicinity of the project area, mature forested habitat is fairly continuous and landscape connectivity is high. Open and seasonally restricted road density is low at 1.0 miles/square mile and total road density is 2.5 miles/square mile, thus there is a low level of access that could facilitate trapping.

Environmental Effects

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

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

Direct and Indirect Effects of the Action Alternative on Fishers

The proposed activities would affect 146 acres (10.4%) of the 1,395 acres of suitable fisher habitat present in the project area. In the 71 acres (5.1%) of upland fisher habitat proposed for regeneration treatments (e.g. seed tree), canopy cover would be reduced to <40%, thus the structure of current fisher habitat would be expected to become unsuitable for fisher use in these areas. However, 75 acres of fisher habitats located in areas proposed for old-growth maintenance treatments, intermediate treatments, and group selection treatments (proposed units A2, B1, C2, D1) would retain stand structure necessary post harvest, to remain suitable habitat for fishers. In these units, some canopy cover and habitat quality for fishers would be reduced. Approximately 6.6 acres of riparian fisher habitat are proposed for harvest. However, measures would be applied to retain riparian vegetation in a manner that would maintain threshold levels of cover and structure that would maintain habitat suitability for fishers in these areas. Within riparian fisher habitat, at least 75% of the stands would be retained in the sawtimber size class in moderate to well-stocked density (*ARM 36.11.440(b)*). The availability of some important habitat characteristics (i.e. snags, coarse woody debris) could be reduced by harvest activities. However, across the project area coarse woody debris would be retained and at least 2 large snags and 2 large recruitment trees (>21 inches dbh) per acre would be retained on DNRC harvest units (*ARM 36.11.411 and 36.11.414*). If such large trees and snags are absent, the largest available snags and/or recruitment trees would be retained. No additional roads are planned for construction, thus trapping risk associated with human access is not likely to increase as a result of this project. Connectivity of mature forested habitats suitable for use by fishers would be expected to decrease under the Action Alternative, although travel corridors associated with riparian habitat would remain intact, albeit with lowered cover and tree density on 6.6 acres. If present in the vicinity of the project area, fishers could be disturbed and temporarily displaced by forest management activities for up to 21 months over 3 years. Thus, since: 1) structural changes to fisher habitat would occur on 146 acres and habitat would be removed on 71 acres, but some snags and coarse woody debris would be retained; 2) riparian harvest would occur, but 75% of the stands would be retained in sawtimber size class in moderate to well-stocked density; 3) landscape connectivity would be reduced to a minor degree; and 4) no road construction would occur, minor adverse direct and indirect effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Fishers

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

Cumulative Effects of the Action Alternative on Fishers

The proposed activities would affect 146 acres (1.0%) of the 14,969 acres of potential suitable fisher habitat available in the large cumulative effects analysis area. The proposed activities would change the structure of these habitats, reducing canopy cover to <40% in areas proposed for regeneration treatments (71 acres), thus the structure of these current fisher habitats proposed for harvest would be expected to become unsuitable for fishers. However, 75 acres of existing fisher habitat proposed for harvest (proposed units A2, B1, C2, D1) would be retained in a condition potentially suitable for use by fishers after treatment, although habitat quality would be reduced, due to reductions of some snags, tree density and cover. Additionally, 6.6 acres (0.5%) of the 1,387 acres of riparian fisher habitat available in the large CEAA are proposed for harvest. However, measures would be applied to retain riparian vegetation in a manner that would maintain threshold levels of cover and structure that would maintain habitat suitability for fishers in these areas. At least 75% of the existing stands considered fisher riparian habitat would be retained in sawtimber size class in moderate to well-stocked density following logging and would remain suitable for use by fishers (*ARM 36.11.440(b)*). The availability of some important habitat characteristics (i.e. snags, coarse woody debris) could be reduced by harvest activities; although retention of some dead material and live snag recruitment trees would be required to meet DNRC Forest Management Rules (*ARM 36.11.411 and ARM 26.11.414*). Connectivity of fisher habitats would be reduced, but travel corridors associated with riparian habitat would be maintained. Any adverse affects to fisher would be additive to any proposed or ongoing sales in the large cumulative effects analysis area (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The Swedish Chicken Timber Sale is expected to reduce the availability of fisher habitat by approximately 341 acres (338 upland and 3 riparian acres), and is likely to occur concurrently with the proposed Upper Whitefish Lake Timber Sale. Fishers could be temporarily displaced by forest management activities associated with the proposed Upper Whitefish Lake Timber Sale for up to 21 months over 3 years in addition to any displacement associated with the Swedish Chicken Timber Sale. Thus, since: 1) structural changes to fisher habitat would occur on 146 acres and habitat would be removed on 71 acres, but snags and coarse woody debris would be retained (*ARM 36.11.411 and ARM 26.11.414*); 2) riparian harvest would occur, but 75% of the stands would be retained in sawtimber size class in moderate to well-stocked density; 3) landscape connectivity would be reduced by a minor degree; and 4) no road construction would occur, minor adverse cumulative effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the Action Alternative.

HARLEQUIN DUCKS

Issue: The proposed activities could remove riparian vegetation, increase sedimentation, and increase disturbance to harlequin ducks, which could reduce harlequin duck habitat suitability.

Introduction

Harlequin ducks are medium-sized diving ducks that winter along rocky coastal zones and typically inhabit clear, fast-moving mountain streams in the summer. Harlequin ducks require streams that contain rapids interspersed with eddies and rocky substrates supporting benthic macro-invertebrate communities for feeding. Nesting habitat is highly variable; however, harlequin ducks typically nest within 100 feet of stream banks or on islands (*Cassirer et al. 1996, Bruner 1997*). Forest management considerations for harlequin ducks include retaining riparian vegetation for nesting habitat, minimized disturbance during the breeding season, and preventing increases in sedimentation associated with logging (*Cassirer et al. 1996*).

Analysis Area

The analysis area for direct and indirect effects is the 2,770-acre project area (*FIGURE W-1 –ANALYSIS AREAS*). The analysis area for cumulative effects is the 32,201-acre large cumulative effects analysis area described in *TABLE W-1 –ANALYSIS AREAS* and depicted in *FIGURE W-1 –ANALYSIS AREAS*. This scale is defined by geographic features and includes extended reaches of East Fork Swift Creek and Swift Creek, which have been occupied by harlequin ducks during the breeding season in the past (*MNHP data, 2012*). This scale is also centered on the project area and provides a reasonable scale of analysis for harlequin ducks that could be influenced by project-related activities.

Analysis Methods

Analysis methods include field evaluation, aerial photograph interpretation, analysis of MNHP data, and GIS analysis of available habitats. Harlequin duck habitat was defined as habitat located within a 275-foot Riparian Management Zone (RMZ) (*USFWS and DNRC 2010: Vol. II, pp. 2-75 and 2-84*) occurring adjacent to streams that have previously been occupied by harlequin ducks during the breeding season (*Cassirer et al. 1996*). See *Attachment IV -- WATER RESOURCES* for additional information on how the RMZ was defined. In the cumulative effects analysis area, the RMZ was determined by examining RMZ distances of similar streams in the project area. Factors considered in the analysis include: 1) the degree of harvesting, 2) the amount of riparian habitat proposed for harvest, 3) risk of increased sediment delivery to streams, and 4) disturbance levels.

Existing Conditions

The project area contains 7.7 miles of the East Fork Swift Creek, which contain appropriate habitat elements for harlequin duck use including clear, fast-moving water and a rocky substrate capable of supporting macro-invertebrate communities. In 2005, a male harlequin duck was observed within the project area on East Fork Swift Creek outside of the migration period as defined by *Cassirer et al. (1996)*. Additionally, other observations of harlequin ducks during the breeding season downstream of the project area on Swift Creek indicate that harlequin duck use of streams associated with the project area for breeding activities is possible (*MNHP data, 2012*). The project area contains 221 acres of riparian habitat located within the 275-foot RMZ that may provide nesting habitat and visual screening for harlequin ducks

The large cumulative effects analysis area contains 7.7 miles of the East Fork Swift Creek and 4.8 miles of Swift Creek, which likely contain appropriate habitat elements for harlequin ducks. Female harlequin ducks have been documented using these streams during the breeding season and male harlequin ducks have been documented using these streams outside of the migration period (*Cassirer et al. 1996*); thus, harlequin duck use of streams and riparian areas associated with the large CEAA is possible. The harlequin cumulative effects analysis area contains 796 acres of riparian habitat located within the 275 foot RMZ that may provide nesting habitat and visual screening for harlequin ducks (see *Attachment IV -- WATER RESOURCES* for additional information on how the RMZ was defined).

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Harlequin Ducks

None of the proposed forest management activities would occur. Timber harvest would not occur in potential harlequin duck habitat that occurs in the project area. Thus, since: 1) no riparian harvest would occur, 2) no increased risk of sediment delivery would occur, and 3) disturbance levels would not change, no direct or indirect effects to harlequin ducks or suitability of their habitat would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Harlequin Ducks

The proposed activities would occur in 14 acres (6.2%) of the 221 acres of harlequin duck habitat available in the project area. No harvest would occur within 50 feet of East Fork Swift Creek, but 50% of merchantable trees would be harvested in the remaining 225 feet of the RMZ. Considering that harlequin ducks typically nest on stream banks or islands within streams, the proposed activities are unlikely to adversely affect the availability of harlequin duck nesting habitat. Under the Action Alternative, sediment delivery potential is expected to be reduced due to the replacement of a bridge and CMP (corrugated metal pipe) (see *Attachment IV -- WATER RESOURCES* for additional information). Additionally, to reduce disturbance to nesting harlequin ducks, harvest activities would be prohibited from May 1- August 1 in proposed harvest units located adjacent to East Fork Swift Creek (applies to units A1, A2, D1, D2). Forest management activities are likely to be more disruptive when conducted during the pre-nesting and early brood-rearing season (*Cassirer et al. 1996*) and mortality of ducklings typically occurs within the first 3 weeks of life (*Kuchel 1977*). Thus, providing additional protections for harlequin ducks during this time-period is important. Disturbance associated with harvesting could adversely affect harlequin ducks for up to 21 months over 3 years during non-winter months, should they be present in the project area. Thus, since: 1) 14 acres (2.7%) of harlequin duck habitat would be harvested, but 50% retention of merchantable trees would be required and no harvest would occur within 50 feet of East Fork Swift

Creek; 2) sediment delivery is expected to decrease long-term; and 3) harlequin ducks may be disturbed by forest management activities, but harvest activities would be restricted from May 1- August 1 in harvest units located adjacent to East Fork Swift Creek; minor adverse direct and indirect effects to harlequin ducks or the suitability of their habitat would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Harlequin Ducks

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the large cumulative effects analysis area could degrade harlequin duck habitat suitability. No additional cumulative effects to harlequin ducks or the suitability of their habitat would be expected to result from the No-Action Alternative. Thus, since: 1) no riparian harvest would occur, 2) no increased risk of sediment delivery would occur, and 3) disturbance levels would not change, no cumulative effects to harlequin ducks or the suitability of their habitat would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Harlequin Ducks

The proposed activities would occur in 14 acres (1.7%) of the 796 acres of potential harlequin duck habitat in the large cumulative effects analysis area. The proposed activities would remove up to 50% of merchantable trees in the RMZ outside of the 50 foot no-harvest buffer located adjacent to East Fork Swift Creek. Sediment delivery is expected to decrease long-term (see *Attachment IV -- WATER RESOURCES* for additional information). Mechanized activities would be prohibited from May 1- August 1 in units adjacent to East Fork Swift Creek to reduce disturbance to harlequin ducks during the pre-nesting and early brood-rearing season. DNRC is unaware of any proposed or ongoing projects in the large CEEA that could affect harlequin duck habitat suitability. If present in the vicinity of the project area, disturbance associated with the proposed activities could adversely affect harlequin ducks for up to 21 months over 3 years during the non-winter months. Thus, since: 1) 14 acres (1.7%) of harlequin duck habitat would be harvested, but 50% retention of merchantable trees would be required and no harvest would occur within 50 feet of East Fork Swift Creek, 2) sediment delivery is expected to decrease long-term, and 3) harlequin ducks may be disturbed by forest management activities, but harvest activities would be restricted from May 1- August 1 in harvest units located adjacent to East Fork Swift Creek; minor adverse cumulative effects to harlequin ducks and the suitability of their habitat would be anticipated as a result of the Action Alternative.

PILEATED WOODPECKER

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

Introduction

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

Analysis Area

The analysis area for direct and indirect effects is the 2,770-acre project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the 11,022-acre medium cumulative effects analysis area described in TABLE W-1 –ANALYSIS AREAS and depicted in FIGURE W-1 –ANALYSIS AREAS. This scale provides a sufficient area to support multiple pairs of pileated woodpeckers, is defined by geographic features, is centered on the project area, and provides a reasonable scale of analysis for pileated woodpeckers that could be influenced by project-related activities (*Bull and Jackson 1995*).

Analysis Methods

Analysis methods include field evaluation, aerial photograph interpretation, and GIS analysis of available habitats. SLI data were used to identify preferred pileated woodpecker habitat (*ARM 36.11.403(58)*). To

assess potential pileated woodpecker habitat on DNRC-managed lands, sawtimber stands ≥ 100 years old within preferred pileated cover types (*ARM 36.11.403(58)*) with $\geq 40\%$ or greater canopy closure were considered potential pileated woodpecker habitat. On non-DNRC lands, the stands considered most likely to provide suitable habitat for pileated woodpeckers were mature forest stands ($\geq 40\%$ canopy cover, >9 inches dbh average) below 6,000 feet elevation. Factors considered in the analysis include: 1) the degree of harvesting, and 2) the structure of pileated woodpecker preferred habitat types including snag and coarse woody debris availability.

Existing Conditions

The project area contains 1,246 acres (45.0% of project area) of pileated woodpecker habitat. This habitat is composed primarily of western larch, Douglas-fir stands, and western white pine stands. No timber sales have occurred in this area in the past 20 years, but firewood cutting does occur along open roads in the project area, which likely reduces the availability of snags and coarse woody debris. Snag density averaged 14.6 snags/acre and coarse woody debris amounts averaged 14.4 tons/acre in the project area. Three snags >20 inches dbh were observed during field assessments. Snags and coarse woody debris in these amounts likely facilitate use of the project area by pileated woodpeckers (see ***SNAGS AND COARSE WOODY DEBRIS*** in the coarse-filter analysis section for additional information).

The medium cumulative effects analysis area contains 1,983 acres (18.0% of medium CEAA) of potential pileated woodpecker habitat, which includes 1,592 acres on DNRC ownership and 391 acres on USFS ownership. Of the remaining 4,492 acres of DNRC managed lands, 2,833 acres were unsuitable cover types consisting primarily of subalpine fir stands and 1,659 acres were <100 years old. No timber sales have occurred in this area in the past 20 years. Open and seasonally restricted road density is low at 0.6 miles/square mile and total road density is 1.9 miles/square mile, thus there is a low risk of firewood harvest of suitable snags and coarse-woody debris. From reviewing aerial photographs and observations made during site visits of habitat conditions and past management influences, suitable snags and coarse-woody debris are likely present in appreciable amounts in the medium cumulative effects analysis area.

Environmental Effects

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

None of the proposed forest management activities would occur. Timber harvest would not occur in DNRC-managed pileated woodpecker habitat in the project area. Thus, since no change in the structure of pileated woodpecker habitat would occur, no direct or indirect effects to pileated woodpecker habitat suitability would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Pileated Woodpeckers

The proposed activities would occur in 111 acres (8.9%) of the 1,246 acres of pileated woodpecker habitat available in the project area. The regeneration treatments (e.g. seed tree) proposed for 50 acres of current pileated woodpecker habitat would open the stands to $<40\%$ canopy cover, thus these stands would be expected to become unsuitable for appreciable use by pileated woodpeckers. However, 61 acres of pileated woodpecker habitats are located in areas proposed for old-growth maintenance treatments, intermediate treatments, and group selection treatments (proposed units A2, B1, C2, D1), which would retain stand structure necessary post harvest, to remain suitable habitat for pileated woodpeckers. In these units some canopy cover and habitat quality for pileated woodpeckers would be reduced; however, the sustainability of stands treated in this manner would be enhanced for the next several decades due to thinning treatments that would reduce fuels and tree competition for soil moisture. Some snags could be removed by the proposed harvest, but at least 2 large snags and 2 large snags recruitment trees per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). Disturbance associated with harvesting could adversely affect pileated woodpeckers for up to 21 months over 3 years, should they be present in the project area. Thus, since: 1) structural changes to existing pileated woodpecker habitat would occur, but mitigation would include retention of snags and coarse woody debris (*ARM 36.11.411 and ARM 36.11.414*); 2) 61 acres of harvested stands would retain habitat features suitable for use by pileated woodpeckers; 3) harvesting would remove 50 acres of suitable pileated habitat within the area; and 4) no changes in long-term access or risk of firewood cutting would be expected, minor adverse

direct and indirect effects to pileated woodpecker habitat suitability would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Pileated Woodpeckers

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the medium cumulative effects analysis area could change pileated woodpecker habitat availability. No additional cumulative effects to pileated woodpecker habitat availability are expected to result from the No-Action Alternative. Thus, since no change in the structure of pileated woodpecker habitat would occur, no cumulative effects to pileated woodpecker habitat suitability would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Pileated Woodpeckers

The proposed activities would occur in 111 acres (5.6%) of the 1,983 acres of potential pileated woodpecker habitat in the medium cumulative effects analysis area. The proposed activities would open stands to <40% canopy cover in 50 acres of existing pileated woodpecker habitat, causing habitat structure to become unsuitable pileated woodpecker use. However, the remaining 61 acres of existing pileated woodpecker habitat proposed for harvest (proposed units A2, B1, C2, D1) would retain habitat characteristics necessary for pileated woodpecker use in some areas following logging. Canopy cover and the quality of pileated woodpecker habitat would be reduced to a moderate degree in these areas, whereas the sustainability of stands treated in this manner would be enhanced for the next several decades due to thinning treatments. DNRC is unaware of any proposed or ongoing projects in the medium CEAA that could affect pileated woodpecker habitat suitability. Some snags could be removed by the proposed harvest, but at least 2 large snags and 2 large snags recruitment trees per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). If present in the vicinity of the project area, disturbance associated with the proposed activities could adversely affect pileated woodpeckers for up to 21 months over 3 years. Thus, since: 1) structural changes to existing pileated woodpecker habitat would occur, but mitigation would include retention of snags and coarse woody debris; 2) 61 acres (3.1% of available habitat) of harvested stands would retain habitat features in amounts suitable for use by pileated woodpeckers; 3) harvesting would remove 50 acres (2.5% of available habitat) of suitable habitat within the area; and 4) no changes in long-term access or risk of firewood cutting would be expected, minor adverse cumulative effects to pileated woodpecker habitat suitability would be anticipated as a result of the Action Alternative.

FIGURE W-1 – ANALYSIS AREAS. Wildlife analysis areas for the proposed DNRC Upper Whitefish Lake Timber Sale.

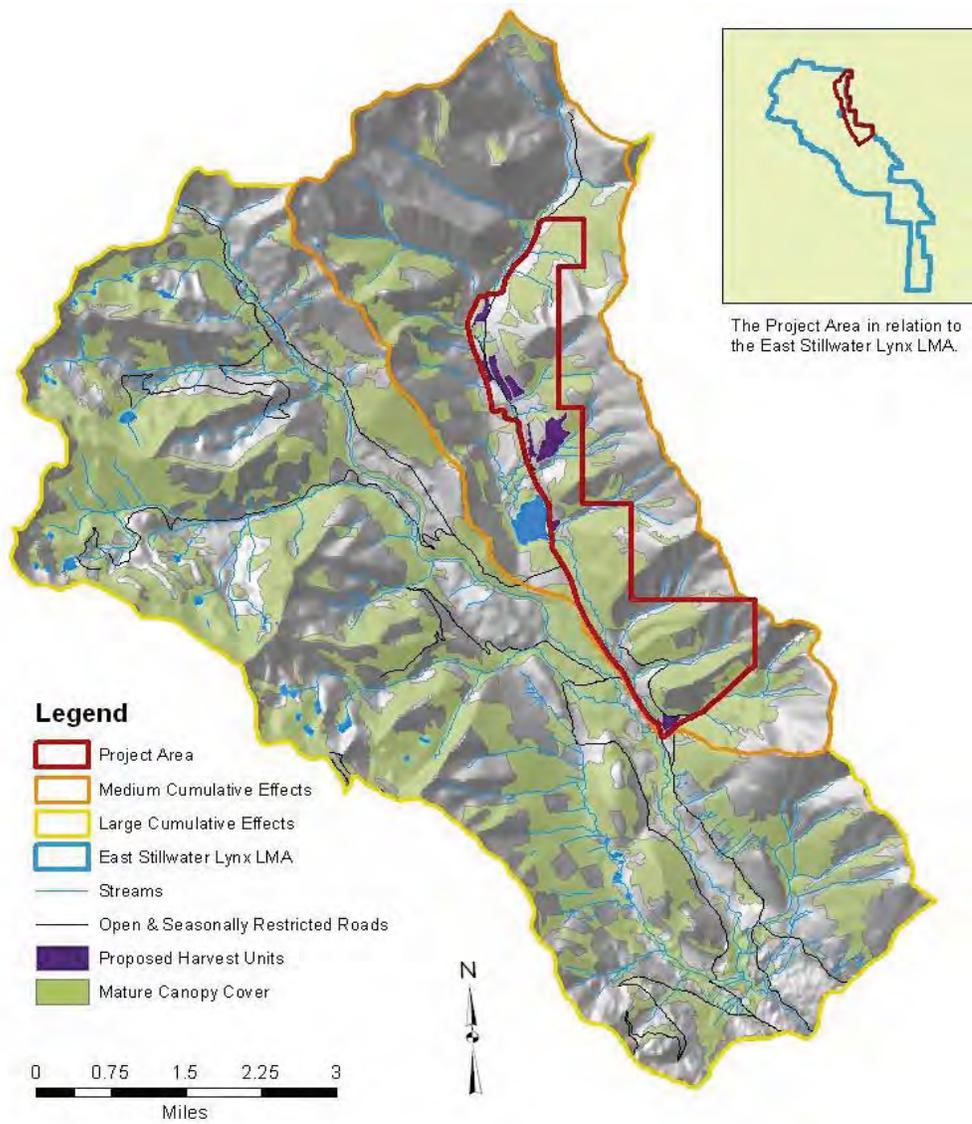
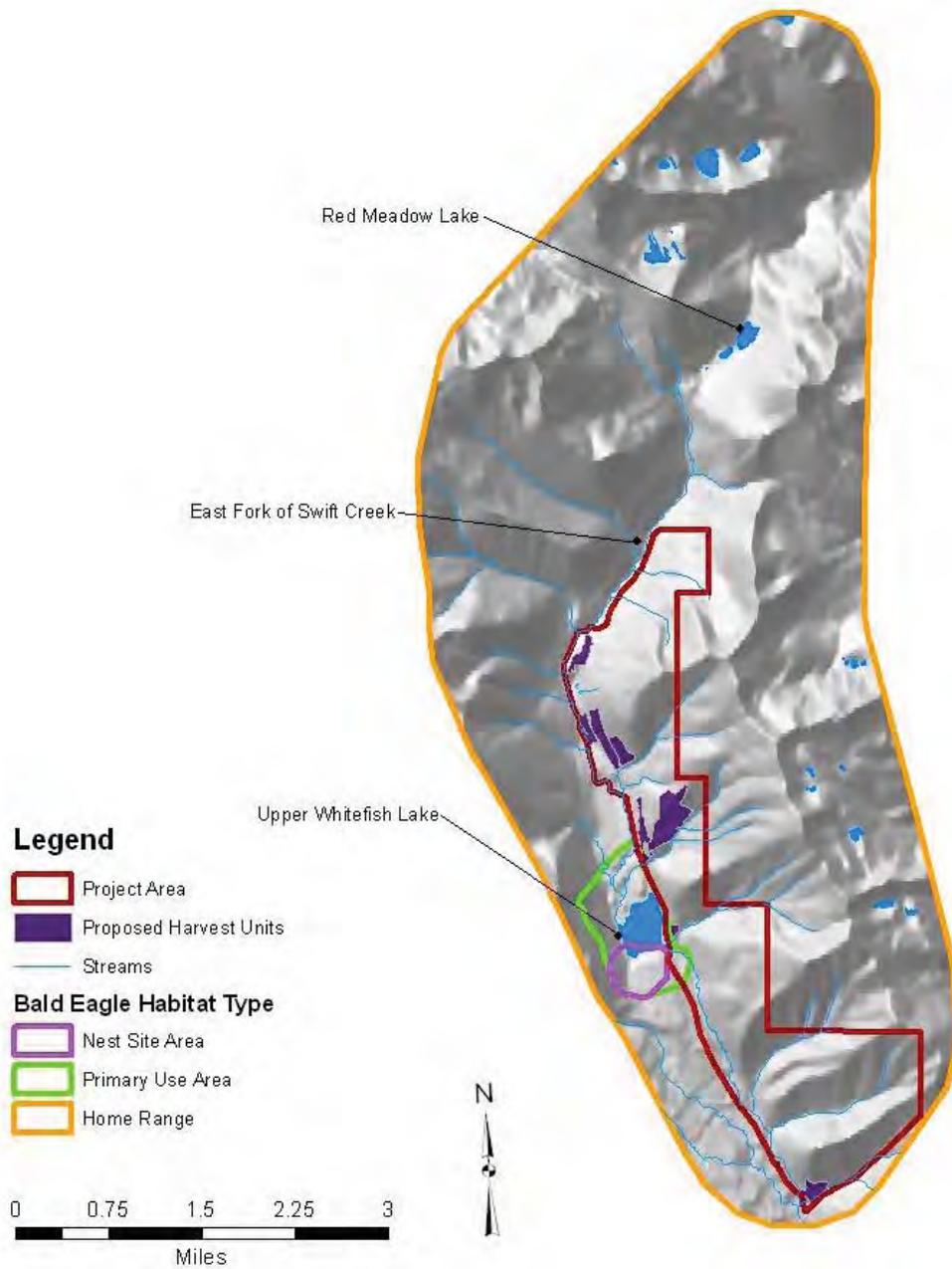


FIGURE W-2 –BALD EAGLES. The bald eagle cumulative effects analysis area in relation to the Upper Whitefish Lake Timber Sale Project Area and bald eagle habitats.



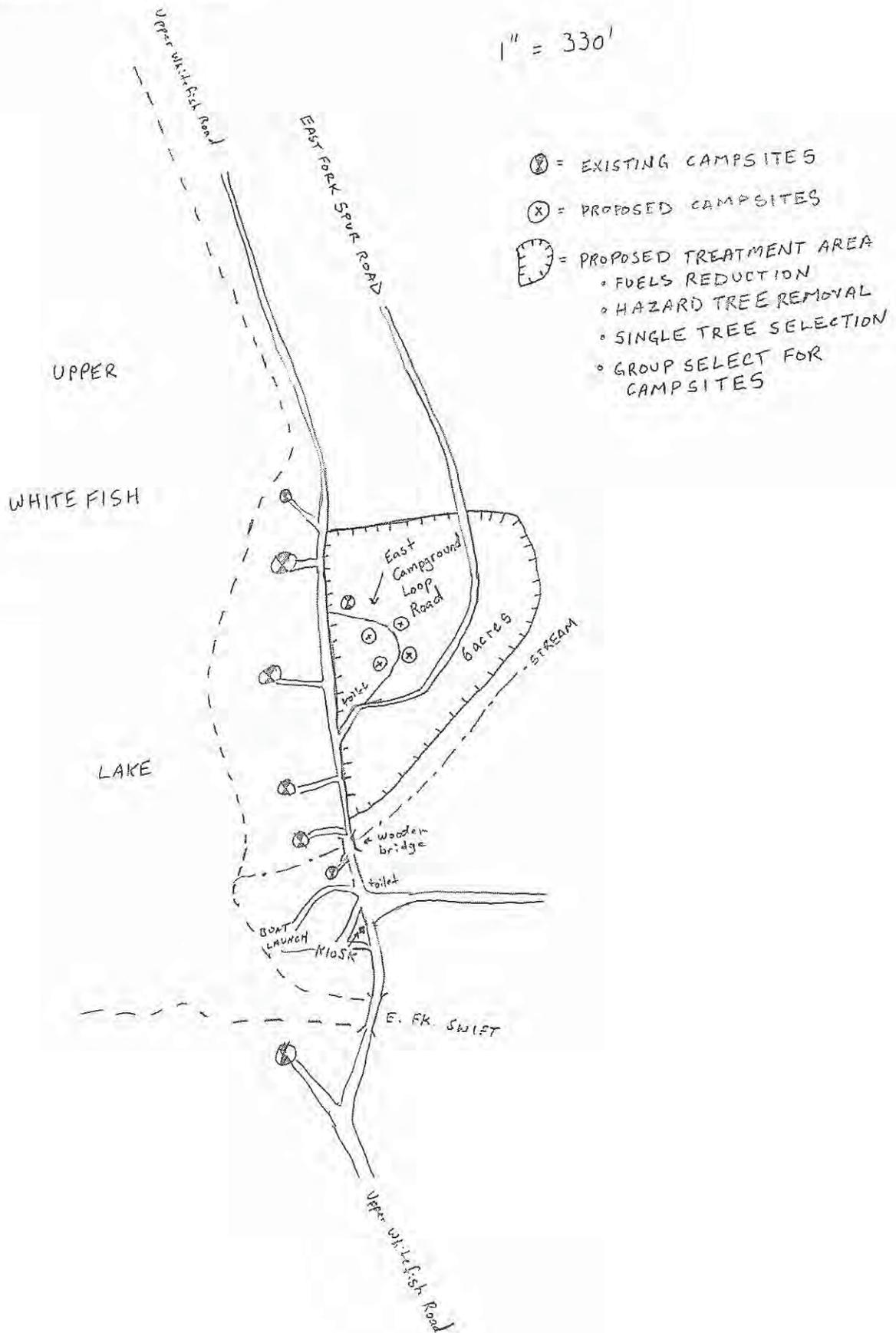
UPPER WHITEFISH TIMBER SALE PROJECT

S28-T34N-R23W

CAMPGROUND MAP

BY JASON PARKE 09/15/2011

1" = 330'



Attachment VII: STIPULATIONS AND SPECIFICATIONS

AESTHETICS

- Logging-damaged residual vegetation visible from open roads will be slashed.
- Landings will be limited in size and number and be located away from main roads when possible.
- In areas where cable logging is required, the width of the cable corridor would be limited, and a minimum distance between corridors would be required to reduce the amount and visibility of corridors in the harvest areas.
- Some harvest areas will include designated 'uncut' areas, and most areas will have trees remaining in clumps or groups. This, along with leaving strips of small trees along roads, will help reduce sight distance into these harvest areas.

AIR QUALITY

- To minimize cumulative effects during burning operations, burning would be done in compliance with the Montana Airshed Group, reporting regulations and any burning restrictions imposed in Airshed 2. This would provide for burning during conditions of acceptable ventilation and dispersion.
- Dust abatement may be applied on some road segments, depending on the seasonal conditions and level of public traffic.

ARCHAEOLOGY

- A contract clause provides for suspending operations if cultural resources were discovered. A DNRC archeologist would be consulted and operations may only resume as directed by the Forest Officer.
- If cultural resources were discovered, the Confederated Salish-Kootenai Tribe would be notified.

FISHERIES

- Apply all applicable Forestry Best Management Practices (BMPs), including the Streamside Management Zone (SMZ) Law and Rules, HCP commitments, and Forest Management Rules for fisheries, soils, and watershed management (*ARMs 36.11.425 and 36.11.426*).
- Apply the SMZ Law and Rules to all streams 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.

RECREATION

- The operating period for Unit B1 would be after September 15 to minimize conflicts with campground users.
- No winter log hauling would be allowed to avoid conflicts with winter recreation.
- Log hauling may not take place on weekends, although the operators may use their personal or repair vehicles to travel to the job site.
- Current road restrictions would continue to apply for the general public.

SOILS

- Equipment operations will be limited to periods when soils are relatively dry (less than 20 percent moisture), frozen, or snow-covered to minimize soil compaction and rutting and maintain drainage features. Soil moisture conditions will be checked prior to equipment start-up.
- On ground-based units, the logger and sale administrator will agree to a general skidding plan prior to equipment operations. The skid-trail planning process will identify which main trails to use and how many additional trails are needed. Trails that do not comply with BMPs (i.e. trails in draw bottoms) will not be used and may be closed with additional drainage installed where needed or grass seed will be planted to stabilize the site and control erosion.
- Tractor skidding will be limited to slopes of less than 40 percent unless the operation can be completed without causing excessive erosion. Based on site review, short, steep slopes above incised draws may require a combination of mitigation measures, such as adverse skidding to a ridge or winchline skidding from more moderate slopes of less than 40 percent.
- Skid trails will be kept to 20 percent or less of the harvest unit acreage. Drainage will be provided in skid trails and roads concurrently with operations.
- Slash disposal - The combination of disturbance and scarification will be limited to 30 to 40 percent of the harvest units. No dozer piling will be done on slopes over 35 percent; no excavator piling will be done on slopes over 40 percent unless the operation can be completed without causing excessive erosion. Lopping and scattering or jackpot burning will be considered on the steeper slopes. Disturbance incurred during skidding operations will be accepted to provide adequate scarification for regeneration.
- Ten to fifteen tons of large woody debris and a majority of all fine litter feasible will be retained following harvesting. On units where whole tree harvesting is used, one of the following mitigations for nutrient cycling will be implemented: 1) use in-woods processing equipment that leaves slash on site; 2) for whole-tree harvesting, return-skid slash and evenly distribute within the harvest area; or 3) cut tops from every third bundle of logs so that tops are dispersed as skidding progresses.

VEGETATION

NOXIOUS WEED MANAGEMENT

- All tracked and wheeled equipment will be cleaned of noxious weeds prior to beginning project operations. The forest officer administrating the contract will inspect equipment periodically during project implementation.

- Prompt vegetation seeding (with a native grass seed mix or an annual mix) of disturbed roadside sites will be required. Roads used and closed as part of this proposal will be reshaped and reseeded.
- Herbicide weed spraying may be implemented on roads that are abandoned following the timber sale project.
- Herbicide weed spraying will be implemented on closed roads used in the timber sale project before roadwork takes place and the next spraying season after the roadwork is done.

FUELS MANAGEMENT

- Ten to 15 tons of large woody debris will be retained on the forest floor following site preparation.

WILDLIFE

- Consult a DNRC biologist if a threatened or endangered species is encountered to determine if additional mitigations that are consistent with the administrative rules for managing Threatened and Endangered Species (*ARM 36.11.428 through 36.11.435*) are needed.
- On restricted roads that have been opened for this timber sale project, restrict public access at all times by using signs during active periods and/or a physical closure (gate, barriers, equipment, etc.) during inactive periods (nights, weekends, etc.).
- Reclose roads and skid trails that have been opened for this timber sale project to reduce the potential for unauthorized motor vehicle use.
- Reduce views into harvest units along open roads by using a combination of topography, group retention of trees, and roadside vegetation.
- Manage for snags, snag recruits, and coarse woody debris according to *ARMs 36.11.411 through 36.11.414* by particularly favoring western larch and western white pine.
- Contractors and purchasers conducting contract operations are prohibited from carrying firearms while operating on restricted roads.
- On Class A lands, commercial forest management activities would be limited to 30 operating days or less for activities greater than 0.5 miles apart during the non-denning period. (*HCP FEIS, commitment GB-ST2*).
- 0.5 miles of Spur C and 0.3 miles of Spur E and the accompanying portions of units C1 and E1 would have operations restricted to 30 consecutive days or less per year during the grizzly non-denning period.
- Mechanized activities would be prohibited from May 1- August 1 in units adjacent to East Fork Swift Creek to reduce disturbance to harlequin ducks during the pre-nesting and early brood-rearing season.

**Attachment VIII:
PREPARERS AND CONTRIBUTORS**

DECISION MAKER

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Acronyms

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

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