Upper Stillwater Forest Management Project Environmental Assessment

Stillwater Unit
Northwest Land Office
Montana Department of Natural Resources and Conservation
November 2024

Upper Stillwater Forest Management Project Environmental Assessment

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Environmental Assessment

Project Name: Upper Stillwater Forest Management Project
Proposed Implementation Date: November 2024
Proponent: Stillwater Unit, Northwest Land Office, Montana DNRC
County: Flathead and Lincoln Counties

Type and Purpose of Action

Description of Proposed Action:

The Stillwater Unit of the Montana Department of Natural Resources and Conservation (DNRC) is proposing the Upper Stillwater Forest Management Project. The project is located approximately two miles north of Olney, Montana (refer to Attachments vicinity map A-**1** and project map A-**2**) and includes the following sections:

Beneficiary	Legal Description	Total Acres	Treated Acres
Common Schools	**T33N R24W S 5, 6, 8, 9, 10, 14, 15, 16, 23, 24, 25, 36; T34N R24W S 31; T34N R25W S 36**	**1618.7**	**820.7**
Public Buildings	**T33N R23W S29, 30, 32**	**677.5**	**421.2**
MSU 2nd Grant	**T33N R23W S31**	**447.9**	**246.9**
MSU Morrill			
Eastern College-MSU/Western College-U of M			
Montana Tech			
University of Montana			
School for the Deaf and Blind			
Pine Hills School			
Veterans Home			
Public Land Trust			
Acquired Land			

Objectives of the project include:

- The proposed harvest of 5-7 million board feet (MMbf) would contribute to the DNRC's sustained yield as mandated by state statute 77-5-222 to sell approximately 60 MMbf of timber annually and continue to produce revenue over time. The revenue generated from this proposal would benefit Common Schools, Public Buildings, and MSU 2nd Grant trusts.

- Promote biodiversity on State ownership by managing for appropriate or desired stand structures and species composition based on ecological characteristics such as topography, habitat type, disturbance regimes, and unique characteristics.
- Address forest insect and disease issues, capture the economic value of dead and dying trees, and promote healthier and more resilient trees through regeneration.
- Incorporate strategies from the Montana Forest Action Plan to sustain and prioritize landscape-scale cross boundary forest management and restoration projects around the project area with our partners and neighbors.
- Reduce recreational induced impacts to soil, water, and timber resources.
- Identify and repair potential sediment sources which may be impacting streams.
- Reduce fire hazard and associated risks of loss to the State of Montana and privately-owned land in the area.

Proposed activities include:

Action	Quantity
Proposed Harvest Activities	# Acres
Clearcut	33
Seed Tree	275.5
Shelterwood	232.3
Old-Growth Maintenance	6.3
Commercial Thinning	229.6
Over Story Removal	174.4
Proposed Forest Improvement Treatment	# Acres
Pre-commercial Thinning	687
Planting	372.7
Mechanical Site Prep	540.7
Prescribed Burn Site Prep	204.8
Total Treatment Acres	**1488.8**
Proposed Road Activities	# Miles
New permanent road construction	0
New temporary road construction	1.8
Road maintenance	19.4
Road reconstruction	0.9
Road abandoned	0
Road reclaimed	0.6

Duration of Activities:	7.5 years
Implementation Period:	June 2025-December 2032

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

The DNRC would manage lands involved in this project in accordance with:

- The State Forest Land Management Plan (DNRC 1996),

- Administrative Rules for Forest Management (ARM 36.11.401 through 471),
- The Montana DNRC Forested State Trust Lands Habitat Conservation Plan (HCP) (DNRC 2010)
- and all other applicable state and federal laws.

Project Development

SCOPING:

- DATE:
  - Monday April 17, 2023
- PUBLIC SCOPED:
  - The scoping notice was posted on the DNRC Website: https://dnrc.mt.gov/News/scoping-notices
  - Emails and letters were sent to the statewide scoping list and adjacent landowners of the project area.
- AGENCIES SCOPED:
  - Montana Department of Fish, Wildlife, and Parks, statewide tribal agencies, and internal DNRC staff.
- COMMENTS RECEIVED:
  - How many: Eighteen (18) individuals or groups made comments
  - Concerns:
    - Protect and buffer wetlands, lakes, and streams
    - Manage SMZs within the law
    - Loss of wildlife habitat
    - Harvest could reduce fuel loading and help with wildfire control
    - Increased traffic could damage roads
    - Ensure the safety of public on the road system
    - Harvest can generate revenue for the Trust
    - Non-saw product economics
    - Buffer Nordic Ski trails
    - Loss of use of Nordic Ski trails during timber sale
    - Monotony from all forest land looking the same
    - Preserve old growth and trees of concern
    - Support of uneven-aged management
    - Remove hazard trees along power line corridors
    - Manage forest by creating a mosaic like wildfire would do
    - Noise pollution from the highway would affect recreation
    - General support of project and objectives
    - Protect cultural resources
  - Results (how were concerns addressed): The public concerns were incorporated into project planning and design or have been explained in this document. Issue statements were developed to facilitate the analyses of the various resources, and mitigations are listed by resource to describe the actions that would be taken to reduce some impacts. Additionally, Attachment H contains comments from Friends of the Wild Swan and DNRC response to the comments.

Internal and external issues and concerns were incorporated into project planning and design and will be implemented in associated contracts.

INTERDISCIPLINARY TEAM (ID):

- Project Leader: Joe Rizzi
- Archeologist: Patrick Rennie
- Wildlife Biologist: Victoria Forristal
- Hydrologist: Tony Nelson
- Real Estate Specialist: Dan Dobbin
- Silviculturist: Tim Spoelma

OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED: *(Conservation Easements, Army Corps of Engineers, road use permits, etc.)*

- **United States Fish & Wildlife Service-** DNRC is managing the habitats of threatened and endangered species on this project by implementing the Montana DNRC Forested Trust Lands Habitat Conservation Plan (HCP) and the associated Incidental Take Permit that was issued by the United States Fish & Wildlife Service (USFWS) in February of 2012 under Section 10 of the Endangered Species Act. The HCP identifies specific conservation strategies for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout, and Columbia redband trout. This project complies with the HCP. The HCP can be found at https://dnrc.mt.gov/_docs/Trust-Land/Planning-and-Reports/2010_HabitatConservationPlan_TLMD_FMB.pdf.

- **Montana Department of Environmental Quality (DEQ)-** DNRC is classified as a major open burner by DEQ and 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 replacing a bridge on a stream would introduce sediment above natural levels into streams.

- **Montana/Idaho Airshed Group-** The DNRC is a member of the Montana/Idaho Airshed Group which was formed to minimize or prevent smoke impacts while using fire to accomplish land management objectives and/or fuel hazard reduction (Montana/Idaho Airshed Group 2006). The Group determines the delineation of airsheds and impact zones throughout Idaho and Montana. Airsheds describe those geographical areas that have similar atmospheric conditions, while impact zones describe any area in Montana or Idaho that the Group deems smoke sensitive and/or having an existing air quality problem (Montana/Idaho Airshed Group 2006). As a member of the Airshed Group, DNRC agrees to burn only on days approved for good smoke dispersion as determined by the Smoke Management Unit.

- **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:
  - Rehabilitation of a user made trail that fords Spring Creek, a class 1 stream

ALTERNATIVES CONSIDERED:

No-Action Alternative: Under this alternative, no timber would be harvested and therefore no revenue would be generated from the project area for the Common Schools, Public Buildings, and MSU 2nd Grant trusts at this time. Salvage logging, firewood cutting, recreational use, fire suppression, noxious-weed management, and additional requests for permits and ongoing management would continue to occur. Natural events such as plant succession, tree mortality due to insects and disease/windthrow, downed fuel accumulation, in-growth of ladder fuels, and wildfires would continue to occur.

Action Alternative: A commercial timber harvest would occur on 951 acres, removing approximately 6 MMbf of timber. This volume would be harvested utilizing ground-based equipment on 915.7 acres and skyline yarding on 35.3 acres. Mechanical piling and scarification would be performed on 540.7 acres of ground-based harvesting units and prescribed broadcast burning would be applied on 204.8 acres skyline and ground-based yarding units to reduce slash fuel loading or reduce brush competition allowing for natural regeneration/planting sites. Specific harvest unit data is provided in **Attachment B – Upper Stillwater Forest Management Project Prescription Table**; using this table and associated maps in **Attachment A - Maps** will provide further details for this project.

An even-aged management strategy would be applied across the 944.7 acres of harvested units to promote DNRC's desired future conditions (*ARM 36.11.405*). The DNRC's desired future condition would be obtained through 33 acres of clear cut, 275.5 acres of seed tree and 232.2 acres of shelterwood harvest in which 4 to 13 trees per acre would be retained for seed source, thus promoting healthy regeneration of the desired species mix. Intermediate harvest using 229.6 acres of commercial thin and 174.4 acres of overstory removal treatments would promote and enhance vigor of established stands with desired species mix. An uneven-aged management strategy would be applied across 6.3 acres of a harvested unit to maintain old-growth characteristics.

Road maintenance and Best Management Practices (BMP) improvements would be performed on approximately 19.4 miles of existing roads. Additionally, there would be approximately 0.9 miles of road reconstruction, 1.8 miles of new temporary roads to facilitate harvest operations and 0.6 miles of road obliteration.

Impacts on the Physical Environment

VEGETATION:

Issues and Concerns- The following issue statements were developed during scoping regarding the effects of the proposed action to vegetation:

- Noxious weeds are present along open and closed roads within the project area. Further soil disturbance and logging equipment activity could increase the amount and distribution of noxious weeds in the project area.

- There may be habitat alterations to the amount and distribution of sensitive plants in the project area.
- Cover types and age-class distributions may be affected by timber harvesting related to this project and other timber-harvesting projects
- Timber harvesting and road construction through old growth stands may affect the amount, quality, attribute level, and distribution within the project area as well as on the Stillwater Unit.

Recommended Mitigation Measures for Vegetation- The analysis and levels of effects to vegetation resources are based on implementation of the following mitigation measures.

- Require all tracked or wheeled equipment to be cleaned of noxious weeds prior to beginning project operations.
- Control the spread of noxious weeds with pre – and – post harvest herbicide treatments on established weed populations.
- Require prompt vegetation seeding of all disturbed roadside sites. Roads used and closed as part of this proposal would be reseeded and reshaped to prevent motorized use.
- If rare plants are found during the project period, operations would be diverted away from the population and further reviewed by DNRC and plant specialist.

FOR COMPLETE VEGETATION ANALYSIS SEE ATTACHMENT C.

SOILS:

Issues and Concerns- The following issue statements were developed during scoping regarding the effects of the proposed action to soils:

- Timber harvesting and associated activities may affect soil conditions in the proposed project area through ground-based and cable yarding activities, and through repeated entries to previously harvested areas
- Forest management can affect the volumes of fine and coarse woody debris through timber harvesting and result in changes to potentially available nutrients for long-term forest production
- Slope stability can be affected by timber management activities by removing stabilizing vegetation, concentrating runoff, or by increasing the soil moisture

Recommended Mitigation Measures for Soils- The analysis and levels of effects to soil resources are based on implementation of the following mitigation measures.

- Limit equipment operations to periods when soils are dry (less than 20% oven-dried weight), frozen or snow-covered in order to minimize soil compaction and rutting, and to maintain drainage features. Check soil moisture conditions prior to equipment start-up.
- On ground-based units, the logger and sale administrator would agree to a skidding plan prior to equipment operations. Skid trail planning would identify which existing trails to use and how many additional trails are needed.
- Do not use existing trails if they are located in draw bottoms or other unfavorable locations.

- Grass seeding or other erosion control measures may be required to stabilize some trails.
- Limit ground-based operations to slopes less than 40% unless they can be used without causing excessive displacement or erosion.
- Keep skid trails to 20 percent or less of the harvest unit acreage. Provide for surface drainage on all roads and skid trails concurrent with operations.
- Slash disposal: Limit the total of disturbance and scarification to 30-40 percent of harvest units.
- Limit dozer piling to slopes less than 35 percent and limit excavator piling to slopes less than 40 percent unless it can be completed without causing excessive erosion.
- Retain between 7 and 25 tons/acre of woody debris 3-inches in diameter or greater (depending on habitat type) and a feasible majority of fine branches and needles following harvesting operations. On units where whole-tree harvesting is used, implement one of the following mitigations for nutrient cycling: 1) use in-woods processing equipment that leaves fine 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.

FOR COMPLETE SOILS ANALYSIS SEE ATTACHMENT D.

WATER RESOURCES:

Issues and Concerns- The following issue statements were developed during scoping regarding the effects of the proposed action to water resources:

- Sediment delivery and subsequent water quality impacts can be affected by timber harvesting and related activities
- Water yield increases can result from timber harvesting and associated activities

Recommended Mitigation Measures for Water Resources- The analysis and levels of effects to water resources are based on implementation of the following mitigation measures.

- Implement Riparian Management Zones on all Class 1 streams based on site-potential tree heights in the project area
- Implement BMPs on all new temporary roads and improve BMPs on existing roads where needed
- Use spot-blading on existing roads to preserve as much of the existing vegetative cover as possible on vegetated road surfaces

FOR COMPLETE WATER RESOURCES ANALYSIS SEE ATTACHMENT E.

FISHERIES RESOURCES *(including unique, federally listed as threatened or endangered, sensitive, and/or species of special concern):*

Issues and Concerns- The following issue statements were developed during scoping regarding the effects of the proposed action to fisheries resources:

- The proposed actions may adversely affect fisheries habitat features, including channel forms, stream temperature and connectivity

Recommended Mitigation Measures for Fisheries Resources- The analysis and levels of effects to fisheries resources are based on implementation of the following mitigation measures.

- Applying all applicable Forestry BMPs (including the SMZ Law and Rules) and Forest Management Administrative Rules for fisheries, soils, and wetland riparian management zones (ARMs 36.11.425 and 36.11.426)

FOR COMPLETE FISHERIES RESOURCE ANALYSIS SEE ATTACHMENT F.

WILDLIFE ***(terrestrial & avian including unique, federally listed as threatened or endangered, sensitive, and/or species of special concern):***

Issues and Concerns- The following issue statements were developed during scoping regarding the effects of the proposed action to wildlife:

- Mature forest cover, old-growth, and connectivity. The proposed activities could decrease forested cover, which may reduce habitat connectivity and suitability for wildlife species associated with mature and old-growth forest.
- Canada lynx. The proposed activities could result in the modification of habitat preferred by Canada lynx (*Felis lynx*) and decrease the area's suitability for lynx.
- Grizzly bear. The proposed activities could alter grizzly bear cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats and/or increase risk of human-caused bear mortality.
- Fishers. The proposed activities could decrease habitat suitability for fishers (*Martes pennanti*) by decreasing canopy cover in forest stands, decreasing abundance of snags and coarse woody debris, and elevating risk of trapping mortality due to increased road access.
- Pileated woodpeckers. The proposed activities could reduce tree density and alter the structure of forest stands, which could reduce habitat suitability for pileated woodpeckers (*Dryocopus pileatus*).
- Big game. The proposed activities could reduce habitat quality for big game, especially during the fall hunting and winter seasons, by removing forest cover, increasing roads in secure areas, and disturbing animals.
- Bald eagle. The proposed activities could reduce bald eagle nesting and perching structures and/or disturb nesting bald eagles.
- Hoary Bat. The proposed activities could disturb hoary bats and alter the structure of forest stands, which could affect habitat suitability for hoary bats.

Recommended Mitigation Measures for Wildlife- The analysis and levels of effects to wildlife are based on implementation of the following mitigation measures.

- If a threatened or endangered species is encountered, consult a DNRC biologist immediately. Similarly, if undocumented nesting raptors are encountered within ½ mile of the Project Area contact a DNRC biologist.
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while on duty as per *ARM 36.11.432(1)(c)*.
- Contractors will adhere to food storage and sanitation requirements as described in the timber sale contract. Ensure that all attractants such as food, garbage, and petroleum products are stored in a bear-resistant manner *ARM 36.11.432(1)(d)*.
- Prohibit all harvesting-related motorized activities more than 100 feet from open roads from April 1 – June 15 per *ARM 36.11.432 (2)(c)*.
- Restrict public access at all times on restricted roads that are opened for harvesting activities. Effectively close all restricted roads following harvest completion.
- Within seed tree or clear cut treatment units, no point in the harvest unit can be >600 feet to hiding cover or a topographic break per *ARM 36.11.432(2)(d)*.
- Provide visual screening along open roads to the extent practicable by retaining available submerchantable trees and brush.
- Close roads and trails to the maximum extent possible following the proposed activities to reduce the potential for unauthorized motor vehicle use and/or loss of snags to firewood gathering.
- Retain patches of advanced regeneration of shade-tolerant trees within commercial harvest units as per *ARM 36.11.428 (4)(f).* Where broadcast burning is prescribed, work with biologists and burn crews to minimize the loss of these patches.
- In all pre-commercial thinning units, retain small, shade-tolerant trees that do not pose competition risks to crop trees as per *ARM 36.11.428 (4)(e).*
- Prohibit mechanized forest management activities within ½ mile of the Upper Stillwater Lake bald eagle nest from February 1 – August 15 to protect nesting bald eagles per *ARM 36.11.436 (7).* Harvesting would be permitted during this time period within ½ mile of the nest in a small portion in the northeastern part of the primary use area where commercial harvesting occurs over 0.4 miles from the nest and in pre-commercial thinning units T and U if heavy equipment is not used.
- Retain at least 2 snags and 2 snag recruits per acre (>21" dbh or largest available size class), particularly favoring western larch, ponderosa pine and Douglas-fir for retention. If snags are cut for safety concerns, leave them in the harvest unit. Retain coarse-woody debris as described in the Forest Management ARMs and *SOILS ANALYSIS* in this document.
- Retain 7 to 25 tons/acre coarse-woody debris according to *ARM 36.11.414* and emphasize retention of 15-inch diameter downed logs aiming for at least one 20-foot-long section per acre *ARM 36.11.428 (4)(b).*

FOR COMPLETE WILDLIFE ANALYSIS SEE ATTACHMENT G.

AESTHETICS

Any change to the scenery in the area from these alternatives would be in addition to past activity within the project area. This analysis includes all past and present effects.

Issues and Concerns- The following issue statements were developed during scoping regarding the effects of the proposed action to aesthetics:

- The proposed actions may impact the visual quality from nearby viewpoints, including Dog Creek Lodge, Dog Mountain, Dog Lake, Upper Stillwater Lake, Duck Lake, Old Fort Steele Road, Highway 93, and the Dog Creek Lodge Nordic trail system.
- The proposed actions may increase noise pollution from nearby transportation systems.

Recommended Mitigation Measures for Aesthetics- The analysis and levels of effects to aesthetics are based on implementation of the following mitigation measures.

- Retain visual screening along the Nordic Ski trail
- Retain patches of advanced regeneration of shade tolerant trees in regeneration harvest along the Nordic Ski trail to break up sight distance
- Silvicultural prescriptions will favor more leave tree retention in regeneration units along the Nordic Ski trail

Existing Conditions
The project area is located in the middle of the rocky mountain trench which is a south-east north-west trending glaciated valley bound by the Salish Mountains to the West and the Whitefish Range to the East. The project area has been logged multiple times over the last hundred years across all ownerships and contains a variety of forest age classes forming a mosaic across the landscape. Younger forest tend to contain more deciduous vegetation compared to darker, more mature forest. Snow cover during winter months tends to increase the contrast between openings, both in natural forest openings and existing harvest units, and in surrounding mature forests. The east boundary of the project area is bound by U.S. Highway 93 which is a major transportation corridor. Most traffic along highway 93 occurs in typical business hours of 7 am to 6 PM. The Burlington Northern Santa Fe railroad runs through the middle of the project area, which also services AMTRAK and operates at all hours.

Environmental Effects

-VISUAL QUALITY

No-Action Alternative:
Effects to the visual resource would occur from activities such as firewood gathering and recreational use, which are presently taking place.

Action Alternative:

Direct, Secondary, and Cumulative Effects
Damage to residual vegetation and soil disturbance would have short-term effects to visual quality as seen from roads and trails. Slash from the harvest would be noticeable yet temporary and typically breaks down within five years. The sight distance into the harvest units and to broader landscapes would be increased. Harvest units would generally be lighter in color than can be seen currently from viewpoints. Short-term visual impacts are anticipated but, over time, shrubs, grasses, and seedlings would regenerate in the post-harvest area lessening the visual impacts. Cumulatively, the proposed action would be similar to previous timber management activity but would be additive to changes that have taken place within the viewshed historically.

-NOISE

No-Action Alternative:

Under the No-Action Alternative, no increase to existing audible noise would be anticipated to occur from forest management activities.

Action Alternative:

Direct, Secondary, and Cumulative Effects
Harvest activities would be audible and, depending upon air conditions, equipment could be heard many miles from their location. Noise would be generated by harvest operations, harvest related traffic, road construction, and administrative oversight. Project-related noise could be expected during the general work week (Monday – Friday) for the entire season of harvest, which typically occurs from mid-June through mid-March, for the duration of the harvest of two to three years. Timber harvest could potentially increase audibility of highway and railroad noise.

Based on the anticipated operating periods and the short duration of the timber sale, the direct, secondary, and cumulative effects of noise would be temporary and low.

HISTORICAL AND ARCHEOLOGICAL SITES:

The tribes were scoped but none identified a specific cultural resource concern. Several Class III cultural and paleontological resource inventories have been conducted in portions of the Area of potential effect (APE) since 1985. One recurrent cultural resource in the APE is The Tobacco Plains Trail/Fort Steele Road route (24FH1024/24LN1195) which follows Highway 93 and a county road near Upper Stillwater Lake. This site will not be modified from its present condition so proposed timber harvest work will have no effect.

Sites 24FH48, 24FH252/24FH1033, 24FH1123 are cabin remnants associated with past timber camps. Additionally, an unrecorded timber camp is reported in SWSENW1/4 of Section 29, T33N R23W. These sites should be located and temporarily flagged so that they may be avoided with timber harvest activities.

24FH1583 is the Vissotzky Petroglyph site which has been determined eligible for listing in the National Register of Historic Places. Site 24FH1582 is a series of low-walled rock structures of unknown age and function in close proximity to 24FH1583. The perimeters of sites 24FH1582 and 24FH1583 should be marked and no timber harvesting within their boundaries should be allowed. Site 24FH1708 is a series of five rock ovens believed to be associated with Italian railroad laborers in 1904. These features should be flagged and avoided with timber felling, skidding or landing or slash pile construction activities.

There is a site lead of a 1930s powder cache (magazine) in the N1/2 of Section 24, T33N R24W. This feature should be located, perimeter marked, and avoided with timber harvesting activities. Lastly, site 24FH1034 is a small-size historic trash dump that has been determined ineligible for listing in the National Register of Historic Places. Timber harvest activities will result in No Effect to this site whether avoided or not.

If recommendations outlined herein are implemented, proposed timber harvest activities will have *No Effec*t to *Antiquities* as defined under the Montana State Antiquities Act. Formal reports of findings for the various inventories conducted since 1985 are on file with the DNRC and the Montana State Historic Preservation Officer.

DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR, AND ENERGY:

There will be no measurable direct, secondary, and cumulative impacts related to environmental resources of land, water, air, and energy due to the relatively small size of the timber sale project.

OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:

- Spring Creek South Timber Sale Environmental Assessment, April 1980
- South Bull Lake Timber Sale Environmental Assessment
- Radnor-Dog Mountain Timber Sale Environmental Assessment January,1984
- Ritsenberg/Fitzsimmons Timber Sale Environmental Assessment
- Dog Mountain Timber Sale Proposal Environmental Assessment, August 1993
- Duck to Dog Timber Sale Project Environmental Assessment, May 2007
- Dog Creek Lodge Nordic Skiing Proposal Checklist Environmental Assessment, December 2014

Impacts on the Human Population

HUMAN HEALTH AND SAFETY:

Air Quality

The DNRC is a member of the Montana/Idaho Airshed Group which was formed to minimize or prevent smoke impacts while using fire to accomplish land management objectives and/or fuel hazard reduction (Montana/Idaho Airshed Group 2006). The Group determines the delineation of airsheds and impact zones throughout Idaho and Montana. Airsheds describe those geographical areas that have similar atmospheric conditions, while impact zones describe any area in Montana or Idaho that the Group deems smoke sensitive and/or having an existing air quality problem (Montana/Idaho Airshed Group 2006).

The project area is located within Montana Airsheds 1 & 2, which encompasses portions of Flathead, Lincoln and Sanders Counties. Currently, this Airshed does contain impact zones.

Issues and Concerns- The following issue statements were developed during scoping regarding the effects of the proposed action to air quality:

- Smoke will be produced during pile burning.
- Dust will be produced during harvesting and hauling activities.

Recommended Mitigation Measures for Air Quality- The analysis and levels of effects to air quality are based on implementation of the following mitigation measures:

- Only burn on days approved by the Montana/Idaho Airshed group and DEQ.
- Conduct test burn to verify good dispersal.
- Dust abatement may be used as necessary.
- Slower speed limits may be included in contracts as necessary to reduce dust.

-SLASH BURNING

No-Action Alternative:

No slash would be burned within the project areas. Thus, there would be no effects to air quality within the local vicinity and throughout Airshed 1 & 2.

Action Alternative:

Direct and Secondary Effects
Slash consisting of tree limbs and tops and other vegetative debris would be piled throughout the project area during harvesting. Slash would ultimately be burned after harvesting operations have been completed. Burning would introduce particulate matter into the local airshed, temporarily affecting local air quality. Over 70% of emissions emitted from prescribed burning are less than 2.5 microns (National Ambient Air Quality PM 2.5). High, short-term levels of PM 2.5 may be hazardous. Within the typical column of biomass burning, the chemical toxics are Formaldehyde, Acrolein, Acetaldehyde, 1,4 Butadiene, and Polycyclic Organic Matter. Burning within the project area would be short in duration and would be conducted when conditions favor good to excellent ventilation and smoke dispersion as determined by the Montana Department of Environmental Quality and the Montana/Idaho Airshed Group. The DNRC, as a member of the Montana/Idaho Airshed Group, would burn only on approved days.

Thus, direct and secondary effects to air quality due to slash burning associated with the proposed action would be minimal.

Cumulative Effects
Cumulative effects to air quality would not exceed the levels defined by State of Montana Cooperative Smoke Management Plan (1988) and managed by the Montana/Idaho Airshed Group. Prescribed burning by other nearby airshed cooperators (for example the U.S. Forest Service) would have potential to affect air quality. All cooperators currently operate under the same Airshed Group guidelines. The State, as a member, would burn only on approved days. This should decrease the likelihood of additive cumulative effects. Thus, cumulative effects to air quality due to slash burning associated with the proposed action would also be expected to be minimal.

-DUST

No-Action Alternative:
No increased dust would be produced as a result of the proposed forest management project. Current levels of dust would be produced in the area.

Action Alternative:

Direct, Secondary, and Cumulative Effects
Harvesting operations would be short in duration. Dust may be created from log hauling on portions of native surface roads during summer and fall months. Contract clauses would provide for the use of dust abatement or require trucks to reduce speed if necessary to reduce dust near any affected residences.

Thus, direct, secondary, and cumulative effects to air quality due to harvesting and hauling associated with the proposed action would be minimal.

Log Hauling Traffic
Log hauling traffic is common in the project area.

Issues and Concerns- The following issue statements were developed during scoping regarding the effects of the proposed action to log hauling traffic:

- There will be increased travel on weekends.
- Trucks will drive fast.

Recommended Mitigation Measures for Log Hauling Traffic- The analysis and levels of effects of log hauling traffic is based on implementation of the following mitigation measures:

- Log hauling will take place typically during the general "work week".
- Signs will be posted making the public aware of log hauling traffic in the area.
- If necessary, a slower speed limit may be imposed in the timber harvest contract.

No-Action Alternative:
No increase in log truck traffic would occur.

Action Alternative:

Direct, Secondary, and Cumulative Effects
Log truck traffic in the area would increase for the duration of the timber sale. However, signs will be posted indicating that log truck traffic is present in the area. If necessary, a slower speed limit may be imposed in the timber harvest contract.

Based on the mitigation measures direct, secondary, and cumulative effects of log hauling on human health and safety would be minimal.

RECREATION *(including access to and quality of recreational and wilderness activities):*

Issues and Concerns- The following issue statements were developed during scoping regarding the effects of the proposed action to recreation:

- The proposed action could disrupt recreation on the Dog Creek Lodge Nordic Ski trail system

Recommended Mitigation Measures for Recreation- The analysis and levels of effects to recreation are based on implementation of the following mitigation measures.

- Forest management activities in proposed units located along the Nordic Ski trail would be limited to an operational period of June 15th to November 30th.
- Forest management activities would be required to rehabilitate Nordic Ski trails damaged or modified by forest management activities.

Existing Conditions
The project area encompasses state and federal forested land around the rural communities of Olney, Radnor and Stryker making this area easily accessible to the local community and public. The project area also contains popular recreation sites such as Dog Lake, Upper Stillwater Lake, Duck Lake and the Stillwater River. The project area is primarily used by the public for hiking, hunting, fishing, site seeing, motorized trail riding, snowmobiling and other general recreational uses. Many of the proposed haul routes are open to yearlong motorized use that currently receive moderate to high use from the public. In addition, there is a Land Use

License that authorizes Dog Creek Lodge to conduct commercial recreation activities within the project area. Dog Creek Lodge operates during the winter season which is typically December 1 – April 1 on 10.6 miles of Nordic trails they have constructed.

Environmental Effects

No-Action Alternative:
Under the No-Action Alternative, no changes to recreation would be anticipated to occur from forest management activities.

Action Alternative:

Direct, Secondary, and Cumulative Effects

Recreation within the project area would continue to be available year-round. Although new temporary roads would be built as part of project activities, these roads would not be open for public motorized use except between December 1st and March 31st.

Indirectly, recreational opportunities in the project area would likely benefit temporarily. Harvest operations would create openings in forested areas that could be used for a multitude of activities, such as hunting and snowmobiling, until trees regenerate to a large enough diameter to restrict travel again.

Cumulatively, over the next three to seven years, this project could be hauling logs on portions of the Old Fort Steele, Dog Lake and Duck Lake Road systems adding to the vehicle traffic that recreationists might encounter.

Will the Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Health and Human Safety	**X**				**X**				**X**					
Industrial, Commercial, and Agricultural Activities and Production	**X**				**X**				**X**					
Quantity and Distribution of Employment	**X**				**X**				**X**					
Local Tax Base and Tax Revenues	**X**				**X**				**X**					
Demand for Government Services	**X**				**X**				**X**					
Access to and Quality of Recreational Activities	**X**				**X**				**X**					
Density and Distribution of Population and Housing	**X**				**X**				**X**					
Social Structures and Mores	**X**				**X**				**X**					
Cultural Uniqueness and Diversity	**X**				**X**				**X**					

Will the Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Action														
Health and Human Safety		**X**			**X**				**X**				**Yes**	**S-1**
Industrial, Commercial, and Agricultural Activities and Production	**X**				**X**				**X**					**E-1**
Quantity and Distribution of Employment		**X**			**X**				**X**					**E-2**
Local Tax Base and Tax Revenues	**X**				**X**				**X**					
Demand for Government Services	**X**				**X**				**X**					
Access to and Quality of Recreational Activities			**X**			**X**			**X**				**Yes**	**R-1 R-2 R-3 R-4 R-5**
Density and Distribution of Population and Housing	**X**				**X**				**X**					
Social Structures and Mores	**X**				**X**				**X**					
Cultural Uniqueness and Diversity	**X**				**X**				**X**					

Comments:

S-1: Mitigations have been developed for all log hauling to allow for safe travel and shared use of open roads through the duration of the project.

E-1: Due to the relatively small size of the proposed forest management project, no measurable direct, indirect or cumulative effects would be likely.

E-2: Employment within the logging industry is common in the Flathead area, and this project would contribute to local employment.

R-1: Forest management activities in proposed units located along the Nordic Ski trail would be limited to an operational period of June 15th to November 30th.

R-2: Forest management activities would be required to rehabilitate Nordic Ski trails damaged or modified by forest management activities.

R-3: Retain patches of advanced regeneration of shade tolerant trees in regeneration harvest units along the Nordic Ski trail to break up sight distance

R-4: Retain visual screening along the Nordic Ski trail

R-5: Silvicultural prescriptions will favor more leave tree retention in regeneration units along the Nordic Ski trail

LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

There are no locally adopted environmental plans or goals associated with this proposal.

OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

The proposed action has a projected harvest volume between 5 and 7 MMBF. This volume is worth approximately $400/MBF delivered to a forest products manufacture site at current market prices. Delivered to market, the proposed action has a total revenue value of an estimated $2,400,000. Removing the timber sale purchaser's contracted operations and DNRC's development, administration, and operation expenses, the trust beneficiaries net between an estimated 15 and 35 percent of total delivered sawlog market value. Therefore, the proposed action may generate net income for trust beneficiaries between $360,000 and $840,000. Costs related to the administration of the timber sale program are only tracked at the Land Office 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 by land office and statewide. These revenue-to-cost ratios are a measure of economic efficiency. A recent revenue-to-cost ratio of the Northwest Land Office was 1.59. This means that, on average, for every $1.00 spent in costs, $1.59 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.

Currently the Sustained yield and target harvest from Trust Lands is 60.0 MMBF, which represents approximately 16.4% of timber harvested in the state of Montana. This project would provide approximately 6 MBF of timber towards the annual sustained yield target thus helping sustain current mill capacity.

Environmental Assessment Checklist Prepared By:

Name: Joe Rizzi
Title: Upper Stillwater Forest Management Project
Date: November 20, 2024

Finding

Alternative Selected

Upon Review of the Environmental Assessment and attachments, I find the Action Alternative, as proposed, meets the intent of the project objectives as stated in the *Type and Purpose of Action* section of this document.

The lands involved in this project are held by the State of Montana in trust for the support of specific beneficiary institutions and DNRC is required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X Section 11; and, 77-1-212 MCA).

The Action Alternative complies with all pertinent environmental laws, the DNRC SFLMP and HCP, and is based upon a consensus of professional opinion on limits of acceptable environmental impact. This Action Alternative also addresses the eighteen public comments received during the 30-day public scoping process. For these reasons and on behalf of DNRC I have selected the Action Alternative to be implemented on this project.

Significance of Potential Impacts

After a review of the scoping documents and comments, project file, Forest Management Rules, SFLMP and HCP checklists, and Department policies, standards, and guidelines, I find that all the identified resource management concerns have been fully addressed in this Environmental Assessment and its attachments.

Specific project design features and various recommendations by the resource management specialists will be implemented to ensure that this project will fall within the limits of environmental change. Taken individually and cumulatively, the proposed activities are common practices, and no project activities are being conducted on important unique or fragile sites. I find there will be no significant impacts to the human environments as a result of implementing the Action Alternative.

In summary, I find that the identified impacts will be controlled, mitigated, or avoided by the design of the project to the extent that the impacts are not significant.

Need for Further Environmental Analysis

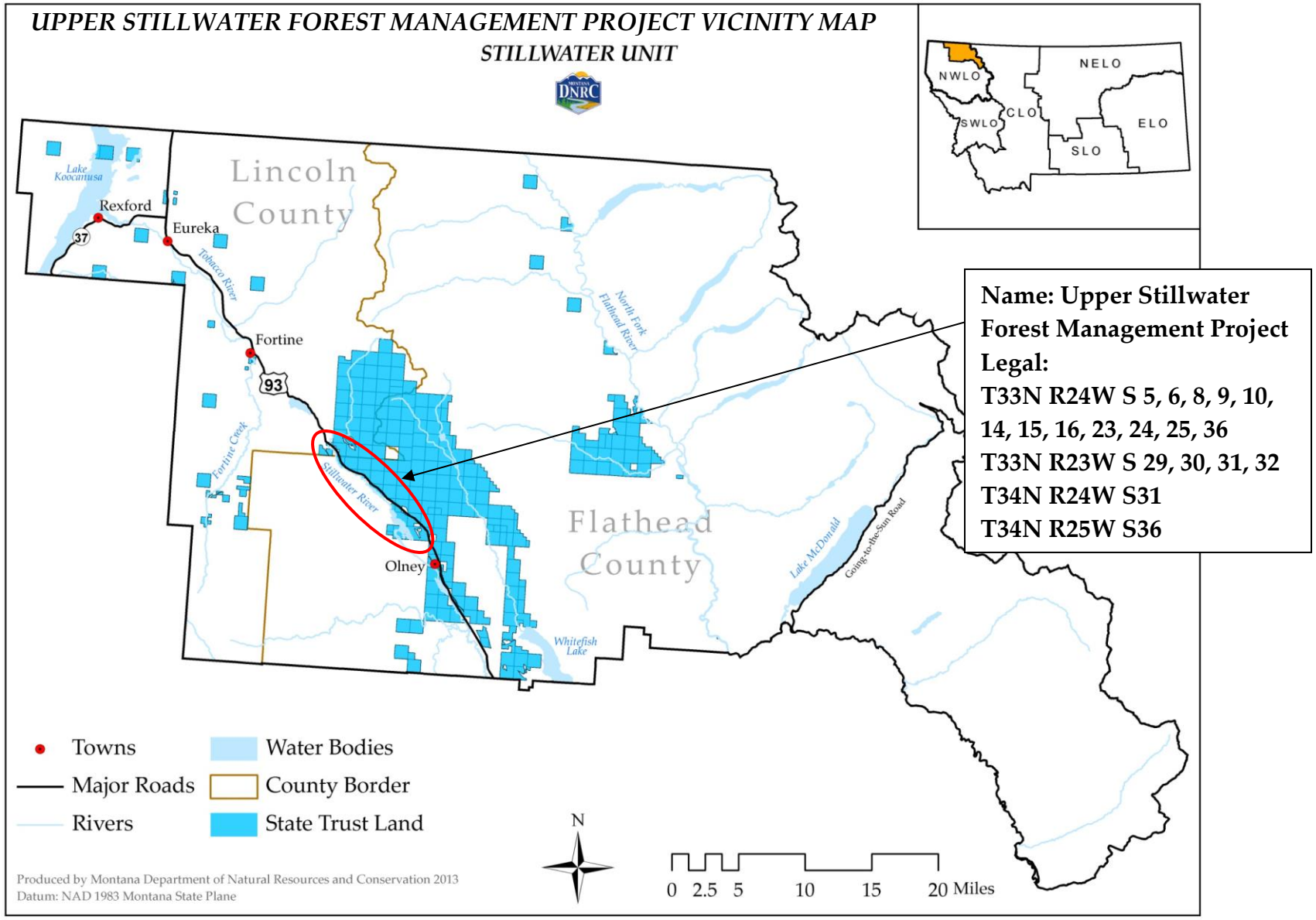
☐	EIS	☐	More Detailed EA	☒	No Further Analysis

Environmental Assessment Checklist Approved By:

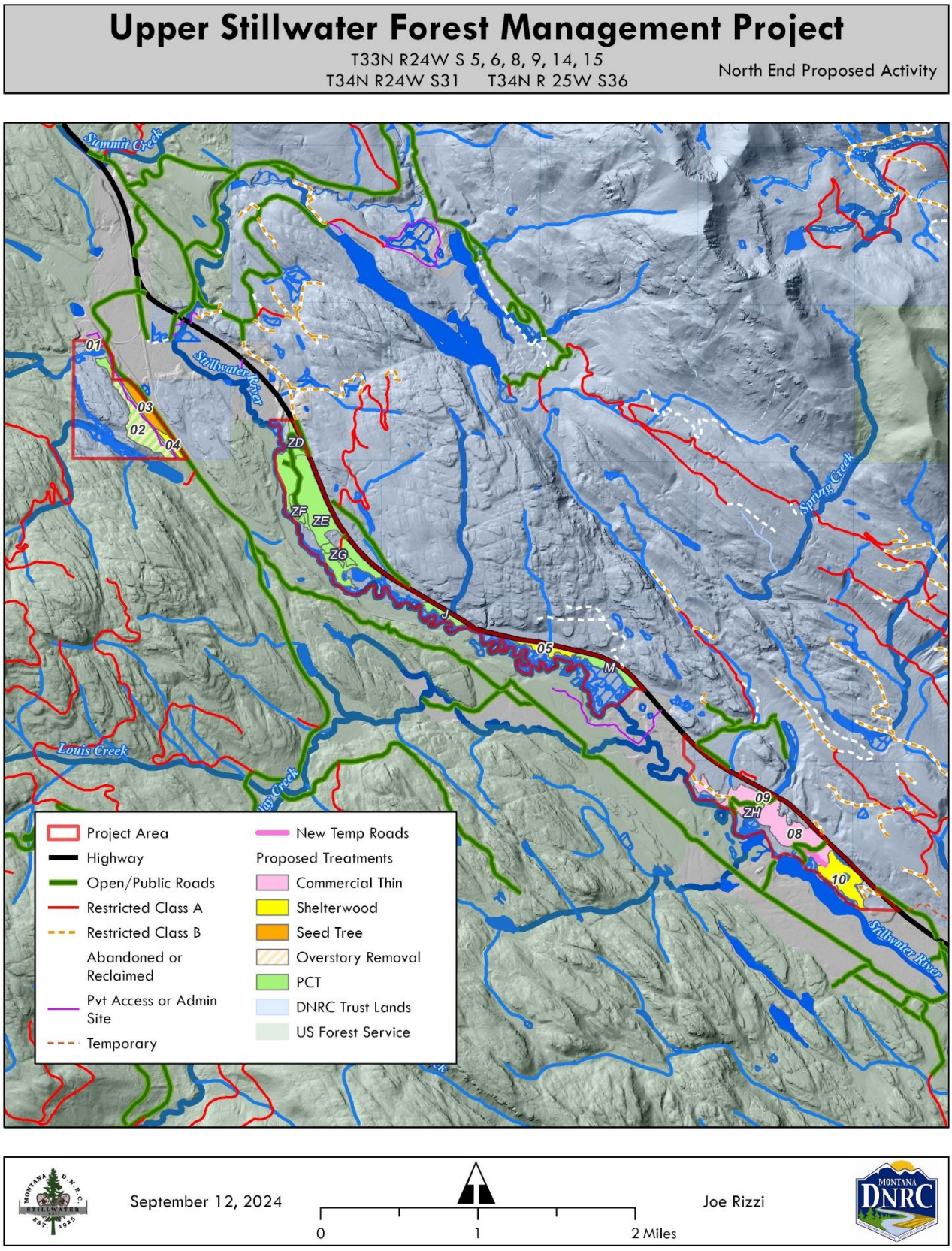
Name: Dave Ring
Title: Stillwater Unit Manager
Date: November 22,2024
Signature: /s/ David A. Ring

Attachment A - Maps

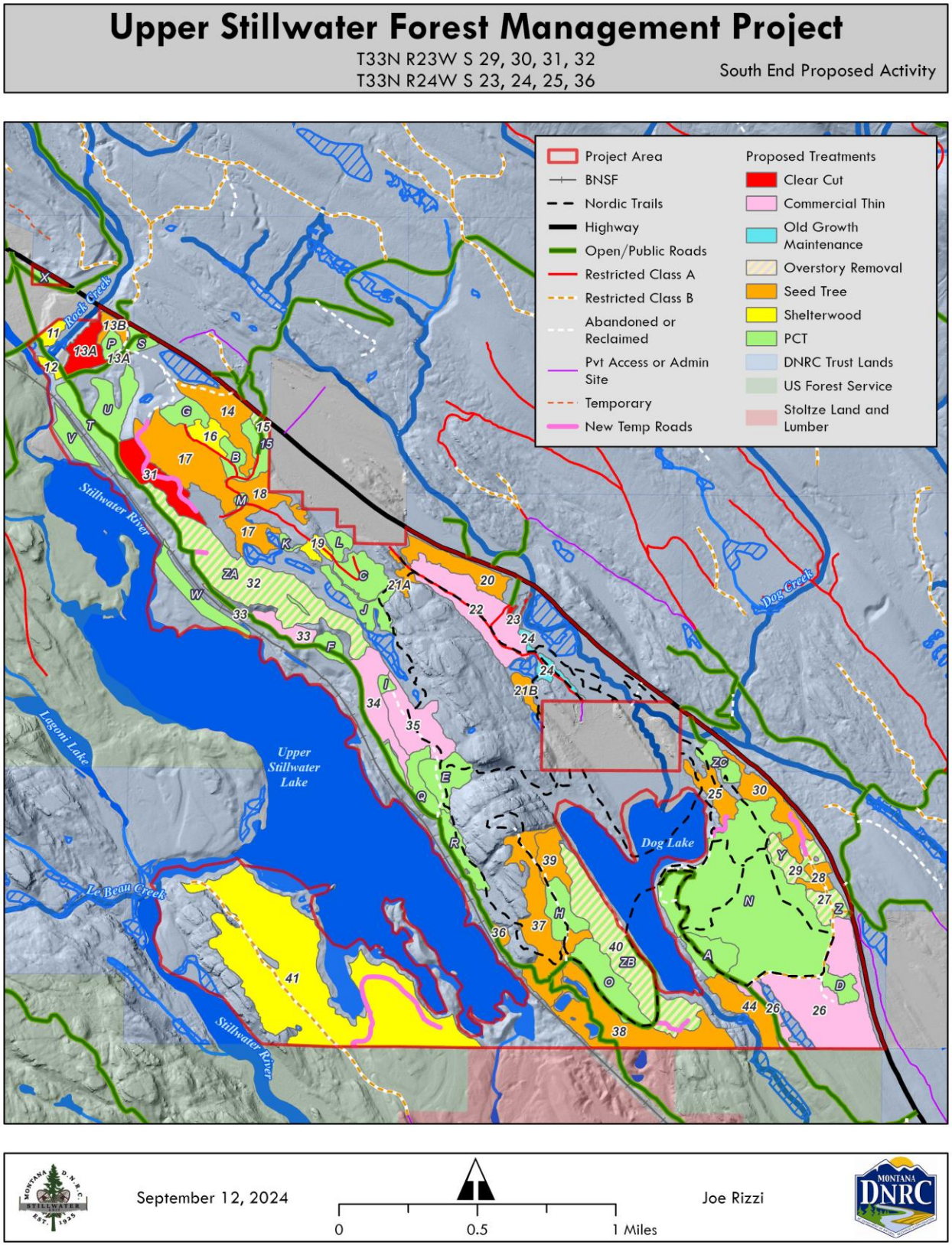
A-1: Upper Stillwater Forest Management Project Vicinity Map



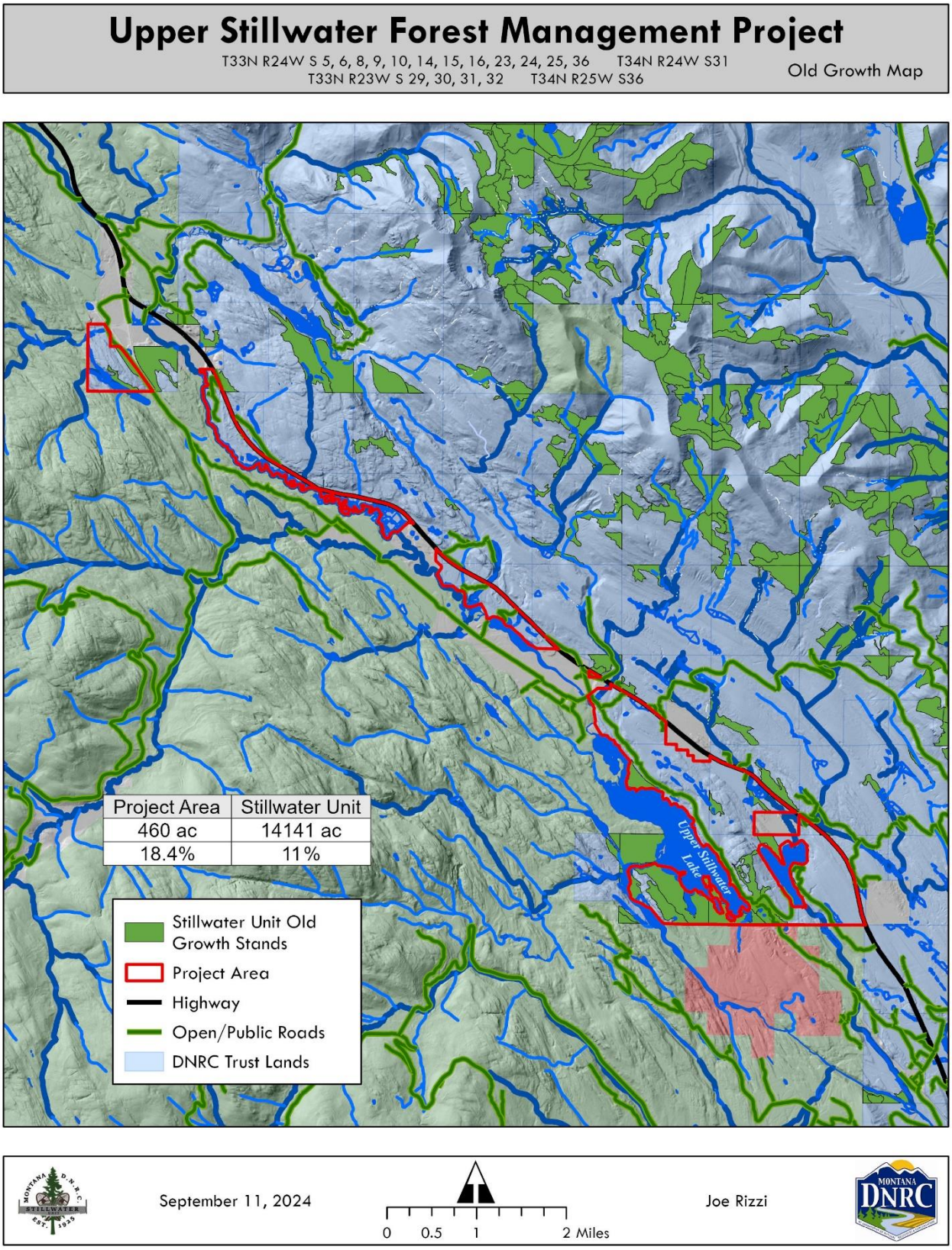
A-2: Upper Stillwater Forest Management Project Harvest Units (1/2)



A-3: Upper Stillwater Forest Management Project Harvest Units (2/2)



A-4: Upper Stillwater Forest Management Old Growth Map



Attachment B – Prescription Table

Unit	Acres	Prescription	Particulars involved in unit
1	3.2	Shelterwood	-Tractor harvest -WL>DF at 57' spacing or 13 tpa -WMZ harvest -High hazard fuel reduction along open road and property line -Mechanical scarification -Rely on natural regeneration
2	31.9	Overstory Removal	-Tractor harvest -4 TPA or 100' spacing -PCT 3 years post-harvest WL @ 14x14 and LPP @ 10x10
3	14.8	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -High hazard fuel reduction along open road and property line -Mechanical scarification -Rely on natural regeneration
4	5.7	Shelterwood	-Tractor harvest -WL>DF at 57' spacing or 13 tpa -WMZ harvest -High hazard fuel reduction along open road -Mechanical scarification -Rely on natural regeneration

5	9.0	Shelterwood	-Tractor harvest -WL>DF at 57' spacing or 13 tpa -WMZ harvest -High hazard fuel reduction along open road -Mechanical scarification -Rely on natural regeneration
8	75.4	Commercial Thin	-CTL harvest -LPP at 18’ spacing or 134 tpa -RMZ harvest -High hazard fuel reduction along open road
9	5.3	Overstory Removal	-Tractor harvest -4 TPA or 100' spacing -Class 1 SMZ harvest -PCT 3 years post-harvest DF @ 14x14
10	28.0	Shelterwood	-Tractor harvest -WL>DF at 57' spacing or 13 tpa -High hazard fuel reduction along open road and property line -Mechanical scarification -Rely on natural regeneration and interplant WL

11	3.6	Shelterwood	-Tractor harvest -WL>DF at 57' spacing or 13 tpa -High hazard fuel reduction along open road -Mechanical scarification -Rely on natural regeneration
12	2.1	Shelterwood	-Tractor harvest -WL>DF at 57' spacing or 13 tpa -RMZ harvest along Rock Cr and Stillwater River -High hazard fuel reduction along open road -Mechanical scarification -Rely on natural regeneration
13A	12.4	Clear Cut	-Tractor harvest -6-8 tpa WL>DF. 74'-85' where available -High hazard fuel reduction along open road and property line -Mechanical scarification -Rely on natural regeneration
13B	4.4	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -High hazard fuel reduction along open road and property line -Mechanical scarification -Rely on natural regeneration

14	20.2	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -WMZ harvest -High hazard fuel reduction along highway -Mechanical scarification -Rely on natural regeneration and interplant WWP 30 tpa & WL 70 tpa
15	2.5	Overstory Removal	-Tractor harvest -4 TPA or 100' spacing -High hazard fuel reduction along highway -PCT 3 years post-harvest LPP @ 10x10 WL/DF @ 14x14
16	7.0	Shelterwood	-Tractor harvest -WL>DF at 57' spacing or 13 tpa -Mechanical scarification -Rely on natural regeneration
17	48.9	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -Unit contains ERZ -WMZ harvest -Mechanical scarification -Rely on natural regeneration and interplant WWP 30 tpa & WL 70 tpa

18	11.3	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -Unit contains ERZ -Mechanical scarification -Rely on natural regeneration and interplant WWP 30 tpa & WL 70 tpa
19	4.1	Shelterwood	-Tractor harvest -WL>DF at 57' spacing or 13 tpa -Mechanical scarification -Rely on natural regeneration
20	16.7	Seed Tree	-Tractor harvest -6-8 tpa leave all WL -Mechanical scarification -Plant 30 WWP and 170 WL per acre
21A	4.2	Seed Tree	-Tractor harvest -6-8 tpa leave all WL -Nordic ski trail in unit -Mechanical scarification -Plant 30 WWP and 70 WL per acre

21B	4.5	Seed Tree	-Tractor harvest -6-8 tpa leave all WL -Nordic ski trail in unit -Mechanical scarification -Plant 30 WWP and 70 WL per acre
22	36.7	Commercial Thin	-CTL harvest -LPP at 18’ spacing or 134 tpa -Harvest all OS DF reserve all snags -Nordic ski trail in unit -WMZ Harvest
23	1.7	Clear Cut	-Tractor harvest -6-8 tpa WL>DF. 74'-85' where available -High hazard fuel reduction along open road and property line -Mechanical scarification -Rely on natural regeneration
24	6.3	Old Growth Maintenance	-Tractor harvest -Leave tree mark. No less than 13 big tpa or 57' spacing. Stand should be well stocked with 100 BA residual. Retain cull shade tolerant species. -Nordic ski trail in unit -RMZ and WMZ harvest -Mechanical scarification -Rely on natural regeneration

25	10.8	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -Reserve all healthy WWP -Mechanical scarification -Plant 30 WWP and 70 WL per acre
26	63.6	Commercial Thin	-Tractor harvest -109 tpa WL>DF. 20’ -WMZ harvest -High hazard fuel reduction along open road and highway
27	8.3	Overstory Removal	-Tractor harvest -4 TPA or 100' spacing -High hazard fuel reduction along highway -PCT 3 years post-harvest LPP @ 10x10 WL/DF @ 14x14
28	5.9	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -Reserve all healthy WWP -Fell all snags that are risk to highway and powerline. These will be substituted with snags further back. -Mechanical scarification -Plant 30 WWP and 70 WL per acre

29	11.8	Overstory Removal	-Tractor harvest -4 TPA or 100' spacing -High hazard fuel reduction along highway -PCT 3 years post-harvest LPP @ 10x10 WL/DF @ 14x14
30	17.4	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -Reserve all healthy WWP -Fell all snags that are risk to highway and powerline. These will be substituted with snags further back. -Mechanical scarification -Plant 30 WWP and 70 WL per acre
31	18.9	Clear Cut	-Combo tractor and cable harvest -6-8 tpa WL>DF. 74'-85' where available -High hazard fuel reduction along open road -Mechanical scarification or prescribed burn -Rely on natural regeneration
32	64.3	Overstory Removal	-Tractor harvest -4 TPA or 100' spacing -PCT 3 years post-harvest LPP @ 10x10 WL/DF @ 14x14

33	8.9	Commercial Thin	-Tractor harvest -109 tpa WL>DF. 20’ -High hazard fuel reduction along open road and highway
34	20.5	Commercial Thin	-Tractor harvest -109 tpa WL>DF. 20’ -High hazard fuel reduction along open road and highway
35	24.6	Commercial Thin	-Tractor harvest -Harvest all merchantable white woods and cedar. MTC WL retaining 80-60 BA. 30' spacing or 48 tpa. -Nordic ski trail in unit
36	3.0	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -Nordic ski trail in unit -High hazard fuel reduction along open road -Mechanical scarification -Rely on natural regeneration
37	37.3	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -Nordic ski trail in unit -High hazard fuel reduction along open road -Mechanical scarification -Rely on natural regeneration

38	48.4	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -Nordic ski trail in unit -High hazard fuel reduction along open road -Mechanical scarification -Plant 30 WWP and 70 WL per acre
39	11.3	Seed Tree	-Tractor harvest -6-8 tpa WL>DF. 74'-85' -Nordic ski trail in unit -Mechanical scarification -Plant 30 WWP and 70 WL per acre
40	50.3	Overstory Removal	-Tractor harvest -4 TPA or 100' spacing -Nordic ski trail in unit -PCT 3 years post-harvest LPP @ 10x10 WL/DF @ 14x14
41	169.5	Shelterwood	-Tractor harvest -WL>DF at 57' spacing or 13 tpa -Mechanical scarification or Prescribed Fire -Plant 30 WWP and 70 WL per acre

44	16.4	Seed Tree	-Cable harvest -6-8 tpa WL>DF. 74'-85' -Reserve all healthy WWP -High hazard fuel reduction along open road -Mechanical scarification or prescribed burn -Rely on natural regeneration
A	13.5	Pre-Commercial Thin	WL/DF @ 14' x 14'
B	13.5	Pre-Commercial Thin	WL/DF @ 14' x 14'
C	14.4	Pre-Commercial Thin	WL/DF @ 14' x 14'
D	6.7	Pre-Commercial Thin	WL/DF @ 14' x 14'
E	15.0	Pre-Commercial Thin	WL/DF @ 14' x 14'
F	5.6	Pre-Commercial Thin	WL/DF @ 14' x 14'
G	8.1	Pre-Commercial Thin	WL/DF @ 14' x 14'
H	12.6	Pre-Commercial Thin	WL/DF @ 14' x 14'
I	2.0	Pre-Commercial Thin	LPP @ 10' x 10'
J	11.6	Pre-Commercial Thin	WL/DF @ 14' x 14'
J	8.7	Pre-Commercial Thin	WL/DF @ 14' x 14'
K	1.4	Pre-Commercial Thin	WL/DF @ 14' x 14'
L	4.6	Pre-Commercial Thin	WL/DF @ 14' x 14'
M	1.3	Pre-Commercial Thin	WL/DF @ 14' x 14'
M	13.3	Pre-Commercial Thin	WL/DF @ 14' x 14'
N	147.3	Pre-Commercial Thin	WL/DF @ 14' x 14'
O	21.3	Pre-Commercial Thin	WL/DF @ 14' x 14'
P	3.5	Pre-Commercial Thin	WL/DF @ 14' x 14'
Q	13.7	Pre-Commercial Thin	WL/DF @ 14' x 14'
R	9.8	Pre-Commercial Thin	WL/DF @ 14' x 14'
S	4.0	Pre-Commercial Thin	WL/DF @ 14' x 14'
T	10.2	Pre-Commercial Thin	WL/DF @ 14' x 14'

U	16.1	Pre-Commercial Thin	LPP @ 10' x 10'
V	8.3	Pre-Commercial Thin	WL/DF @ 14' x 14'
W	12.7	Pre-Commercial Thin	WL/DF @ 14' x 14'
X	2.0	Pre-Commercial Thin	WL/DF @ 14' x 14'
Y	11.8	Pre-Commercial Thin	WL/DF @ 14' x 14'
Z	8.3	Pre-Commercial Thin	WL/DF @ 14' x 14'
ZA	65.0	Pre-Commercial Thin	WL/DF @ 14' x 14'
ZB	50.3	Pre-Commercial Thin	WL/DF @ 14' x 14'
ZC	7.7	Pre-Commercial Thin	WL/DF @ 14' x 14'
ZD	11.3	Pre-Commercial Thin	WL/DF @ 14' x 14'
ZE	94.5	Pre-Commercial Thin	LPP @ 10' x 10'
ZF	6.0	Pre-Commercial Thin	LPP @ 10' x 10'
ZG	7.5	Pre-Commercial Thin	LPP @ 10' x 10'
ZH	5.3	Pre-Commercial Thin	WL/DF @ 14' x 14'

Attachment C – Vegetation Analysis

Upper Stillwater Forest Management Project – Vegetation Analysis

Analysis Prepared By:
Name: Joe Rizzi
Title: Management Forester, Montana DNRC

Introduction

The vegetation section describes present conditions and components of the forest as well as the anticipated effects of both the No Action and the Action Alternatives.

Issues and Measurement Criteria

- Noxious weeds are present along open and closed roads within the project area. Further soil disturbance and logging equipment activity could increase the amount and distribution of noxious weeds in the project area.
- There may be habitat alterations to the amount and distribution of sensitive plants in the project area.
- Cover types and age-class distributions may be affected by timber harvesting related to this project and other timber-harvesting projects
- Timber harvesting and road construction through old growth stands may affect the amount, quality, attribute level, and distribution within the project area as well as on the Stillwater Unit.

Regulatory Framework

The following plans, rules, and practices have guided this project's planning and/or will be implemented during project activities:

State Forest Land Management Plan (SFLMP)
DNRC developed the SFLMP to "provide field personnel with consistent policy, direction, and guidance for the management of state forested lands" (DNRC 1996: Executive Summary). The SFLMP provides the philosophical basis, technical rationale, and direction for DNRC's forest management program. The SFLMP is premised on the philosophy that the best way to produce long-term income for the trust beneficiaries is to manage intensively for healthy and biologically diverse forests. In the foreseeable future, timber management would continue to be the primary source of revenue and primary tool for achieving biodiversity objectives on DNRC forested state trust lands.

DNRC Forest Management Rules
DNRC Forest Management Rules (*ARM 36.11.401 through 456*) are the specific legal resource management standards and measures under which DNRC implements the SFLMP and subsequently its forest management program. The Forest Management Rules were adopted in March 2003 and updated in December 2020. They provide the legal framework for DNRC project-level decisions and provide field personnel with consistent policy and direction for managing forested state trust lands. Project design considerations and mitigations developed for this project must comply with applicable Forest Management Rules.

Montana Best Management Practices (BMPs) for Forestry
Montana BMPs consists of forest stewardship practices that reduce forest management impacts to water quality and forest soils. The implementation of BMPs by DNRC is required under *ARM 36.11.422*. Key forestry BMP elements include streamside management; road design and planning; timber harvesting and site preparation; stream crossing design and installation; winter logging; and hazardous substances storage, handling, and application.

Montana DNRC Forested Trust Lands Habitat Conservation Plan (HCP)

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

Analysis Areas

Direct and Secondary Effects Analysis Area

The direct and secondary effects of the proposed activities on all issues were analyzed within the Project Area.

Cumulative Effects Analysis Area

The cumulative effects of the proposed activities on old growth were analyzed within the Stillwater Unit. All remaining issues were analyzed withing the project area.

Existing Conditions

Noxious Weeds

Centaurea stoebe (Spotted Knapweed), *Hypericum perforatum* (St. Johnswort), *Leucanthemum vulgare* (Oxeye Daisy), *Hieracium caespitosum* (Meadow Hawkweed) and *Hieracium aurantiacum* (Orange Hawkweed) are found in and around the proposed project area. Current occurrences are found mainly along existing roads, dispersed recreation sites and some old landings and skid trails. Incursions of noxious weeds into most forested sites have not been observed.

Rare Plants

The Montana Natural Heritage Program was queried for potential species of concern and species of concern of all vascular plants species. Within the project area *Amerorchis rotundifolia* (Round-leaved Orchis), *Bidens beckii* (Beck Water-marigold), *Cypripedium parviflorum* (Small Yellow Lady's-slipper), *Cypripedium passerinum* (Sparrow's-egg Lady's-slipper), *Ophioglossum pusillum* (Adder's Tongue), and *Viola selkirkii* (Great-Spurred Violet) were identified. During project development a new species occurrence of *Lobelia kalmii* (Kalm's Lobelia) was recorded.

Standard Vegetative Community

The Great Northern Railroad was built through the project area in the early twentieth century and we can assume that the harvest of timber for ties occurred. Much of the project area was acquired by the state in 1918 by a land swap with the federal government. The first documented timber harvest in the project area was in the 1920's west of Upper Stillwater Lake where ruins of Henry Good's logging camp remain. Little activity occurred until the early 1950's when mechanized logging high-graded most timber stands. In 1972 the Dog Lake Lodgepole TS#870 occurred with a selection harvest of residual stands.

Active management of the project area began in 1980 with the Spring Creek South TS#1005 which primarily regenerated lodgepole stands along Duck Lake in reaction to mountain pine beetle outbreaks. In 1983 the South Bull Lake TS#1026 removed the overstory of a stand located on a bench above the Stillwater River. In 1984 the Radnor/Dog Mountain TS#1059 primarily regenerated lodgepole pine stands and selection stands also in reaction to a mountain pine beetle outbreak. In 1994 the Ritsenberg/Fitzsimmons TS#1239 improved and regenerated stands in the Dog Lake area. In 1995 the Dog Mountain TS#1271 regenerated new stands of timber, built new roads, and improved some stands of timber. In 2010 Steele Dog TS#1585 regenerated, thinned and improved stands along Old Fort Steele Road and Dog Lake. In 2013 Dog Wing TS#1657 regenerated a timber stand near Dog Lake. Pre-commercial thinning has occurred in some stands in the

project area along Duck Lake in 2000 and above Old Fort Steele Road in the 1970's. Pre-commercial thinning and western white pine pruning has occurred south of Radnor in 2009.
The Upper Stillwater Forest Management project area contains stands primarily composed of low elevation moist forest. Younger stands are typically one or two storied and composed of seral species such as western larch, lodgepole pine, Douglas-fir and occasionally western white pine. Mature stands are typically multi storied, mixed conifer stands that have been historically high graded.

Data in table **V-1** indicate that mixed conifer cover types are currently overrepresented compared to desired future conditions. This cover type is mainly comprised of shade tolerant species and trend toward more multi storied stand structures. The western white pine cover type is underrepresented primarily due to white pine blister rust and timber harvest activities. Western larch/Douglas-fir cover types are underrepresented as well primarily due to historical high-grading of timber stands where western larch and Douglas-fir were selectively logged. Selective logging in mature western larch/Douglas-fir stands tended to convert them to mixed conifer stands.

Data in table **V-2** shows that the project area has a deficit of 0 to 39 year age class (seedling/sapling stands), nearly twice the historic estimated percent of 40 to 99 year age class (pole stands) and near historic level of 100 to 150 year age class (mature stands) and 150+ year age class (old stands). These percentages are not static and change regularly dependent upon disturbance regimes, either natural or human caused.

In the project area *Phaeolus schwinitzii* (root and butt rot), *Armillaria ostoyae* (armillaria root disease), *Echinodontium tinctorium* (indian paint), *Phellinus pini* (pini), *Dendroctonus rufipennis* (spruce beetle), *Dendroctonus pseudotsugae* (douglas-fir beetle), *Scolytus ventralis* (fir engraver), *Cronartium ribicola* (white pine blister rust) and *Onnia tomentosa* (tomentosus root disease) have been observed. *Postia sericeomollis* (cedar brown pocket rot) is suspected to be in the project area.

Table V-1 – Current and appropriate cover type for the Upper Stillwater Forest Management Project Area.

Cover Type	Current Acres	Current Percent of Project Area	Desired Future Condition (DFC)	
			Acres	Percent
Subalpine fir	99.1	4%	0	0%
Douglas-fir	9.7	0.4%	0	0%
Lodgepole pine	375.7	15%	299.1	11.9%
Mixed conifer	735.3	29.3%	22	0.9%
Western larch/Douglas-fir	1209.2	48.3%	1743.4	69.6%
Western white pine	76.9	3.1%	441.3	17.6%
Total:	2505.8	100%	2505.7	100%

Table V- 1: Distribution of age classes in the project area based on Losensky 1997 Section M333B Lower Flathead

Age Class	Historic	Current Percent of Project Area
0-39 years	22%	16.6%
40-99 years	13%	25.5%

100-150 years	15%	19.6%
150+ years	36%	38.4%

Old Growth

DNRC uses the minimum criteria for number and age of large live trees and stand basal area as described by Green et al. (1992) to identify old growth stands on State trust lands. Green et al. described characteristics of old growth forests in Montana and provided minimum amounts of trees per acre of a given diameter at breast height (dbh), age, and basal area for each old growth type; DNRC classifies stands that meet or exceed those minimums as old growth. For this analysis, existing conditions and effects on old growth are presented according to this definition. The Stillwater Unit currently has 14,141 acres of old growth or 11.0%. The Upper Stillwater Forest Management Project area currently has 460.1 acres of old growth which represents 18.4% of the project area or 3.3% of the Stillwater Unit's old growth acreage.

Environmental Effects

No Action Alternative: Direct and Secondary Effects and Cumulative Effects

Under the No Action Alternative, no forest management operations would occur, and natural processes would continue to have a direct influence on forest conditions. No soil disturbance would be caused by the proposed actions and established infestations of noxious weeds would continue to be treated with an ongoing program of site-specific herbicide spraying along roads and in small areas of infestation. Rare plant populations would be expected to undergo natural population dynamics. No trees would be harvested in the analysis area, thus cover type and age-class distributions would remain unchanged. No change in amount or distribution of old growth would occur beyond natural disturbance events.

Action Alternative: Direct, Secondary, and Cumulative Effects

Noxious Weeds

Direct and Secondary

The operation of harvesting and yarding equipment, log trucks, and personal vehicles on existing roads as well as new roads would occur. Additional mineral soil would be exposed through the operation of this equipment in the project area and during the construction of landings and temporary roads, which may facilitate the spread of noxious weeds in the project area.

Cumulative

Weed populations would be monitored and herbicide treatments on haul roads would be scheduled through the Stillwater Unit's weed management program to maintain or reduce noxious weed occurrence over time.

Rare Plants

Direct and Secondary

No impacts would be anticipated as no populations of rare plants are recorded near project activities.

Cumulative

No additional impacts would be anticipated.

Standard Vegetative Community

Direct and Secondary

The data shown in table **V-3** indicate that the action alternative would convert 233.3 acres to the western larch/Douglas-Fir cover type from the lodgepole pine (3.2 acres), mixed conifer (224.4 acres) and subalpine fir (5.7 acres) cover types. 179.8 acres of western larch/Douglas-fir would not change following treatment. 320.6 acres would be converted to the western white pine cover type from the mixed conifer (286.5 acres), subalpine

fir (28.2 acres), and western larch/Douglas-fir (5.9 acres) cover types. 64.3 acres of western white pine would not change following treatment. 145.1 acres of lodgepole pine would not change following treatment. 5.3 acres would be converted to the Douglas-Fir cover type from Lodgepole cover type. 2.5 acres would be converted to the mixed conifer cover type from the Lodgepole cover type.

In addition, the data shown in table **V-4** indicates that 485.7 acres would be converted to 0 to 39 years age class. This would transition 400.6 acres from 150+ year age class, 49.6 acres from 100 to 149 year age class and 35.5 acres from 40 to 99 year age class. 166.6 acres of 0 to 39 year age class would remain the same, 181.9 acres of 40 to 99 year age class would remain the same, 100.7 acres of 100 to 149 year age class would remain the same and 16.1 acres of 150+ age class would remain the same.

It would be expected to see a general reduction of insect and disease issues as the general age class of the project area becomes younger

Table V-3 – Effects of proposed action on cover type for the Upper Stillwater Forest Management Project Area.

Cover Type	Current Acres	Current Percent of Project Area	Desired Future Condition (DFC)		Proposed Action	
			Acres	Percent	Acres	Percent
Subalpine fir	99.1	4%	0	0%	65.2	2.6%
Douglas-fir	9.7	0.4%	0	0%	15.0	0.6%
Lodgepole pine	375.7	15%	299.1	11.9%	364.7	14.6%
Mixed conifer	735.3	29.3%	22	0.9%	226.9	9.1%
Western larch/Douglas-fir	1209.2	48.3%	1743.4	69.6%	1436.6	57.3%
Western white pine	76.9	3.1%	441.3	17.6%	397.5	15.9%
Total:	2505.8	100%	2505.8	100%	2505.8	100%

Table V- 4: Effect of proposed action on distribution of age classes in the project area based on Losensky 1997 Section M333B Lower Flathead

Age Class	Historic	Current Percent of Project Area	Proposed Action Percent of Project Area
0-39 years	22%	16.6%	35.9%
40-99 years	13%	25.5%	24.0%
100-150 years	15%	19.6%	17.6%
150+ years	36%	38.4%	22.4%

Cumulative

The cumulative effects, in combination with other ongoing and proposed harvests, would be trending towards increasing seral cover types and moving the project area as well as the Stillwater Unit toward younger age classes as harvesting reduces the amount of older age classes.

Old Growth

Direct and Secondary

The proposed activities would treat approximately 254.1 acres of old growth and remove 247.8 acres of old growth. 6.3 acres of old growth would be treated with an old growth maintenance treatment. Old growth maintenance treatment would retain 100 ft^2 of basal area with 13 trees per acre greater than 21" dbh. 212.3 acres of old growth would remain in the project area representing 8.5% of the project area.

Cumulative

247.8 acres of old growth would be removed from the old growth acres on the Stillwater Unit. These acres represent 1.8% of the Stillwater Units old growth. 13893.2 acres of old growth would remain on the Stillwater Unit representing 10.8%.

Vegetation Mitigations

- Require all tracked or wheeled equipment to be cleaned of noxious weeds prior to beginning project operations.
- Control the spread of noxious weeds with pre – and – post herbicide treatments on established weed populations.
- Require prompt vegetation seeding of all disturbed roadside sites. Roads used and closed as part of this proposal would be reseeded and reshaped to prevent motorized use.
- If rare plants are found during the project period, operations would be diverted away from the population and further reviewed by DNRC and plant specialist.

VEGETATION REFERENCES

DNRC 1996. State Forest Land Management Plan: final environmental impact statement (and appendixes). Montana Department of Natural Resources and Conservation, Forest Management Bureau, Missoula, Montana.

DNRC 2010. Montana Department of Natural Resources and Conservation Forested State Trust Lands Habitat Conservation Plan: Final EIS, Volume II, Forest Management Bureau, Missoula, Montana.

Green, P., J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann. 1992. Old-growth forest types of the Northern Region. R-1 SES. USDA Forest Service, Northern Region, Missoula, MT.

Hagle, Susan. Gibson, K., Tunnock, S. 2003. A Field Guide to Disease and Insect Pests of Northern and Central Rocky Mountain Conifers. USDA Forest Service. Northern Region. Missoula, Montana.

Losensky, B.J. 1997. Historical Vegetation of Montana. Montana Department of Natural Resources and Conservation. Missoula, MT.

Attachment D – Soil Analysis

Upper Stillwater Forest Management Project – Soils Analysis

Analysis Prepared By:
Name: Tony Nelson
Title: Hydrologist, Montana DNRC

Introduction

The following analysis will disclose anticipated effects to soil resources within the Upper Stillwater Forest Management project area. Direct, secondary, and cumulative effects to soil resources of both the No-Action and Action alternatives will be analyzed.

Issues and Measurement Criteria

Soil Physical Disturbance
Analysis of soil physical disturbance addresses the issue that timber harvesting and associated activities may affect soil conditions in the proposed project area through ground-based and cable yarding activities, and through repeated entries to previously harvested areas. Operation of ground-based machinery can displace fertile layers of topsoil, which can lead to a decrease in vegetation growth. Ground-based machinery can also lead to compaction of the upper layers of soil. Compaction decreases pore space in soil, reduces its ability to absorb and retain water, and can increase runoff and overland flow. These conditions can also lead to a decrease in vegetation growth. Surface erosion can also affect vegetation growth and water quality. Sheet and rill erosion can remove fertile surface layers of soil, and also make revegetation difficult.

Nutrient Cycling
Nutrient cycling, microbial habitat, moisture retention and protection from mineral erosion are provided by coarse and fine woody debris in forested environments (Harmon et al, 1986). Forest management can affect the volumes of fine and coarse woody debris through timber harvesting and result in changes to potentially available nutrients for long-term forest production.

Slope Stability
Slope stability can be affected by timber management activities by removing stabilizing vegetation, concentrating runoff, or by increasing the soil moisture. The primary risk areas for slope stability problems include, but are not limited to, landtypes that are prone to soil mass movement, and soils on steep slopes (generally over 60 percent).

Analysis Areas

The analysis area for evaluating soil physical disturbance and nutrient cycling will include areas proposed for harvest within the gross project area. Analysis area for existing conditions and slope stability will include DNRC owned land within the Upper Stillwater Forest Management project area. A map of the Landtypes in the Upper Stillwater Forest Management project area is found below in Figures S-1-4.

Figure S-1 – Rad Dog/Upper Stillwater Landtype Map – South Parcels

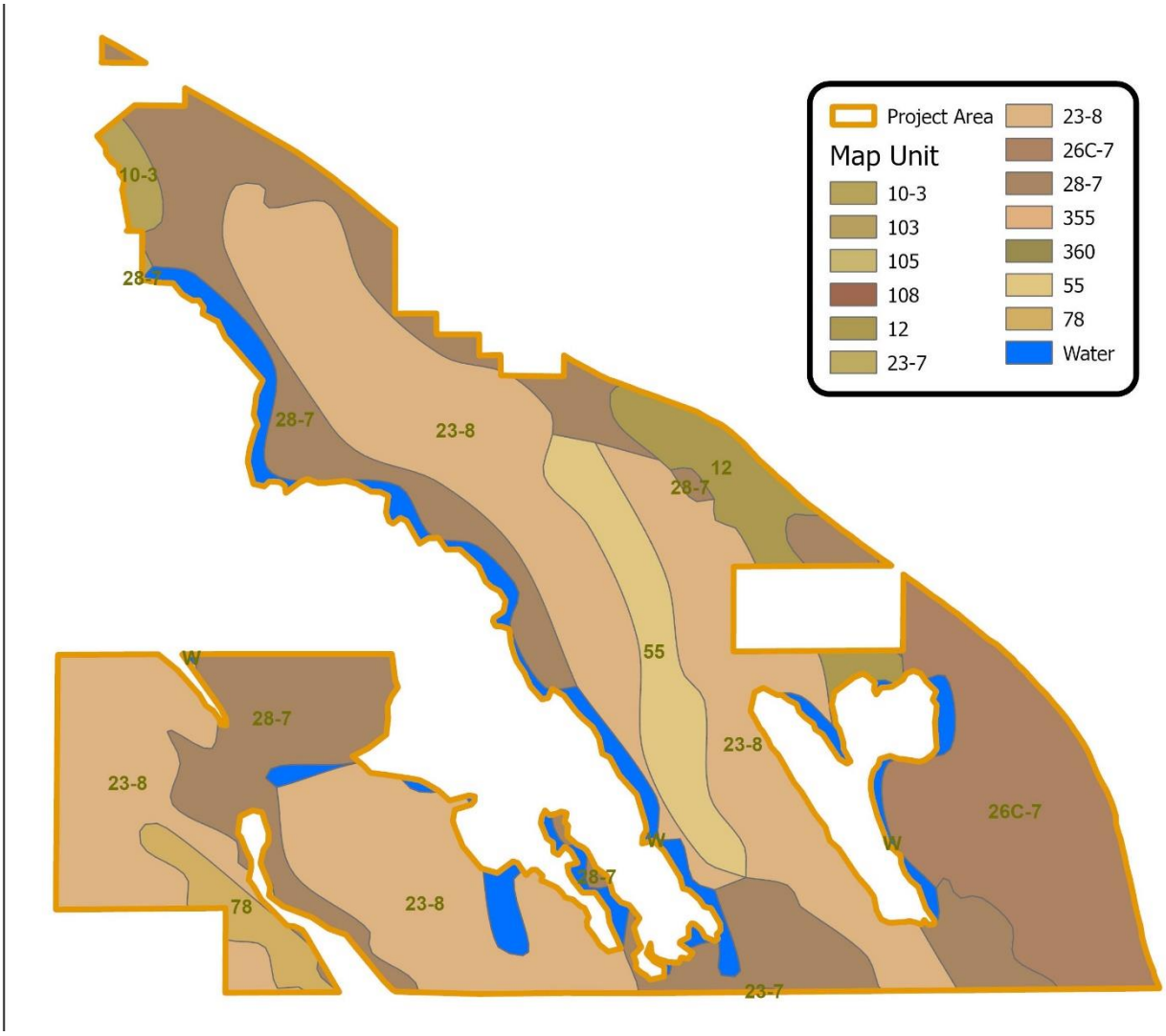


Figure S-2 – Rad Dog/Upper Stillwater Landtype Map – Mid-South Parcels

Figure S-3 – Rad Dog/Upper Stillwater Landtype Map – Mid-North Parcels

Figure S-4 – Rad Dog/Upper Stillwater Landtype Map – North Parcels

Analysis Methods

Physical Disturbance

Impacts to soil physical disturbance will be analyzed by evaluating the current levels of soil disturbance in the proposed project area based on field review and aerial photo review of existing and proposed harvest units. Percent of area affected is determined through pace transects, measurement, aerial photo interpretation, and GIS to determine skid trail spacing and skid trail width. From this, skid trail density and percent of area impacted are determined. Estimated effects of proposed ground-based and cable yarding activities will be assessed based on findings of DNRC soil monitoring (DNRC, 2011). Soil erosion potential will be measured using the K-value as determined by the NRCS (1996). A description of the K-value and its associated interpretations is found in **Table S-2**.

Nutrient Cycling

Nutrient cycling will be analyzed by determining levels of coarse woody debris from research on habitat types similar to those found in the project area. The method for quantifying the coarse woody debris is described in the *Handbook for Inventorying Downed Woody Material* (Brown, 1974). Potential impacts to nutrient cycling will be assessed by evaluating risks to nutrient pools and long-term site productivity from timber sale contract requirements and mitigation measures.

Slope Stability

Slope stability risk factors will be analyzed by reviewing the Web Soil Survey to identify landtypes listed as high risk for mass movement. Field reconnaissance will also be used to identify any slopes greater than 60 percent as an elevated risk for mass movement.

Existing Conditions

Geology

The geology, landform and parent materials in the project area are generally quartzite and argillite bedrock soils with small areas of glacial till or glacial drift influence. Volcanic ash surface layers are common, especially on northern aspects. The majority of the bedrock consists of slightly metamorphosed sedimentary rocks formed from sand, silt, clay, and carbonate materials deposited in an ancient shallow sea during the Precambrian period.

Physical Disturbance (Compaction and Displacement)

Soil physical disturbance can be affected through management activities. In the gross project area, DNRC has conducted timber harvesting since the 1950s. Timber sale records dating back to the 1950s indicate most of the proposed project area has been harvested using a combination of ground-based and cable yarding methods. Ground-based yarding can create soil impacts through displacement and compaction of productive surface layers of soil, mainly on heavily used trails. Existing skid trails are spaced at between 60 and 120 feet apart, and none were identified as erosion or sediment sources. Trails are still apparent, but most are well vegetated and past impacts are beginning to ameliorate from freeze-thaw cycles and root penetration. Based on pace transects of trail spacing, knife penetration tests for compaction, and ocular estimates of revegetation,

approximately 10% of previously ground-skidded harvest units are in an impacted condition in the proposed project area.

Table S-2 – Soil Map Unit Description

Map Unit	Description	Acres	Analysis Area	Landtype Description	Compaction hazard	Erosion Hazard	Displacement Hazard
10-3	Aquepts, stream bottoms	273	8.7%	Flood plains from alluvium	M	L	L
12	Borosaprists, depressions	91	2.9%	Moraines, flood plains, terraces	L	L	L
23-7	Andeptic Cryoboralfs-Andic Cryochrepts complex, rolling	1	0.0%	Mountain slopes	M	M/H	M
23-8	Andeptic Cryoboralfs-Andic Cryochrepts complex, hilly	1055	33.8%	Mountain slopes	M	M/H	M
26C-7	Andeptic Cryoboralfs, silty till substratum, rolling	321	10.3%	Moraines, silty till	M	M/H	M
28-7	Dystric Eutrochrepts, outwash substratum	859	27.5%	Terraces	M	M	M
55	Rock Outcrop, glaciated mountain slopes	129	4.1%	Rock outcrop	N/A	L	N/A
78	Ochrepts-Rock outcrop complex, southerly aspects	47	1.5%	Troughs, Material derived from metasedimentary rocks	L	L	M
103	Andic Dystrochrepts, 0-15%	0.1	0.0%	Stream terraces, mixed sandy and gravelly alluvium	L	L	L
105	Aquic Udifluvents, poorly drained	13	0.4%	Alluvial basins	H	M	H
108	Andic Dystric Eutrochrept, 0-15%	74	2.4%	Glacial outwash terraces, Silty glaciolacustrine deposits	L	M	H
355	Andic Dystrochrepts – Rock outcrop complex	125	4.0%	Glaciated mountain slopes	L	L	L
360	Rock outcrop – Lithic Cryochrepts complex	135	4.3%	Glaciated mountain ridges	L	L	L

Nutrient Cycling

Nutrient cycling was assessed in the proposed project area by stand walk-throughs to estimate the current levels of coarse woody debris. These evaluations found no apparent deficiencies in coarse woody debris in any of the stands proposed for harvest. Approximately 419 of the 951 acres proposed for harvest have been previously managed for timber production. All other acres should closely mirror natural conditions found in research. These results appeared generally within the recommended range discussed in *Managing Coarse Woody Debris in Forests of the Rocky Mountains* (Graham et. al., 1994) on similar habitat types. Sub-alpine fir and Douglas-fir habitat types in Montana are recommended to have a range of 7 to 25 tons/acre to maintain forest productivity.

Slope Stability
Slope stability was evaluated in the proposed project area through field review and aerial photo interpretation. Soil types in the project area range from gentle/flat in the valley bottoms and on convex ridges to moderately steep (40-60%) and steep (>60%) glacially scoured ridges and hillsides. The Web Soil Survey reports the findings in the *Flathead National Forest Area, Montana (MT619)* (NRCS, 1998) and *Kootenai National Forest Area, Montana-Idaho (MT634)* (NRCS, 1995) soil surveys. Analysis of landtypes in the proposed project area revealed that there are no landtypes with marginal stability concerns in the proposed project area. There are very few areas within the proposed project area with slopes greater than 60%. However, no areas of slope instability or mass movement were identified during field reconnaissance. Because no areas of the slope instability were identified in any parcel of the proposed project area, and because none of the land types in the proposed project area is listed as a high risk for slope stability, slope stability will not be evaluated on this project in the remainder of this analysis. A list of soil map units found in the Upper Stillwater Forest Management project area and their associated management implications is found in **Table S-2**.

Environmental Effects

No Action Alternative: Direct, Secondary, and Cumulative Effects
Implementation of the no-action alternative would result in no soil resource impacts in the project area. Soil resource condition would remain similar to those described in the existing conditions sections of this environmental assessment.

Action Alternative: Direct, Secondary, and Cumulative Effects

Geology
Direct and Secondary & Cumulative
The geology would remain similar to those described in the existing conditions sections of this environmental assessment.

Physical Disturbance (Compaction and Displacement)
Direct and Secondary
Based on DNRC soil monitoring on soils and sites similar to those found in the project area, direct impacts to soil physical disturbance would be expected on up to 138 of the total 951 acres proposed for harvesting in the proposed project area. Soil monitoring conducted on DNRC lands shows that sites harvested on DNRC lands statewide on similar soils with ground-based machinery had a range of impacts from 1 to 33 percent of the acres treated, with an average disturbance rate of 14.2% (DNRC, 2011). These impacts include operations on dry soils in non-winter conditions. Soil monitoring conducted on DNRC lands shows that sites harvested on DNRC lands statewide on similar soils with cable yarding equipment had a range of impacts from 2.3 to 11.4 percent of the acres treated, with an average disturbance rate of 6.2% (DNRC, 2011). As a result, the extent of impacts expected would likely be similar to those reported by DNRC soil monitoring (DNRC, 2011), or approximately 1 to 33 percent of ground-based harvested acres, and approximately 2.3 to 11.4 percent of cable harvest acres. The proposal includes 916 acres of ground-based mechanical harvesting, 35 acres of cable yarding and construction of approximately 1.8 miles of new temporary road.

Ground-based site preparation would be done on tractor units, and prescribed fire may be used for site preparation on portions of cable harvest units. These activities would also generate direct impacts to the soil physical disturbance. Site-preparation disturbance would be intentionally done, and these impacts are considered light and promote reforestation of the site. **Table S-3** summarizes the expected impacts to the soil resource as a result of the Action Alternative. These activities would leave approximately 14.5 percent of the proposed harvest units in an impacted condition. This level is below the range analyzed for in the *EXPECTED*

FUTURE CONDITIONS section of the *SFLMP*, and well within the 20-percent impacted area established as a level of concern in the *SFLMP (DNRC 1996)*. This level translates to a low risk of low direct and secondary impacts to soil physical disturbance. These impacts would likely persist for 20-40 years, depending on site specific conditions. In addition, BMPs and a combination of mitigation measures would be implemented to limit the area and degree of soil impacts as noted in ARM 36.11.422 and the SFLMP (DNRC, 1996).

Cumulative

Cumulative effects to soil physical disturbance may occur from repeated entries into a forest stand where additional ground is impacted by equipment operations. With this alternative, approximately 419 of the 951 acres proposed for harvesting have had previous ground-based timber sale operations. Existing skid trails where compaction has begun to ameliorate through freeze-thaw cycles and revegetation would return to a higher level of impact due to this alternative. Additional trails may also be required if existing trails are in undesirable locations. The remaining acres proposed for harvesting have not been previously managed. Cumulative effects to soil physical disturbance in these areas would be identical to those displayed in the Direct and Secondary Effects section of this analysis. Cumulative impacts to soil physical disturbance under the Action Alternative would fall below the range analyzed for in the EXPECTED FUTURE CONDITIONS section of the SFLMP and are well within the 20-percent impacted area established as a level of concern in the SFLMP (DNRC, 1996). This level translates to a low risk of low cumulative impacts to soil physical disturbance. These impacts would likely persist for 20-40 years, depending on site specific conditions.

Table S-3 – Detrimental Soil Disturbance for the Action Alternative

Area of Analysis	Total Area (Acres)	Disturbance Rate (%)	Affected Area (Acres)
Ground Based Harvest Units (including landings)	916	14.2	130
Cable Harvest Units (including landings)	35	6.2	2
Roads *	6	100	6

* Assuming an average width of 25 feet, roads are approximately 3 acres per mile

Nutrient Cycling

Direct and Secondary

Direct and secondary effects to nutrient cycling may include a slight decrease in coarse woody debris from the Action Alternative by removing standing timber. This would present a low risk of low direct and secondary effects to nutrient cycling. These effects are estimated to persist for a moderate time duration. Some stands where woody debris levels are low may see an increase in large woody debris as a result of the proposed harvesting due to material being intentionally left on the ground. In addition, this alternative would lead to an increase in fine woody material in the form of limbs and tree tops being left after harvest. Through the timber sale contract, approximately 7-25 tons of coarse woody material would be left on the ground following harvesting activities, as well as fine material for nutrient retention.

Cumulative

Risk of cumulative effects to nutrient cycling from nutrient pool loss would be low. This would present a low risk of low cumulative effects to nutrient cycling. These effects are estimated to persist for a moderate time duration. This alternative would follow research recommendations found in Graham (1994) for retention of coarse and fine woody debris through contract clauses and site-specific mitigation measures.

Soils Mitigations

- Limit equipment operations to periods when soils are dry (less than 20% oven-dried weight), frozen or snow-covered in order to minimize soil compaction and rutting, and to maintain drainage features. Check soil moisture conditions prior to equipment start-up.
- On ground-based units, the logger and sale administrator would agree to a skidding plan prior to equipment operations. Skid trail planning would identify which existing trails to use and how many additional trails are needed.
- Do not use existing trails if they are located in draw bottoms or other unfavorable locations.
- Grass seeding or other erosion control measures may be required to stabilize some trails.
- Limit ground-based operations to slopes less than 40% unless they can be used without causing excessive displacement or erosion.
- Keep skid trails to 20 percent or less of the harvest unit acreage. Provide for surface drainage on all roads and skid trails concurrent with operations.
- Slash disposal: Limit the total of disturbance and scarification to 30-40 percent of harvest units.
- Limit dozer piling to slopes less than 35 percent and limit excavator piling to slopes less than 40 percent unless it can be completed without causing excessive erosion.
- Retain between 7 and 25 tons/acre of woody debris 3-inches in diameter or greater (depending on habitat type) and a feasible majority of fine branches and needles following harvesting operations. On units where whole-tree harvesting is used, implement one of the following mitigations for nutrient cycling: 1) use in-woods processing equipment that leaves fine 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.

Soils References

Brown, J. K. 1974. *Handbook for Inventorying Downed Woody Material*. In: USDA and Forest Service (editors). Ogden, Utah: Intermountain Forest and Range Experiment Station.

DNRC, 2011. DNRC Compiled Soils Monitoring Report on Timber Harvest Projects. Missoula, MT.

DNRC, 1996. State Forest Land Management Plan. Montana Department of Natural Resources and Conservation. Missoula, MT.

Graham, R. T., A. E. Harvey, M. F. Jurgensen, T. B. Jain, J. R. Tonn and D. S. Page-Dumroese. 1994. Managing Coarse Woody Debris in Forests of the Rocky Mountains. USDA Forest Service Research Paper. INT-RP-447. 13 pp.

NRCS, 1995. MT634 – Soil Survey of Kootenai National Forest Area, Montana-Idaho. United States Department of Agriculture Natural Resources Conservation Service.

NRCS, 1998. MT619 – Soil Survey of Flathead National Forest Area, Montana. United States Department of Agriculture Natural Resources Conservation Service.

Attachment E – Water Resources Analysis

Water Resources Analysis

Analysis Prepared By: Tony Nelson

Title: Hydrologist, Montana DNRC

Introduction

The following analysis will disclose anticipated effects to water resources within the Upper Stillwater Forest Management project area. Direct, secondary, and cumulative effects to water resources of both the No-Action and Action alternatives will be analyzed.

Issues and Measurement Criteria

The following issues encompass the specific issues and concerns raised through public comment and scoping of the proposed project. For a specific list of individual comments and concerns, please refer to the project file, located at the DNRC Stillwater Unit office.

Sediment Delivery

Sediment delivery and subsequent water quality impacts can be affected by timber harvesting and related activities (such as road construction), by increasing the production and delivery of fine sediment to streams. Construction of roads, skid trails, and landings can generate and deliver substantial amounts of sediment through the removal of vegetation and exposure of bare soil. In addition, removal of vegetation near stream channels reduces the sediment-filtering capacity and may reduce channel stability and the amounts of large woody material. Large woody debris is a very important component of stream dynamics, creating natural sediment traps and energy dissipaters to reduce the velocity and erosive power of stream flows.

Measurement Criteria: Sediment from roads, harvesting activities and vegetative removal will be analyzed qualitatively through data collected during past statewide and DNRC internal BMP (Best Management Practices) field reviews.

Water Yield

Water yield increases can result from timber harvesting and associated activities, which can affect the timing, distribution, and amount of water yield in a harvested watershed. Water yields increase proportionately to the percentage of canopy removal (*Haupt, 1976*), because removal of live trees reduces the amount of water transpired, leaving more water available for soil saturation and runoff. Canopy removal also decreases interception of rain and snow and alters snowpack distribution and snowmelt, which lead to further water-yield increases. Higher water yields may lead to increases in peak flows and peak-flow duration, which can result in accelerated streambank erosion and sediment deposition. Vegetation removal can also reduce peak flows by changing the timing of snowmelt. Openings will melt earlier in the spring with solar radiation and have less snow available in late spring when temperatures are warm. This effect can reduce the synchronization of snowmelt runoff and lower peak flows.

Measurement Criteria: The water yield increase for the project area streams was determined using field review and aerial photo interpretation. Visual inspection of the runoff patterns and stream channel stability within the Upper Stillwater Forest Management project area were used to assess the impacts of past management to

water yield. Aerial photo interpretation was used to determine the extent of past management in these watersheds.

Regulatory Framework

The following plans, rules, and practices have guided project planning and/or will be implemented during project activities:

Montana Surface Water Quality Standards

According to the Montana Surface Water Quality Standards found in *ARM 17.30.608* (*1*)(*a*), this portion of the Flathead River drainage, including the Stillwater River, Spring Creek, Rock Creek and Dog Creek, is classified as B-1. Among other criteria for B-1 waters, no increases are allowed above naturally occurring levels of sediment, and minimal increases over natural turbidity. "Naturally occurring," as defined by *ARM 17.30.602* (*19*), includes conditions or materials present during runoff from developed land where all reasonable land, soil, and water conservation practices (commonly called Best Management Practices or BMPs) have been applied. Reasonable practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses. These practices include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures. Appropriate practices may be applied before, during, or after completion of activities that could create impacts.

Designated beneficial water uses within the project area include cold-water fisheries and recreational use in the streams, wetlands, and lakes in the surrounding area. Several existing surface water rights exist in the Stillwater River corridor adjacent to the proposed project area. They include stock watering, irrigation, fish and wildlife, and domestic use. Each of these surface water rights are located on private land adjacent to parcels of DNRC Trust Lands in the proposed project area.

Water-Quality-Limited Waterbodies

None of the streams in the proposed project area are currently listed as water-quality-limited waterbodies in the *2020 Montana 303*(*d*) list (*DEQ, 2020).* Reaches of the Stillwater River approximately 8 miles downstream from the proposed project area are listed as not fully supporting aquatic life. Probable causes are listed as Alteration in stream-side or littoral vegetative covers *(with probable sources listed as Site Clearance (Land Development or Redevelopment), Agriculture, Loss of Riparian Habitat)*; and Sedimentation-Siltation *(with probable sources listed as Loss of Riparian Habitat, Site Clearance (Land Development or Redevelopment), Upstream Source)*. A total maximum daily load (TMDL) has been developed, but these are the issues that still persist in this river system. DNRC is an active partner and participant in this process. All proposed activities within the Project Area would implement activities to alleviate identified sources of sediment and comply fully with all TMDL requirements.

Montana Streamside Management Zone (SMZ) Law

By the definition in *ARM 36.11.312* (*3*), several of the stream reaches in the project area are Class 1 streams. All of these streams and many of their tributaries have flow for more than 6 months each year and contribute flow to downstream waters. The rest of the stream reaches in the project area are classified as Class 2 or 3 based on site-specific conditions. A Class 3 stream is defined as a stream that does not support fish, normally has surface flow during less than 6 months of the year, and rarely contributes surface flow to another stream,

lake or other body of water (*ARM 36.11.312* (*5*)). According to ARM 36.11.312 (4), a Class 2 stream is a portion of a stream that is not a Class 1 or Class 3 stream segment.

Forest Management Rules

In 2003, DNRC drafted Administrative Rules for Forest Management. The portion of those rules applicable to watershed and hydrology resources include ARM 36.11.422 through 426. All applicable rules will be implemented if they are relevant to activities proposed with this project.

Habitat Conservation Plan

In 2011, DNRC adopted a habitat conservation plan (HCP) in coordination with the United States Fish and Wildlife Service. All applicable HCP riparian timber harvest and aquatic conservation strategies (DNRC, 2010) would be implemented if they are relevant to activities proposed with this project.

Analysis Areas

Sediment Delivery

Analysis area for direct, indirect and cumulative effects to sediment delivery will be analyzed on all existing roads in and leading to the proposed project area; and on stream channels for in-channel sources of sediment and harvest unit areas for harvest-related sediment sources. Additional sites on proposed haul routes located outside the project area will be assessed qualitatively for their potential to affect downstream water bodies.

Water Yield

Direct, indirect, and cumulative effects to water yield will be analyzed in the stream systems within the project. All existing activities on all ownerships and proposed activities related to the Upper Stillwater Forest Management project, including road construction, within the Project Area watershed will be analyzed using methods described below. These areas were chosen as an appropriate scale of analysis, and will effectively display the estimated impacts of proposed activities.

Analysis Methods

Where risk is assessed in both sediment-delivery and water-yield analyses, the following definitions apply to the level of risk reported:

- low risk means that impacts are unlikely to result from proposed activities,
- moderate risk means that there is approximately a 50 percent chance of impacts resulting from proposed activities, and
- high risk means that impacts are likely to result from proposed activities.

Where levels or degrees of impacts are assessed in this analysis, the following definitions apply to the degree of impacts reported:

- very low impact means that impacts from proposed activities are unlikely to be measurable or detectable and are not likely to be detrimental to the water resource;
- low impact means that impacts from proposed activities would likely be measurable or detectable, but are not likely to be detrimental to the water resource;
- moderate impact means that impacts from proposed activities would likely be measurable or detectable, and may or may not be detrimental to the water resource;
- high impact means that impacts from proposed activities would likely be measurable or detectable, and are likely to have detrimental impacts to the water resource.

Sediment Delivery

Analysis methods to assess sediment delivery will include qualitative assessments where stream crossings exist within the proposed project area using visual inspection and lineal measurement to determine the road surface area delivering to a stream. Sediment from roads, harvesting activities and vegetative removal will be analyzed qualitatively through data collected during past statewide and DNRC internal BMP field reviews.

Water Yield

Analysis methods to assess water yield increases for the project area streams was determined using field review and aerial photo interpretation. Visual inspection of the runoff patterns and stream channel stability within the Upper Stillwater Forest Management project area were used to assess the impacts of past management to water yield. All existing activities on all ownership within project area watersheds and proposed activities related to the Upper Stillwater Forest Management project will be analyzed using methods described above.

Existing Conditions

General Description

The following section will describe the existing conditions within the proposed project area and the analysis areas that are relevant to the issues discussed above in this analysis.

Sediment Delivery

Sediment delivery on this parcel was reviewed by a DNRC hydrologist in 2024. Numerous stream channels were identified in the project area. Spring Creek flows through a portion of the project area and is a perennial Class 1 stream with an approximately 6-foot bankfull width. The stream was classified as a B3/4 channel using a classification system developed by *Rosgen* (*1996*). Channel types rated as “B” are typically in the 2- to 4-percent gradient range, and have a moderate degree of meander (sinuosity). Channel-bed materials in B3/4 types are mainly cobble and gravel. Rock Creek flows through a portion of the project area and is a perennial Class 1 stream with an approximately 6-foot bankfull width. The stream was classified as a B3/4 channel using a classification system developed by *Rosgen* (*1996*). Channel types rated as “B” are typically in the 2- to 4-percent gradient range, and have a moderate degree of meander (sinuosity). Channel-bed materials in B3/4 types are mainly cobble and gravel. Dog Creek flows adjacent to a portion of the project area and is a perennial Class 1 stream with an approximately 8-foot bankfull width. The stream was classified as a B3/4 channel using a classification system developed by *Rosgen* (*1996*). Channel types rated as “B” are typically in the 2- to 4-percent gradient range, and have a moderate degree of meander (sinuosity). Channel-bed materials in B3/4 types are mainly cobble and gravel. Several unnamed tributary stream channels ranging

from 1 to 3 foot bankfull widths were identified throughout the project area. Some of these channels are perennial and some flow less than 6 months. Most of these streams are B4/5 channels. Channel-bed materials in B4/5 types are mainly gravel and coarse sand. No areas of unstable or actively down-cut channels were identified during field reconnaissance. Large woody debris was found in adequate supply to support channel form and function. Woody material in a stream provides traps for sediment storage and gradient breaks to reduce erosive energy and work as flow deflectors to reduce bank erosion. No evidence of past SMZ harvesting was found. Based on these findings, no in-channel sources of erosion or deposition were identified in project area streams.

One high-risk sediment site has been identified in the proposed project area. This site is found on Spring Creek near a proposed harvest unit. The site is an unimproved ford used by ATVs and other off-road vehicles. This site is a chronic source of sediment delivery to Spring Creek and Duck Lake, located immediately downstream from this site. The road is not a system road, and would not be used for commercial use.

No other sediment delivery from the existing road system was identified on any of the proposed haul routes within or leading to the project area. The existing road system in the proposed project area is low to moderate standard native-surfaced road, and most reaches meet applicable best management practices for surface drainage and erosion control. Road surfaces on gated systems are mainly densely vegetated with grass/forbs and are not actively eroding. Improvements to BMPs at specific sites may be required prior to use. Most road grades are generally under 8%. The road system was constructed to access timber harvesting by the USDA Forest Service and Montana DNRC during past entries. Most of the road segments in the project area are not causing active erosion or sediment delivery to streams.

Water Yield

No water yield impacts were identified from past activities in and around the proposed project area streams. Past management activities consist of timber management on USDA Forest Service, industrial private and state land.

Evidence of water yield increases was not found during field reconnaissance of the proposed project area. As a result, it was determined that a detailed water yield analysis would not be necessary for the proposed project area. None of the broad ephemeral draws within the proposed project area have any evidence of overland flow (channel scour, re-alignment of litter, definable banks). Defined stream channels showed no evidence of instability from water yield increases, and very little scouring effect from annual runoff events. As a result, water yield increases resulting from past activities in the watershed have not been sufficient to destabilize stream channels, or to scour a channel in any of the broad draws throughout the project area. After evaluating the watershed cumulative effects risks along with the current conditions in the Upper Stillwater Forest Management project area, by ARM 36.11.423, a detailed quantitative watershed analysis is not needed in these parcels.

Environmental Effects

No-Action Alternative: Direct, Secondary, and Cumulative Effects

Sediment Delivery

Direct and Secondary

Under this alternative, no timber harvesting or related activities would occur. Sediment from all sources would continue as described in Existing Conditions.

Cumulative

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

Water Yield

Direct and Secondary

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

Cumulative

No increase in water yield would be associated with this alternative. As vegetation continues toward a fully forested condition, annual water yields would also be expected to gradually decline.

Action Alternative: Direct, Secondary, and Cumulative Effects

Sediment Delivery

Direct and Secondary

There is a low risk of direct or secondary effects to sediment delivery to streams from the timber harvesting activities proposed in the Action Alternative. The SMZ law, Administrative Rules for Forest Management, Riparian Management Zones (RMZ), channel migration zones (CMZ) on fish-bearing Class 1 streams, and applicable BMPs would be applied to all harvesting activities, which would minimize the risk of sediment delivery to draws and streams. The Montana BMP audit process has been used to evaluate the application and effectiveness of forest-management BMPs since 1990; this process has also been used to evaluate the application and effectiveness of the SMZ Law since 1996. During that time, evaluation of ground-based skidding practices near riparian areas has been rated 92 percent effective, and these same practices have been found effective over 99 percent of the time from 1998 to present (*DNRC 1990 through 2018*). Since 1996, effectiveness of the SMZ width has been rated over 99 percent (*DNRC 1990 through 2018*). As a result, with the application of BMPs and the SMZ Law, proposed activities are expected to have a low risk of low impacts to sediment delivery.

There is a low risk of direct or secondary effects to sediment delivery to streams from the use of existing roads proposed in the Action Alternative. The existing road system meets BMP standards, and no direct sources of sediment were identified. Applicable BMPs would be maintained or improved on approximately 20.3 miles of existing roads within and leading to the proposed project area. Use of existing closed roads to haul timber would present a low risk of low impacts to sediment delivery due to vegetation loss on existing grassed-in roads.

There is a high risk of low impacts to sediment delivery from construction of approximately 1.8 miles of new temporary road. No new stream crossings are proposed on any of these miles of proposed new temporary road. The risk of sediment delivery would remain elevated for 2 to 3 years after project completion while bare soils are revegetated.

There is a high risk of low impacts to sediment delivery from removal and rehabilitation of an existing unimproved ford on Spring Creek. The existing road would also be partially recontoured and put back to slope to discourage future use by off-road vehicles. This activity would likely release a short-term pulse of fine sediment into the stream during construction. All applicable laws and permits would be secured for the

proposed work. The risk of sediment delivery would remain elevated for 2 to 3 years after project completion while bare soils are revegetated. This proposed rehabilitation may occur outside of the proposed timber sale activities, but would occur on a similar timeframe to proposed timber harvesting activities.

Cumulative

Risk of sediment delivery and sediment loading to the Stillwater River and waters downstream from the proposed project area would be slightly increased from current levels in the short term and below current levels in the long term. Maintenance and improvement of existing erosion control and surface drainage on the existing road system, along with the repair and rehabilitation of an existing unimproved ford, would yield erosion rates similar to or below current levels. Overall, there is a high risk of short-term low-level increases in sediment loading for about 2 to 3 years. However, water quality standards are expected to be met and there is a low risk of impacts to beneficial uses.

Water Yield

Direct and Secondary

There is a low risk of very low direct or secondary effects to water yield from harvesting of approximately 951 acres of timber under this alternative within the proposed project area. It is a low risk that this level of harvesting would be sufficient to generate measurable increases in water yield in any streams located within or near the project area or cause channel instability. The stability of channels would be sufficient to handle any anticipated increases without measurable change. As a result, there is a low risk of very low direct or secondary impacts to water yield in project area drainages as a result of the proposed Action Alternative.

Cumulative

The proposal is to harvest the stands within the proposed project area with a shelterwood prescription. Cumulative effects to water yield in this parcel are not anticipated for the following reasons: 1) The well-drained nature of the soils would absorb additional available and not produce increased surface runoff, and would in turn produce little or no detectable change in water yield from upland sites, 2) Flows in project area streams and draws are stable, channels have not shown increased lateral or vertical erosion that could be attributed to increased flows, so any increases in water yield present a low risk of increased in-channel erosion or other channel adjustments, and 3) The other streams and ephemeral draws within these parcels are stable and vegetated with a dense mat of grass and forbs vegetation or armored with bed materials, making them capable of handling potential water yield increases without destabilizing.

Water Resources Mitigations

Hydrologic related resource mitigations that would be implemented with the proposed Action Alternative include:

- Implement Riparian Management Zones on all Class 1 streams based on site-potential tree heights in the project area
- Implement BMPs on all new temporary roads and improve BMPs on existing roads where needed
- Use spot-blading on existing roads to preserve as much of the existing vegetative cover as possible on vegetated road surfaces

Water Resources References

DNRC, 1990-2018. Montana Forestry Best Management Practices Monitoring. Missoula, Montana.

DNRC, 1996. State Forest Land Management Plan. Montana Department of Natural Resources and Conservation. Missoula, Montana.

Farns, P. 1978. Hydrology of Mountain Watersheds, Preliminary Report. Soil Conservation Service. Bozeman, MT.

Haupt, H.F., et al. 1974. *Forest Hydrology Part II Hydrologic Effects of Vegetation Manipulation*. USDA Forest Service, Region 1. Missoula, MT.

Montana Department of Environmental Quality. "Clean Water Act Information Center." 30 March, 2020. <http://www.cwaic.mt.gov/>

Rosgen, David L. 1996. *Applied River Morphology.* Wildland Hydrology, Pagosa Springs, CO.

Attachment F – Fisheries Resources Analysis

Assessment Prepared By:

Name: Tony Nelson
Title: Hydrologist, Montana DNRC

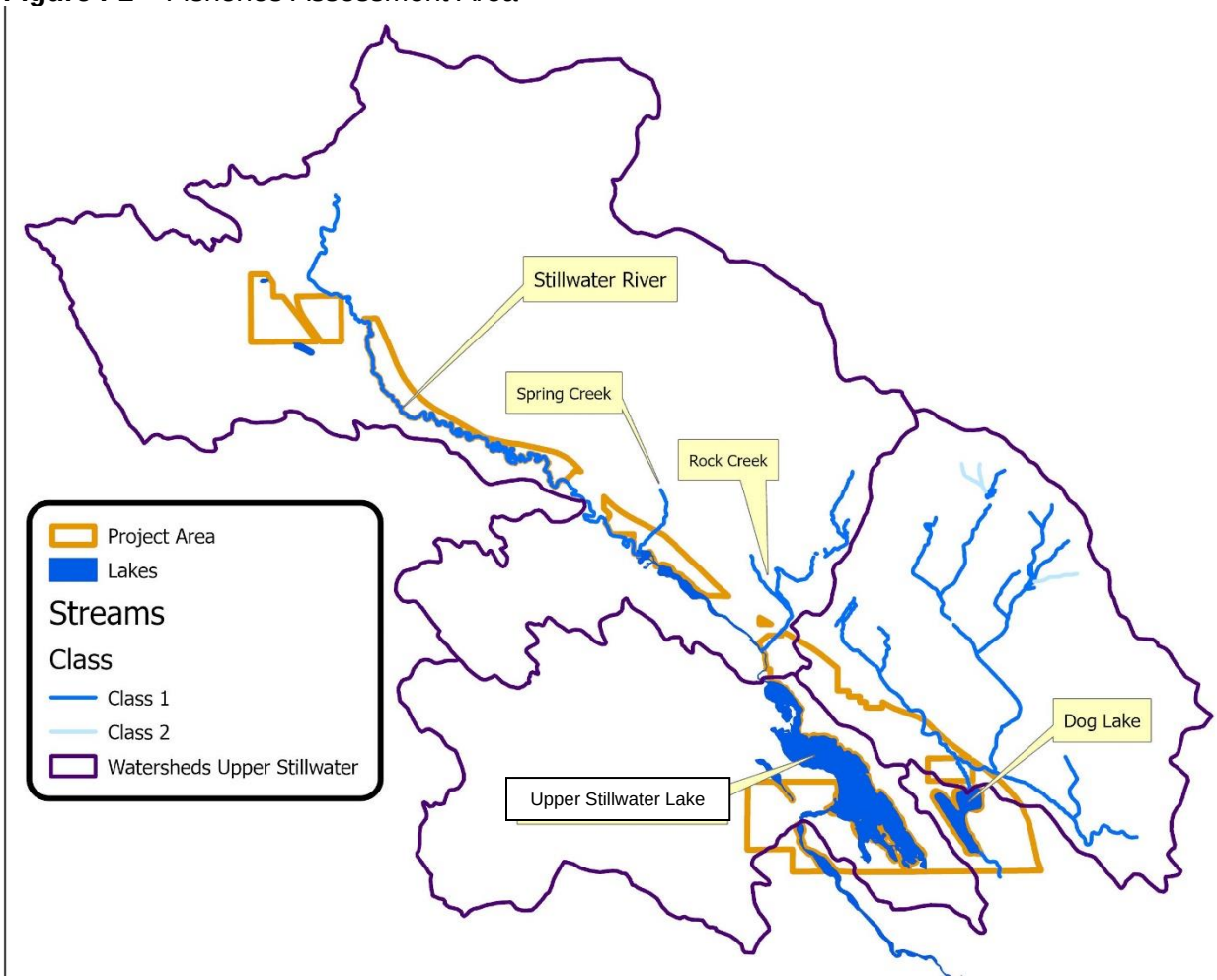
Introduction

The following assessment will disclose anticipated effects to fisheries resources within the Stillwater Forest Management project area.

Assessment Areas

The assessment area for direct, indirect and cumulative effects will be used to evaluate the existing and potential impacts to fisheries resources associated with the proposed project. The assessment area was chosen because it includes (1) the watershed of known or potential fish-bearing streams and (2) the proposed harvest units and haul routes that could have foreseeable**,** measurable**,** or detectable impacts to those fisheries resources. The assessment area is shown in Figure F1 below.

Figure F1 – Fisheries Assessment Area



Assessment Methods

Methodology to assess the status and potential impacts of the proposal to fish populations will include presence/absence determinations in project area parcels and evaluating risk factors to habitat degradation. The risk factors to habitat degradation were evaluated with a sediment source inventory during preparation of the Upper Stillwater Forest Management project. The inventory included cataloging channel stability, in-channel and out-of-channel sediment sources.

The descriptions of foreseeable adverse impacts to fisheries resources are described in Table F1 – Descriptions of foreseeable adverse impacts. Positive impacts to fisheries resources will also be described, if applicable, using information on impact extent and duration.

Table F1 – Descriptions of foreseeable adverse impacts.

Impact Description	Probability of Impact	Severity of Impact	Duration of Impact
Negligible	The resource impact is not expected to be detectable or measurable	The impact is not expected to be detrimental to the resource	Not applicable

Low	The resource impact is expected to be detectable or measurable	The impact is not expected to be detrimental to the resource	Short- or long-term
Moderate	The resource impact is expected to be detectable or measurable	The impact is expected to be moderately detrimental to the resource	Short- or long-term
High	The resource impact is expected to be detectable or measurable	The impact is expected to be highly detrimental to the resource	Short- or long-term

Cumulative impacts are those collective impacts on the human environment of the proposed action when considered in conjunction with other past, present, and future actions related to the proposed action by location or generic type (75-1-220, MCA). The potential cumulative impacts to fisheries resources in the assessment area(s) are determined by assessing the collective anticipated direct and indirect impacts, other related existing actions, and future actions affecting the fisheries resources.

Issues

For the purposes of this environmental assessment, issues will be considered actual or perceived effects, risks, or hazards as a result of the proposed alternatives. Issues, in respect to this environmental assessment, are not specifically defined by either the Montana Environmental Policy Act or the Council on Environmental Quality.

Fisheries resource issues raised internally include: the proposed actions may adversely affect fisheries habitat features, including channel forms, stream temperature and connectivity.

Regulatory Framework

The US Fish and Wildlife Service has listed bull trout as 'threatened' under the Endangered Species Act. Both bull trout and westslope cutthroat trout are listed as S2 Montana Animal Species of Concern. Species classified as S2 are considered to be at risk due to very limited and/or potentially declining population numbers, range, and/or habitat, making the species vulnerable to global extinction or extirpation in the state (Montana Fish, Wildlife and Parks, Montana Natural Heritage Program, and Montana Chapter American Fisheries Society Rankings). DNRC has also identified bull trout and westslope cutthroat trout as sensitive species (ARM 36.11.436).

DNRC is a cooperator and signatory to the following relevant agreements: Restoration Plan for Bull Trout in the Clark Fork River Basin and the Kootenai River Basin, Montana (2000), Memorandum of Understanding (2005) for the Swan Valley Bull Trout Work Group, and Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout and Yellowstone Cutthroat Trout in Montana (2007). All 3 agreements contain land management conservation strategies or action items utilized by DNRC as decision-making tools.

Fisheries-specific forest management ARMs (36.11.425 and 36.11.427), the SMZ Law and rules, and other site-specific prescriptions would be implemented as part of any action alternative.

All waterbodies contained in the fisheries analysis area(s) are classified as B-1 in the Montana Surface Water Quality Standards (ARM 17.30.608[1][a]). The B-1 classification is for multiple beneficial-use waters, including the growth and propagation of cold-water fisheries and associated aquatic life. Among other criteria for B-1 waters, a 1-degree Fahrenheit maximum increase above naturally occurring water temperature is allowed within the range of 32 to 66 degrees Fahrenheit (0 to 18.9 degrees Celsius), and no increases are allowed above naturally occurring concentrations of sediment or suspended sediment that will harm or prove detrimental to fish or wildlife. In regard to sediment, naturally occurring includes conditions or materials present from runoff or percolation from developed land where all reasonable land, soil, and water conservation practices have been applied (ARM 17.30.602[19]). Reasonable practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses (ARM 17.30.603[25]). The State has adopted BMPs through its Nonpoint Source Management Plan as the principle means of controlling nonpoint source pollution from silvicultural activities.

Existing Conditions

Upper Stillwater River Assessment Area

The Stillwater River-Hellroaring Creek, Stillwater River-Upper Stillwater Lake, and Dog Creek sub-watersheds of the Upper Stillwater River watershed define the boundary of this assessment area. The proposed activities that may affect fisheries resources in the Upper Stillwater River assessment area include: upland and RMZ timber harvest; temporary forest road construction, reclamation and maintenance; road-stream crossing structure removal and associated stream restoration; and forest road utilization for timber hauling and equipment transportation. The fisheries resource variables potentially affected by the proposed actions are channel forms, sediment, flow regime, stream shading, stream temperature, and connectivity.

Bull trout are known to occur throughout approximately 8 miles of stream reaches in the Upper Stillwater River watershed. Westslope cutthroat trout are known to occur throughout at least 1-2 miles of the Spring Creek.

Channel forms comprise the primary spatial component of fisheries habitat and include the frequency and volume of different slow and fast water features. Stream temperature is the primary thermal component of fisheries habitat and typically includes watershed-specific seasonal and daily fluctuations. Although channel forms and stream temperature are a function of numerous environmental processes, the variables of sediment, flow regime, woody debris and stream shading are major contributors that are also potentially affected by the proposed actions. Furthermore, the ranges of conditions of all of these variables throughout a watershed are highly varied, and the mechanisms by which they are naturally affected are also numerous and complex. For the purposes of this environmental assessment, potentially measurable or detectable effect mechanisms to these variables will be used to evaluate existing conditions and the foreseeable effects of the proposed actions. Site-specific surveys within project area lands serve as a resource subsample to extrapolate foreseeable effects across the assessment area.

Road-stream crossings and roads adjacent to stream channels (both perennial and intermittent stream channels) may be major sources of existing direct and indirect effects to the sediment component of fisheries habitats. Three road-stream crossings occur in the proposed project area on DNRC-managed land. Road-stream crossing density per square mile is 0.7 in the proposed project area on DNRC-managed land. The length of all roads within 300 feet of all streams is 0.25 miles. The density of adjacent roads within 300 feet of a stream is 0.1 miles per square mile in the proposed project area. No direct sediment delivery was observed during field reconnaissance from roads located adjacent to streams. Sediment delivery is analyzed in the watershed and hydrology portion of the analysis. While the precise level and extent of impact from each individual road-stream crossing or adjacent road is unknown, the expected existing direct and indirect impact to sediment from road sources is low in the proposed project area due to low-level proximity of roads to fish-bearing streams.

Flow regime components include total annual water yield and peak seasonal flow timing, duration and magnitude. In addition to the physical geography of a watershed, this variable is also greatly affected by both natural disturbances and land management activities. The Water Resources analysis indicates that the existing condition in the assessment area is expected to be within the historic range of variability.

Riparian zone vegetation heavily influences the delivery and in-channel frequency of woody debris, a major component of channel forms. The riparian zone is also a major regulator (shading) of stream temperature, since direct solar radiation is an important driver of stream thermal regimes, especially during peak seasonal periods. Riparian vegetation in Dog Creek, Rock Creek and Spring Creek is mainly a mature forest overstory with hardwood shrubs in the understory. Riparian vegetation along the Stillwater River is mainly shrubs and some overstory trees. Based on field reconnaissance, stream shading is adequate to maintain shade cover on most stream reaches in the assessment area.

While the level of impact from each affected riparian zone is unknown, the expected existing direct and indirect impact to both woody debris and stream temperature is low in the assessment area.

No existing impacts to fisheries connectivity were found in the proposed project area. None of the existing road stream crossings on fish-bearing reaches of streams were identified as a fish passage barrier.

Other existing impacts to fisheries resources in all of the analysis areas, but outside of the immediate project area include: high impacts to native fish species through displacement, disease, and hybridization by nonnative species; road-stream crossings that likely affect habitat connectivity; recreational fishing pressures; stream dewatering for agricultural or other purposes; and off-road vehicle impacts. (Past potential effects from forest management activities performed on all land ownerships are included in the assessment of existing direct and indirect effects.) The combination of direct and indirect effects and other existing impacts are expected to have an existing moderate cumulative impact to fisheries resources in the assessment area.

Environmental Effects

The environmental effects section will compare the existing conditions to the anticipated effects of the proposed No-Action and Action Alternatives to determine the foreseeable impacts to associated fisheries resources.

Upper Stillwater River Assessment Area

No Action Alternative: Direct, Indirect, and Cumulative Effects
As a result of implementing the No-Action Alternative, no additional direct or indirect effects to fisheries resources would be expected to occur within the assessment area beyond those described in the Existing Conditions.

Future-related actions considered part of cumulative impacts include other forest management practices; continued high impacts to native fish species by nonnative species; a stable to declining number of road-stream crossings that affect habitat connectivity; stable to increasing recreational fishing pressures; ongoing stream dewatering for agricultural or other purposes; and ongoing off-road vehicle impacts. Open, public roads that intersect the analysis areas will continue to be utilized year-round for forest management, recreation and other purposes. Consequently, foreseeable cumulative impacts to fisheries resources are expected to be similar to those described in Existing Conditions.

Action Alternative: Direct, Indirect, and Cumulative Effects
Project-specific BMPs and road maintenance would be applied to all segments of the haul routes through the assessment area (see Water Resources analysis). All impact descriptions are short-term unless otherwise noted.

Increased truck traffic can accelerate the mobilization and erosion of roadbed material at road-stream crossings and roads located adjacent to streams. However, through the implementation of project-specific BMPs and road maintenance, the associated road sites would be expected to deliver most mobilized sediment away from the stream and road prism and filter eroded material through roadside vegetation. There are two road-stream crossings intersecting the haul route in the proposed project area. The assessment area has an existing road-stream crossing density of 0.7 sites per square mile. The Action Alternative would utilize two of these existing road-stream crossings, would remove and rehabilitate the third (an existing ford), and would not construct any new road-stream crossings. The length of roads that would be used within 300 feet of all streams is 0.25 miles. None of the proposed 1.8 miles of new temporary road would be constructed within 300 feet of a stream. Project-specific BMPs and road maintenance would be expected to substantially offset the risk of increased sediment delivery due to project-specific vehicle traffic. As a result, low impacts to sediment are expected in the assessment area.

Upland harvest on sites with risk of erosion may mobilize material that could be delivered to adjacent stream channels; however, the Water Resources analysis indicates that the anticipated impacts from this action are low. This assessment takes into consideration the implementation of the SMZ Law and Rules and supplemental ARMs for Forest Management on high risk of erosion sites.

As described in the Water Resources analysis, the levels of proposed timber harvest is not expected to lead to measurable increases in water yield or consequent changes in flow regime.

The Action Alternative would propose to harvest 1.7 acres within established Riparian Management Zones (RMZ) along class 1 streams. The established RMZ for the project area is 105 feet based on 100-year site-index site-potential tree heights. Rules within the RMZ establish

a 50-foot no-cut buffer, and allow harvest of 50 percent of merchantable trees between 50 and 105 feet away from fish-bearing and non-fish-bearing perennial streams. The Action Alternative would also propose to harvest 2.1 acres within established Streamside Management Zones (SMZ). All of these proposed riparian harvesting activities would follow all applicable laws and rules. An analysis of this same riparian harvest prescription in the Environmental Impact Statement for the Forested State Trust Lands Habitat Conservation Plan indicates a low risk of impacts to woody debris and stream shading (and stream temperatures affected by direct solar radiation). Due to the very limited magnitude and extent of this management action, low impact to woody debris and stream shading is expected in the proposed project area.

Due to the potential effects to riparian shading, a consequent low impact to stream temperature is expected in the proposed project area.

As part of the consideration of cumulative effects, all direct, indirect and other related impacts described in the Existing Conditions and Environmental Effects for the No-Action Alternative would be expected to continue. Additionally, low direct and indirect impacts may occur to channel forms, and low direct and indirect impacts may occur to stream temperature as a result of implementing the proposed actions. Considering all of these impacts collectively, low cumulative impacts to fisheries resources are expected in the proposed project area.

Fisheries Mitigations

Fisheries related resource mitigations that would be implemented with the proposed Action Alternative include:

- Applying all applicable Forestry BMPs (including the SMZ Law and Rules) and Forest Management Administrative Rules for fisheries, soils, and wetland riparian management zones (ARMs 36.11.425 and 36.11.426)

Fisheries References

Attachment G – Wildlife Analysis

Upper Stillwater Forest Management Project – Wildlife Analysis

Analysis Prepared By:
Name: Vicki Forristal
Title: Wildlife Biologist, Montana DNRC

Introduction

The following analysis will disclose the anticipated direct, secondary, and cumulative effects to wildlife associated with the No-Action and Action alternatives.

Issues

- Mature forest cover, old-growth, and connectivity. The proposed activities could decrease forested cover, which may reduce habitat connectivity and suitability for wildlife species associated with mature and old-growth forest.
- Canada lynx. The proposed activities could result in the modification of habitat preferred by Canada lynx (*Felis lynx*) and decrease the area's suitability for lynx.
- Grizzly bear. The proposed activities could alter grizzly bear cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats and/or increase risk of human-caused bear mortality.
- Fishers. The proposed activities could decrease habitat suitability for fishers (*Martes pennanti*) by decreasing canopy cover in forest stands, decreasing abundance of snags and coarse woody debris, and elevating risk of trapping mortality due to increased road access.
- Pileated woodpeckers. The proposed activities could reduce tree density and alter the structure of forest stands, which could reduce habitat suitability for pileated woodpeckers (*Dryocopus pileatus*).
- Big game. The proposed activities could reduce habitat quality for big game, especially during the fall hunting and winter seasons, by removing forest cover, increasing roads in secure areas, and disturbing animals.
- Bald eagle. The proposed activities could reduce bald eagle nesting and perching structures and/or disturb nesting bald eagles.
- Hoary Bat. The proposed activities could disturb hoary bats and alter the structure of forest stands, which could affect habitat suitability for hoary bats.

Regulatory Framework

The following plans, rules, and practices have guided this project's planning and/or will be implemented during project activities: *DNRC Forest Management Rules, DNRC Forested Trust*

Lands and Habitat Conservation Plan (USFWS and DNRC 2010), the Endangered Species Act, the Migratory Bird Treaty Act, and the *Bald and Golden Eagle Protection Act.*

Analysis Areas

Direct and Secondary Effects Analysis Area
Direct and indirect effects of the proposed activities on all species/issues were analyzed within the Project Area (FIGURE WI-1), which consists of portions of non-contiguous DNRC parcels in section 36 of T34N, R25W, section 31 of T34N R24W, sections 5, 6, 8, 9, 10, 14, 15, 16, 23, 24, 25, 26 & 36 of T33N, R24W, and sections 29, 30, 31 & 32 of T33N, R23W.

Cumulative Effects Analysis Areas
The cumulative effects of the proposed activities on all species/issues were analyzed at a broad surrounding landscape scale that varies according to the issue or wildlife species being discussed. Cumulative effects analysis areas are named according to the relative size of the area and are summarized in *TABLE WI-1* and *FIGURE WI-1*. Cumulative effects analysis areas (CEAAs) include the Project Area as well as lands managed by other agencies and private landowners. Detailed descriptions of each analysis area are located in the **Affected Environment** section for each issue or wildlife species evaluated (e.g., Canada lynx, pileated woodpecker, etc.). In general, CEAAs were delineated to approximate the size of a focal species' home range or to approximate a surrounding landscape in which the proposed activities could most likely have measurable cumulative effects to wildlife habitat.

Table WI-1 - Wildlife Analysis Areas. *Descriptions of the areas used to analyze the proposed project's effects on wildlife species/issues.*

Analysis Area Name	Description	Total Acres	Issues/Species Analyzed
Project Area	**Portions of** section 36 of T34N, R25W, section 31 of T34N R24W, sections 5, 6, 8, 9, 10, 14, 15, 16, 23, 24, 25, 26 & 36 of T33N, R24W, and sections 29, 30, 31 & 32 of T33N, R23W.	2,772	Direct & indirect effects for all issues/species
Small CEAA	The Project Area and portions of sections surrounding it.	18,782	Mature forest cover, flammulated owls, pileated woodpeckers, hoary bats
Large CEAA	Portions of the Stillwater River-Hellroaring Creek, Sunday Creek, Dog Creek, Stillwater River-Upper Stillwater Lake, Stillwater River-Lower Stillwater Lake, and Martin Creek HUC12 subwatersheds.	49,673	Canada lynx, grizzly bear, fishers, big game

Analysis Methods

Analysis methods are based on the DNRC State Forest Land Management Plan, which is designed to promote biodiversity. The primary basis for this analysis includes information obtained by field visits, review of scientific literature, Montana Natural Heritage Program (MNHP) data queries, DNRC Stand Level Inventory (SLI) data analysis, USDA Forest Service VMap data, GIS aerial photograph analysis, lidar canopy height models, and consultation with professionals.

The coarse-filter wildlife analysis section includes analyses of the direct, secondary, and cumulative effects of the proposed alternatives on old-growth forest and connectivity of mature forest habitat.

In the fine-filter analysis, individual species of concern are evaluated. These species include wildlife species federally listed under the Endangered Species Act, species listed as sensitive by DNRC, and species managed as big game by the Montana Department of Fish Wildlife and Parks (DFWP).

Cumulative effects analyses account for known past and current activities, as well as planned future agency actions. Recent timber sale projects (≤10 years) that could contribute to cumulative effects are summarized in the following table.

Table WI-2 RECENT PROJECTS. *Recent projects that could contribute to cumulative effects and the number of harvested or potentially affected acres that occur in each analysis area.*

Project Name	Agency	Status	Project Area	Small CEAA	Large CEAA
Mistle Dog	DNRC	Closed 2014	0	0	39
SE Stryker Ridge	DNRC	Closed 2014	0	0	27
Fish Bull Face	DNRC	Closed 2015	0	0	383
Ewing Central	DNRC	Closed 2016	0	99	289
Mystery Fish	DNRC	Closed 2017	0	0	465
Upper Ewing OSR	DNRC	Closed 2020	0	0	20
MollyWood	DNRC	Closed 2023	0	509	521
Stryker Bull	DNRC	Closed 2023	0	256	536
McCabe Meadow	DNRC	Closed 2024	0	282	743
McStryker	DNRC	Active	0	0	154
Olney North	DNRC	Active	0	171	387
Dog Rock	DNRC	Scoped	0	168	561
McStryker Salvage	DNRC	Active	0	0	13
Olney Fuels Reduction	DNRC	MEPA complete	0	24	60

Swift Stryke	DNRC	Scoped	0	0	21
Stryker Permit	DNRC	Planned	0	46	46
Stryker Bull Fuel Break	DNRC	Planned	0	0	19
HB-883 Pre-commercial Thinning Projects	DNRC	Active	0	167	480
Sunday Vegetation Management	USFS	Scoped/On Hold	-	-	-

Coarse Filter Wildlife Analysis

Issue

The proposed activities could decrease forested cover, which may reduce habitat connectivity and suitability for wildlife species associated with mature and old-growth forest.

Introduction

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

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

Analysis Area

The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 18,782-acre Small CEAA as described in TABLE WL-1 and depicted in FIGURE WL-1. The Small CEAA is large enough to support a diversity of species that use mature forested habitat and/or require connected forested habitats and centers evaluation of cumulative effects on those areas most likely to be affected by the proposed action.

Measurement Criteria
Mature forested habitat was defined as forest stands with ≥40% canopy cover comprised primarily of trees ≥9 inches dbh. Forested stands containing trees of at least this size and density were considered adequate for providing minimal conditions necessary to facilitate movements of many wildlife species that benefit from well-connected mature forest conditions across the landscape. On DNRC-managed lands, old-growth stands were identified using the tree density, age, and size standards published in Green et al. (1992). Road density was calculated in linear miles per square mile by dividing the number of road miles by the specified analysis area in square miles. Factors considered in the analysis include: 1) availability of mature forested habitat (≥40% canopy cover, ≥9 inches dbh) and old-growth forest, 2) average patch size, 3) the degree of timber harvesting, 4) open and restricted road density, and 5) the availability of potential travel corridors.

Affected Environment
The Project Area currently contains approximately 1,087 acres (39.2% of Project Area) of primarily mature Douglas-fir/western larch, mixed conifer, and lodgepole pine stands that have a reasonably well-developed canopy (≥40% crown closure). Unforested areas of residential developments, rock outcrops, paved roads, lakes and wetlands make up another 343 acres (12.4% of Project Area). Old-growth forest, as defined by Green et. al (1992), is present on 460 acres (16.6% of Project Area) within the Project Area. Both mature forested stands and old growth stands are poorly represented and poorly connected in the northern part of the Project Area, and well represented and well connected in the southern portion of the Project Area. Within the Project Area, there are 62 patches of mature forest averaging 18 acres in size (TABLE WI-3, FIGURE WI-2), and 13 patches of old growth averaging 35 acres in size (TABLE WI-4). Very few of the mature forest patches are connected to mature forest stands outside of the Project Area, those that are connected tend to be the larger patches in the southern end of the Project Area. Habitat availability and connectivity for species requiring larger patches of old-growth is limited. The largest old growth patch is 319 acres and located south/southwest of Upper Stillwater Lake and is adjacent to mature forest on other ownerships which may provide some additional suitable habitat. Mature forest and old growth connectivity within the Project Area has been influenced by prior timber harvest and landscape features. Over the last 25 years, 487 acres of timber harvesting occurred in the Project Area. Approximately 455 of these acres were treated with seed tree prescriptions and these areas will not become mature forest for at least another 60 years. Another 32 acres were treated with a commercial thin, some of which is currently considered mature forest. Mature forest and old growth connectivity within the Project Area and to these habitats on adjacent lands is further reduced by landscape features that fragment the forest, including Upper Stillwater Lake, Dog Lake, Stillwater River, and Highway 93. Approximately 23.5 miles (5.4 miles/sq. mile) of roads exist in the Project Area, of which 17.7 miles (4.1 miles/sq. mile) are open to public motorized use and 5.7 miles (1.3 miles/sq. mile) are restricted to public motorized use. Due to existing mature forest abundance, patch characteristics, and existing road densities, habitat suitability and connectivity for species using well-stocked, mature forest is moderate within the Project Area. Old growth abundance and connectivity in the Project Area is low.

Abundance and locations of old growth and mature, well-stocked forest within the Small CEAA has been influenced by past timber harvesting, landscape features, and human developments. Within the Small CEAA, Montana Department of Natural Resources and Conservation (DNRC) manages 9,125 acres (48.6%) and USDA Forest Service (USFS) manages 6,386 acres (34.0%). Approximately 2,336 acres (12.4%) is privately owned and has had variable levels of forest management in the past. The remaining 935 acres (5.0%) consists of lakes. Presently,

36.2% (6,769 acres) of the Small CEAA contains mature forest stands possessing ≥40% crown closure, of which 46.6% is located on DNRC-managed lands. Average patch size of mature forest in the small CEAA is 15.6 acres (436 patches, see TABLE WI-3 – Mature Forest Attributes). Landscape connectivity of mature forest stands within the Small CEAA is moderate, with the 59.5% mature forest (4,028 acres) occurring in 13 patches ranging from 85 to 1,225 acres in size. On DNRC managed lands within the CEAA, there are approximately 1,134 acres (6.0% of the CEAA) of old-growth forest. Old growth status is unknown on other ownerships, but it is likely that some old growth exists on USFS ownership. There are 25 patches of old-growth with an average patch size of 45.3 acres (TABLE WI-4). Additional mature forested stands not meeting old-growth classification are interspersed between some old-growth stands and likely provide some additional connectivity for species that move between existing patches. Logging over the last 25 years has resulted in approximately 2,745 acres of harvest on DNRC managed lands and 38 acres on USFS managed lands (14.8% of the CEAA). Many of these harvested acres are comprised of young, regenerating trees with few large, scattered trees that do not provide suitable habitat for species that utilize well-stocked, mature forests. The Olney North Timber Sale is currently removing mature forest within the CEAA (TABLE WL-2) and three other projects affecting the Small CEAA are planned. In addition to past timber harvest, prominent landscape features including Upper Stillwater Lake, Dog Lake, Lagoni Lake, Stillwater River, Highway 93, and the railroad and powerline corridors fragment mature and old growth forest patches in the CEAA. In total, approximately 2,205 acres (11.8%) are comprised of lakes, wetlands and other non-forested habitat. Approximately 98.5 miles (3.4 miles/sq. mile) of roads exist within the CEAA. Of these roads, there are 60.8 miles of open roads that equate to a density of 2.1 miles/square mile. Across the CEAA, old-growth and mature forest habitat abundance, as well as landscape connectivity are moderate for species that require and/or prefer these conditions.

Table WI-3 – Mature Forest Attributes. *Acreages and patch size metrics of mature forested habitat (≥40% canopy cover, ≥9 inches dbh) pre- and post-harvest in the Project Area and Small CEAA for the proposed Upper Stillwater Forest Management Project. Percent of the total corresponding analysis area is in parentheses.*

Mature Forest Attribute	Project Area		Small CEAA	
	Existing	Post-Harvest	Existing	Post-Harvest
Acres of Mature Forest	1,087.1 (39.2%)	579.8 (20.9%)	6,797.6 (36.2%)	6,287.8 (33.5%)
Number of Patches	62	66	436	446
Average Patch Size (acres)	17.5	8.8	15.6	14.1
Minimum Patch Size (acres)	1	1	1	1
Maximum Patch Size (acres)	338.2	181.4	1,225.3	1,225.3

Table WI-4 – Old-Growth Attributes. *Acreages and patch size metrics of old-growth forests (Green et al. 1992) pre- and post-harvest in the Project Area and DNRC managed lands in the Small CEAA for the Upper Stillwater Forest Management Project. Percent of the total corresponding analysis area is in parentheses.*

Old Growth Attribute	Project Area		Small CEAA	
	Existing	Post-Harvest	Existing	Post-Harvest
Acres of Old Growth	460.1 (16.6%)	209.6 (7.6%)	1,133.8 (6.0%)	883.5 (4.7%)

Number of Patches	13	18	25	32
Average Patch Size (acres)	35.4	11.6	45.3	27.6
Minimum Patch Size (acres)	0.6	1.2	2.4	1.2
Maximum Patch Size (acres)	318.6	51.6	322.4	145.0
Number of large patches greater than 80 acres	1	0	4	3
Average size for large patches	318.6	--	171.6	121.4

Environmental Effects – Mature Forest Cover, Old Growth, and Connectivity

No Action Alternative: Direct and Secondary Effects

None of the proposed forest management activities would occur. This would result in: 1) no immediate changes to existing stands; 2) no appreciable changes to forest age, the distribution of forested cover, or landscape connectivity; and 3) no changes to wildlife use. Thus, no short-term direct or indirect effects to old-growth or mature forested habitat suitability and connectivity would be anticipated.

No Action Alternative: Cumulative Effects

None of the proposed forest management activities would occur. Therefore: 1) no immediate changes to existing stands would occur, 2) no further changes to the suitability of mature forested cover or connectivity would be anticipated, and 3) no changes to wildlife use would be expected. Past and ongoing forest management projects have affected mature forest wildlife habitat in the CEAA, and other proposed projects could affect mature forest habitat in the future (see TABLE WI-2). Thus, no additional short-term cumulative effects to old-growth, mature forested habitat suitability and connectivity would be anticipated.

Action Alternative: Direct and Secondary Effects

Under the Action Alternative, approximately 1,462 acres (52.8% of the Project Area) would be altered by the proposed activities. Of these acres, 659 acres (23.8% of the Project Area) of well-stocked, mature forest would undergo harvesting. Approximately 507 acres of mature forest (46.7% of existing mature forest) would receive harvest treatments that would reduce overstory crown closure to less than 40%. The remaining 152 acres would undergo treatments that reduce stand density but retain mature forest with an overstory crown closure of at least 40%. Average patch size of mature forest within the Project Area would be reduced from 17.5 to 8.8 acres (49.7% reduction) and the number of patches would increase from 62 to 66 (TABLE WI-3, FIGURE WI-2). Approximately 580 acres (20.9% of Project Area) of mature forest in the Project Area with ≥40% crown closure would persist after harvesting and could provide suitable habitat for species utilizing mature forest. Approximately 273 acres (59.2% of existing) of old growth would be impacted by the proposed harvest activities. Proposed harvest on 251 of these acres (54.4% of existing) would effectively remove old growth. Post harvest, old growth stands would remain on 210 acres (7.6% of Project Area) in the Project Area. Average patch size of old growth within the Project Area would be reduced by 24 acres (68.6% reduction) and the number of patches would increase from 13 to 18 (TABLE WI-4). No large patches (>80 acres) of old growth would remain after harvest. The remaining patches of old growth would be poorly connected as would mature forest through most of the Project Area. Interior habitat would be reduced which may negatively impact species that rely on large, contiguous areas of mature forest or old-growth. Overall, connectivity within the Project Area would decrease. However,

three wildlife travel corridors and riparian areas would retain existing vegetation that provides some connectivity through the Project Area.

Under the Action Alternative, 1.8 miles of temporary road would be built in the Project Area. Approximately 5.2 miles of restricted road and 0.4 miles of abandoned road would be used for activities and functional open road density during activities would increase from 4.1 to 5.4 miles/sq. mile. Restricted and abandoned roads opened for harvesting would remain restricted to the public during harvest activities. Post-harvest, open road density would decrease slightly to 4.0 miles/sq. mile due to the obliteration of 0.6 miles of open roads.

Thus, moderate adverse direct and secondary effects to connectivity and suitability of mature forest and high impacts to old-growth habitat in the Project Area would be expected since: 1) harvesting would appreciably reduce tree density and existing cover on approximately 507 acres (46.7%) of existing available mature stands and 251 acres (54.4%) of existing old-growth stands (TABLES WI-3 and WI-4); 2) connectivity of mature and old-growth forest would be altered with a decrease in average patch size of 9 and 24 acres, respectively; 3) a measure of habitat availability and connectivity would be maintained on 580 acres (20.9% of Project Area) of mature forest and 210 acres (7.6%) of old growth, primarily along riparian areas; 4) the only large patch of old-growth (>80 acres) would be removed; and 5) functionally open roads would increase in the short-term by 1.3 miles/sq. mile and long-term open road density would decrease 0.1 miles/sq. miles after the proposed activities conclude.

Action Alternative: Cumulative Effects

Under the Action Alternative, timber harvesting would alter 659 acres of the 6,798 acres (9.6% of available) of mature forest habitat available in the Small CEAA. Harvest treatments would remove 509 acres (7.5% of available) of mature forest for 40-60 years (TABLE WI-3). Reductions in the availability and quality of suitable mature forested habitat would be additive to past and planned harvest activities within mature forests in the Small CEAA (TABLE WI-2). Across the CEAA, 92.5% of existing mature, forested habitats would remain and landscape connectivity would be altered to a moderate degree given habitat conditions within the surrounding forested landscape. Habitat availability and connectivity of mature forest would be reduced, as average patch size would decrease from 15.6 acres to 14.1 acres and the number of patches would increase from 436 to 446 patches (TABLE WI-3). The largest mature forest patch (1,225 acres) within the CEAA would not be impacted by harvest (FIGURE WI-2).

Approximately 273 acres (24.1% of available old-growth within the CEAA) of old-growth forest would be altered by harvesting treatments and 251 acres (22.1% of available old-growth within the CEAA) would be effectively removed (TABLE WI-4). Remaining old-growth patches would decrease in average size from 45 acres to 28 acres; 3 patches greater than 80 acres would remain across the CEAA (TABLE WI-4). After harvest, the largest patch of old growth within the CEAA would be 145 acres. Most old-growth patches within the CEAA would be connected to interspersed mature forest patches within the CEAA which would likely provide a larger effective patch size for some old-growth associated species. Reductions in the availability of suitable mature forested and old-growth habitat would be additive to past, proposed, or ongoing harvest activities in the Small CEAA (TABLE WI-2).

Under the Action Alternative, 1.8 miles of new temporary roads would be built and road use during the proposed activities would increase on 12.1 miles of open road and 8.0 miles of restricted and abandoned roads. During activities, open road density would increase from 2.1 miles/sq. mile to 2.3 miles/sq. miles within the CEAA for up to 4 years. Increased road use and

associated disturbance under the proposed Action Alternative would be additive to anticipated increases in open road traffic associated with other active projects within the CEAA (see TABLE WI-2). All temporary roads would be reclaimed.

Thus, low adverse cumulative effects to connectivity and suitability of mature forest and moderate cumulative effects to old-growth habitat in the Small CEAA would be expected as a result of the Action Alternative since: 1) the abundance of mature forested and old-growth habitat in the CEAA would decrease by 7.5% and 20.3%, respectively (TABLES WI-3 and WI-4); 2) approximately 6,288 acres (33.5%) of mature forest and 883.5 acres (4.7%) of old-growth within the CEAA would continue to provide habitat connectivity, particularly through riparian areas; 3) average patch size of suitable habitat would decrease by 1.5 acres for mature forest and 18 acres for old-growth forest; 4) some habitat connectivity with larger patches in the CEAA would be maintained, particularly in riparian areas; 5) temporary increases in open roads would occur and long-term open road density would not change.

Fine Filter Wildlife Analysis

In the fine-filter analysis, individual species of concern are evaluated. These species include those listed as threatened or endangered under the Endangered Species Act of 1973, species listed as sensitive by DNRC, and animals managed as big game by Montana DFWP. TABLE WI-4 – Fine Filter provides an analysis of the anticipated effects for each species.

Table WI-4 – Anticipated Effects of the Upper Stillwater Forest Management Project on wildlife species.

Species/Habitat	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
Threatened and Endangered Species	
Canada lynx (*Felix lynx)* Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zones	[**Y**] **Detailed Analysis Provided Below -** The Project Area contains approximately 2,152 acres of suitable lynx habitat.
Grizzly bear *(Ursus arctos)* Habitat: Recovery areas, security from human activity	[**Y**] **Detailed Analysis Provided Below**. The proposed Project Area occurs in non-recovery occupied habitat of the Northern Continental Divide Ecosystem (NCDE) Recovery Area (Wittinger 2002, USFWS 1993).
Yellow-billed cuckoo (*Coccyzus americanus*) Habitat: open cottonwood riparian forest with dense brush understories (Lake and Flathead counties)	[**N**] No suitable open cottonwood riparian habitat occurs in the vicinity of the Project Area and yellow-billed cuckoos have not been observed in the area (MNHP 2024). Thus, no direct, indirect, or cumulative effects to yellow-billed cuckoos would be expected to occur as a result of either alternative.

Species/Habitat	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
Wolverine *(Gulo gulo)* Habitat: Alpine tundra and high-elevation boreal forests that maintain deep persistent snow into late spring	[**N**] No potentially suitable wolverine habitat exists within the proposed Project Area. The Project Area does not maintain deep snow into late spring and does not contain high-elevation alpine habitat. Appreciable use of the area is not expected. Given the large home range area (average 150+ sq. miles) wolverines occupy, and long distances wolverines typically cover during their movements, the proposed activities would not be expected to measurably affect use of the area by wolverines. Thus, no direct, indirect, or cumulative effects to wolverines would be expected to occur under the proposed action.
Sensitive Species	
Bald eagle *(Haliaeetus leucocephalus)* Habitat: Late-successional forest less than 1 mile from open water	[**Y**] **Detailed Analysis Provided Below**. The primary use area of the Upper Stillwater Lake bald eagle territory falls within a portion of the proposed Project Area.
Black-backed woodpecker *(Picoides arcticus)* Habitat: Recently burned or beetle-infested forest	[**N**] No recently burned areas (<5 years) occur within 2 miles of the Project Area. Thus, no direct, indirect, or cumulative effects to black-backed woodpeckers would be expected to occur as a result of either alternative.
Common loon *(Gavia immer)* Habitat: Cold mountain lakes, nest in emergent vegetation	[**Y**] **Detailed Analysis Provided Below**. Common loons are known to nest in Upper Stillwater Lake, Dog Lake, and potentially in Blue Lake (DFWP, unpublished data) which are adjacent to the Project Area. Historic nest sites have been located within 500 feet of the proposed harvest units. Loons have a high territory fidelity and may reuse nest sites. Human disturbance is the biggest threat to nesting loons. These lakes will be surveyed for active nests each spring. If an active nest is identified, mechanized activity within a 500-foot radius of the nest site would be prohibited between April 15 and July 15 per ARM 36.11.436 (9)(a). With these mitigations in place, negligible direct, indirect, and cumulative effects to common loons would be expected as a result of the action alternative.
Fisher *(Martes pennanti)* Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian	[**Y**] **Detailed Analysis Provided Below** – Approximately 1,464 acres of suitable fisher habitat occur within the Project Area.
Flammulated owl *(Otus flammeolus)* Habitat: Late-successional ponderosa pine and Douglas-fir forest	**[N]** Approximately 108 acres of potential flammulated owl habitat occur in the Project Area. However, no potentially suitable habitat would be impacted by harvest. Thus, no direct, indirect, or cumulative effects to flammulated owl would be expected to occur as a result of either alternative.
Peregrine falcon *(Falco peregrinus)* Habitat: Cliff features near open foraging areas and/or wetlands	[**N**] Some cliffs potentially suitable for peregrine falcon nesting exist within the Project Area. Recent or historical observations of peregrine falcons within 1 mile of the Project Area are lacking (MNHP 2024). Thus, no direct, indirect, or cumulative effects to peregrine falcons would be anticipated as a result of either alternative.
Pileated woodpecker *(Dryocopus pileatus)*	[**Y**] **Detailed Analysis Provided Below -** Approximately 920 acres of suitable pileated woodpecker habitat occur in the Project Area.

Species/Habitat	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
Habitat: Late-successional ponderosa pine and larch-fir forest	
Fringed myotis (*Myotis thysanodes*) Habitat: low elevation ponderosa pine, Douglas-fir and riparian forest with diverse roost sites including outcrops, caves, mines	[**N**] No suitable caves or mine tunnels are known to occur in the Project Area. Small rocky outcrops are present in the southwest corner of the Project Area. Recent or historical observations of fringed myotis within 10 miles of the Project Area are lacking despite acoustic and mist-net surveys conducted in the past (MNHP 2024). Thus, no direct, indirect, or cumulative effects to fringed myotis would be expected to occur as a result of either alternative.
Hoary bat (*Lasiurus cinereus*) Habitat: coniferous and deciduous forests and roost on foliage in trees, under bark, in snags, bridges	[**Y**] **Detailed Analysis Provided Below –** The Project Area contains approximately 2,772 acres of potentially suitable hoary bat habitat.
Townsend's big-eared bat *(Plecotus townsendii)* Habitat: Caves, caverns, old mines	[**N**] 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.
Big Game Species	
Elk	[**Y**] **Detailed Analysis Provided Below -** The Project Area contains potential elk, moose, whitetail deer, and mule deer winter range habitat**.**
Whitetail Deer	
Mule Deer	
Moose	

Threatened and Endangered Species

CANADA LYNX

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

Introduction
Canada lynx are listed as "threatened" under the Endangered Species Act. Canada lynx are associated with subalpine fir forests, generally between 4,000 to 7,000 feet in elevation in western Montana (Ruediger et al. 2000). Lynx abundance and habitat use are strongly associated with snowshoe hare populations; thus, activities which decrease habitat quality for snowshoe hares can reduce the availability of prey for lynx. Lynx habitat in western Montana consists primarily of stands that provide habitat for snowshoe hares including young and mature coniferous stands with high levels of horizontal cover (Squires et al. 2010, Squires et al. 2013). Forest type, tree densities, natural disturbance history, and time since harvesting play important roles in shaping the suitability of foraging habitat for lynx. Mature forest stands with abundant horizontal cover and coarse woody debris provide structure important for foraging, denning, travel, and security. These conditions are found in a variety of habitat types (Pfister et al. 1977), particularly within the subalpine fir series. Historically, northwest Montana contained a variety of stand types with differing fire regimes. This variety of stand types, combined with patchy elevation and snow-depth gradients preferred by lynx, likely formed a non-continuous mosaic of

lynx and non-lynx habitats (Fischer and Bradley 1987, Ruggiero et. al. 1999, Squires et al. 2010). Forest management considerations for lynx include providing a mosaic of young and mature lynx habitats that are well connected across the landscape.

Analysis Area
The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 49,673-acre Large CEAA as described in TABLE WI-1 and depicted in FIGURE WI-1. The Large CEAA is large enough to encompass one or more lynx home ranges, is centered on the Project Area, and is defined according to geographic features (e.g., ridgelines, forest habitat, high traffic roads) which are likely to influence movements of Canada lynx in the vicinity of the Project Area; providing a reasonable analysis area for Canada lynx that could be influenced by project-related activities.

Measurement Criteria
Factors considered in the analysis include: 1) the level of harvesting, 2) the availability of suitable lynx habitat, and 3) landscape connectivity. 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. Other suitable lynx habitat is defined as habitat that has the potential to provide connectivity and lower quality foraging habitat but does not contain the necessary attributes to be classified as winter or summer foraging habitat classes. The temporary non-habitat category consists of forested stands that are not expected to be used by lynx until suitable horizontal cover develops. All habitat classes were identified according to DNRC's lynx habitat mapping protocols (USFWS and DNRC 2010). On non-DNRC lands, lidar canopy height models and USFS vegetation maps were used to identify potential lynx habitat which was defined as any stand/area with at least 40% canopy closure of vegetation/trees greater than 6 feet in height.

Affected Environment
Approximately 2,266 acres (81.8% of Project Area) of potential lynx habitat occurs in the 2,772-acre Project Area. Of this potential lynx habitat, 2,152 acres (77.7% of Project Area) are currently providing suitable habitat (TABLE Wl-6). Suitable lynx habitat within the Project Area is defined as the sum of the summer foraging, winter foraging, and “other suitable” lynx habitat categories. In the Project Area, winter foraging habitat is the most abundant type of suitable habitat (TABLE Wl-6). Additionally, riparian areas present within the proposed Project Area provide a number of potential travel corridors for lynx. In the last 25 years, 374 acres of potential lynx habitat in the Project Area has been altered by harvest, and 297 acres have regenerated enough to provide suitable habitat for lynx (mainly as other suitable habitat). The remaining 77 acres of temporary non-suitable habitat will likely be suitable for use by lynx within the next 10 years. Human access and use of the Project Area is high year-round and includes both motorized and non-motorized uses such as hunting, camping, firewood cutting, and Nordic skiing on 10.3 miles of groomed trails. Throughout much of the Project Area, habitat types and forest structure are favorable for lynx, however the Project Area is below the typical elevation range and winter snowfall levels preferred by lynx (Ruediger et al. 2000). Habitat connectivity is moderate due to fragmentation by landscape features (e.g. rivers and lakes) and human development (e.g. railroad and highway corridor) which may impede movement of lynx across the landscape (Ruediger et. al. 2000). At least one lynx has been observed in the last 5 years within 5 miles of the Project Area (MNHP 2024).

The Large CEAA contains approximately 18,423 acres (37.1% of CEAA) of suitable lynx habitat on DNRC lands and another 21,160 acres (42.6% of CEAA) of potentially suitable habitat on other ownerships (TABLE WI-6). The remaining portions of the CEAA that do not provide lynx

habitat consist primarily of human development, wetlands, lakes, scree slopes, and logged stands with <40% canopy cover. DNRC manages 49.9% of the CEAA, USDA Forest Service administers 42.6%, private timber companies own 2.1%, and other private owners account for 5.4% of the CEAA. Approximately 7,144 (14.4%) of the CEAA has been harvested within the last 25 years and reduced the availability of suitable lynx habitat containing mature trees. Overall, habitat suitability and connectivity for lynx is high and use of the CEAA by lynx is likely, although reports of lynx observations are rare (MNHP 2024).

Table WI-6 – **Lynx habitat.** *Estimates of existing lynx habitat and habitat that would persist post-harvest on DNRC lands in the Project Area and cumulative effects analysis area. Percent refers to the percent of the lynx habitat category of the total potential habitat[a] present on DNRC-managed lands.*

Lynx Habitat Category	Acres of lynx habitat			
	Project Area		Cumulative Effects Analysis Area	
	Existing	Post-Harvest	Existing	Post-Harvest
Other Suitable	342	632	3,367	3,657
	(15.3%)	(28.2%)	(15.5%)	(16.9%)
Summer Forage	203	52	4,199	4,048
	(9.0%)	(2.3%)	(19.4%)	(18.7%)
Temporary Non-suitable	92	649	3,267	3,825
	(4.1%)	(28.9%)	(15.1%)	(17.6)
Winter Forage	1,607	910	10,857	10,161
	(71.6%)	(40.6%)	(50.1%)	(46.8%)
Grand Total: Suitable Lynx Habitat[b]	2,152	1,595	18,423	17,866
	(95.9%)	(71.1%)	(84.9%)	(82.4%)

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

Environmental Effects – Canada Lynx

No Action Alternative: Direct and Secondary Effects on Canada Lynx

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

No Action Alternative: Cumulative Effects on Canada Lynx

No appreciable change in lynx habitats would occur under this No-Action Alternative, and no further changes in landscape connectivity would be anticipated. Future forest management projects not associated with the proposed Upper Stillwater Forest Management Project could alter lynx habitat in the future (TABLE WI-2). Activities on non-DNRC lands could continue altering lynx habitat and create disturbance within the CEAA. Thus, no additional cumulative effects to suitable lynx habitat are expected to result from the No-Action Alternative that could affect lynx habitat suitability in the CEAA.

Action Alternative: Direct and Secondary Effects on Canada Lynx

The proposed activities would alter approximately 1,253 acres (58.2%) of the 2,152 acres of suitable lynx habitat available in the Project Area. Proposed harvest prescriptions on 551 acres (34.3% of available) of winter foraging lynx habitat would decrease mature tree abundance such

that overstory crown closure would be reduced to <10%. All suitable lynx habitats inside these harvest units would be converted to temporary non-suitable habitat (TABLE WI-6) for the next 15-20 years. Harvest treatments on 4 acres of summer foraging habitat and 3 acres of other suitable habitat would reduce canopy closure to <10% and these acres would become temporary non-suitable habitat. Approximately 147 acres of existing summer forage habitat would be treated with prescriptions that would retain sufficient mature tree densities and horizontal vegetation to still be considered suitable habitat. Where operationally feasible and available, existing patches of shade-tolerant sub-merchantable conifers would be retained in commercial harvest units. The total area of these patches would not be expected to comprise more than 10% of the acres proposed for harvest. In pre-commercial thinning units, some small shade tolerant trees would be retained in addition to species/spacing guidelines so that suitable lynx habitat would remain. Growth of retained mature trees and patches of sapling to pole-sized conifers, combined with post-harvest conifer regeneration following harvest, would shorten the time harvested stands would be temporarily unsuitable for lynx. Activities associated with active logging operations could temporarily displace any lynx using the area for 1-4 years. Following proposed logging, 1,595 acres (57.6% of Project Area) of suitable lynx habitat would remain within the Project Area (TABLE WI-6). To facilitate movement through the Project Area and to adjacent lands, travel corridors that are approximately 300 feet wide will be retained along Dog Creek, Rock Creek and through a draw west of Spring Creek. Vegetation retention along important riparian areas could facilitate lynx movement in the Project Area. In the proposed harvest units, 7 to 24 tons/acre of coarse woody debris would be retained that would provide future horizontal cover and security structure for lynx and lynx prey once harvest units have regenerated back into suitable habitat. Post-harvest shade-tolerant tree abundance and coarse woody debris levels would likely be reduced on approximately 205 acres that could undergo broadcast burning site preparation compared to 1,427 acres that would not be burned. Overall, moderate adverse direct and indirect effects to habitat suitability for Canada lynx would be expected since: 1) the amount of existing suitable lynx habitat in the Project Area would be reduced by 25.8% (TABLE WI-5, 2) landscape connectivity would persist along most RMZs and wildlife travel corridors despite an overall reduction in landscape connectivity, and 3) coarse woody debris and small shade-tolerant conifers would be retained where feasible to promote forest structural complexity in harvest units, expediting their growth back into suitable lynx habitat.

Action Alternative: Cumulative Effects on Canada Lynx

Under the Action Alternative, approximately 1,462 acres (2.9%) of the 49,673-acre CEAA would be altered by harvesting. Harvesting would affect 1,253 acres of currently suitable lynx habitat and 557 of these acres would be converted to temporarily unsuitable lynx habitat. Following proposed harvesting, the CEAA would contain 39,026 acres (78.6% of the CEAA) of suitable lynx habitat, of which 17,866 acres are on DNRC managed lands (TABLE WI-6). Expected reductions in suitable lynx habitat and increases in temporary non-suitable habitat in the proposed harvest units would not be expected to appreciably alter long-term lynx use of the CEAA, particularly given that habitat suitability and connectivity is relatively high in the surrounding landscape. Following treatments, connectivity of suitable lynx habitat would be maintained along riparian areas and features frequently used by lynx during daily movements (i.e. drainages, prominent ridges etc.) throughout the majority of the CEAA. Suitable lynx habitat within the CEAA could be altered by ongoing and proposed DNRC timber sales (see TABLE WI-2). Alteration of suitable lynx habitat under the Action Alternative would be additive to these projects. Furthermore, increased levels of motorized activities associated with the Action Alternative would be additive to disturbance from current and proposed timber sales, which could temporarily displace lynx should they be present near the proposed Project Area and associated roads. Thus, low adverse cumulative effects to lynx and the suitability of their habitat

would be expected as a result of proposed activities since: 1) overall baseline habitat suitability would remain high with 78.6% of the CEAA as potentially suitable habitat; 2) existing suitable lynx habitat within the CEAA would be reduced by 1.4% and those areas would remain unsuitable for at least 20-25 years, 3) stands converted to temporary non-suitable habitat in old logging units would continue maturing and developing into suitable habitat within the CEAA in the absence of additional disturbance, 4) habitat connectivity within the CEAA would be affected by a minor degree by the proposed activities, and 5) lynx could be temporarily displaced by logging activities in parts of the CEAA for up to four years.

GRIZZLY BEAR

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

Introduction
Grizzly bears are opportunistic omnivores that inhabit a variety of habitats in Montana. Preferred grizzly bear habitat includes avalanche chutes, fire-mediated shrub fields, and riparian areas, all of which provide seasonal food sources (Servheen 1983, McLellan and Hovey 2001). Grizzly bears are federally listed as a threatened species and primary threats are related to human-bear conflicts and long-term habitat loss associated with human development (Mace and Waller 1997). Reductions in vegetative cover and increased disturbances, such as those associated with timber harvest, can lower effective use of habitat by bears and render bears more vulnerable to human-caused mortality (Servheen et. al. 1999). Forest management considerations for grizzly bears include minimizing potential for conflicts with humans, minimizing adverse effects to cover, minimizing access and the construction of new roads, and reducing disturbance levels during the non-denning season, especially in the spring and fall periods when grizzly bears have important nutritional demands.

Analysis Area
The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 49,637-acre Large CEAA as described in TABLE WI-1 and depicted in FIGURE WI-1. The Large CEAA approximates the home range size of a male or female grizzly bear in northwest Montana and is defined by landscape features (i.e., ridgelines, well-traveled open roads) which are likely to influence movements of a grizzly bear in the vicinity of the Project Area; providing a reasonable analysis area for grizzly bear that could be influenced by project-related activities.

Measurement Criteria
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, and 4) open and restricted road densities. Grizzly bear visual screening is considered to be vegetation that will hide 90% of a grizzly bear at a distance of 200 feet. Hiding cover on DNRC lands was estimated by evaluating forest stand size class and the total crown density of all trees in the stand using field-collected, GIS, and forest inventory data. On non-DNRC lands, hiding cover was considered areas where lidar canopy height models identified areas where vegetation was greater than 2 feet in height.

Affected Environment

All 2,772 acres of the proposed Project Area occurs in non-recovery occupied habitat of the NCDE (USFWS 1993). Grizzly bears have been observed in the vicinity of the Project Area in the past and continued use by bears is anticipated. Approximately 2,226 acres (80.3% of Project Area) of grizzly bear hiding cover is present within the proposed Project Area. The abundance of vegetative cover likely contributes to security for bears and facilitates their ability to move freely within the Project Area. Preferred riparian and wetland areas are present within the Project Area. Portions of the Project Area and CEAA are predicted to be of high importance in providing connectivity pathways for bears moving between the Northern Continental Divide Ecosystem (NCDE) and the Cabinet-Yaak Ecosystem (CYE) recovery areas (Sells et. al. 2003). Highway 93 borders the eastern edge of the Project Area and the railroad tracks bisect, or are adjacent to, portions of the Project Area, both of these features can impede grizzly bears movement through the landscape. There is no grizzly bear denning habitat in the Project Area. Human access and use of the Project Area is high year-round and includes both motorized and non-motorized uses such as hunting, camping, firewood cutting, Nordic skiing, and huckleberry picking. Managing human access is an important factor in management of grizzly bear habitat. Presently, open road density in the proposed Project Area is 4.1 miles/sq. mile and total road density is 5.4 miles/sq. mile. In addition, there are a number of unauthorized, user-built roads and breaches of existing closures which allow the public to access restricted roads. Due to existing high levels of human use and the abundance of open roads in the northern 2/3 of the Project Area, grizzly bear security within the Project Area is low. Due to relatively high levels of hiding cover and abundance of preferred riparian habitat, grizzly bear habitat quality within the Project Area is good.

The 49,673-acre Large CEAA is comprised of 26,946 acres of non-recovery occupied habitat and 22,727 acres in the NCDE Recovery Area (USFWS 1993). The CEAA is bisected by Highway 93, a 70-mph two-lane state highway, the Burlington Northern Santa Fe (BNSF) railroad tracks on which at least 20-30 trains travel per day, the Stillwater River, multiple lakes, and a major powerline corridor. Grizzly bear use of the area is well-documented and continued use of the CEAA by bears is likely. The CEAA contains at least 41,122 acres (81.8% of CEAA) of hiding cover. Forest habitats across the CEAA are a combination of age classes, ranging from recently harvested stands to mature stands. Approximately 14.4% of the CEAA (7,144 acres) has been harvested within the last 25 years on DNRC and USFS managed lands in the CEAA. These areas primarily consist of younger stands with regenerating trees that provide some hiding cover. The Large CEAA contains approximately 3,908 acres (7.9% of the CEAA) of Stillwater grizzly bear security zone that is free of all motorized use during the non-denning period. Ongoing timber sale projects within the CEAA (see TABLE WL-2) are sources of disturbance and are currently altering grizzly bear habitat. Human disturbance levels are closely tied to road abundance and access. Open road density within the CEAA is approximately 1.3 miles/sq. mile and total road density is approximately 2.8 miles/sq. mile. Roads present in the CEAA are primarily a result of past timber management activities, however open roads within the CEAA receive moderate amounts of motorized recreational use. The greatest risk factors for bears within or near the CEAA are likely associated with homes, developments, highways and railroad activities. Areas where high levels of human recreational use occur are also higher-risk localities for grizzly bears. Unnatural attractants potentially associated with these areas could increase the probability of human-bear conflicts, which can result in bear mortalities.

Environmental Effects – Grizzly Bear

No Action Alternative: Direct and Secondary Effects on Grizzly Bear

Under this alternative, no proposed project activities would occur. Thus, 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.

No Action Alternative: Cumulative Effects on Grizzly Bear
Under this alternative, no proposed project activities would occur. Past forest management projects not associated with the proposed Upper Stillwater Forest Management Project have affected grizzly bear habitat in the CEAA, and ongoing and proposed projects could alter bear habitat in the future (TABLE WI-2). Activities on non-DNRC lands could continue altering grizzly bear habitat and create disturbance within the CEAA. Thus, since no additional changes in available habitats or level of human disturbance would be anticipated as a result of the No-Action Alternative, no cumulative effects to grizzly bear displacement or effects involving mortality risk would be anticipated.

Action Alternative: Direct and Secondary Effects on Grizzly Bear
Under the Action Alternative, 1,396 acres (62.7% of available) of grizzly bear hiding cover would be impacted by the proposed harvest. Of these acres, hiding cover would be removed on 534 acres (38.3% of available) due to reductions in stand density with clear cut, seed tree, and shelterwood prescriptions. Harvesting associated with the action alternative would increase sight distances within all proposed harvest units. However, retention of patches of regenerating conifers and submerchantable trees within harvest units would reduce sight distances and increase available hiding cover. Approximately 205 acres within harvest units would undergo post-harvest broadcast burning, which would likely temporarily remove any hiding cover existing in the understory on these acres. Hiding cover in harvest units would be expected to recover within 15 to 20 years following proposed treatments as shrub and tree regeneration proceeds. Existing stands of adjacent dense regenerating conifers, neighboring mature forest patches, and topographic breaks would exist in such a manner that no point in any harvest unit would be greater than 600 feet to screening cover. Existing riparian cover along Class 1 and 2 streams would be largely retained and offer movement corridors as well as hiding cover for bears in this preferred habitat. Additionally, vegetation in three wildlife travel corridors would be retained along upper Dog Creek, Rock Creek and through a draw west of Spring Creek to facilitate travel across the Project Area to adjacent habitat. Should grizzly bears be present in the area at the time of harvest operations, they could be temporarily (1-4 years) displaced by harvest activities. Proposed activities in grizzly bear habitats would reduce grizzly bear security, possibly resulting in increased stress and/or energy expenditures to endure the disturbance or causing bears to temporarily move away from the area. Continued use of the Project Area by grizzly bears would be anticipated during and after harvesting activities. Spring restrictions on motorized use and commercial harvest restrictions would apply to harvest units, which would minimize disturbance to bears during the spring period. Additionally, contract requirements would assist in mitigating bear-human conflict risk by specifying that contractors are not permitted to carry firearms on the work site and that unnatural attractants must be stored or disposed of in a bear-resistant manner.

Motorized activities associated with the Action Alternative, such as the use of restricted roads and the construction of new temporary roads, could affect grizzly bears by temporarily (1 to 4 years) disturbing or displacing from the area. No new permanent roads would be built. Approximately 1.8 miles of temporary road would be built under the Action Alternative. The use of up to 7.4 miles of restricted, abandoned, and temporary roads and 9.2 miles of open road would increase motorized vehicle activity during the non-denning season for up to 4 years. The use of existing restricted, abandoned, and temporary roads would contribute to open road density in the short term (1-4 years); increasing potential for disturbance to grizzly bears. Including temporary roads, functionally open road amounts could increase temporarily from 17.7 miles (density 4.1 mi./sq. mi.) up to 23.4 miles (density 5.4 mi./sq. mi.) during project operations. Restricted and abandoned roads opened for harvesting would remain restricted to the public

during harvest activities. All temporary roads would be reclaimed in a manner that prevents any motorized use. Additionally, 0.4 miles abandoned road would be converted to restricted road and 0.6 miles of existing open road would be obliterated which would lead to a slight decrease in open road density (4.1 to 4.0 miles/sq. mile).

Thus, low adverse direct or indirect effects to grizzly bears associated with displacement and mortality risk would be expected since: 1) moderate levels of temporary (1-4 years) disturbance and displacement would be anticipated; 2) hiding cover on 534 acres (19.3% of Project Area) would be removed, but would be expected to recover in 15-20 years; 3) hiding cover would remain on approximately 1,692 acres (61.1% of Project Area) of the Project Area; 4) reductions in hiding cover would be mitigated through vegetation retention patches within and between harvest units, vegetation retention along riparian corridors and through wildlife travel corridors, and reduced sight distances associated with varied topography; 5) commercial harvest would be restricted during the spring period; 6) short-term increases in functional open road densities from 4.1 mi/sq. mi. to 5.4 miles/sq. mi. would be anticipated; 7) long-term open road density would decrease slightly.

Action Alternative: Cumulative Effects on Grizzly Bear

Approximately 534 acres (1.1% of CEAA) of grizzly bear hiding cover in the Large CEAA would be removed as a result of the action alternative. Hiding cover would be reduced on an additional 862 acres (1.7% of CEAA). Removal of hiding cover and anticipated elevated disturbance levels would be additive to past timber harvesting that has affected approximately 7,144 acres (14.4%) in the CEAA, as well as current forest management projects (see TABLE WL-2). Mature stands and young, fully stocked stands that provide hiding cover would continue to make up approximately 40,588 acres (81.7%) of the CEAA. Early successional stages of vegetation occurring in harvest units could provide foraging opportunities that do not exist in some mature stands across the CEAA. No harvest activities would occur within Stillwater grizzly bear security zones. Continued use of the CEAA by grizzly bears would be anticipated during and after project activities.

Collectively, short-term (1 to 4 years) increases in human disturbance would be anticipated in the CEAA, but contract requirements would lessen risk of human-bear conflicts during active harvest operations (e.g. proper storage/disposal of unnatural attractants, prohibit possession of firearms etc.). The increased use of road systems during the proposed project would temporarily increase human disturbance and displacement risk for grizzly bears within a portion of the CEAA. A short-term increase in functional open road density would occur, increasing from 1.3 mi/sq. mi. to 1.4 miles/sq. mile in the CEAA. The obliteration of 0.6 miles of open road and conversion of 0.4 miles of abandoned road to restricted road would very slightly decrease the density of permanent roads within the CEAA. Disturbance associated with temporarily accessed roads would be additive to that occurring on roads used for other ongoing forest management projects (see TABLE WL-2). The greatest risks to bears within the CEAA would remain human habitations and associated attractants that bring bears into conflict with people.

Thus, low adverse cumulative effects to grizzly bears associated with displacement or effects involving mortality risk would be expected in the short term (1 to 4 years) and long term (15 to 20 years) since: 1) short-duration (1 to 4 year) increases in human disturbance levels would be expected within the CEAA, 2) hiding cover would be removed in the short-term (~15 to 20 years) on a relatively small portion (1.1%) of the CEAA, 3) approximately 81.7% of the CEAA would continue to provide hiding cover (40,588 acres), and 4) short-term increases in functional open road densities from 1.3 mi/sq. mi. to 1.4 miles/sq. mi. would be anticipated and long-term open road density would decrease slightly.

Sensitive Species

Bald Eagle

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

Introduction
Bald eagles are diurnal raptors associated with significant bodies of water, such as major rivers, lakes, and coastal zones. The bald eagle diet consists primarily of fish and waterfowl, but includes carrion, mammals, and items taken from other birds of prey. In northwestern Montana, bald eagles begin the breeding process with courtship behavior and nest building in early February; the young fledge by approximately mid-August, ending the breeding process. Preferred nest-stand characteristics include large emergent trees that are within site distances of lakes and rivers and screened from disturbance by vegetation.

Analysis Area
Direct and indirect effects were analyzed for activities conducted in the Project Area within 2.5 miles of the nest. Cumulative effects were analyzed on the Upper Stillwater Lake bald eagle territory home range. This cumulative effects analysis area includes the likely nesting home range area used by the pair of eagles, considering the size of such areas typically used by eagles breeding in western Montana.

Analysis Methods
Effects were analyzed using a combination of field evaluations and aerial photograph interpretation in the bald eagle home range. Bald eagle habitat is managed at 3 spatial scales, according to ARM 36.11.436; the nest area (area within a 0.25-mile radius of the active nest tree or nest sites that have been active within 5 years), the primary use area (within 0.50 miles of the nest tree), and the home range (area within 2.5 miles of all nest sites that have been active within 5 years). Factors considered in this analysis include disturbance levels and availability of snags and large, emergent trees with stout horizontal limbs for nests and perches.

Existing Environment
The Upper Stillwater Lake bald eagle nest site is located on a peninsula in Upper Stillwater Lake outside of the Project Area, but within 0.2 miles of the nearest proposed harvest unit. Use of this nest site by breeding bald eagles has been documented since at least 2015 (MNHP 2024, DNRC unpublished data). The aquatic habitat associated with this bald eagle territory includes Upper Stillwater Lake, Lagoni Lake, and Stillwater River, which are likely the primary foraging areas for eagles during the breeding season. Aquatic and terrestrial prey species are common in the home range. The terrestrial habitat in the Upper Stillwater Lake bald eagle territory is a coniferous/deciduous mixture along the lakeshores and riparian areas, with coniferous forests in the upland areas. Large emergent conifers provide important nesting, roosting, and perching sites. Human disturbance within the primary use area is moderate and includes a boat launch and associated motorized and non-motorized boat traffic, campground (0.3 miles), hiking trails, railroad corridor (0.1 miles), and open gravel roads. Therefore, these eagles are likely habituated to moderate amounts of motorized disturbance. Several large emergent trees are available across portions of the home range but logging in the last 100 years has likely reduced some of these trees, while others have experienced mortality and are declining in quality. Any

harvesting that may be occurring on other ownerships in the home range could continue to disturb bald eagles or modify their habitats.

Environmental Effects

No Action Alternative: Direct and Secondary Effects on Bald Eagles
No direct or indirect effects to bald eagles would be expected. Human disturbance would continue at approximately the same levels. No changes in available nesting or perching structures would occur. Thus, since: 1) no changes to human disturbance levels would occur; and 2) no changes in the availability of large, emergent trees would be expected, negligible direct and indirect effects would be expected to affect bald eagles using the territory.

Action Alternative: Direct and Secondary Effects on Bald Eagles
Under the action alternative, approximately 19 acres of harvest would occur in the nest area, 150 acres of harvest would occur in the primary use area, and 951 acres would occur in the home range of the Upper Stillwater Lake bald eagles. Of these acres, proposed commercial harvest on 14 acres within the nest area, 102 acres in the primary use area, and 345 acres in the home range would remove mature trees and vegetative cover, therefore reducing some structural and ecological characteristics important to eagles. Additional commercial harvest on 6 acres in the primary use area and 364 acres in the home range would retain important habitat characteristics such as large emergent trees, snags, and potential perch and roost trees. Pre-commercial thinning on the remaining harvested acres in each area would have negligible effects on bald eagle habitat. In all harvest units, at least 2 snags and 2 snag recruits per acre would be retained to provide potential nesting and roosting sites for eagles. To reduce disturbance and minimize effects to bald eagles during the nesting season, commercial harvest would not be permitted from February 1 – August 15 within ½ mile of the nest with the exception of a small portion in the northeastern part of the primary use area where commercial harvesting over 0.4 miles from the nest and the far side of the railroad corridor would be permitted during this time period. Additionally, pre-commercial thinning that does not involve heavy equipment (e.g. chainsaws only), would be allowed during the timing restriction in units T and U, which are east of the railroad tracks. No harvest would occur within 600 feet of the nest tree or on the lakeshore. The potential for temporary displacement would only be expected to affect eagles during the physical harvest activities and not beyond. Public motorized access within the home range would not appreciably change. Thus, low direct and indirect effects to bald eagles would be anticipated since: 1) disturbance could be elevated in a portion of the territory during operations but timing restrictions would minimize nearby disturbance during nesting; 2) no change in long-term, motorized human access in the Project Area would occur; 3) most harvesting would occur in upland areas not likely used by this pair of eagles, and 4) negligible changes in the availability of large, emergent trees within 100 feet of Upper Stillwater Lake would be expected.

No-Action Alternative: Cumulative Effects on Bald Eagles
Nesting bald eagles would continue to experience varying levels of disturbance from the ongoing recreational use as well as any ongoing timber management on other nearby ownerships. Additionally, human developments on private lands and the potential disturbance associated with the railroad and Highway 93 corridors would continue to provide potential sources of disturbance to the territory. Emergent trees exist across portions of the home range. No further changes in human disturbance, development, recreation, timber harvesting, or firewood gathering within the home range area would be anticipated. Thus, no cumulative

effects to bald eagles would be expected since: 1) no changes to human disturbance levels would occur, and 2) no changes in the availability of large, emergent trees would be expected.

Action Alternative: Cumulative Effects on Bald Eagles
Nesting bald eagles would continue to experience varying levels of disturbance from the ongoing recreational use of the vicinity, as well as any ongoing timber harvesting. Additionally, human developments on private lands and the disturbance associated with the railroad and Highway 93 corridor would continue to provide potential sources of disturbance to the territory. Any potential disturbance and/or noise from the proposed harvesting would be additive to any of these other forms of disturbance; however, no changes in bald eagle behavior would be anticipated. Emergent trees exist across ownerships in the home range. Thus, minor cumulative effects to affect bald eagles would be anticipated since: 1) disturbance would be temporarily elevated within the territory during harvesting operations; 2) no long-term changes in public motorized access within the territory would occur; and 3) negligible changes in the availability of large, emergent trees in eagle foraging areas would be expected.

FISHER

Issue
The proposed activities could decrease habitat suitability for fishers by decreasing canopy cover in mature forest stands, decreasing abundance of snags and coarse woody debris, and by increasing roads, which could elevate risk of trapping mortality.

Introduction
In the Rocky Mountains, fishers prefer mesic late-successional forests with complex vertical and horizontal structure, large-diameter trees, and relatively dense canopies (Schwartz et al. 2013, Raley et al. 2012). Fishers generally avoid large openings, clearcuts, and ponderosa pine and lodgepole pine stands (Schwartz et al. 2013). Fishers prey upon snowshoe hares, ungulate carrion, porcupines, birds, and small mammals as well as seasonally available fruits and berries. Fisher resting and denning sites are found in cavities of live trees and snags, downed logs, brush piles, mistletoe brooms, squirrel and raptor nests, and holes in the ground. Forest-management considerations for fishers involve providing upland and riparian resting and denning habitat, retaining adequate snags and downed woody debris, 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 Project Area and the analysis area for cumulative effects is the 18,782-acre Small CEAA as described in TABLE WI-1 and depicted in FIGURE WI-1. The Small CEAA is centered on the Project Area and is defined according to geographic features and could support the home range of at least one male and female fisher given enough suitable habitat; providing a reasonable analysis area for fishers that could be influenced by project-related activities.

Measurement Criteria
Factors considered in the analysis include: 1) the degree of harvesting, 2) availability and structure of preferred fisher habitats, 3) landscape connectivity, and 4) human access as it relates to risk of trapping mortality. Habitat structure considered appropriate for fisher use includes stands with 40-100% total stocking density with ≥10% canopy closure of mature (≥9 inches dbh). On other ownerships, potential fisher habitat was identified using lidar canopy height models to detect areas of mature forest (≥40% canopy closure of trees >65 feet in height) situated below 6,000 feet in elevation.

Affected Environment

The proposed Project Area contains 1,468 acres (53.0% of Project Area) of potentially suitable riparian and upland fisher habitat. These acres contain habitat features necessary for fisher resting and denning sites and serve to maintain landscape connectivity. Additionally, there are approximately 385 acres (13.8% of Project Area) of temporarily non-suitable habitat which consists of cover types preferred by fishers, but these stands are currently lacking the structural components (e.g., large trees) necessary for use by fishers. The remaining 919 acres (33.2%) are not considered fisher habitat because they are not the correct cover types. Fisher habitat is scarce and scattered in the northern part of the Project Area and is more abundant and connected in the southern portion of the Project Area. Habitat connectivity throughout the Project Area is impacted by prior forest management, landscape features (e.g. lakes), and human development (e.g. highway and railroad corridors). Open roads facilitate firewood gathering, which can affect the abundance of snags and CWD used by fishers. Additionally, open roads can also offer trappers convenient access which increases trapping risk to fishers should they be using the area. Approximately 23.5 miles (5.4 miles/sq. mile) of roads exist in the Project Area, of which 17.7 miles (4.1 miles/sq. mile) are open to public motorized use and 5.7 miles (1.3 miles/sq. mile) are restricted to public motorized use. Overall, fisher habitat suitability and connectivity within the Project Area is moderate and risk factors are high. Use of the Project Area by fishers is possible, but appreciable use is unlikely due to the factors listed above and lack of recent sightings or detections in the area (MNHP 2024, Krohner et. al 2022).

Historical records of fisher occurring in the Small CEAA within the last 20 years are lacking (MNHP 2024, Krohner et. al 2022). However, fisher use of the CEAA is unlikely but possible. Within the CEAA, there are 9,196 acres (49.0% of the CEAA) of potentially suitable fisher habitat. Fisher habitat is patchy throughout the CEAA but generally more abundant with higher connectivity in the southern and western areas of the CEAA. Multiple creeks, rivers, and lakes in the CEAA provide riparian habitat. There are approximately 60.8 miles of open roads (2.1 miles/sq. mile) in the CEAA could facilitate trapper access, however many of these roads are not plowed which limits some access during typical winter conditions. Trapping of fishers is not currently legal inside the CEAA, however they can be trapped incidentally in traps set for other target species. Habitat suitability for fishers and risk factors within the CEAA are moderate.

Environmental Effects – Fisher

No Action Alternative: Direct and Secondary Effects on Fishers

Under this alternative, no proposed project activities would occur. Thus, no direct or indirect effects associated with fisher habitat suitability or trapping mortality risk would be anticipated as a result of the No-Action Alternative.

No Action Alternative: Cumulative Effects on Fishers

Under this alternative, no proposed project activities would occur. Past forest management projects not associated with the proposed Upper Stillwater Forest Management Project have affected fisher habitat in the CEAA, and ongoing and proposed projects could alter fisher habitat in the future (TABLE WI-2). Activities on non-DNRC lands could continue altering fisher habitat and create increased trapping risk within the CEAA. Thus, since no additional changes in available habitat or level of human access would be anticipated as a result of the No-Action Alternative, no cumulative effects to fisher habitat suitability or trapping mortality risk would be anticipated.

Action Alternative: Direct and Secondary Effects on Fishers

Approximately 820 acres of the 1,468 acres (55.9%) of suitable fisher habitat in the Project Area would be harvested under the Action Alternative. Approximately 603 acres of fisher habitat would receive harvest treatments that would likely yield stands lacking forest structure suitable for appreciable use by fishers for 80 years. Approximately 865 acres (58.9% of available habitat) of suitable fisher habitat would remain in the Project Area post-harvest. Additionally, within the next 20 years, 50.0 acres of stands that currently do not possess the structural attributes necessary for fishers would likely mature into suitable habitat. In all areas, harvest prescriptions call for retention of at least 2 snags and 2 snag recruits per acre (≥21 in. dbh) where they exist, otherwise the next largest size class. In addition, 7 to 25 tons of coarse woody debris per acre would be planned for retention within harvest units. However, 205 acres of the Project Area could undergo prescribed burning after harvest which could further limit downed wood in these areas. Long-term open road density during the trapping season would decrease slightly from 4.1 miles/sq. mile to 4.0 miles/sq. mile under the Action Alternative. The clearing of overgrown roads and construction of temporary roads could increase trapping risk by a minor degree by making some areas more accessible to snowmobiles. The potential future risk for snag and coarse woody debris loss due to firewood gathering would not be expected to appreciably change. Thus, minor adverse direct and indirect effects would be anticipated that would affect fisher habitat suitability in the Project Area since: 1) existing baseline suitability and connectivity of fisher habitat within the Project Area is moderate and existing use by fishers is unlikely, 2) 865 acres (31.2% of the Project Area) would remain as suitable habitat, 3) harvesting would reduce suitable fisher habitat in the Project Area by 41.1%, 4) overall habitat connectivity would be reduced but riparian habitat would be minimally affected, 5) some large snags, snag recruits, and coarse woody debris would be retained, and 6) overall risk factors associated with motorized human access levels would increase to a minor degree.

Action Alternative: Cumulative Effects on Fisher

Approximately 820 acres (11.3%) of 7,227 acres of suitable fisher habitat in the Small CEAA would be harvested. Of these acres, approximately 603 acres (8.3% of available) of suitable habitat would lower overstory crown closure enough to render it temporarily unsuitable for use by fishers. Reductions in fisher habitat would be additive to the changes associated with current and planned timber harvesting in the CEAA (TABLE WI-2), and past harvesting within the last 40 years. Approximately 6,624 acres of the 18,782-acre cumulative effects analysis area (35.2%) would remain as suitable fisher habitat. Reductions in landscape connectivity of suitable fisher habitat within the CEAA would occur; however most existing suitable forest stands along riparian areas would persist and appreciable effects on fisher use of the CEAA would not be expected. The potential future risk for snag and coarse woody debris loss due to firewood gathering would not be expected to appreciably change. Potential trapping mortality would be minimally influenced, as there would be no change in public motorized access during the trapping season. Thus, minor adverse cumulative effects would be anticipated that would affect fisher habitat suitability within the CEAA since: 1) existing baseline suitability and connectivity of fisher habitat within the CEAA is moderate but appreciable use of the CEAA by fishers is unlikely, 2) 6,624 acres (35.2% of the Project Area) would remain as suitable habitat, 3) harvesting would alter tree density, snags, and stand structure in 11.3% of existing suitable fisher habitat within the CEAA, 4) suitable fisher habitat would remain connected within riparian areas where present but overall habitat connectivity would be reduced, and 6) no appreciable change in the risk of snag/coarse woody debris loss and trapping mortality would be expected.

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

Analysis Area

The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 18,782-acre Small CEAA as described in TABLE WI-1 and depicted in FIGURE WI-1. The Small CEAA is centered on the Project Area and provides a sufficient area to support multiple pairs of pileated woodpeckers if enough suitable habitat is present (Bull and Jackson 2011).

Measurement Criteria

Factors considered in the analysis include: 1) the degree of harvesting and 2) the amount and structure of pileated woodpecker preferred habitat types. On DNRC-managed lands, sawtimber stands averaging ≥100 years old within preferred pileated cover types (ARM 36.11.403(63)) with ≥40% canopy closure were considered potential pileated woodpecker habitat. On non-DNRC lands, lidar canopy height models and vegetation maps were used to identify potential pileated woodpecker habitat. Pileated woodpecker habitat was defined as any stand with at least 40% canopy closure of trees greater than 65 feet in height and of an appropriate forest type.

Affected Environment

In the Project Area, there are approximately 917 acres (33.1% of Project Area) of potential pileated woodpecker habitat. Current potential pileated habitat within the Project Area consists primarily of mature Douglas-fir and western larch forest. Suitable habitat is patchy and poorly represented in the northern portion of the Project Area and moderately represented within the southern portion of the Project Area. Snags and coarse woody debris within the proposed Project Area are sufficient for suitable pileated woodpecker. However, firewood gathering, which can result in a reduction of snags and downed logs valuable as woodpecker nesting and foraging substrates, is likely due to the abundance of open roads within the Project Area. Thus, habitat quality and abundance is moderate within the Project Area.

The Small CEAA contains approximately 5,137 acres (27.4% of the CEAA) of potential pileated woodpecker habitat. Of these acres, 2,174 acres (11.6% of the CEAA) are located within DNRC lands. The largest patch of potentially suitable habitat is located just west of the Project Area and is 1,225 acres in size. The second largest patch of potentially suitable habitat (758 acres) includes 448 acres inside the Project Area. Appreciable use of the CEAA and Project Area by pileated woodpeckers would be expected. Recent harvesting on 2,783 acres (14.8% of the CEAA) on DNRC and USFS lands within the last 25 years has altered forest habitat and created

forest conditions unsuitable for use by pileated woodpeckers. Thus, habitat quality and availability for pileated woodpeckers within the CEAA is currently moderate.

Environmental Effects – Pileated Woodpeckers

No Action Alternative: Direct and Secondary Effects on Pileated Woodpeckers

Under this alternative, no proposed project activities would occur. Thus, no direct or indirect effects to pileated woodpecker habitat suitability would be anticipated as a result of the No-Action Alternative.

No Action Alternative: Cumulative Effects on Pileated Woodpeckers

Under this alternative, no proposed project activities would occur. Past forest management projects not associated with the proposed Action Alternative have affected pileated woodpecker habitat in the CEAA, and ongoing and proposed projects could affect habitat suitability in the future (TABLE WI-2). Activities on non-DNRC lands could continue altering pileated woodpecker habitat within the CEAA. Thus, since no additional changes in available habitat would be anticipated as a result of the No-Action Alternative, no cumulative effects to pileated woodpecker habitat suitability would be anticipated.

Action Alternative: Direct and Secondary Effects on Pileated Woodpeckers

The proposed activities would occur in 540 acres (58.9% of available) of the 917 acres of pileated woodpecker habitat available in the Project Area. Proposed harvest prescriptions on 432 acres (47.1% of available) would open stands to <40% canopy cover causing the structure of these stands to become unsuitable for appreciable use by pileated woodpeckers. The remaining 108 acres would undergo less intensive harvesting and would likely retain some suitable habitat for pileated woodpeckers post-harvest, although fewer large trees and snags available for nesting and foraging. Patch size and connectivity of suitable habitat would be reduced, particularly in the southern portion of the Project Area. Several remaining patches would remain connected to larger patches of suitable habitat outside of the Project Area. However, the largest habitat patch within the Project Area would be partially removed and remaining patches would be narrow and lacking interior habitat. Three patches over 50 acres in size would remain within the Project Area and could provide breeding habitat for pileated woodpeckers. Some snags would be removed by the proposed harvest, but at least 2 large snags and 2 large snag recruitment trees per acre (>21 inches dbh, or next largest size class) would be retained where present (ARM 36.11.411). Approximately 7 to 25 tons of coarse woody debris per acre would also be left in harvest units, with an emphasis on downed logs >15 inches diameter. Disturbance associated with harvesting could adversely affect pileated woodpeckers within the Project Area for up to 4 years, should they be present. Thus, high adverse direct and indirect effects to pileated woodpecker habitat suitability in the Project Area would be anticipated as a result of the Action Alternative since: 1) harvesting would reduce pileated woodpecker suitable habitat availability by 432 acres (47.1% of existing), and 17.5% of the Project Area (485 acres) would remain suitable habitat; 2) forest structural changes would occur, but mitigations would include retention of snags and coarse woody debris (ARM 36.11.411, ARM 36.11.414), as well as large-diameter seral species; 3) connectivity would decline and the average patch size of suitable habitat would decrease from 54 to 18 acres and three patches over 50 acres would remain; and 4) pileated woodpeckers could be temporarily displaced for up to 4 years due to disturbance from forest management activities.

Action Alternative: Cumulative Effects on Pileated Woodpeckers

Under this alternative, pileated woodpecker habitat would be altered on 540 acres (2.9% of Small CEAA) of the 5,138 acres of potentially suitable habitat in the CEAA. Harvesting would remove 434 acres (8.4% of available) of suitable pileated woodpecker habitat for the next 40 to

60 years. Habitat suitability would decrease due to a decrease in the average patch size from 22 to 19 acres and an increase in the number of patches from 231 to 242 which indicates habitat fragmentation. The largest habitat patch would not be impacted by harvest, and 13 patches >50 acres would remain in the CEAA. These patches would be expected to continue to provide breeding habitat for pileated woodpeckers. Past harvesting in the CEAA has altered the quality and abundance of pileated woodpecker habitat. Reductions associated with this Action Alternative would be additive to past reductions and to habitat reductions associated with 554 acres of active harvest and 707 acres of proposed harvest (TABLE WI-2). Suitable habitat would remain present on 4,704 acres (25.0% of the CEAA) and continued use of the CEAA by breeding pileated woodpeckers would be anticipated. Snags, coarse woody debris, and potential nesting trees would be retained in the Project Area according to forest management ARM 36.11.41; however, snags and live trees would be reduced from existing levels in all of the proposed harvest units. Disturbance associated with the proposed activities could adversely affect pileated woodpeckers in the vicinity of the Project Area for up to 4 years. Timber harvesting throughout the CEAA and firewood gathering along open roads would continue to limit the abundance of snags and woody debris within more accessible areas of the CEAA. Thus, moderate cumulative effects to habitat suitability for pileated woodpeckers would be anticipated since: 1) 8.4% of suitable pileated woodpecker habitat currently present within the CEAA would be altered; 2) approximately 25.0% of the CEAA would contain suitable habitat post-harvest; 3) patch size of suitable habitat would decrease and connectivity of suitable habitat would be altered within the CEAA; and 4) some snags and snag recruits would be removed in the proposed harvest areas for operational and human safety purposes, however, mitigation measures would retain at least 2 large snags and 2 large recruitment trees per acre, as well as 7 to 25 tons per acre of coarse woody debris in harvested areas.

Hoary Bat

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

Introduction
The hoary bat is a large insectivorous bat species that is found throughout Montana, though not in high numbers. Solitary creatures, hoary bats roost alone in foliage and under the thick bark of Douglas firs, ponderosa pines, and cottonwoods 10 to 40 feet above the ground. They prefer live trees and snags at the edge of clearings but have also been found in dense forests, open wooded glades, and shade trees along urban streets and in city parks (Anderson 2002). Hoary bats reach their peak activity at about five hours after sunset, often feeding in open spaces such as over water and roads, in forest clearings, and along forest edges. Females have been documented traveling one-way distances up to 20 km from day roosts while on first of up to five nightly foraging bouts in Manitoba Canada (Barclay 1989). The bats begin arriving in Montana each spring during May, and in September fly south for warmer climates. Hoary bats have been observed near the Project Area (MNHP 2024) and are considered common and widespread throughout Montana, but wind energy and diseases such as white-nosed syndrome pose threats to their population (Bachen et al. 2020).

Analysis Area
The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 18,782-acre Small CEAA as described in TABLE WI-1 and depicted in

FIGURE WI-1. The CEAA is centered on the Project Area and provides a sufficient area to support foraging if enough suitable habitat is present (Barclay 1989).

Measurement Criteria
Factors considered in the analysis include: 1) the degree of harvesting and 2) the amount and structure of hoary bat preferred habitat types.

Affected Environment
The Project Area there are 2,772 acres of suitable hoary bat habitat which consist of a mosaic of conifer forest types and age classes as well as riparian habitat, wetlands, and lakes. Snags and coarse woody debris within the proposed Project Area are sufficient, but likely at lower levels in the northern part of the Project Area where open and unauthorized roads allow access for firewood gathering, which can result in a reduction of snags valuable as roosting sites. Several open meadows with shallow wetlands within the project area, and the Stillwater River corridor adjacent to the Project Area, provide foraging habitat for hoary bats. Thus, habitat quality is high for hoary bats within the Project Area.

The CEAA contains approximately 18,782 acres of potential hoary bat habitat. Of these acres, 9,125 acres (48.6% of the CEAA) are located within DNRC lands. Use of the CEAA and Project Area by hoary bats would be expected. Recent harvesting on 2,783 acres (14.8% of the CEAA) within the last 25 years has altered forest habitat and created forest conditions potentially less suitable for roosting by hoary bats due to the reduction in mature trees; however, these areas may still be used, or even preferred, for foraging. Thus, habitat quality and availability for hoary bats within the CEAA is currently high.

Environmental Effects – Hoary Bats
No Action Alternative: Direct and Secondary Effects on Hoary Bats
Under this alternative, no proposed project activities would occur. Thus, no direct or indirect effects to hoary bat habitat suitability would be anticipated as a result of the No-Action Alternative.

No Action Alternative: Cumulative Effects on Hoary Bats
Under this alternative, no proposed project activities would occur. Past forest management projects not associated with the proposed Action Alternative have affected hoary bat habitat in the CEAA, and ongoing and proposed projects could affect habitat suitability in the future (TABLE WI-2). Activities on non-DNRC lands could continue altering hoary bat habitat within the CEAA. Thus, since no additional changes in available habitat would be anticipated as a result of the No-Action Alternative, no cumulative effects to hoary bat habitat suitability would be anticipated.

Action Alternative: Direct and Secondary Effects on Hoary Bats
The proposed activities would alter 1,462 acres (52.7%) of hoary bat habitat in the Project Area. Regeneration prescriptions on 714 of these acres would remove most potential roosting trees and snags. However, harvested acres would remain suitable for foraging after harvest activities are completed. Because hoary bats typically roost in trees and snags, they could be temporarily disturbed by timber harvesting for up to four years. Potential disturbance would only be expected from May through September, when hoary bats are in Montana. After the conclusion of activities, continued use of the Project Area, including harvested areas, by hoary bats would be anticipated. At least 2 large snags and 2 large snag recruitment trees per acre (>21 inches dbh, or largest size class available) would be retained and could provide roosting sites (ARM 36.11.411). Thus, low adverse direct and indirect effects to hoary bat habitat suitability in the

Project Area would be anticipated as a result of the Action Alternative since: 1) harvesting would reduce suitable roosting habitat in 25.8% of the Project Area; 2) forest structural changes would occur, but mitigations would include retention of snags and coarse woody debris (ARM 36.11.411, ARM 36.11.414), as well as large-diameter seral species; 3) hoary bats use recently logged areas and openings for foraging; and 4) hoary bats could be temporarily displaced for up to 4 years by forest management activities occurring during the summer season.

Action Alternative: Cumulative Effects on Hoary Bats
Under this alternative, hoary bat habitat would be altered on 1,462 (7.8%) of the 18,782 acres of potentially suitable roosting habitat in the Small CEAA. Harvesting would reduce potential hoary bat roosting habitat and would be additive to past harvesting in the CEAA (TABLE WI-2). Roosting and foraging habitat would remain abundant in the CEAA and continued use of the CEAA by hoary bats would be anticipated. Snags, coarse woody debris, and potential nesting trees would be retained in the Project Area according to forest management ARM 36.11.411 and 36.11.414; however, snags and live trees would be reduced from existing levels in all of the proposed harvest units. Disturbance associated with the proposed activities could adversely affect hoary bats in the vicinity of the Project Area for up to 4 years if occurring during the summer season when bats are present. Timber harvesting throughout the CEAA and firewood gathering along open roads would continue to limit the abundance of snags and woody debris within more accessible areas of the CEAA. Thus, low cumulative effects to habitat suitability for hoary bats would be anticipated since: 1) 7.8% of suitable hoary bat habitat currently present within the CEAA would be altered; 2) abundant suitable roosting and foraging habitat would persist on the landscape after harvest and hoary bats would continue to use the area; and 3) some snags and snag recruits would be removed in the proposed harvest areas for operational and human safety purposes, however, mitigation measures would retain at least 2 large snags and 2 large recruitment trees per acre in harvested areas.

BIG GAME

ELK, MOOSE, WHITE-TAILED DEER, AND MULE DEER WINTER RANGE

Issue
The proposed activities could reduce habitat quality for big game, especially during the fall hunting and winter seasons, by removing forest cover, and disturbing animals.

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

Timber harvesting can increase big game (e.g., elk) vulnerability by changing the size, structure, juxtaposition, and accessibility of areas that provide security during times of hunting pressure

(Hillis et al. 1991). As visibility and accessibility increase within forested landscapes, elk and deer have a greater probability of being observed and, subsequently, harvested by hunters. Because the female segments of the elk and deer populations are normally regulated carefully during hunting seasons, primary concerns are related to a substantial reduction of male animals and resulting decrease in hunter opportunity.

Analysis Area
The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 49,673-acre Large CEAA as described in TABLE WI-1 and depicted in FIGURE WI-1. The Large CEAA is defined according to geographic features (e.g., watershed boundaries, state highways), which provide a reasonable biological analysis unit for big game animals that could be influenced by project-related activities.

Measurement Criteria
Factors considered in the analysis include: 1) the degree of timber harvesting, 2) the availability and structure of forest cover on big game winter range, and 3) the level of human access for recreational hunting. Big game thermal cover was considered mature forested habitat (as identified by lidar canopy height models) with ≥60% canopy cover in the Large CEAA. Marginal thermal cover with mature canopy cover between 40% and 60% was also identified.

Hiding cover on DNRC lands was estimated by evaluating forest stand size class and the total crown density of all trees in the stand using GIS and forest inventory data. On non-DNRC lands, hiding cover was identified using lidar canopy height/canopy closure models and was considered vegetation greater than 2 feet in height.

Affected Environment
The Project Area contains 535 acres (19.3%) of white-tailed deer winter range, 573 acres (20.7%) of mule deer winter range, 2,772 acres (100%) moose and elk winter range, as identified by DFWP (2008). Evidence of summer deer use was also observed during field visits to the Project Area. The Project Area contains approximately 2,226 acres (80.3% of the Project Area) of habitat that is currently providing hiding cover for big game. Approximately 1,098 acres (39.6% of the Project Area) provides thermal cover and snow intercept for wintering big game. Patches of thermal cover within the Project Area are poorly connected and patchy. Lakes, wetlands, rocky areas, past forest management and existing roads break up connectivity of thermal cover in the Project Area. Another 390 acres of marginal thermal cover is also present. The density of open roads in the Project Area is 4.1 miles/sq. mile and total road density is 5.4 miles/sq. mile. Human disturbance in the Project Area is high due to the proximity to Highway 93 and open roads that provide abundant recreational opportunities in and adjacent to the Project Area. Elk security habitat as defined by Hillis et. al. (1991), is not present in the Project Area due to existing roads, vegetation, and landscape features. Overall, the northern portion of the Project Area provides low values of winter range cover, moderate levels of hiding cover, and high levels of human disturbance due to the abundance of roads and human use in that area. In the southern portion of the Project Area there are moderate levels of winter range thermal cover and hiding cover, and low levels of disturbance where open roads are less prevalent.

Within the Large CEAA, white-tailed deer winter range occupies approximately 12,273 acres (24.7%), 17,236 acres (34.7%) is mule deer winter range, 42,201 acres (85.0%) is elk winter range, and 49,673 acres (100.0%) is moose winter range. Presently, approximately 22,761 acres (45.8%) within the CEAA are providing thermal cover and snow intercept for big game. An additional 4,740 acres of marginal thermal cover is also present. In the last 25 years, up to 7,144 acres (14.4% of the CEAA) of harvesting on DNRC and USFS managed lands has

reduced thermal cover and snow intercept on big game winter range within the CEAA. Recent harvests have reduced the quality and quantity of usable cover on winter range within the area, but they may have increased forage quality and quantity by opening the forest overstory canopy. However, forage occurring in forest openings is often not available to wintering animals during appreciable portions of the winter due to deep, crusted snow conditions. Encroachment of noxious weeds into recently logged areas has also likely offset some of the potential gain in forage production. Open road density within the CEAA is 1.3 miles/sq. mile and total road density is 2.8 miles/sq. mile. The CEAA also likely receives moderate levels of hunter access, especially in areas where roads, both open and restricted, are more numerous. Overall, winter range habitat quality and big game security are moderate within the CEAA.

Environmental Effects

No Action Alternative: Direct and Secondary Effects on Big Game

No changes in big game habitat would be expected as no timber harvesting activities would occur. Existing cover would continue to contribute to winter range quality and visual screening would not be altered in the short term. No appreciable changes to winter carrying capacity would be anticipated. No direct effects to big game winter ranges would be anticipated. Since subtle changes in thermal cover due to continued tree mortality and successional advances would not change appreciably, and the levels of human disturbance would remain similar, indirect effects to big game winter ranges would be negligible adverse effects that gradually affect the winter ranges and the deer that use this resource during the next few decades. Thus, no immediate direct or indirect effects to big game habitat in the Project Area would be anticipated since: 1) no changes to big game habitat would be anticipated and continued mortality and successional advances would not change appreciably, and 2) the level of human access would remain unchanged.

No Action Alternative: Cumulative Effects on Big Game

No additional changes in big game habitat would be expected as no timber harvesting activities would occur. Stands that are providing thermal cover and snow intercept would be expected to continue providing these attributes. Past and ongoing forest management projects not associated with the proposed Upper Stillwater Forest Management Project have affected big game habitat in the Project Area, and other proposed projects could disturb big game species and/or alter habitat quality in the future (TABLE WI-2). Activities on other ownerships could continue altering big game winter range habitat and create disturbance within the CEAA. Gradual reductions in canopy cover and mature forest habitat suitability are likely to continue due to tree mortality from insects and disease, primarily Douglas-fir bark beetle. Human disturbance levels across the winter ranges would be anticipated to continue at similar levels, including the elevated levels due to USFS harvesting. No additional cumulative effects to big game habitat quality are expected to result from the No-Action Alternative that could affect big game species in the CEAA since: 1) no big game habitat would be altered and continued maturation of forest cover in harvested areas would improve thermal cover and snow intercept, and 2) the level of human access would remain unchanged.

Action Alternative: Direct and Secondary Effects on Big Game

Under the Action Alternative, approximately 1,462 acres (52.8% of Project Area) of big game habitat would be impacted by harvest within the Project Area. Currently, there are 1,098 acres (39.6% of Project Area) of big game thermal cover/snow intercept in the Project Area. Of these acres, approximately 560 acres (51.0% of available) would be altered by the proposed harvest activities. Harvest on 396 of these acres (36.1% of available) would result in forest canopy too open to effectively function as thermal cover or snow intercept for the next 40-60 years. Post-harvest, 702 acres (25.3% of Project Area) in the Project Area would continue to function as

thermal cover and snow intercept for big game. Thermal cover would remain scattered and poorly connected throughout the Project Area. Proposed timber harvesting would not prevent big game movement through the Project Area in winter and could stimulate browse production within the units.

The proposed Action Alternative would impact approximately 1,396 acres of hiding cover (62.7% of existing hiding cover within the Project Area). Sight distances would increase within all proposed harvest units, however proposed commercial thin, pre-commercial thin, overstory removal, and old growth maintenance prescriptions (862 acres, 61.7% of available) would retain tree densities that would continue to provide hiding cover. Clear cut, seed tree, and shelterwood prescriptions on 534 acres (38.3% of available hiding cover) would remove the ability of these stands to hide or screen big game. Topographic breaks and the retention of some regenerating conifers and submerchantable trees within harvest units would reduce sight distances and provide some hiding cover within proposed harvest units. Hiding cover in harvest units would be expected to recover within 15 to 20 years following proposed treatments as shrub and tree regeneration proceeds. Post-harvest, 1,692 acres (61.1% of Project Area) of hiding cover would remain in the Project Area. Additionally, three wildlife travel corridors would be retained along Dog Creek, Rock Creek and through a draw west of Spring Creek and would continue to provide hiding cover for animals moving through the area.

Short-term (1-4 years) displacement of big game would be expected as a result of the proposed motorized logging disturbance. Approximately 1.8 miles of temporary road would be constructed. Approximately 5.2 miles of existing restricted road, 0.4 miles of abandoned road, and 9.2 miles of open road within the Project Area would see a temporary increase in use during harvest activities. During all phases of the project, any currently restricted roads would be restricted from motorized use by the public and remain closed after completion of project activities. Long-term open road density would be reduced slightly from 4.1 to 4.0 miles/sq. mile with the obliteration of 0.6 miles of existing open road. The level of human access would remain similar or be greater during active harvesting as a result of the proposed motorized logging equipment.

Thus, moderate adverse direct and indirect effects to big game security habitat and winter range habitat quality would be expected since: 1) 51.0% of available thermal cover in the Project Area would be altered by harvesting and 25.3% (702 acres) of the Project Area would continue to provide thermal cover/snow intercept; 2) 38.3% of hiding cover within the Project Area would be removed by harvesting; 3) relatively short-term logging activities would create disturbance in this area; 4) the behavioral adaptability of white-tailed deer, such as winter feeding on lichens and food sources made more available by timber harvesting; and 5) long-term open road density would decrease slightly.

Action Alternative: Cumulative Effects on Big Game

The proposed Action Alternative would impact 1,462 acres (2.9%) of big game habitat in the Large CEAA. The proposed harvesting would alter 560 acres (2.5% of available) of thermal cover in the CEAA. Forest stands providing thermal cover and snow intercept would be removed by harvesting on 396 acres (1.7%) of the 22,761 acres of existing thermal cover. These acres would be too open to provide adequate thermal cover/snow intercept after project completion. This reduction in thermal cover and snow intercept would be additive to past reductions and to the 1,261 acres of proposed or ongoing DNRC forest management projects within the CEAA (TABLE WI-2). The proposed activities would alter 1,396 acres of hiding cover and remove 534 acres of hiding cover (1.2% of available) of hiding cover in the CEAA. Some dense patches of regenerating conifers (>6 feet height) and some canopy cover would be

retained, providing some residual cover in harvest units. Appreciative changes in big game distribution or abundance during the winter would not be expected at the scale of the CEAA.

Harvesting and motorized disturbance within the CEAA associated with the proposed project could temporarily displace wintering big game for up to 4 years, with elk most affected. Under the Action Alternative, use of existing restricted roads and construction of temporary roads for harvesting activities could temporarily increase access and disturbance on 12.4 miles of open road and 9.8 miles of restricted and temporary roads within the CEAA. After harvesting, there would be a minor decrease in open road density, however an extensive network of open and restricted roads would continue to facilitate moderate amounts of hunter and recreational access.

Thus, minor adverse cumulative effects to big game winter range and big game security would be expected since: 1) Harvesting would remove 1.7% (396 acres) of hiding cover and 40,588 (81.7% of CEAA) acres would remain 2) existing thermal cover and snow intercept on winter range in the CEAA would be altered, but approximately 22,345 acres (45.0% of CEAA) of stands with these attributes would remain after harvest; 3) some canopy cover and regenerating conifer patches would be retained in harvest units; 4) overall habitat quality and connectivity within the larger winter range would not be appreciably altered; 5) logging activities would create additional disturbance on a minor portion of the CEAA and be additive to existing forest management activities in the area; and 6) temporary road would be built but long-term open road densities would not change appreciably.

Wildlife Mitigations

- If a threatened or endangered species is encountered, consult a DNRC biologist immediately. Similarly, if undocumented nesting raptors are encountered within ½ mile of the Project Area contact a DNRC biologist.
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while on duty as per *ARM 36.11.432(1)(c)*.
- Contractors will adhere to food storage and sanitation requirements as described in the timber sale contract. Ensure that all attractants such as food, garbage, and petroleum products are stored in a bear-resistant manner *ARM 36.11.432(1)(d)*.
- Prohibit all harvesting-related motorized activities more than 100 feet from open roads from April 1 – June 15 per *ARM 36.11.432 (2)(c)*.
- Restrict public access at all times on restricted roads that are opened for harvesting activities. Effectively close all restricted roads following harvest completion.
- Within seed tree or clear cut treatment units, no point in the harvest unit can be >600 feet to hiding cover or a topographic break per *ARM 36.11.432(2)(d)*.
- Provide visual screening along open roads to the extent practicable by retaining available submerchantable trees and brush.
- Close roads and trails to the maximum extent possible following the proposed activities to reduce the potential for unauthorized motor vehicle use and/or loss of snags to firewood gathering.
- Retain patches of advanced regeneration of shade-tolerant trees within commercial harvest units as per *ARM 36.11.428 (4)(f).* Where broadcast burning is prescribed, work with biologists and burn crews to minimize the loss of these patches.
- In all pre-commercial thinning units, retain small, shade-tolerant trees that do not pose competition risks to crop trees as per *ARM 36.11.428 (4)(e).*

- Prohibit mechanized forest management activities within ½ mile of the Upper Stillwater Lake bald eagle nest from February 1 – August 15 to protect nesting bald eagles per *ARM 36.11.436 (7).* Harvesting would be permitted during this time period within ½ mile of the nest in a small portion in the northeastern part of the primary use area where commercial harvesting occurs over 0.4 miles from the nest and in pre-commercial thinning units T and U if heavy equipment is not used.
- Retain at least 2 snags and 2 snag recruits per acre (>21" dbh or largest available size class), particularly favoring western larch, ponderosa pine and Douglas-fir for retention. If snags are cut for safety concerns, leave them in the harvest unit. Retain coarse-woody debris as described in the Forest Management ARMs and *SOILS ANALYSIS* in this document.
- Retain 7 to 25 tons/acre coarse-woody debris according to *ARM 36.11.414* and emphasize retention of 15-inch diameter downed logs aiming for at least one 20-foot-long section per acre *ARM 36.11.428 (4)(b).*

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Figure WI-1 – Wildlife analysis areas for the proposed Upper Stillwater Forest Management Project.

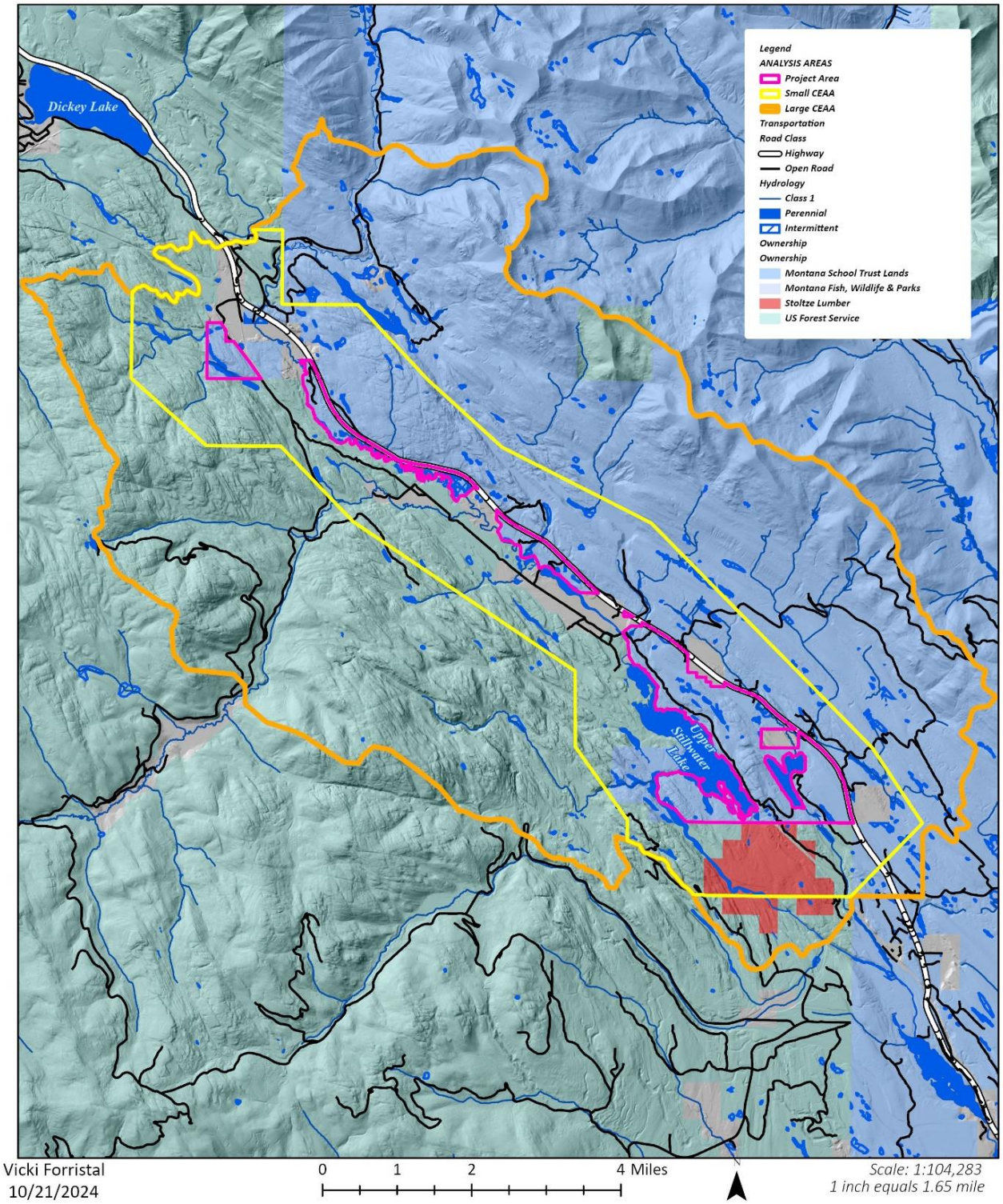
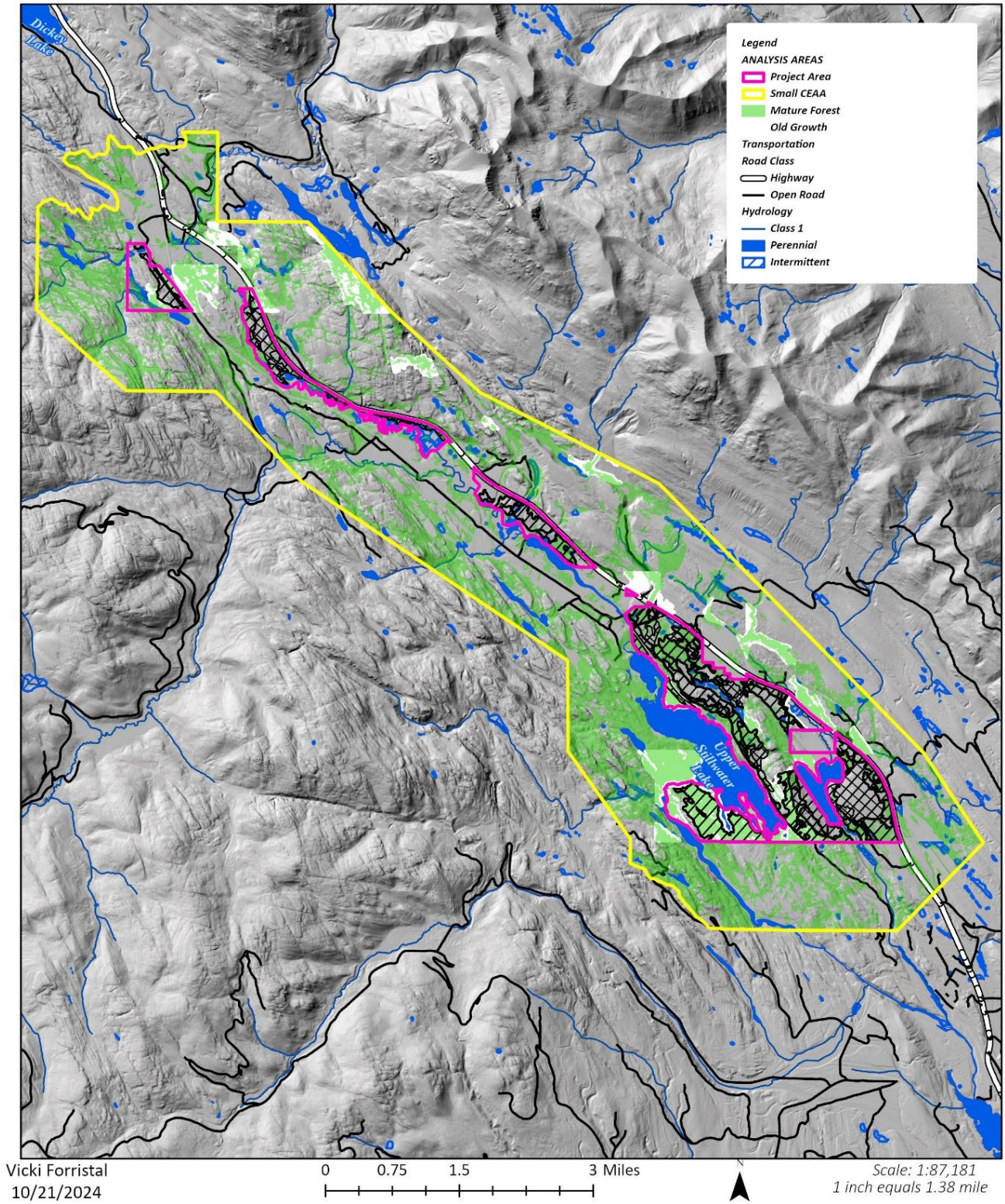


Figure WI-2 Mature Forested Habitat and Landscape Connectivity. Relationship of the Project Area and proposed units to mature forested stands and potential connectivity for the proposed Upper Stillwater Forest Management Project.



Attachment H – Scoping Comments and Responses

INTRODUCTION

Eighteen comments were received during the scoping of the Upper Stillwater Forest Management Project in the form of emails, phone calls and letters. This section contains public comment letter received from a non-profit environmental organization interested in the Upper Stillwater Forest Management Project and DNRC's responses to those comments; all other scoping comments are summarized in the Project Development section of the EA. The contents of the letter are displayed in the left column of the following table, with DNRC responses in the right column. Portions of the comment letter that are either an opinion or recommendation do not require a response from DNRC.

All comments were carefully reviewed. The DNRC appreciates both the time and thought that was involved in producing these comments. The decision maker will carefully consider each received comment to aid them in deciding on a course of action for this project.

Table H-1 – Friends of the Wild Swan comment and DNRC response

Comment #	***Friends of the Wild Swan*** ***PO Box 103*** ***Bigfork, MT 59911*** May 17, 2023 Montana DNRC Stillwater Unit Attn: Joe Rizzi PO Box 164 Olney, MT 59927 Via email to: Joseph.Rizzi@mt.gov	DNRC Responses
1	Following are Friends of the Wild Swan's comments on the proposed Upper Stillwater Forest Management Project to be incorporated into your Environmental Impact Statement. **<u>Old-Growth Forest Habitat</u>** Before DNRC logs any old-growth forest habitat they must have a plan for how old-growth forests will be managed on the Stillwater State Forest. Old-growth habitat must be identified and mapped	***DNRC Response to Comment 1:*** *For information on current location and connectivity of old-growth stands, please refer to the EA, Attachment C, Vegetation Analysis (pg 43) and Attachment A, Maps (A-4) for maps. Connectivity would be reviewed and analyzed in any future projects proposed.*

	(preferably with an aerial photograph map). Where does old growth currently exist on the forest? How is it connected? How will connectivity be maintained or improved? These were recommendations of the Technical Review Committee of scientists that were hired by DNRC. (Pfister et al 2000)	
2	Realizing that existing old-growth stands do not last forever, there must be a provision for putting stands on longer rotations so that habitat is connected. Existing old-growth stands must be put on longer rotations so that this component of the forest is retained. Other stands should be put on long rotations so that they develop old-growth characteristics and are able to replace existing old growth. These are not "reserves" but long rotations.	***DNRC Response to Comment 2:*** *DNRC management decisions regarding old growth at the project level follow ARM 36.11.418(a) and (c). When considering old-growth management at the project level, careful attention is given to many variables including, but not limited to cover types, stand locations, patch sizes, habitat connectivity, insect/disease risk, etc. This approach has allowed the DNRC to evaluate conservation biology principles and trade-offs at the landscape scale and have flexibility to address stand changes and economic losses caused by natural disturbance agents, such as insects, diseases, and wildfire. DNRC must also consider the requirements of MCA 77-5-116, which is a law that prohibits the Department from establishing old-growth deferrals and set-asides without compensation to trust beneficiaries. For each timber sale in the Upper Stillwater Forest Management Project, stand maps are produced to help evaluate management priorities and trade-offs necessary for informed decision-making. Old-growth stands receiving uneven-aged harvesting will be managed under a relatively long rotation with DNRC's current approach.* *Environmental impacts on old growth are described in the EA, Attachment C, Vegetation Analysis (43) and Attachment G, Wildlife Analysis (76,77). The estimated amounts of old growth prior to the project and the amount of old growth after this project (by alternative) are also disclosed*
3	DNRC must use the Green et al old-growth definition in its entirety instead of only the minimum number of large trees. Manipulating old-growth forest habitat using the assumption that it will still be old growth after logging is an untested hypothesis and is not supported by science. Where is the existing old growth on the Stillwater State Forest? A priority and goal for this project	***DNRC Response to Comment 3:*** *DNRC defines old growth as a forest stand that meets or exceeds the minimum number, size, and age of large trees, and stand basal area, as noted in "Old Growth Forest Types of the Northern Region" by Green et al. (1992, errata corrected 02/05, 12/07, 10/08, 12/11) [ARM 36.11.403(54)]. Descriptions within the various resource analyses presented in this document of old growth forests on state*

	should be to designate an old-growth network to ensure that this component of biodiversity is maintained over the long term. The EIS must analyze what the effects of logging will be on existing and recruitment old growth forest habitat, riparian areas, wetlands and other habitats both in terms of blowdown and other effects on the forest itself as well as on old-growth dependent wildlife. Are there sufficient snags and down woody material? If not, what can be done to restore these attributes?	*trust lands are consistent with this definition. Green et al. (1992) state in their report that "old growth is not necessarily 'virgin' or 'primeval'. Old growth could develop following human disturbances." Additionally, there is a growing body of scientific literature addressing the use of silvicultural harvest treatments to retain and promote the development of old-growth forest attributes (Larson et al. 2012, Bauhus et al. 2009, Raymond et al. 2009, Twedt and Somershoe 2009, Brewer et al. 2008, Fiedler et al. 2007, Keeton 2006, Beese et al. 2003, Latham and Tappeiner 2002, Fiedler 2000). DNRC's management reflects and incorporates that research. ARM 36.11.418 describes the types of silvicultural cutting treatments that may be used in old growth stands on state trust lands. Two of those treatment types, old-growth maintenance and old-growth restoration, require the stand meets the minimum criteria presented by Green et al. (1992) after harvesting to be defined as old growth. When implementing such treatments, DNRC works to maintain other attributes associated with old-growth forests to the extent practicable, including multi-storied canopy structures, presence of snags and coarse woody debris. DNRC acknowledges that when treatments in old –growth stands occur, habitat attributes are altered and habitat quality for some associated species of wildlife may be reduced (Jobes et al. 2004). As such, because a logged old-growth stand may meet the Green et al. definition after treatment, it does not mean that it will provide high-quality habitat for all old-growth associated species. Such stands following logging, however, will possess a definable threshold of very large, old trees that would otherwise take centuries to develop, and which provide important raw materials for other attributes found in old growth stands.*
4	The project must demonstrate compliance with ARM 36.11.407 so that the amount and distribution of old growth forest habitat is within the historic range, not just at the low threshold.	***DNRC Response to Comment 4:*** *ARMs 36.11.407 and 36.11.418 require DNRC to manage old growth for biodiversity and fiduciary objectives. Age class representation and historical natural disturbance patterns are considered as specified in ARM 36.11.407 and 36.11.418 in DNRC's management of old growth, as well as MCA 77-5-116, which states that old growth may not be set aside for the purposes of preservation unless the trust is compensated for that disposition. The historical distribution of old growth is considered at a regional landscape scale by assessing the proportions of old forest stands present in differing climatic sections across the state that were compiled by Losensky (1997); however, those proportions provide only a snapshot in time of past forest conditions, and the amount of old growth present on the landscape would vary based on natural disturbance patterns present prior to Euro-American settlement. The*

		data Losensky (1997) used for his analysis lacked sufficient resolution to provide historic estimates that are consistent with DNRC's current old growth definition [ARM 36.11.403(54)] based on Green et al. (1992). Thus, DNRC conducted an analysis that found approximately 19.8 percent of its western Montana lands would have historically been old growth using DNRC's current definition. The importance of maintaining old growth to meet biodiversity objectives was reflected by the inclusion of a constraint requiring the model used to determine the annual sustainable yield to maintain or achieve a target number of old growth acres on each administrative unit using management regimes consistent with those described in ARM 36.11.418. In the most recent Sustainable Yield Calculation (MB&G 2020), the model constraint was designed to ensure that each administrative unit within the Northwestern and Southwestern Land Offices would maintain 8 percent old growth, which represents slightly less than one-half the historic estimate of 19.8 percent and provides a balance between DNRC's biodiversity and fiduciary objectives. Stillwater Unit's analysis of old growth amount was estimated at 11% (page 43 of Attachment C – Vegetation Analysis), which is above the target level modeled in the sustainable yield calculation and demonstrates compliance with ARM 36.11.407.
5	**Wildlife** What conservation strategies does DNRC have to ensure that biological diversity is maintained on the Stillwater State Forest? The SFLMP rules do not constitute an overall conservation strategy, they are broad guidance.	***DNRC Response to Comment 5:*** *The State Forest Land Management Plan (SFLMP, Record of Decision (ROD), 1996) requires DNRC to implement a comprehensive set of resource management standards to address biodiversity. Specific measures and requirements were later codified in ARMs in 2003 and have since been revised as recently as December 2020. The ARMs pertaining to biodiversity (36.11.404 through 36.11.419) address important coarse filter considerations and ecological attributes such as, land types, disturbance regimes, forest cover type, age class, fragmentation, patch size, patch shape, patch connectivity, linkage, stand structure, and old-growth amounts, which are applied as appropriate to each local project and area. These ARMs also contain important measures that are applied to ensure that attributes such as large snags and coarse woody debris are retained on all lands managed by DNRC, these support habitat needs of numerous species of wildlife. The ARMs require DNRC to address the needs of listed threatened, endangered, and sensitive plant and animal species under a fine filter management approach (ARM 36.11.406; ARM 36.11.428, ARM 36.11.436). The Forest Management HCP adopted in 2012, provides further*

		assurances that DNRC will continue to meet federal legal requirements under the Endangered Species Act for listed terrestrial and aquatic threatened and endangered fine filter species. The Forest Management ARMs pertaining to road management (ARM 36.11.421), wetland management (ARM 36.11.425), livestock grazing (ARM 36.11.444), and weed control (ARM 36.11.445), were designed and are implemented where applicable with resource protection and support for maintaining biodiversity in mind. The Upper Stillwater Forest Management Project was designed to comply with all measures that support biodiversity as required by the SFLMP, Forest Management ARMs, and DNRC's Forest Management HCP.
6	When will DNRC develop conservation strategies for sensitive and old growth associated species? Previous EISs have disclosed that previous logging projects have a negative impact on pileated woodpeckers, fisher, big game and other wildlife.	***DNRC Response to Comment 6:*** *DNRC's conservation approach to threatened, endangered, and sensitive species is addressed through application of both the coarse and fine filter management approaches as specified in the SFLMP (SFLMP, ROD, 1996), Forest Management ARMs (ARM 36.11.406; ARM 36.11.428, ARM 36.11.436), and as required by measures contained in the HCP. DNRC currently addresses habitat for such species more specifically under the Forest Management Rules (ARM 36.11.427 through 36.11.442) that address endangered, threatened, and sensitive species such as grizzly bears and bald eagles. Measures for these species are frequently reviewed and can be revised when necessary. Addressing the revision of programmatic strategies for these species and applicable ARMs was beyond the scope and purpose of this project analysis. Like other forest management project environmental analyses, the proposed Upper Stillwater Forest Management Project Action Alternative is anticipated to adversely affect some wildlife species due to tree removal. However, no old-growth removal or treatment would occur therefore no adverse effects to old-growth associated species are anticipated. Detailed analyses of effects to threatened and sensitive wildlife species are described in Attachment G, Wildlife Analysis.*
7	DNRC must mitigate for these previous negative impacts and ensure that future projects do not diminish biological diversity.	***DNRC Response to Comment 7:*** *DNRC mitigates for adverse effects to wildlife on previous timber sales according to the HCP and Forest Management Rules. These mitigations are consistently applied at the project level and are described in the Wildlife Analysis*

		within each Environmental Assessment for each timber sale and are intended to promote the maintenance of biological diversity. Relevant cumulative habitat-related effects associated with previous natural and man-caused disturbances were identified, analyzed, and disclosed for each species and resource category contained in the analysis.
8	For all wildlife DNRC needs to quantify what does current habitat availability, local population monitoring, and current status of the species indicate about current population health in this landscape, or in other words, <u>is the current habitat enough?</u> If it is, how much more can you take and still not trigger significant population impacts? If there currently isn't enough habitat, how can you justify taking more?	***DNRC Response to Comment 8:*** *DNRC promotes biodiversity by taking a 'coarse-filter approach', which favors an appropriate mix of stand structures and compositions on state trust lands (ARM 36.11.404). Appropriate stand structures are based on ecological characteristics (e.g., land type, habitat type, disturbance regime, unique characteristics). A coarse-filter approach assumes that if landscape patterns and processes are maintained similar to those with which Montana wildlife evolved, the full complement of species would persist, and biodiversity would be maintained. This coarse-filter approach supports diverse wildlife populations by managing for a variety of forest structures and compositions that approximate historic conditions across the landscape (Lozensky 1997). DNRC cannot assure that the coarse-filter approach will adequately address the full range of biodiversity; therefore, DNRC also employs a 'fine-filter' approach for threatened, endangered, and sensitive species (ARM 36.11.406). The fine-filter approach focuses on a single species' habitat requirements and considers the status for each listed species that may be affected. In the SFLMP, DNRC acknowledged that localized adverse impacts would be expected and accepted within the context of an overall strategy that supports habitat capability for these species. DNRC also recognized that their role in conserving such species was supportive, but subsidiary to the principal role played by Federal agencies with larger land holdings (SFLMP, ROD:31, 1996).* *For each species or habitat issue, existing conditions are described and compared to the anticipated effects of the No-Action and Action alternatives. If suitable habitat conditions for a particular species exist within a Project Area, relevant mitigations are applied regardless of if the animal is present, thus, local population monitoring is typically not conducted. DNRC consults FWP and USFWS for information regarding local population status, concerns, and appropriate mitigations and assists with monitoring efforts when possible. We believe the analysis adequately*

		describes and discloses anticipated effects of the proposed activities. Under the MEPA process, project decision makers must review the analysis and weigh the impacts and environmental consequences before issuing a final decision.
9	Wildlife require corridors to move for foraging, denning, nesting and seasonal habitats. The EIS must disclose: Where are these corridors? What is the habitat quality in them? What size are they? Are they wide enough to protect from edge effects and provide security? Are they fragmented by roads or past logging units? How much canopy cover, thermal cover or hiding cover is in them? How much down woody debris is in them? What type of habitat is considered suitable? Once these questions have been answered then the project must ensure that adequate habitat linkages are delineated and protected. Corridors of interior forest habitat between old growth habitat have been recommended by the old growth Technical Review Team, and they recommend a minimum width of >100 meters.	***DNRC Response to Comment 9:*** *Detailed analyses of effects to mature forested habitat and connectivity are described beginning on page 77. A map of mature forest pre- and post-harvest is available on page 107 and depicts corridors identified for retention along Dog Creek, Rock Creek, a draw west of Spring Creek and the Stillwater River. We believe the analysis addressed the appropriate parameters and accurately disclosed impacts that would be associated with the proposed activities. Outside of riparian areas, a 300-foot minimum width was used in analyses of connected forest and impacts to forest edge is described in this section. These forest stands typically contain ≥40% canopy cover comprised primarily of trees that are on average >9 inches dbh. Within riparian areas, DNRC's ARM and HCP commitments for vegetation retention within RMZ and SMZs are expected to retain connectivity and visual screening for wildlife moving through areas. Coarse woody debris retention in these corridors would follow recommendations by habitat type from Graham et al. (1994). Habitat quality is species dependent and described in analyses of effects on sensitive species beginning on page 99.*
10	Do you have any actual width criteria you are using at present to define corridors in the project area? DNRC needs to map all corridor habitat in the project area, and define both current and long term objectives for maintaining these corridors over time.	***DNRC Response to Comment 10:*** *Information regarding corridors for wildlife can be found on pages 74-79. Outside of riparian areas, we considered stands 300-feet wide to provide connectivity as per ARM 36.11.403(20)(b) and DNRC's Forest Management HCP. DNRC intends to retain corridors along creeks and prominent ridgelines, and to retain connectivity between drainages. Corridors are evaluated at the project level and the location of corridors are anticipated to change over time as stands age and following natural processes such as windstorms, wildfire, or pest outbreaks.*
11	DNRC must disclose whether there have been sightings, nests and/or dens of sensitive, threatened and endangered species in the project area and what is being done to protect them.	***DNRC Response to Comment 11:***

		DNRC reports nests and sightings of sensitive, threatened, and endangered species to MNHP. Information regarding key high use areas or denning sites for threatened and endangered species is sensitive and is typically not published. DNRC applies mitigations and protections for species based on the presence of suitable habitat rather than species observations, which are less reliable. We believe the analysis provides all important and relevant information necessary to make an informed decision regarding habitat effects to threatened, endangered and sensitive species.
12	The EIS must evaluate the impacts of blowdown on forest structure and edge effects.	***DNRC Response to Comment 12:*** *Wind events occasionally remove large stands of timber leaving openings resembling clearcuts behind. DNRC cannot predict the size or location of large wind events, and when they occur it is unfortunate. Secondary potential effects of wind are commonly discussed by DNRC ID teams when developing timber stand prescriptions. In cases where extreme wind events or other natural disturbance events occur in previously logged stands, appropriate follow up environmental reviews are conducted, and subsequent salvages are mitigated and designed to comply with DNRC's Forest Management HCP and ARMs.*
13	Has DNRC defined how much deer and elk winter range needs to be maintained over time on this landscape to maintain stable big game populations? What are your management goals for big game winter range and associated populations on Stillwater State Forest lands? Do you have any limitations on the amount of big game winter range that you can remove over a given period of time?	***DNRC Response to Comment 13:*** *Statewide or regionwide objectives for deer and elk winter range do not directly relate to the scope of the project and have been removed from further analysis. The Upper Stillwater Forest Management Project Area includes winter range habitat for deer and elk (FWP 2008). DNRC is required under ARM 36.11.443 to solicit feedback from FWP regarding big game concerns and to work with FWP on a project-level basis to implement appropriate mitigations. Winter range conditions and potential impacts from forest management activities are analyzed on pages 98-102.*
14	How will this project affect those elk, mule deer and whitetail deer habitat attributes such as thermal cover, hiding cover, security, etc? How will this project affect moose?	***DNRC Response to Comment 14:*** *The Project Area contains potential elk, mule deer, moose and white-tailed deer winter range habitat as*

	Guidelines for elk security are a minimum of 250 acres for providing security under favorable conditions; under less favorable conditions the minimum must be >250 acres. Effective security areas may consist of several cover-types if the block is relatively unfragmented. Among security areas of the same size, one with the least amount of edge and the greatest width generally will be the most effective. Wallows, springs and saddles may require more cover than other habitats.	*identified by DFWP (DFWP 2008). Elk security habitat (Hillis et. al 1991) does not occur in the project area. Ungulate sign was observed in the Project Area and we anticipate that proposed logging treatments would have both positive and negative impacts on big game. Reductions in mature canopy cover would reduce the availability of hiding cover and thermal cover, but treatments would also likely increase the availability of forbs and grass which may benefit foraging big game. DNRC defers to FWP on concerns regarding big game populations and moose were not brought up as a species of particular concern regarding this project. Detailed analysis of potential impacts to big game is available on pages 98-102.*
15	Where is the current lynx foraging and denning habitat located? How will it be maintained, how will it be improved, how is it connected? How will it be impacted by this project? What are the effects to critical habitat for lynx? Will it be adversely modified? Lynx avoid clearcuts, will this project include or expand clearcuts and negatively impact lynx? Winter foraging habitat is limited – how much is there? Where is it?	***DNRC Response to Comment 15:*** *Detailed analyses of effects of the action alternative on Canada lynx including assessments of suitable habitat types and connectivity can be found beginning on page 81. Suitable habitat is present throughout most (78%) of the Project Area. Suitable lynx habitat is analyzed in terms of winter foraging habitat, summer foraging habitat, and other suitable habitat as described in DRNC's Forest Management HCP. DNRC does not categorize specific areas as lynx denning habitat since denning habitat is not likely to be a limiting factor (USFWS and DNRC 2011).* *The proposed harvest would remove approximately 558 acres of suitable lynx habitat and 33 of these acres would be impacted by clearcuts. We anticipate that these stands would be avoided by lynx for 15-20 years until saplings are large enough to support a snowshoe hare population. We disagree that winter foraging habitat is limited in the Project Area and anticipate that 910 acres (41% of potential lynx habitat) would provide winter foraging habitat post-harvest. Winter foraging habitat is primarily found in the southern portion of the Project Area. Post-harvest suitable habitat ratios would meet all retention requirements as described in DNRC's Forest Management HCP and connectivity would remain in riparian areas and travel corridors and 58% of the Project Area would contain suitable lynx habitat.*
16	What is the current total and open road density? How much grizzly bear core area is there? Will new roads be built? Will roads be decommissioned? How does this project favor the needs of the grizzly bear? This project must comply with ARM 36.11.432 which restricts the timing of activities in certain grizzly bear secure core.	***DNRC Response to Comment 16:*** *In the Upper Stillwater Forest Management Project Area, the total road density is 5.4 miles/square mile and open road density is 4.1 miles/square mile. The Project Area does not contain security zone habitat (i.e., core) and no timber harvest is proposed in security zone habitat. Detailed analyses of effects of the action alternative on grizzly bears including impacts to road density can be*

		found beginning on page 85. We anticipate that the timber sale would adversely impact grizzly bears. However, mitigations such as spring timing restrictions and vegetation retention in regeneration treatments would be implemented to reduce these adverse impacts.
17	How will this project contribute to viability of sensitive species?	***DNRC Response to Comment 17:*** *Detailed analyses of effects to threatened and sensitive wildlife species are described beginning on page 79. Population viability analyses are beyond the scope of this analysis. In general, DNRC manages landscapes such that ecological characteristics like cover type, age class, and stand structure are balanced and appropriate for the local area as per ARM 36.11.404. If these attributes are considered and properly managed as per historic conditions, habitat for native wildlife species will be maintained. DNRC also employs a 'fine-filter' approach for threatened, endangered, and sensitive species (ARM 36.11.406). The fine-filter approach focuses on a single species' habitat requirements.*
18	What monitoring will be done for wildlife? fish? old-growth dependent wildlife? sensitive plants? other? What past monitoring has been done to determine whether the proposed treatments actually achieve the desired results? New research shows that the Rocky Mountain Fisher selects for large, old trees, snags and dense overhead cover more than had been previously thought. Research also shows that Fisher do not select and use riparian areas as much as biologists had hypothesized. Retention and recruitment of connected old-growth forest habitats is very important to maintain viability of fisher; relying on riparian buffer zones is not adequate. This project must maintain existing fisher habitat outside of riparian areas and provide linkage corridors. Fishers appear to be selective of relatively dense overhead cover and large forest structures at resting sites because they use relatively large trees, snags, and logs for resting, and the forest conditions around such structures differ from those that occur randomly in the forest. (Aubrey et al. 2013)	***DNRC Response to Comment 18:*** *DNRC has conducted monitoring pertaining to the DNRC Forest Management Program required by the SFLMP since 1997, and the comprehensive 5-year monitoring report may be found at the following link --* https://dnrc.mt.gov/_docs/Trust-Land/Planning-and-Reports/20221007_2017-2021SFLMPMonitoringReport_TLMD_FMB.pdf*. These reports contain information pertaining to wildlife, fisheries, and terrestrial and aquatic habitat monitoring results as required by the standards contained in the SFLMP. DNRC is also required to conduct annual monitoring as a requirement of the Forest Management HCP. The most recent report addressing compliance with measures contained in the HCP may be found at the following link -* https://dnrc.mt.gov/TrustLand/about/planning-and-reports*..* *DNRC engages in many efforts to monitor the effectiveness of treatments implemented during a timber sale:* • *Timber sale inspections conducted during sale administration ensure that sale operations comply with certain standard operating procedures, Administrative Rules for Forest Management, Montana Best Management Practices for Forestry (BMPs), and any other mitigation measures that might be stipulated in the sale contract.*

	All known fisher reproductive dens are in cavities in live trees or snags. Reproductive dens are typically in the oldest and largest trees available. Large trees with cavities and platforms are also used extensively by males and females for resting. (Naney et al. 2012) Moderate to dense canopy closure provides key habitat features, and overstory trees provide one of the key components of this cover. They also contribute to the structural diversity of forested environments. Overstory trees also contribute to current and future structural elements and prey species abundance and diversity. One of the most consistent predictors of fishers appears to be expanses of forest with moderate to high canopy cover. (Id.) Fishers have relatively large home ranges, use habitat at multiple spatial scales, and typically avoid areas with little or no contiguous cover. Fragmented landscapes may affect landscape permeability, either permanently through vegetation type conversion or temporarily until vegetation recovery occurs. Fragmentation can affect fishers' use of the landscape because moderate to high amounts of contiguous cover are a consistent predictor of fisher occurrence at large spatial scales. (Id.) The incidence of heartwood decay and cavity development is more important to fishers for denning than is the tree species. Other characteristics, such as the size and height of the cavity opening and the interior dimensions of the cavity, may also influence females' choice of natal and pre-weaning den structures. The cavity must be large enough to accommodate an adult female and 1–4 growing kits, and have a relatively small opening (just large enough for a female to fit through) high off the ground. The cavity must also have adequate thermal properties to protect kits from weather extremes. (Raley et al. 2012) Fisher resting habitat in western North America is also strongly tied to forest structure. Fishers typically rest in large deformed or deteriorating live	• *Regeneration surveys are used following harvesting to monitor regeneration success.* • *Internal DNRC and statewide BMP audits are conducted on completed DNRC timber sales either annually or biannually to determine whether BMPs were properly applied and whether the BMPs were effective in preventing erosion and sediment delivery.* • *DNRC participates in fisheries monitoring with the Department of Fish, Wildlife, and Parks to measure the potential impact of forest management on fisheries habitats.* • *DNRC conducts fish populations, passage, and genetic surveys, fish habitat inventories, and riparian stand assessments to evaluate both existing effects as well as potential effects of the proposed Action Alternative. Implementation of post-project fisheries resource monitoring is generally limited to riparian timber harvest effects.* • *Road closure devices are monitored annually to determine whether each is effective at keeping motorized users from entering restricted areas.* • *Biodiversity field reviews are conducted on selected timber sales, typically three to five years following harvesting, to monitor the implementation at the timber sale level of the biodiversity resource management standards described in the State Forest Land Management Plan and Administrative Rules for Forest Management. These reviews are conducted in a field setting and examine biodiversity issues associated with the timber sale, the silvicultural treatments used, and biodiversity-related mitigations (such as protection of snags, coarse woody debris, nutrients, and wildlife) implemented during the sale.*

	trees, snags, and logs, and forest conditions around the rest structures (i.e., the rest site) frequently include structural elements characteristic of late-seral forests. In live trees, fishers rested primarily in rust brooms in more northern study areas and mistletoe brooms or other platforms elsewhere. In contrast, fishers primarily used cavities when resting in snags. Fishers used hollow portions of logs or subnivean spaces beneath logs more frequently in regions with cold winters. These results suggest that fishers use structures associated with subnivean spaces to minimize heat loss during cold weather. (Id.) In western North America, a moderate to dense forest canopy is one of the strongest and most consistent predictors of fisher distribution and habitat use or selection at all spatial scales. The association of fishers with high amounts of canopy cover is further demonstrated by their avoidance of open environments. (Id.) Previously, it was thought that fishers in western North America may favor riparian forests; however, results from recent studies do not support this hypothesis. Although riparian forests were important to fishers in some locales, consistent use or selection for riparian forests has not been demonstrated. (Id.) Female fishers consistently selected for large trees at both stand and landscape scales. Thus, we recommend that silvicultural treatments of stands consider not only the retention of large trees, but consider the larger landscape when managing for fishers. (Schwartz et al. 2013) Female fishers are selecting habitat at two scales: a stand scale as indicated by stands that have large trees (as well as a large variation in tree size) and a landscape scale with a high proportion of large trees. Thus, it appears that while fishers can be detected in riparian stringers that bisect open landscapes, this habitat may not be sufficient for persistence. The converse is also likely true.	

	Landscapes that do not have variation in large trees, snags, and cavities, and drier landscapes (i.e., landscapes with ponderosa and lodgepole pine) are probably not sufficient for fisher persistence either. Forest activities that promote the growth of multi-stage stands with ample structure and variation in tree widths and ages will provide the best habitat for fishers. Retaining trees that have decadence, disease, or defects will help provide some of this habitat. (Id.) The relationship between the extent of open areas and probability of home range occupancy suggests that past and proposed forest harvesting can strongly affect the ability of the landscape to support fishers. Landscapes with previous widespread and intensive forest harvesting may lose their ability to support fishers until these harvested areas regenerate sufficiently. Intensive forest harvesting in the future may exacerbate the already diminished ability of modified landscapes to support fishers, particularly in forests that are slated for salvage harvest of diseased or damaged trees. (Weir and Corbould 2010) Because salvage harvest of beetle-killed trees typically involves clearcut harvesting, whereby all tree species (including spruce and fir) and secondary structure within the harvest unit are felled or cleared, our results suggest that this expedited harvest will gravely affect the ability of these landscapes to be occupied by fishers. (Id.)	
19	How will this project impact fisher and its habitat? How will making sure that fisher habitat is sufficient provide for the needs of other wildlife?	***DNRC Response to Comment 19:*** *We anticipate that the proposed harvest would adversely impact fisher and would remove approximately 603 acres of fisher habitat (41% of fisher habitat in the Project Area). Additional information regarding impacts of the proposed activities on fishers can be found beginning on page 91. We consider addressing the relationships between fisher habitat and other species of wildlife beyond the scope of this analysis and not relevant under the procedural requirements of MEPA for this project*
20	Wolverine are proposed for listing under the Endangered Species Act. The SFLMP does not contain any standards for wolverine and needs to	***DNRC Response to Comment 20:***

	be revised to account for this changed circumstance. New scientific studies are emerging about landscape effects from logging and other human activities on wolverines so habitat usage, prey availability and motorized use must be considered in the EIS. For example, Fisher, et al Wolverines (Gulo gulo luscus) on the Rocky Mountain slopes: natural heterogeneity and landscape alteration as predictors of distribution found: Wolverines were more abundant in rugged areas protected from anthropogenic development. Wolverines were less likely to occur at sites with oil and gas exploration, forest harvest, or burned areas, even after accounting for the effect of topography. Wolverines elsewhere avoid human-disturbed areas (Carroll et al. 2001; Rowland et al. 2003; May et al. 2006) and recreational and industrial activity (Krebs et al. 2007). Human activities such as trapping, poaching, and road mortality have accounted for 46% (North America; Krebs et al. 2004) to 52% (Scandinavia; Persson et al. 2009) of known-cause wolverine mortalities across their range. Wolverines avoid roads and other human development in British Columbia (Krebs et al. 2007), Norway (May et al. 2008), Idaho (Copeland et al. 2007), Montana (Carroll et al. 2001), and throughout the northwestern United States (Rowland et al. 2003). Wolverine occurrence also increases with topographic ruggedness, where there is a combination of low- and high-elevation habitats. Bighorn sheep (Ovis canadensis Shaw, 1804) (Festa-Bianchet 1988), mule deer (Odocoileus hemionus (Rafinesque, 1817)) (D'Eon and Serrouya 2005), and other ungulates winter at lower elevations; in Scandinavia, wolverines showed significant selection for lower elevation habitats during winter months (Landa et al. 1998). It is possible that wolverines require lower elevations for foraging and higher elevations for predation refuge. Persistent spring snow cover has been hypothesized as important (Schwartz et al. 2009; Copeland et al. 2010) but is not a good predictor at	*Updating the SFLMP or ARMs does not directly relate to the scope of the project and was not addressed in this analysis, and any such revisions pertaining to species listings would not require the revision of management standards. DNRC revised the ARMs in 2020 and addressed public comments regarding these types of concerns during that process. According to the Wolverine Species Status Assessment (USFWS 2018) wolverine behavior associated with logging and hauling appears driven by trade-offs between foraging opportunities and avoidance of predation. Attraction or avoidance of features like logging cuts or roads depends on a complex variety of factors. DNRC will continue to review scientific literature regarding wolverines and will continue contributing to ongoing research and monitoring efforts as described in Lukacs et al. (2020). Discussion regarding potential impacts of the proposed activities on wolverines is available in the Fine Filter Table on page 80 of the Wildlife Analysis, Attachment G.* *Occasional use of the project area by wolverines is possible during their extensive home range movements and no high-quality denning habitat (as measured by multiple years of persistent spring snowpack, avalanche chutes, rock slopes, etc.) would be impacted by the proposed harvesting. Combined with timing and elevation/slope restrictions, any potential disturbance of a wolverine moving through the Project Area in the vicinity of a harvest unit would be temporary. Thus, no adverse direct, indirect, or cumulative effects to wolverines would be expected to occur as a result of the Action Alternative.*

	this scale, since spring snow cover was sufficiently persistent across our study landscape to prevent modelling but wolverine occurrence still varied. Southwest Crown of the Continent monitoring detected wolverines at elevations ranging from 3,346-7,567 feet.	
21	Are wolverine currently being displaced by roads on the Stillwater State Forest? How much more displacement will occur for wolverine as well as other wildlife from this project? **<u>Habitat Fragmentation</u>** Habitat fragmentation is generally defined as the process of subdividing a continuous habitat type into smaller patches, which results in the loss of original habitat, reduction in patch size, and increasing isolation of patches. (Heilman et al. 2002) Habitat fragmentation is considered to be one of the single most important factors leading to loss of native species (especially in forested landscapes) and one of the primary causes of the present extinction crisis. Although it is true that natural disturbances such as fire and disease fragment native forests, human activities are by far the most extensive agents of forest fragmentation. For example, during a 20-year period in the Klamath–Siskiyou ecoregion, fire was responsible for 6% of forest loss, while clear-cut logging was responsible for 94% (emphasis added) (Id.) Depending on the severity of the fragmentation process and sensitivity of the ecosystems affected, native plants, animals, and many natural ecosystem processes (e.g., nutrient cycling, pollination, predator–prey interactions, and natural disturbance regimes) are compromised or fundamentally altered. For many species, migration between suitable habitat patches becomes more difficult, leading to smaller population sizes, decreased gene	***DNRC Response to Comment 21:*** *Specific information regarding the impact of the current road density on local wolverine habitat use in the Stillwater State Forest is not available. The Project Area does not maintain deep snow into late spring and does not contain high-elevation alpine habitat. New permanent roads are not proposed for construction, but approximately 1.8 miles of temporary roads would be constructed. Some short-term displacement (up to 4 years) of wolverines is possible during operations, however appreciable use of the Project Area by wolverines is not likely occurring. Additionally, it is important to note that the effects of roads and disturbance represent a low-level stressor for wolverines (USFWS 2018). Discussion regarding potential impacts of the proposed activities on wolverines is available in the Fine Filter Table on page 80. Information on displacement and other potential impacts to sensitive species can be found beginning on 79.*

	flow, and possible local extinctions. (Id.) As native forests become increasingly fragmented, ecosystem dynamics switch from being predominantly internally driven to being predominantly externally driven. Simultaneously, remnant patches become altered by changes within the patches themselves as the remnants become more and more isolated, thereby resulting in further ecological degradation across the landscape. Declines in forest species as a result of fragmentation have been documented for numerous taxa, including neotropical migrant songbirds, small mammals and invertebrates Forest fragmentation has also been associated with increased susceptibility to exotic invasion (Id.) Among the common changes in forests over the past two centuries are loss of old forests, simplification of forest structure, decreasing size of forest patches, increasing isolation of patches, disruption of natural fire regimes, and increased road building, all of which have had negative effects on native biodiversity. These trends can be reversed, or at least slowed, through better management. (Noss 1999)	
22	This project must reduce fragmentation and edge effects and increase patch size and core areas. Past management through even-aged silvicultural prescriptions have contributed to the fragmentation of forest habitat to the detriment of many bird and wildlife species. Large and small openings should be allowed to be created through natural processes rather than clearcut logging. This project should not sever connectivity between the Stillwater State Forest and Forest Service land.	***DNRC Response to Comment 22:*** *Detailed analyses of effects to mature forested habitat and connectivity are described beginning on page 74 in the Wildlife Analysis (Attachment G). School trust lands are managed lands and DNRC implements timber sales to generate revenue to benefit the school trusts pursuant to 77-1-202, MCA. However, DNRC seeks to design timber sales in a sustainable, thoughtful manner that emulates natural disturbance and reduces adverse impacts to local wildlife and the environment. DNRC implements many silvicultural techniques including even-aged management treatments like clearcuts when appropriate for the stand conditions and landscape. In the SFLMP, DNRC acknowledged that localized adverse impacts would be expected and accepted within the context of an overall strategy that supports habitat capability for these species.*

		The Stillwater River divides DNRC and USFS ownership along the Project Area boundary. Connectivity will be retained in riparian areas and through travel corridors.
23	**Roads and Soils** How will soils be impacted by this project? Opening up stands will dry them out, how will this impact mychorizal fungi and other soil organisms? How much soil damage is there? Does DNRC have a standard for soil disturbance? No new roads should be built, not even temporary roads. Roads fragment habitat and increase mortality for wildlife such as elk, grizzly bear and lynx. Roads degrade stream habitat for fish. Roads take acres out of the timber-growing base.	***DNRC Response to Comment 23:*** *Soil moisture is directly related to site vegetation, precipitation, evaporation, and transpiration. Implementation of any action alternative would modify site vegetation and, potentially, soil moisture. A large amount of empirical studies (Devine and Harrington 2006, Crews and Wright 2000, Klock and Lopushinsky 1980, Dahms 1971, Troendle 1970) show that soil moisture is typically increased after forest harvesting until competing vegetation becomes established, typically 2 to 4 years. At that point, no significant effects to soil moisture are observed. Soils in the Upper Stillwater Forest Management project area are not expected to be drier.* *Organic matter typically found on the forest floor provides both the environment and energy source for a variety of microorganisms that are critical to continued site productivity. Substantial increases in utilization intensity, extremely hot wildfire, excessive soil disturbance or excessive site preparation has the potential to reduce site productivity. Harvest activities and mitigation measures designed in both alternatives will adequately mitigate excessive soil impacts and site nutrient losses. These activities will be monitored for both implementation and effectiveness through contract administration. The level of coarse and fine woody material retention within harvest units will vary by habitat type as recommended by Graham et al. (1994). This level of woody material will continue to support mycorrhizal fungi habitat and their associated energy sources.* *Anticipated impacts to soils are disclosed in Attachment D- Soils Analysis.* *DNRC standards for soil disturbance are found in DNRC's State Forest Land Management Plan (DNRC, 1996).* *Anticipated impacts of roads to wildlife are disclosed in Attachment G- Wildlife Analysis.*
24	Roads, even temporary roads, have negative impacts on wildlife and fish habitat including: a) The greatest surface erosion from roads occurs during the construction phase and first year after. b) Soil erosion and compaction (as always occurs with roads) causes long-term loss of soil productivity. c) The loss of topsoil and attendant loss of soil productivity is permanent.	***DNRC Response to Comment 24:*** *When planning transportation systems, DNRC is instructed to plan for the minimum number of road miles (ARM 36.11.421[1]). DNRC occasionally needs to construct additional roads in order to access timber stands for management. As described in ARM 36.11.422, DNRC shall implement all applicable BMPs on existing roads proposed for use and on all new road construction, including temporary roads. A historical road that is causing resource damage is prioritized for corrective actions to*

	d) Road obliteration does not immediately stop severely elevated soil erosion from roads. e) Even "temporary" roads have enduring impacts on aquatic resources. f) Roads and increased sedimentation cause long-term negative impacts on a variety of aquatic species.	*lessen or eliminate its negative impacts. The Action Alternative attempts to minimize the miles of proposed road construction needed to meet project goals. The temporary roads proposed under the Action Alternative would be reclaimed upon completion of use for this project.*
25	**Cumulative Effects** The Environmental Impact Statement must evaluate the cumulative effects of past, present and foreseeable future logging plans in this area including the Swift-Stryke project on the Stillwater State Forest.	***DNRC Response to Comment 25:*** *Cumulative effects based on past, present and foreseeable logging are found in the EA under each resource section.*
26	**Economically Unsuitable Lands** The EIS should disclose the net economic gain or loss of logging lands unsuitable for timber management for biological or economic reasons. We request that DNRC permanently remove all unsuitable lands from the timber base as they are identified. This will provide added certainty for wildlife security and reveal a more accurate picture of the forest's economic potential in the future. DNRC must identify all lands that are unsuitable for timber production. The EIS should disclose what the rate of growth is from past cutting units, and the number of times past logging units have been replanted. Continuing to log in similar areas that have had regeneration problems does not provide any benefit to the school trust.	***DNRC Response to Comment 26:*** *This issue is programmatic in nature and beyond the scope of this project. DNRC does identify lands unsuitable for timber production and those areas are noted in the stand level inventory. Additionally, such lands are not included in and do not contribute to DNRC's annual sustainable yield. DNRC's annual sustainable yield is based only on commercial forest acres, which are acres comprised of conifer species and have site productivity greater than 20 cubic feet per acre per year. Furthermore, although some sites may be viable for commercial timber management from a site productivity standpoint, other factors such as topography, wet areas, or lack of legal access, among others, preclude timber management. DNRC identifies such areas as 'deferred' from management, and those areas are not included in the sustainable yield calculation (SYC). The most recent SYC accounted for those factors.*
27	DNRC must disclose the basis for the growth and yield calculation on the Stillwater State Forest. What differences are there between past project yield and current project yield? What additional actions is DNRC taking to improve yield? What is present net value?	***DNRC Response to Comment 27:*** *This request is beyond the scope of this project and pertains to the sustainable-yield calculation, which is a complex statewide project. DNRC's most recent SYC was completed by an independent consulting firm, Mason, Bruce, & Girard, in 2020. The SYC process included collecting and summarizing forest inventory data which was used to determine both the current forest conditions and the expected growth and yield associated with the range of*

		management actions used by DNRC. For more information, the 2020 SYC Final Report is available for download online at: https://dnrc.mt.gov/_docs/Trust-Land/Planning-and-Reports/2020_FINALSYC2020FullReport_TLMD_FMB.pdf.
28	How will climate change affect growth and yield of these forests and habitat for species? How is DNRC planning to mitigate these effects? The failure to complete an adequate economic analysis in the past has created an inflated view of the value of logging over other positive economic assets found on the forest. MEPA alternatives must fully examine other viable economic options. A short-term, cash-flow analysis is not adequate, especially if DNRC must then conduct another timber sale in the future to clean up damage from past sales. **Climate Change** Climate change is happening, it is affecting plant growth, stream flows, forests and weather patterns and it will intensify. Neither DNRC's Administrative Rules for Forest Management and Streamside Management nor the Habitat Conservation Plan for listed species fully considers the impacts of climate change. Past conditions will not predict the future in the wake of climate change. The Montana Climate Assessment (MCA) [Found at http://montanaclimate.org/] is an effort to synthesize, evaluate, and share credible and relevant scientific information about climate change in Montana. It must be considered in development of HBRC. Following are key messages and conclusions: KEY MESSAGES • Annual average temperatures, including daily minimums, maximums, and averages, have risen across the state between 1950 and 2015. The	***DNRC Response to Comment 28:*** *Evidence of widespread climate change has been well documented and reported and is an important consideration today (Intergovernmental Panel on Climate Change (IPCC) 2014). In Montana, effects of climate change will be related to changes in temperature and moisture availability, and the response of individual tree species, forests and habitats will be complex and variable, depending local site and stand conditions. Changes in temperature and moisture availability may affect the ability of some tree species to establish and regenerate on some sites. Forest productivity may increase in some areas due to longer growing seasons associated with increased temperature where moisture is not limited but may decrease in other areas where increasing temperature results in decreased water availability (Wade et al. 2017). Drought severity is expected to increase, leading to increases in forest and tree mortality. Changing climate may also lead to changes in the range of some species, resulting in changes in forest composition and distribution (Wade et al. 2017). Given possible changes in the amounts and types of trees and other plants observed in forests, unique vegetation community associations and new climax community types may also begin to appear in the future (Fox 2007). Changing climate is also expected to alter natural disturbance regimes, such as fire and insects, with the resulting effects expected to have greater impact on Montana's forests than changes in temperature and moisture availability that directly affect individual trees and species (Wade et al. 2017). Understanding changes in tree species composition in forests, and the ability of various tree species to thrive under changing climate conditions, may take decades. Predicting possible effects of climate change in forests at local levels is also difficult due to large-scale variables at play, such as possible increases in global evaporation rates, and possible changes in global ocean currents and jet stream. Such outcomes could influence locally observed precipitation amounts and possible influences on natural disturbance regimes (such as changing the average intensity, frequency, and scale of fire events). Normal year to year variation in weather also confounds the ability to identify, understand, predict, and respond to influences of climate change. Given the many*

	increases range between 2.0-3.0°F (1.1-1.7°C) during this period. [high agreement, robust evidence] • Winter and spring in Montana have experienced the most warming. Average temperatures during these seasons have risen by 3.9°F (2.2°C) between 1950 and 2015. [high agreement, robust evidence] • Montana's growing season length is increasing due to the earlier onset of spring and more extended summers; we are also experiencing more warm days and fewer cool nights. From 1951-2010, the growing season increased by 12 days. In addition, the annual number of warm days has increased by 2.0% and the annual number of cool nights has decreased by 4.6% over this period. [high agreement, robust evidence] • Despite no historical changes in average annual precipitation between 1950 and 2015, there have been changes in average seasonal precipitation over the same period. Average winter precipitation has decreased by 0.9 inches (2.3 cm), which can mostly be attributed to natural variability and an increase in El Niño events, especially in the western and central parts of the state. A significant increase in spring precipitation (1.3-2.0 inches [3.3-5.1 cm]) has also occurred during this period for the eastern portion of the state. [moderate agreement, robust evidence] • The state of Montana is projected to continue to warm in all geographic locations, seasons, and under all emission scenarios throughout the 21st century. By mid century, Montana temperatures are projected to increase by approximately 4.5-6.0°F (2.5-3.3°C) depending on the emission scenario. By the end-of-century, Montana temperatures are projected to increase 5.6-9.8°F (3.1-5.4°C) depending on the emission scenario. These state-level changes are larger than the average changes projected globally and nationally. [high agreement, robust evidence]	*variables and difficulty in understanding the ramifications of changing climate, detailed assessment of possible direct, indirect, or cumulative effects of climate change in association with project activities described in this EA is beyond the scope of this analysis. In the face of current uncertainty associated with climate change, DNRC is continuing to manage for biodiversity as guided under the SFLMP. Under the management philosophy of the SFLMP, DNRC will continue to manage for biodiversity using a coarse filter approach that favors an appropriate mix of stand structures and compositions on state lands as described by ARM 36.11.404, while also working to understand relevant ecosystem changes as research findings and changes in climate evolve.*

	• The number of days in a year when daily temperature exceeds 90°F (32°C) and the number of frost-free days are expected to increase across the state and in both emission scenarios studied. Increases in the number of days above 90°F (32°C) are expected to be greatest in the eastern part of the state. Increases in the number of frost-free days are expected to be greatest in the western part of the state. [high agreement, robust evidence] • Across the state, precipitation is projected to increase in winter, spring, and fall; precipitation is projected to decrease in summer. The largest increases are expected to occur during spring in the southern part of the state. The largest decreases are expected to occur during summer in the central and southern parts of the state. [moderate agreement, moderate evidence] This EIS must fully evaluate whether logged areas will regenerate and how changes in precipitation patterns affect streams.	
29	**<u>Weeds</u>** Controlling weeds and preventing their spread is a huge issue that DNRC does not have a grip on. Current methods are obviously not working, weeds spread on forest roads, in cutting units, landings, burn piles, and on to adjacent ownerships. The best way to prevent weeds from spreading out of control is not to disturb the native vegetation.	***DNRC Response to Comment 29:*** *DNRC disagrees with the assertion that an effective weed management plan has not been implemented. On open roads, weed seed is introduced primarily via motor vehicle use. Established infestations of noxious weeds are being addressed with an ongoing program of site-specific herbicide spraying along roads and in small areas of infestation as outlined in the Cooperative Integrated Noxious Weed Management Agreement (CINWA) between Flathead County and the DNRC. Within the proposed project area, spot spraying would target log landing areas and roadways.* *Upon reclamation and final blading, roads would also be grass seeded to mitigate the spread of weeds. Logging equipment would be washed prior to entering the sale area and would be inspected by the Forest Officer to ensure that it meets contract standards. Follow up spot treatments would occur in harvest units and on skid trails following logging as needed. Weed-related effects associated with the proposed action are addressed on pages 41 of the Vegetation Analysis, Attachment C.*

30	So what plan does the Stillwater State Forest have for weeds in the project area? It is likely that this project will spread more weeds, they must be eradicated not spread. Washing equipment does not work, please do not attempt to dupe the public into believing that the same past failed mitigation measures to control weeds will somehow miraculously work in this project. DNRC cannot just resign itself to the fact that there will be an invasive species problem in the project area indefinitely. This is not adequate.	***DNRC Response to Comment 30:*** *DNRC plans to complete herbicide treatments of noxious weeds on the project area to control existing weed infestations. All equipment would be washed and inspected prior to start of work. All restricted roads would be reseeded to site-adapted grass to reduce the threat of noxious weed spread. The project area would be monitored for noxious weeds after harvest operations are complete and herbicide treatments may be applied if needed.*
31	**<u>Costs</u>** DNRC must track the costs expended to plan and implement this timber sale. Without this information it cannot accurately determine whether revenue is being generated for the school trust. We expect our comments to be fully considered in the EIS. Please keep us informed as this project develops and of any field trips to the project area. /s/Arlene Montgomery Program Director	***DNRC Response to Comment 31:*** *Itemized cost accounting involves many unknown variables and is conducted at the programmatic level, rather than on a project-by-project basis. In this EA (see Impacts on the Human Population-Other Appropriate Social and Economic Circumstances), project costs are estimated based on the most recent annual programmatic revenue to cost ratios. A more detailed review of programmatic costs is available in the Trust Land Management Division Fiscal Year 2023 Return on Assets Report and DNRC FY 2023 Annual Report.*

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