

# **St. Mary's Lake Timber Sale Environmental Assessment**



**Kalispell Unit  
Northwestern Land Office  
Montana Department of Natural Resources and Conservation  
March 2015**



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# St. Mary's Lake Timber Sale Environmental Assessment

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# Environmental Assessment

**Project Name: St. Mary's Lake Timber Sale**  
**Proposed Implementation Date: May 2015**  
**Proponent: Kalispell Unit, Northwest Land Office, Montana DNRC**  
**County: Lake**

## Type and Purpose of Action

### Description of Proposed Action:

The Kalispell Unit of the Montana Department of Natural Resources and Conservation (DNRC) is proposing the St. Mary's Lake Timber Sale. The project is located 6 miles SE of St. Ignatius, Mt (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	<b>Sec.36 T18N R19W</b>	<b>~640</b>	<b>524</b>
Public Buildings			
MSU 2 <sup>nd</sup> Grant			
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:

- To generate funds for the Common Schools Trust pursuant to Section 77-1-202 Montana Code Annotated [MCA].
- To reduce insect and disease issues in the project area.
- To return the stand to a more historic forest cover types.

Proposed activities include:

Action	Quantity
<b>Proposed Harvest Activities</b>	
Clearcut	
Seed Tree	330 acres
Shelterwood	194 acres
Selection	
Commercial Thinning	
Salvage	
<b>Total Treatment Acres</b>	524 acres
<b>Proposed Forest Improvement Treatment</b>	
Burning	122 acres
Pre-commercial Thinning	
Planting	100 acres
Mechanical Site Prep.	220 acres
<b>Proposed Road Activities</b>	
New permanent road construction	
New temporary road construction	3.9 miles
Road maintenance	1.5 miles
Road reconstruction	
Road abandoned	
Road reclaimed	
<b>Other Activities</b>	

<b>Duration of Activities:</b>	3 year contract
<b>Implementation Period:</b>	July 2015

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 will 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)
- All other applicable state and federal laws.

## Project Development

**SCOPING:**

- DATE:
  - 12/30/2014
- PUBLIC SCOPED:
  - The scoping notice was posted on the DNRC Website:  
<http://dnrc.mt.gov/PublicInterest/Notices/Default.asp>
  - Adjacent Landowners
- AGENCIES SCOPED:
  - Montana Department of Fish, Wildlife, and Parks
  - USFWS
  - CSKT Tribe
- COMMENTS RECEIVED:
  - 4 public comments receivedConcerns identified:
  - Aesthetics: Concerns were expressed that the project area is visible from residential areas and would impact the view from private property.
  - Fire Danger: Harvest activities would increase the fire danger within the project area by creating logging slash.
  - Logging Traffic: Concerns were raised about road dust being created from log hauling operations. Increased truck traffic could pose a safety risk on open roads.
  - Clean-Up: Concerns were raised about the treatment of logging slash after harvest operations are complete and trash being left on site during harvest operations.

## Mitigations to be implemented:

- Aesthetics: A minimum 100 foot no-cut buffer will be present along the entire length of the St. Mary's Lake Road. This will make the harvest less visible from the road. The project area is not visible from Highway 93 or any residential area.
- Fire Danger: Logging slash will be treated to meet the State 'Hazard Reduction Law'. Dozer piling and scarification will occur on approximately 220 acres. All dozer and landing piles will be burned by the State. Broadcast burning is proposed on approximately 140 acres. Proposed silvicultural treatments would reduce stand densities, remove dead and dying timber, and reduce the crown fire potential.
- Logging Traffic: Log hauling will likely occur Monday thru Friday. Signs will be posted to notify the public that hauling is occurring. Slower speed limits may be imposed to lessen the amount of dust created. Contract clauses would allow the State to require dust abatement be applied if dust becomes excessive.

Internal concerns and issues are detailed in resource sections in the EA. Mitigation measures are listed and explained in resource sections.

**INTERDISCIPLINARY TEAM (ID):**

- Project Leader: Nick Aschenwald
- Archeologist: Patrick Rennie
- Wildlife Biologist: Leah Breidinger
- Hydrologist: Mark Vessar with consultation from Jeff Schmalenberg
- Soil Scientist: Mark Vessar
- 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 [www.dnrc.mt.gov?HCP](http://www.dnrc.mt.gov?HCP)
- **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.
- **Montana/Idaho Airshed Group-** 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.
- **Confederated Salish and Kootenai Tribes –** The project area lies within the administrative boundaries of the Flathead Indian Reservation. A temporary road use permit will be needed to access a portion of the project area (southeast corner of the section).

**ALTERNATIVES CONSIDERED:****No-Action Alternative:**

No timber harvesting would occur. The possibility of future salvage permits does exist in this area.

No new roads would be constructed. Maintenance of existing roads would be limited to periods when the roads are being used for removal of forest products. Fuel mitigation treatments would continue but be limited in size and scope with limited access. Weed control efforts would continue on existing roads as priorities and funding allow.

Recreational uses of the area would continue to include hiking, biking, horseback riding, shooting, hunting, and Nordic skiing. Efforts to curtail vandalism and resource damage associated with unauthorized recreational use would continue as funding and priorities allow.

Forest and plant succession would continue to be mainly influenced by the occurrence of natural events, such as insect and disease outbreaks, windthrow, or wildfire.

### **Action Alternative:**

Harvest of approximately 524 acres of State Common Schools Trust Land would occur.

This would include approximately 3.9 miles of new road construction. All roads will be closed and grass seeded after harvest operations are completed. These roads will be classified as 'abandoned' per definitions in the HCP. Seed tree and shelterwood treatments would be implemented.

Roughly 122 acres of prescribed broadcast burning and 220 acres of mechanical site preparation would be implemented post-harvest to improve natural regeneration.

Spot scalping and tree planting would take place in acres not site prepped.

## **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:

- Forest Health: There are concerns that endemic populations of diseases and insects are increasing on the site and have the potential to reach epidemic proportions and/or reduce productivity.
- Dwarf mistletoe is prevalent in the Douglas-fir and Western larch.
- Douglas-fir bark beetle and mountain pine beetle are actively infesting the current stands.
- Insects and disease may affect timber productivity and value.
- Timber harvesting and associated activities may increase noxious weeds in the project area.

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

- Remove Dwarf mistletoe infected trees and burn slash from infected limbs.
- Remove any trees infected with bark beetle.
- Remove any trees affected by *Armillaria* (root rot)
- Maintain clean equipment on site to avoid weed spread.
- Return to site after harvest and remove any weeds present by spraying and/or burning as appropriate.

**FOR COMPLETE VEGETATION ANALYSIS SEE ATTACHMENT B.**

## **SOILS:**

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

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

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

- 1) Limit ground-based equipment operations to periods when soils are relatively dry, (less than 20 percent oven-dry weight on harvest units), frozen, or snow-covered to in order to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up. In order to prevent soil resource impacts, logging activities would be restricted to periods when one or more of the following conditions occurs, unless otherwise approved in writing by the Forest Officer.
  - Soil-moisture content at 4-inch depth is less than 20% of oven-dry weight
  - Minimum frost depth of 3 inches
  - Minimum of 18 inches loose snow or 12 inches packed snow adequate to avoid soil displacement
- 2) On ground-based units, the logger and sale administrator would agree to a skidding plan prior to equipment operations. Skid trail planning would identify which main trails to use and how many additional trails are needed. Trails that do not comply with BMPs (i.e. trails in draw bottoms) would not be used unless impacts can be

- adequately mitigated. Regardless of use, these trails may be closed with additional drainage installed, where needed, or grass-seeded to stabilize the site and control erosion.
- 3) Tractor skidding should be limited to slopes of less than 40 percent unless the operation can be completed without causing excessive displacement or erosion. Based on site review, short, steep slopes may require a combination of mitigation measures, such as adverse skidding to a ridge or winchline, and skidding from more moderate slopes of less than 40 percent.
  - 4) Keep skid trails/landings to 20 percent or less of the harvest unit acreage. This requires average skid trail spacing at least 60 feet. Provide for drainage on skid trails and roads concurrently with operations.
  - 5) Skyline corridors shall be spaced not less than 75 feet apart. In the case of ridges where fan-shaped settings are required, the minimum distance at the widest divergence will be 150 feet. Clearing width for corridors to accommodate yarding should not exceed 12 feet. Where skyline is required, harvest would be by log-length skidding. Leading end of the logs would be carried free of the ground at all times except during lateral yarding. Erosion control, such as slashing or retaining tops, would be required within cable skidding corridors where excessive soil disturbance may be of an extent to cause erosion. The contract administrator would monitor conditions and recommend erosion control as needed.
  - 6) Slash disposal: Limit the combination of disturbance and scarification to 30 to 40 percent of the harvest units. No dozer piling on slopes over 35 percent; no excavator piling on slopes over 40 percent, unless the operation can be completed without causing excessive erosion. Consider lopping and scattering or jackpot burning on the steeper slopes. Consider disturbance incurred during skidding operations to at least partially provide scarification for regeneration.
  - 7) Retain 5 to 10 tons per acre of large woody debris on Douglas-fir habitat types within the project area and 11 to 22 tons per acre of large woody debris on all other habitat types. Maintain a feasible majority of all fine litter 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 slash on site; 2) 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.
  - 8) Install and maintain, concurrent with hauling operations, adequate road drainage to control erosion and comply with forestry Best Management Practices. To maintain drainage features and avoid rutting, the Department would limit the season of road use to dry, frozen, or adequately snow covered conditions.

**FOR COMPLETE SOILS ANALYSIS SEE ATTACHMENT C.**

**WATER RESOURCES and FISHERIES:**

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

- Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.

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

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

Hydrologic related resource mitigation that would be implemented with the proposed Action Alternative includes:

- Follow all appropriate Forestry Best Management Practices
- Follow all mitigation measures listed in the Soil Analysis

**FOR COMPLETE WATER RESOURCES ANALYSIS SEE ATTACHMENT D.**

**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 and connectivity: The proposed activities could decrease mature forested cover, which could reduce habitat connectivity and suitability for wildlife species associated with mature forest.
- Canada lynx: The proposed activities could reduce landscape connectivity and the availability of suitable Canada lynx habitat, reducing the capacity of the area to support Canada lynx.
- Grizzly bears: The proposed activities could alter grizzly bear cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats, and/or by increasing risk of human-caused bear mortality.
- Fishers: The proposed activities could reduce the availability and connectivity of suitable fisher habitat and increase human access, which could reduce fisher habitat suitability and increase trapping mortality.
- Flammulated owls: The proposed activities could alter the structure of flammulated owl preferred habitat, which could reduce habitat suitability for flammulated owls.
- Pileated woodpeckers: The proposed activities could reduce tree density and alter the structure of mature forest stands, which could reduce habitat suitability for pileated woodpeckers.
- Big game winter range: The proposed activities could reduce cover, which could reduce the quality of big game winter range habitat.

**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 or wolf dens 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 36.11.444(2) and GB-PR2 (USFWS and DNRC 2010).

- 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.
- Restrict public access at all times on restricted roads that are opened for harvesting activities. Effectively close all restricted roads following harvest completion.
- To retain visual screening for grizzly bears, design clearcut and seed tree units such that vegetation or topographic breaks be no greater than 600 feet from any point in the unit as per *GB-NR4 (USFWS and DNRC 2010)*. Prohibit cutting and motorized activities within hiding cover leave-patches.
- In harvest units 1, 8, 9, 12, and 13, retain patches of advanced regeneration of shade-tolerant trees as per *LY-HB4 (USFWS and DNRC 2010)*. Retention patches may be located outside of areas proposed for burning.
- Retain visual screening along roads where possible to increase security for wildlife.
- Retain at least 2 snags and 2 snag recruits per acre, particularly favoring ponderosa pine and Douglas-fir for retention. If snags are cut for safety concerns, they must be left in the harvest unit. Retain 10-22 tons/acre of coarse-woody debris as described in the *SOILS ANALYSIS* section of this document.

**FOR COMPLETE WILDLIFE ANALYSIS SEE ATTACHMENT E.**

**AESTHETICS:**

Any change to the scenery in the project area resulting 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:

- Timber harvest could negatively impact the view of the Mission Mountain range.

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

- A minimum of 100 foot no-cut buffer will be left along the entire length of the St. Mary's Lake Road. The parcel is not visible from Highway 93 or residential areas.

**Existing Conditions**

Currently the stand is made up of heavily-stocked timber with large pockets of disease and dead and dying trees. Past timber harvests have occurred on adjacent Confederated Salish and Kootenai Tribal lands. The project area is located in a narrow drainage and is not readily visible from any populated area.

**-VISUAL QUALITY**

**No-Action Alternative:**

This alternative would likely have no initial effect on aesthetics. However, as disease continues to spread throughout the stand the aesthetic quality could diminish as tree mortality increases.

**Action Alternative:*****Direct, Secondary, and Cumulative Effects***

A minimum 100 foot no-cut buffer will be left along the entire length of the St. Mary's Lake Road which passes through the southern third of the project area. This should screen much of the harvest areas from traffic traveling along the road. Slash from the harvest would be noticeable temporarily and stands would be more open. Generally slash disappears from the site within five years, and is often covered by other vegetation within three years. Again, sites would be generally lighter in color than can be seen currently.

As the stand ages, post-harvest aesthetics could improve beyond current conditions due to the removal of diseased trees.

**-NOISE****No-Action Alternative:**

No discernable effect to noise would occur from this alternative.

**Action Alternative:*****Direct, Secondary, and Cumulative Effects***

Harvest activities would be quite 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. This noise could be expected during the general "work week" for the entire season of harvest, typically from mid-June through mid-March of the following year, and for the duration of the two-to-three year harvest period.

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

**HISTORICAL AND ARCHEOLOGICAL SITES:**

No cultural or paleontological resources have been identified. The terrain is generally greater than 25% slopes, and the geology is not conducive to caves, rock shelters, or tool-quality stone which further decreases the likelihood of artifacts. If any cultural resources are found they will be preserved. DNRC has sent a scoping letter to the Blackfoot Nation and the Confederated Salish and Kootenai Tribes (CSKT), but no response concerning the presence or absence of cultural resources of importance has been received.

**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:**

- No negative direct, indirect, or cumulative effects are expected to occur as a result of the proposed project.

## 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 Airshed 2, which encompasses portions of Lake and Flathead Counties. The Kalispell and Thompson Falls Impact Zones are located within Airshed 2; however, the project area is not located within or near those 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 and broadcast burning.
- Dust may 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 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 (PM) into the local airshed, which may temporarily affect local air quality.

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.

Direct and indirect effects to air quality due to slash burning associated with the proposed action would be minimized.

### ***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. Therefore, cumulative effects to air quality due to slash burning associated with the proposed action would also be minimized.

### **-DUST**

#### **No-Action Alternative:**

No increased dust would be produced as a result of the proposed timber sale. Current levels of dust would be produced in the area.

#### **Action Alternative:**

#### ***Direct, Secondary, and Cumulative Effects***

Harvesting operations would likely occur during a 7 to 8 month period which may be spread out over several years. 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.

Direct, secondary, and cumulative effects to air quality due to harvesting and hauling associated with the proposed action would therefore be temporary possibly lasting a total of 8 months. It is possible much of the log truck traffic would occur during winter months when no dust would be created.

### **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 on log-hauling traffic:

- There will be increased travel on weekends.
- Trucks will drive exceed to posted speed limit of 35 MPH.

**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 typically take place during Monday thru Friday.
- 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 of 20 to 25 MPH 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):**

The area is used for hiking, hunting, cross-country skiing, snowmobiling, and general recreating. Currently, the St. Mary's Lake Road passes through the southern third of the project area is open year round to motorized use. Haul roads located within the project area are closed to motorized use. There would be no change in road closure status and the selection of either alternative would not affect the opportunity for people to recreate on this parcel.

There will be no change from existing conditions. Therefore, there would be no measurable direct, secondary, or cumulative impacts on recreation from this proposed action.

**ADDITIONAL IMPACTS ON THE HUMAN POPULATION**

Will the No-Action or Action Alternatives 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		
<b>No-Action</b>														
Health and Human Safety	X				X				X				N/A	
Industrial, Commercial, and Agricultural Activities and Production	X				X				X				N/A	
Quantity and Distribution of Employment	X				X				X				N/A	
Local Tax Base and Tax Revenues	X				X				X				N/A	
Demand for Government Services	X				X				X				N/A	
Density and Distribution of Population and Housing	X				X				X				N/A	
Social Structures and Mores	X				X				X				N/A	
Cultural Uniqueness and Diversity	X				X				X				N/A	
<b>Action</b>														

Will the No-Action or Action Alternatives 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		
Health and Human Safety	X				X				X				N/A	
Industrial, Commercial, and Agricultural Activities and Production		X				X				X			N/A	
Quantity and Distribution of Employment		X				X				X			N/A	
Local Tax Base and Tax Revenues	X				X				X				N/A	
Demand for Government Services	X				X				X				N/A	
Density and Distribution of Population and Housing	X				X				X				N/A	
Social Structures and Mores	X				X				X				N/A	
Cultural Uniqueness and Diversity	X				X				X				N/A	

**LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS** *(includes local MOUs, management plans, conservation easements, etc):*

**OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:**

The proposed action has a projected harvest volume between 4 and 5 MMBF. This volume is worth approximately \$160/MBF delivered to a forest products manufacturing site at current market prices. Delivered to market, the proposed action has an estimated revenue value of \$672,000. 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 \$436,800 and \$571,200. 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 Northwestern Land Office was 2 to 1. This means that, on average, for every \$1.00 spent in costs, \$2.00 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.

**Environmental Assessment Checklist Prepared By:**

**Name: Nick Aschenwald**  
**Title: Forester**  
**Date: 3/12/2015**

## Finding

### Alternative Selected

The Montana Department of Natural Resources and Conservation has completed the environmental assessment (EA) for the proposed St Mary's Lake Timber Project on State School Trust Lands described on page 1 & 2 of this document. After a thorough review of the EA, public comments, the project file, Department policies, standards, and guidelines, I have made the following decisions concerning this project:

The alternatives proposed for consideration in this EA were the No-Action and Action Alternatives. The Action Alternative would allow for the harvest of approximately 4-5 million board feet of timber from 524 acres, and include 3.9 miles of new road construction. Information contained in the EA indicates that issues associated with vegetation (including weeds and slash disposal), water resources and soils (including road and forestry BMP's), and wildlife (including snag and woody debris recruitment, T & E species requirements, open road densities, and disturbance to nesting loons, hawks and eagles) are identified and have been resolved or mitigated by the design of the project, or those mitigations would be specific contractual requirements of the project.

The Action Alternative has been selected for the following reasons:

- The Action Alternative meets the Project Type and Purpose listed under this section, of the EA:
  - To generate funds for the Common Schools Trust pursuant to Section 77-1-202 Montana Code Annotated [MCA]).
  - To reduce insect and disease issues in the project area.
  - To return the stand to a more historic forest cover types.
- The proposed use is consistent with State and local policies, laws, and regulations.

### Significance of Potential Impacts

Upon review of the project and the analysis herein, I find that none of the project impacts are regarded as severe, enduring, geographically widespread, or frequent. Further, I find that the quantity and quality of the natural resources, including any that may be considered unique or fragile, will not be adversely affected to a significant degree. I find no precedent for the future actions that would cause significant impacts, and I find no conflict with local, State, or federal laws, requirements, or formal plans. In summary, I find that adverse impacts would be avoided, controlled, or mitigated by the design and implementation of the project to an extent that they are not significant.

### Need for Further Environmental Analysis

EIS

More Detailed EA

No Further Analysis

### Environmental Assessment Checklist Approved By:

**Name: David M. Poukish**

**Title: Kalispell Unit Manager**

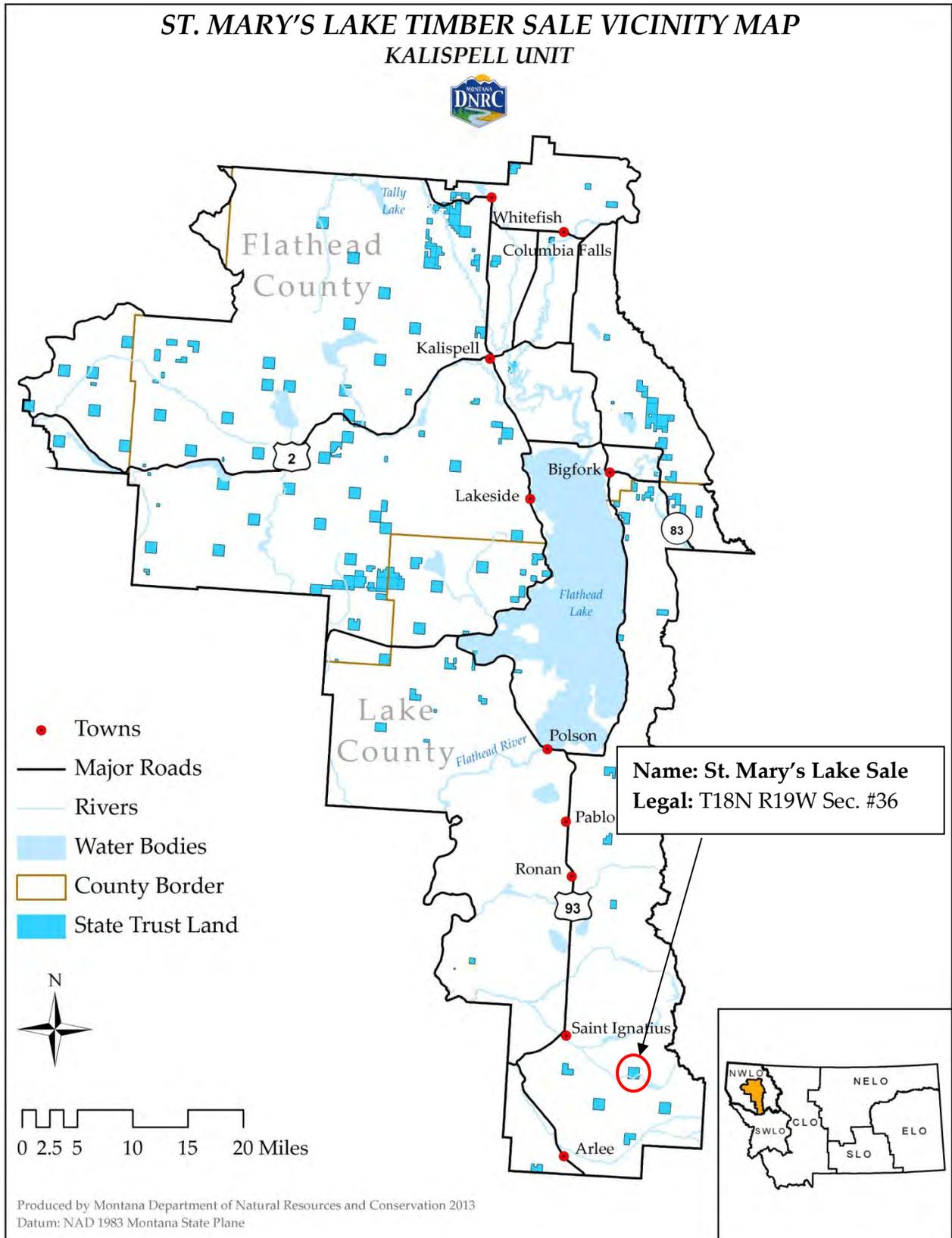
**Date: 4/17/15**

**Signature: /s/ David M. Poukish**

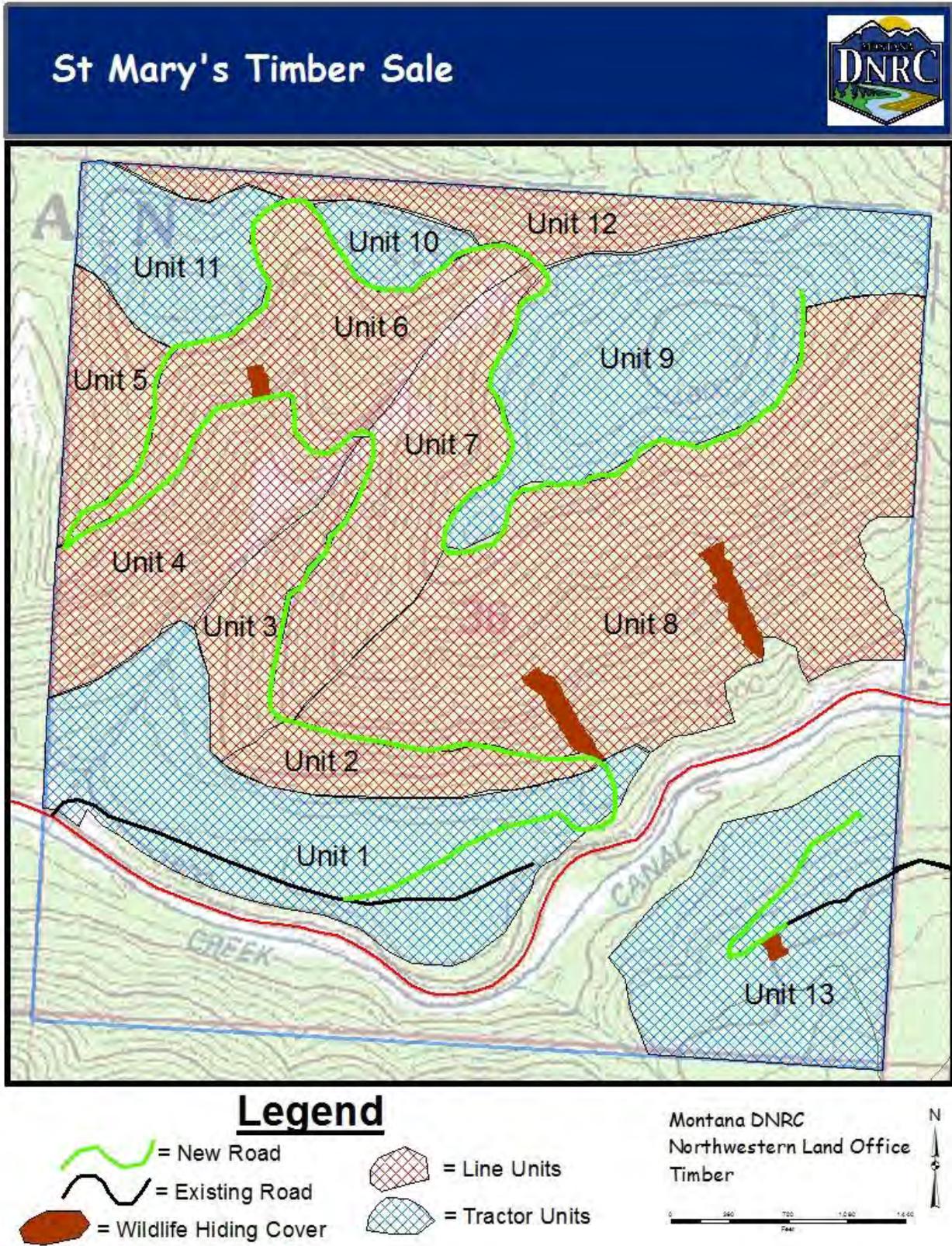


## **Attachment A - Maps**

A-1: St. Mary's Lake Timber Sale Vicinity Map



A-2: St. Mary's Lake Timber Sale Harvest Units



## **Attachment B – Vegetation**

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## St. Mary's Lake Timber Sale – Vegetation Analysis

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### Analysis Prepared By:

**Name: Nick Aschenwald**

**Title: Forester, Montana DNRC**

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## Introduction

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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.

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## Issues and Measurement Criteria

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During the initial scoping, issues were developed both internally and by the public and regarding vegetative concerns. The following concerns were expressed regarding proposed timber harvesting and related activities:

- Forest Health: There are concerns that endemic populations of diseases and insects are increasing on the site and have the potential to reach epidemic proportions and reduce productivity.
- Dwarf mistletoe is prevalent in the Douglas-fir and Western larch. Douglas-fir bark beetle and mountain pine beetle activity has been increasing and is causing a large amount of mortality.
- Timber harvesting and associated activities may increase noxious weeds in the project area.

These issues can be evaluated by analyzing the anticipated changes in current forest conditions in the project area, in conjunction with the extent and location of silvicultural treatments.

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## Regulatory Framework

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Administrative Rules of Montana (ARM 36.11.404) direct DNRC to take a coarse filter approach to favor an appropriate mix of stand structures and compositions on state lands, referred to as a desired future condition. The following characteristics are used to describe current forest and stand conditions in comparison to the estimated natural forest characteristics for Montana prior to extensive influences from fire suppression, logging, and development: forest composition, age class distribution, and cover type and structure. This analysis will compare the desired stand conditions that DNRC believes to be appropriate for the site with current stand conditions. Methods used in the analysis include review of stand level inventory (SLI) data, field visits, review of scientific literature, aerial photography, and consultation with other professionals.

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## Analysis Areas

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The proposed St. Mary's Lake Timber Sale project area is located approximately 6 air miles southeast of St. Ignatius, Montana and includes approximately 640 acres of State Trust Lands. It is located within Section 36 Township 18N, Range 19W. State Trust Lands within the project area share property boundaries with CS&KT

tribal lands. Several other analysis areas were delineated to assess direct, indirect, and cumulative effects of the alternatives considered. More specific details about these are contained under each corresponding resource heading.

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## Existing Conditions

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### Noxious Weeds

Invasions of noxious weeds are generally restricted to areas adjacent to old logging roads and the St. Mary's Lake Road. Current weed infestations consist mostly of spotted knapweed with some orange hawkweed and Canada thistle. Spotted knapweed is abundant and widespread along the St. Mary's Lake Road. Infestations are isolated and not as widespread along old logging roads located within the State ownership. Native plant species may not re-colonize these areas. Several factors may contribute to continued weed encroachment in the St. Mary's Lake project area. Factors include ongoing use of the area for recreation, creation of new roads, and ground-disturbing activities associated with harvest activities.

### Rare Plants

In previous botanical surveys, six separate populations of species of special concern, representing five different families, were located within the St. Mary's Lake project area. These plant populations include the following species: thinsepel monkeyflower (*Mimulus hymenophyllus*), clustered lady's slipper (*Cypripedium fasciculatum*), Douglas' neckera moss (*Neckera douglasii*), netted specklebelly lichen (*Pseudocyphellaria anomala*), hooded ramalina lichen (*Ramalina obtusata*) and powdery twig lichen (*Ramalina pollinaria*). Two of these species (hooded ramalina and powdery twig lichens) occur in low-elevation riparian areas and will be protected by current SMZ regulations. There are no known threats to any of the lichen species (*P. anomala*, *R. obtusata*, *R. pollinaria*) or the Douglas' neckera moss (*N. douglassii*) (Montana Natural Heritage Program). Thinpetal monkeyflower grows on cool moist cliffs, which do not occur in the harvest area. Clustered lady's slipper has not been seen in the project area. If it is located, the State will take appropriate measures to protect this sensitive species.

### Standard Vegetative Community

The existing vegetative types, more specifically forest habitat types and cover types, within the Kalispell Unit landscape and the St. Mary's Lake project area reflect the varied influences of site factors, fire regimes or disturbance patterns, and past management activities.

Site conditions vary depending upon the physiographic and climatic factors associated with geographic locations. Soil types, slope aspect and position, length of growing season, and moisture availability influence the type, growth, and development of forest vegetation. These site factors are considered in the forest habitat classifications (Pfister et al. 1977) generally used to describe forest vegetation, forest stand development, and relative forest productivity associated with the given site and climatic factors.

By reading through Forest Habitat Types of Montana by Pfister, et. al, it is evident that the project area falls into the Thuja plicata (western red cedar) and Pseudotsuga menziesii (Douglas-fir) types. The cedar types are common between 2000 and 5000 feet in elevation where precipitation is normally 32 inches per year or greater.

The cedar types predominately fall into the THPL/CLUN (western cedar red cedar/queencup beadlily) habitat type. This is the most common phase of the cedar types and occurs on the warmer and drier cedar sites. In the St. Mary's project area, this type occurs in the bottoms along streams and in flat, bench areas. The largest area of cedar types is located in the southeast corner of the section along Dry Creek. Grand fir, Douglas-fir, sub-alpine fir, and western larch are present. Some spruce is scattered as well. The St. Mary's project area

also has a high occurrence and density of lodgepole pine in some areas occupied by a cedar habitat type. This is somewhat unusual for a cedar type.

Timber productivity is considered high to very high in cedar types. Trees seldom reach their potential size due to high stand densities. Due to gentle terrain and high productivity, these sites in the project area are excellent candidates for intensive timber management. Past logging in the project area indicated excellent establishment of regeneration if the soil is scarified. Old skid trails are covered with seedling to sapling sized trees.

The Douglas-fir habitat types fall mostly into the ninebark phase (PSME/PHMA). This type occurs mostly on the upper slopes above the benches and stream bottoms. The majority of the project area falls into this habitat type. According to Pfister, this Douglas-fir type occurs mostly on cool, moist north to east facing slopes. Elevation range is 2,000 to 5,700 feet. This matches closely to the St. Mary's project area. In addition to Douglas-fir, Ponderosa pine, western larch, and lodgepole pine are most prevalent.

Timber productivity is considered moderate to high in western Montana. These habitat types respond well to regeneration of Ponderosa pine, western larch, and lodgepole pine in even-aged harvest regimes. Partial cutting favors regeneration of Douglas-fir. Dwarf mistletoe has a high occurrence in these types and can adversely affect timber growth. Dwarf mistletoe was prevalent in both Douglas-fir and western larch in the St. Mary's project area.

Inventory and field reconnaissance were used to identify and quantify insect and disease activity in the project area.

#### Dwarf Mistletoe (*Arceuthobium laricis*) (*Arceuthobium douglasii*)

- Douglas-fir and western larch dwarf mistletoe is infecting the overstory and understory trees on the southern slopes of section 36. It is concentrated in clumps, but where it is present it is adversely affecting the growth of the residual stand.

#### Bark Beetles

- There is evidence of Douglas-fir beetle (*Dendroctonus pseudotsugae*) in the area. The infestation is causing most of the standing red and dead trees, some of the older dead may have been caused by root disease. There are also ponderosa pine and lodgepole pine with evidence of mountain pine beetle (*Dendroctonus ponderosae*).

#### Root Disease

- There are indications that *Armillaria* root rot (*Armillaria mellea*) has infected many pockets of residual timber, resulting in large circular patterns of dead timber.

Fire regimes for the Kalispell Unit landscape are variable, given the broad and scattered nature of Trust Lands, but are predominantly within the moderate-severity fire regime. As a whole, the forest exists as a mosaic of differing age and size classes. This variation has developed as a result of different human activities; fire frequencies and intensities relative to other site factors such as aspect, elevation, weather, stand structure; and fuel loadings. Areas of frequent fire have produced western larch/Douglas-fir, ponderosa pine, and Douglas-fir cover types. In low-severity fire regimes, fires occur frequently and create patches of open-grown forest. Historically, these low-severity regimes maintained stand conditions that were resistant to stand-replacement fires, by regularly consuming forest fuels, killing small trees, and pruning boles of small trees. These characteristics reflect a low- to moderate-severity fire regime. As fire intervals become longer and management activities occur less frequently, more shade-tolerant tree species begin to develop in the understory and stands tend to become multi-storied, with varied patch sizes. High-severity fire regimes are characterized by large patch sizes.

Table V-1 – Current and desired cover types for the St. Mary's Lake project area.

Cover Type	Current Acres	Current Percent of Project Area	Desired Future Condition (DFC)	
			Acres	Percent
Subalpine fir	31	5%		
Douglas-fir	58.7	9%		
Lodgepole pine	0			
Mixed conifer	230.6	37%		
Ponderosa pine	294.4	47%	450	71%
Western larch/Douglas-fir	16.3	2%	181	29%
Western white pine	0			
Non-stocked	0			
Non-forest	9		9	
Other (specify)	0			
<b>Total:</b>	<b>640</b>	<b>100%</b>	<b>640</b>	<b>100%</b>

### Old Growth

Per the Land Board's decision in February 2001, the DNRC adopted definitions for old growth by forest habitat groups, based on minimum number and size of large trees per acre and age of those trees as noted in *Old-Growth Forest Types of the Northern Region* (Green et al. 1992). The DNRC approach to old-growth management (and forest management in general) is further clarified in (ARM 36.11.401 to 36.11.450). Field verification of older stands modeled in the coarse filter analysis of SLI data for the project area identified no stands within the project area meeting the DNRC's old growth definition.

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## Environmental Effects

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### Forest Age Class & Cover Type Distribution

#### **No-Action Alternative – Direct and Indirect Effects**

Under the No-Action Alternative, natural processes would continue to have a direct influence on these forest characteristics. In the absence of wildfires, the effects of current disease-infected trees and insect infestation-induced mortality will continue to influence both short and long term age class distribution and cover type representation.

Openings created in the canopy from insect and disease mortality are not expected to resemble natural fire effects. Openings are likely to be smaller and many may continue to be stocked with younger pole-sized trees. In some areas, there is a lack of any regeneration due to the ninebark brush (*Physocarpus* spp.) taking over the site. Without duff reduction and soil exposure, the regeneration of openings is expected to favor shade-tolerant species over seral species (for example, Douglas-fir regeneration on the upper slopes where ponderosa pine is the desired cover type). The middle to lower slopes are western larch/Douglas-fir or mixed conifer. The drainages and benches are mixed

conifer with a high percent of grand fir, cedar, and Douglas-fir. Without fire, the older age classes (100+ years) would continue to dominate the area and the 0-39 year and 40-99 year age classes would continue to decline.

### ***No-Action Alternative – Cumulative Effects***

Under the No Action Alternative, there would likely be no change from the existing condition. Mixed conifer cover types would persist in the absence of disturbance. Across the landscape, fire suppression, insect and disease occurrence, and increasing human use may influence cover type and age class distribution to an unknown degree. In the absence of stand-replacement fires, variability of age class and cover type distribution would decline.

### ***Action Alternative – Direct and Indirect Effects***

This alternative would harvest 524 acres. The harvest would consist of both seed tree and shelterwood treatments, allowing healthy regeneration to occur and removing trees affected by root rot, dwarf mistletoe, and bark beetles. Both of these harvest types would result in the maintenance of a two-storied stand. The post-harvest forest would be more open, allowing for the regeneration of seral, disease-resistant stands, and a species composition closer to historical conditions.

Sanitation cutting and salvage would occur in combination on all acres. Salvage harvest would capture the value of dead standing and windthrown trees. Sanitation cutting would remove insect-infested and diseased trees. The main pathogens are dwarf mistletoe, bark beetles, root rot, and Indian paint fungus. Tree spacing will be variable with some small openings possibly being created. Healthy Douglas-fir, ponderosa pine, and western larch would be retained to help achieve desired stocking levels, but larch and pine would be favored over Douglas-fir. The reduction in Douglas-fir and grand fir would increase the proportion of other species in the overstory, resulting in a slight change in composition.

As a result of harvesting and planned regeneration operations, the potential exists to increase the amount of ponderosa pine by approximately 155 acres and western larch/Douglas-fir by approximately 55 acres within the project area. Within the project area, this would represent a 24% increase in the amount of ponderosa pine cover types and a 9% increase in the amount of western larch/Douglas-fir cover types. By removing shade-tolerant species (mostly grand fir, spruce, and Douglas-fir) and retaining seral species, ponderosa pine and western larch, ponderosa pine and western larch/Douglas-fir cover types could begin to develop. The average age of some treated stands would decrease, although some stands would remain in the same age class after harvest, depending on the extent of overstory tree removal and the establishment of regeneration.

### ***Action Alternative – Cumulative Effects***

Changes in cover type distribution within the project area would provide a small, incremental change moving the Kalispell Unit toward desired cover type distribution across the landscape. This change would be cumulative to other projects on Kalispell Unit that produce a change in cover type or age class. Across the landscape, fire suppression, insect and disease occurrence, and increasing human use may influence cover type and age class distribution to an unknown degree.

## **Distribution of Old-Growth Stands**

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

No old growth stands are present within the project area. Under the No-Action Alternative, stands would continue to develop under the influence of suppressed wildfire activity and other natural disturbances such as insect and disease activity. Maintenance of old-growth characteristics and defining criteria will be dependent on the persistence and the rate of mortality. If disease is allowed to continue to spread in this area, it is expected that the trees will continue to die, resulting in a younger stand, or an old stand with fewer trees in the near future.

***Action Alternative – Direct, Indirect, and Cumulative Effects***

Under the Action Alternative, effects to old growth would be similar to the No-Action Alternative. Timber harvest activities would improve the growth and vigor of residual trees.

**Stand Structure and Development*****No-Action Alternative – Direct and Indirect Effects***

Stand structure and development could continue to change as a result of damaging agents. The mosaic pattern of multi-aged and multi-storied or small even-aged patches are likely to persist with this type of disturbance, resembling the unstable conditions and stand development often associated with late-successional forests. More shade-tolerant species would increase in all canopy levels continuing to replace or inhibit growth of seral species, as dense, small diameter trees develop in the understory. Area coverage of forest in early successional stages, especially in larger patch sizes would continue to decrease. Forest fuels, both ground and vertical, would continue to build up in stand areas where mortality is occurring, increasing the potential for large scale stand-replacement fires.

***No-Action Alternative – Cumulative Effects***

Forest succession and fire suppression would continue. Conditions favoring the establishment of shade-tolerant species in canopy gaps, the slow growth of seedlings and saplings under closed canopies or the hindrance of tree establishment under closed canopies, and increased fuel loadings would continue.

***Action Alternative – Direct and Indirect Effects***

Under the Action Alternative, seed tree harvests are proposed for 330 acres and shelterwood harvests are proposed for 194 acres. Current stand ages and structures would remain unchanged on the 194 acres scheduled for shelterwood harvest, although canopy closure and forest fuels would be reduced. The shelterwood cut would maintain some of the mid- and lower-canopy, favoring seral species and vigorous trees. These treatments would resemble mixed-severity fires and act as a thinning agent, killing the less fire-resistant species and releasing the more fire-resistant trees, such as western larch. Stand ages would be reduced on the 330 acres scheduled for seed tree harvest. Stand structure would also be changed on the 330 acres scheduled for seed tree harvest; multi-storied stands would be converted to two-storied or single-storied stands. After slash disposal treatments are completed, more fire-resistant stand conditions and structures would be maintained for several decades.

***Action Alternative – Cumulative Effects***

The area covered by single or two-storied stand structures across the Kalispell Unit landscape would increase by 330 acres. The 0-39 year age class acreage would also increase by 330 acres.

**Timber Productivity and Value*****No-Action Alternative – Direct and Indirect Effects***

Due to the effects of insects and disease, the commercial value of sawlogs would continue to decline. Non-sawlog or pulp values are generally less than that received for sawlogs, and the value of this timber trust asset would continue to decline. Growth rates of individual trees in denser, older stands would remain static or continue to decline and opportunities for establishment of replacement trees would be limited to small openings favoring shade-tolerant trees. Development of a larger diameter, commercially valuable tree component in the overstory of older stands would be hindered. Loss of dead and dying trees along both open and closed roads would continue to occur from activities associated with firewood gathering and maintenance of irrigation corridors and public right-of-way easements.

***No-Action Alternative – Cumulative Effects***

Without silvicultural treatments or wildfires to control tree densities, reduce losses to insects or disease, and reduce mortality or initiate new stands, the trend towards older, slower growing stands would continue, increasing acreage on the Kalispell Unit that is more susceptible to beetle infestations, stem decays, or wildfires.

#### **Action Alternative – Direct and Indirect Effects**

Silvicultural treatments to be applied under the Action Alternative would remove diseased trees and decrease stand densities. Healthy and vigorous trees of all species would be favored for retention where they occur. Snags and snag recruits in quantities meeting DNRC requirements would be left. Larger diameter snags and cull trees, especially shade-intolerant species, if not infected with dwarf mistletoe would be favored for potential snag recruits and snag retention. Due to the removal of low-vigor or diseased trees, stand health would improve. Between-tree competition would be reduced allowing residual trees to maintain or increase current growth rates. The bark beetle hazard for the treated stands will be reduced due to decrease in stocking, removal of decadent trees, and by freeing up more available water, sunlight, and nutrients for residual trees.

Timber harvest would reduce fuel load. Slash reduction will mainly include tree length skidding and burning of landing piles the ensuing fall. Some small diameter slash will be placed on skid trails for erosion control and nutrient cycling. Residual trees would provide a seed source for regeneration of healthy and vigorous trees.

Silvicultural treatments would be applied to about 524 acres. Approximately 122 acres would be broadcast burned to reduce fuel loading and promote seral species regeneration. Timber productivity on the treated acres would increase or more closely approximate the site potential, improving the future opportunities for generating revenue for the Trust using the timber resource.

#### **Action Alternative – Cumulative Effects**

The percentage of forested land that is producing timber closer to the site's potential would increase by approximately .001% on the Kalispell Unit. The acres of forest stands that are less susceptible to beetle infestations, stem decays, or wildfires would increase. Potential for greater long-term revenue from the timber resource is expected.

### **Sensitive Plants**

#### **No-Action Alternative – Direct and Indirect Effects**

In previous botanical surveys, six separate populations of species of special concern, consisting of five different families, were located within the St. Mary's Lake project area. Plant populations include the following species: thinsepal monkeyflower (*Mimulus hymenophyllus*), clustered lady's slipper (*Cypripedium fasciculatum*), Douglas' neckera moss (*Neckera douglasii*), netted specklebelly lichen (*Pseudocyphellaria anomala*), hooded ramalina lichen (*Ramalina obtusata*) and powdery twig lichen (*Ramalina pollinaria*). Two of these species (hooded ramalina and powdery twig lichens) occur in low-elevation riparian areas and will be protected by current SMZ regulations. There are no known threats to any of the lichen species (*P. anomala*, *R. obtusata*, *R. Pollinaria*) or the Douglas' neckera moss (*N. Douglassii*) (Montana Natural Heritage Program). Thinsepal monkeyflower grows on cool moist cliffs, which do not occur in the harvest area. Clustered lady's slipper has not been seen in the project area. If it is located, the state will take appropriate measures to protect this sensitive species.

Under the no action alternative these plants would continue to be affected by encroachment of weeds and recreational uses.

#### **No-Action Alternative – Cumulative Effects**

Cumulative effects to the distribution or viability of sensitive plants populations are not expected under No-Action Alternative.

**Action Alternative – Direct and Indirect Effects**

Of the sensitive plant species found in the project area only clustered lady's slipper is affected by logging practices. This species is yet to be encountered in the project area, but if it is found, actions will be taken to protect it.

**Action Alternative – Cumulative Effects**

This timber sale will result in a more historic species composition in the project area. This will likely help to promote sensitive species that would be native to the area and result in healthy populations of sensitive species native to ponderosa pine and western larch/Douglas-fir cover types.

**Noxious Weeds****No-Action Alternative – Direct and Indirect Effects**

Weed seed would continue to be spread or be introduced throughout the project area from recreational use, residential development and use within or adjacent to state land, and commercial and non-commercial use. Herbicide treatment along open, public roads and installation of road closures would continue as funding and Unit priorities allow. Containment of weed infestation areas or a reduction of weed infested acres may be realized.

**No-Action Alternative – Cumulative Effects**

Cumulatively, the potential spread of weed seeds and increases in areas where weed populations could start across the Kalispell Unit landscape is possible under the No-Action Alternative as well. With adoption of ARM 36.11.445 and implementation of Cooperative Noxious Weed Agreements with Flathead, Lake, and Lincoln counties, a more aggressive approach to identification and treatment of noxious weeds is occurring than in the past. This ongoing treatment of noxious weeds should limit large increases in noxious weed spread and may reduce the number of acres infested in the future.

**Action Alternative – Direct and Indirect Effects**

Logging disturbance would -increase the potential for further establishment of noxious weeds with the exposure of mineral soil in skid trails, landings, existing roads, new road construction, and road improvement sites. Applying integrated weed management techniques within the sale design would reduce the occurrence and spread of weeds. Grass-seeding new and disturbed roads and landings and spot-spraying new weed infestations would reduce or prevent establishment of additional populations. Washing logging equipment prior to use would limit the introduction of weed seeds into the forest. Trampling slash in skid trails and closing additional roads would limit the potential for soil disturbance within these routes during or after logging, reducing the potential for weed establishment. Treating existing weed populations along or within roads with herbicide spray would reduce current weed populations, or contain the area of infestation. This project would also likely be winter logged which would limit the exposure of mineral soil and deter new weed infestations.

Under the Action Alternative, harvesting would occur on approximately 524 acres. Acreage within harvest units are at higher risk of incurring weed establishment within the units due to soil disturbances that may occur from skidding, landing, and heavy equipment use for scarifying or fuels reduction treatments. This risk will be mitigated by the measures described above. Enhancement of existing road closures, trampling slash in road prisms, grass seeding sites disturbed during road construction or work, and additional road closures in combination with spot herbicide treatments would reduce current coverage of weed populations and limit the potential risk of further establishment.

**Action Alternative – Cumulative Effects**

In combination with other management activities and recreational use of the Kalispell Unit, the action alternative would increase the risk of further encroachment of forested sites by noxious weeds. The potential risk would be addressed with prevention measures implemented under County Weed Plans, in addition to the site-specific mitigation measures for the project area. Actual treatments would likely be applied to a more extensive area under the Action Alternative, and have a greater potential for reducing current weed populations within the project area, thereby reducing the area within the Kalispell Unit affected by noxious weeds.

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## Vegetation Mitigations

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### ***Vegetation***

- Reduce stand densities to increase tree growth and vigor and improve forest health.
- Limit the spread and infection of Dwarf mistletoe by removing infected trees to the extent practical.
- Capture the value of dead and dying trees by conducting timely timber harvest.

### ***Noxious Weeds***

- All equipment used in road construction and timber harvesting operations will be cleaned of plant parts, dirt, and weed seeds prior to entry to prevent the possibility of seed dispersal by equipment.
- Grass seed cuts and fills associated with new road construction and areas disturbed during reconstruction.
- Monitor project area and contract herbicide spraying as needed to control spot outbreaks of noxious weeds.

### ***Soils***

- Limit timber harvest operations to periods when soils are frozen or less than 20% soil moisture.
- Existing skid trails and roads will be used, wherever possible, to reduce the amount of ground disturbance.
- Grass seed areas disturbed during road construction and reconstruction activities.

### ***Wildlife***

- A DNRC biologist would be consulted if a threatened or endangered species is encountered to determine if additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (ARM 36.11.428 through 36.11.435) are needed.
- Restrict motorized public access on all existing roads and new construction during timber harvesting activities and close roads when project is completed. Discourage motorized use of skid trails by scattering slash on skid trails after harvest is completed.
- Forested corridors would be retained to maintain landscape connectivity and patches of dense vegetation, when possible, to provide security cover. Retention of cover and unharvested areas along the St. Mary's lake road would facilitate travel of some wildlife requiring connected forested habitats.

- Snags, snag recruits, and coarse woody debris would be managed according to *ARM 36.11.411* through *36.11.414*, particularly favoring western larch, ponderosa pine, and Douglas-fir. Clumps of existing snags could be maintained where they exist to offset areas without sufficient snags.
- Contractors and purchasers conducting contract operations would be prohibited from carrying firearms while operating on restricted roads.
- Harvesting activities would be conducted to limit disturbance to nesting goshawks by avoiding the nesting period by conducting the majority of activities outside of the nesting season (May 1- August 31) in the vicinity of the potential goshawk nest. Additional mitigations would be recommended should a nest be verified in the project area in the future.
- Retain areas of thermal cover and snow intercept in portions of the winter range to facilitate use by big game during the winter.

### **Recreation**

- Signage will be installed at the various road access points to inform users of road restrictions.

### **Aesthetics**

- Retain seedlings and saplings along open roads and trails.
- Grass seed disturbed areas around landings and along roads.
- Slashing of sub-merchantable trees damaged during logging.
- Slash treatment in harvest units and high-standard slash clean-up adjacent to open roads and property boundaries.

### **Air Quality**

- Slash burning will be conducted only when weather and air quality conditions are favorable for smoke dispersion and as allowed under the cooperative Montana/Idaho Airshed Group rules and regulations.

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## **VEGETATION REFERENCES**

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### **References**

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## **Attachment C – Soils**

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## St. Mary's Timber Sale – Soils Analysis

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### Analysis Prepared By:

**Name: Marc Vessar**

**Title: Forest Hydrologist, Montana DNRC**

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## Introduction

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The following analysis will disclose anticipated effects to soil resources within the St. Mary's project area. Direct, secondary, and cumulative effects to soil resources of both the No-Action and Action alternatives will be analyzed.

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## Issues and Measurement Criteria

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

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

The Administrative Rules for Forest Management (ARM 36.11.401 to 456) include several rules that guide conservation of soils resources. The Administrative Rules were generally adopted from recommendations in the State Forest Land Management Plan (SFLMP) (DNRC 1996). Part of the project area is also covered by the Montana DNRC Forested Trust Lands Habitat Conservation Plan (2012). The project was developed to be in compliance with both the Administrative Rules and the HCP.

DNRC strives to maintain soil productivity by limiting cumulative soil impacts to 15 percent or less of a harvest area, as noted in the SFLMP (DNRC, 1996). As a recommended goal, if existing detrimental soil effects exceed 15 percent of an area, proposed harvesting should minimize any additional impacts. Harvest proposals on areas with existing soil impacts in excess of 20 percent should avoid any additional impacts and include restoration treatments, as feasible, based on site-specific evaluation and plans.

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## Analysis Areas

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### Direct, Secondary Effects and Cumulative Analysis Area

The project area for this proposal includes approximately 637 acres. Because the proposed harvesting would only affect a portion of the project area, the analysis area is smaller. The direct, indirect and cumulative effects analysis area will cover approximately 524 acres of the DNRC-managed parcel.

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## Analysis Methods

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### Compaction, Displacement and Erosion

Methods for disclosing impacts include using general soil descriptions and the management limitations for each soil type. This analysis will qualitatively assess the risk of negative effects to soils from erosion, compaction, and displacement from each alternative, using insight from previously collected soils-monitoring data from over 90 DNRC post-harvest monitoring projects (DNRC, 2011).

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## Existing Conditions

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Soils information for the project area is from the Soil Survey of Lake County Area, Montana and was obtained using the Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/>). Four mapped soils were identified in the project area and harvesting is proposed on of these soil types. Soil characteristics including erosion factors and particle size content (clay, silt, sand) can be found in the project file at the Northwestern Land Office in Kalispell, Montana.

### Physical Disturbance (Compaction, Displacement and Erosion)

Records of the state managed parcel indicate limited commercial harvest or authorized road construction over the last 70 years. During field reconnaissance, excavated skid roads were found across the state parcel—some of the roads were located in the draw bottoms and most did not have any surface drainage. Very few stumps were found throughout the state parcel.

An estimate of less than 1 percent of project area exhibits moderate or higher impacts due to compaction on the skid roads from past timber removal.

The whole soil erosion factor K—which indicate the susceptibility of sheet or rill erosion by water—for these soils ranges from 0.1 to 0.2. Values of  $K_w$  range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water (NRCS, 1996). This suggests the erosion risk is low for these soils. However, when combined with slopes in the project area, the potential for erosion would increase to severe for much of the area, indicating that erosion is very likely and that mitigation erosion-control measures and are advised.

### Nutrient Cycling

Coarse and fine woody debris provide a crucial component in forested environments through nutrient cycling, microbial habitat, moisture retention and protection from mineral soil erosion. (Harmon et al 1986). While coarse woody debris decays at various rates due to local climatic conditions, the advanced stages of decay contains many nutrients and holds substantial amounts of moisture for vegetation during dry periods (Larson et al. 1978, Wicklow et al. 1973). Forest management can affect the volumes of fine and coarse woody debris through timber harvesting and result in changes to the available nutrients for long term forest production.

Recommendation for large woody debris can be found in Managing Coarse Woody Debris in Forests of the Rocky Mountains (Graham et al, 1994). Douglas-fir habitat types found in the analysis area are recommended to have post-harvest coarse woody debris in the range of 5 to 10 tons per acre to maintain forest productivity. Subalpine fir and western red cedar habitats are recommended to have 11 to 22 tons per acre.

**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**

Approximately 518 acres would be commercially harvested under this alternative. Approximately 330 acres would be treated with a seed tree prescription (retaining ~12 trees per acre) and 188 acres would be treated with a shelterwood prescription (retaining ~35 trees per acre). Approximately 220 acres would be completed using ground based equipment and 298 acres would be harvested using skyline cable systems. Harvesting would not occur in any SMZs except for the Class 3 SMZs on the western edge of the parcel. Approximate miles of road activities include:

- 3.9 miles of new temporary road construction
- 1.5 miles of existing road would be maintained or have drainage improvements installed as necessary to protect water quality.

**Physical Disturbance (Compaction, Displacement and Erosion)**

The comparison of the soil type map, field reconnaissance notes, and topographic map features with the proposed harvest unit map, indicates that ground-based skidding would occur on approximately 220 acres of the proposed units.

Past monitoring on DNRC timber sales from 1988 to 2011 has shown an average of 12.2 percent soil impacts due to compaction, displacement or severe erosion across all parent materials (DNRC 2011). Twenty monitoring sites had soil textures similar (gravelly loam/gravelly silt loam) to the areas proposed for harvest in this project. Stratifying the results by soil texture that are similar to the majority of the proposed harvesting shows an average of approximately 8.9 percent of the harvest areas impacted from erosion, displacement or severe compaction on summer ground-based harvesting operations and an average of 4.1 percent on cable yarding harvesting operations (DNRC 2011).

Using these percentages of expected impacts, moderate or higher impacts would result from timber harvesting on approximately 32 acres in harvest units. Additionally, the proposed 3.9 miles of new temporary road construction would remove 12 acres from forest production. Table ST-2 below exhibits the expected level of impacts from the proposed activities.

Post-harvest treatment of slash with broadcast burning would cover approximately 138 acres. Due to the reduction in slash, coarse woody debris and duff resulting from prescribed burning, a moderate to high increase in erosion potential would be expected until vegetation emerges. All ground-based harvest units would be mechanically piled and scarified to promote natural regeneration. Scarification would cover approximately 30 to 35 percent of the 220 acres. Because the scarification would minimize disturbance to soils and would intermittently expose mineral soils, the risk of detrimental erosion would be low. Compaction would be minimized during scarification by following the same soil moisture restrictions required during harvest operations.

Table ST-2 – Expected Soil Impacts for the Action Alternative

Area of Analysis	Total Area (Acres)	Disturbance Rate (%)	Affected Area (Acres)
Ground based harvest	220 acres	8.9%	20 acres

units (including landings)			
Cable harvest units (including landings)	298 acres cable	4.1%	12 acres
Roads * (3.9 miles)	--	--	~12 acres
*Road are removed from commercial production of timber			

### Nutrient Cycling

Coarse woody debris would be left on-site in volumes recommended to help reduce hillslope erosion and to maintain soil moisture and forest productivity, generally in the 5 to 22 tons per acre range for habitat types found in the harvest locations (Graham et al. 1994). Because coarse woody debris would be left on site in amounts recommended by scientific literature, and the feasible majority of fine debris (branches and foliage) would be left in the woods the risk of adverse direct or indirect impacts to nutrient cycling would be low.

### Cumulative

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

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## Soils Mitigations

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- ARM 36.11.422 (2) and (2)(a) state that appropriate BMPs shall be determined during project design and incorporated into implementation. To ensure that the incorporated BMPs are implemented, the specific requirements would be incorporated into the DNRC Timber Sale Contract. As part of this alternative design, the following BMPs and recommendations are considered appropriate and, would be implemented during harvesting operations:
  - 9) Limit ground-based equipment operations to periods when soils are relatively dry, (less than 20 percent oven-dry weight harvest units), frozen, or snow-covered to in order to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up. In order to prevent soil resource impacts, logging activities would be restricted to periods when one or more of the following conditions occurs, unless otherwise approved in writing by the Forest Officer.
    - Soil-moisture content at 4-inch depth is less than 20% of oven-dry weight
    - Minimum frost depth of 3 inches
    - Minimum of 18 inches loose snow or 12 inches packed snow adequate to avoid soil displacement
  - 10) On ground-based units, the logger and sale administrator would agree to a skidding plan prior to equipment operations. Skid-trail planning would identify which main trails to use and how many additional trails are needed. Trails that do not comply with BMPs (i.e. trails in draw bottoms) would not be used unless impacts can be adequately mitigated. Regardless of use, these trails may be closed with additional drainage installed, where needed, or grass-seeded to stabilize the site and control erosion.
  - 11) Tractor skidding should be limited to slopes of less than 40 percent unless the operation can be completed without causing excessive displacement or erosion. Based on site review, short, steep

- slopes may require a combination of mitigation measures, such as adverse skidding to a ridge or winchline, and skidding from more moderate slopes of less than 40 percent.
- 12) Keep skid trails/landings to 20 percent or less of the harvest unit acreage. This requires average skid trail spacing at least 60 feet. Provide for drainage on skid trails and roads concurrently with operations.
  - 13) Skyline corridors shall be spaced not less than 75 feet apart. In the case of ridges where fan-shaped settings are required, the minimum distance at the widest divergence will be 150 feet. Clearing width for corridors to accommodate yarding should not exceed 12 feet. Where skyline is required, harvest would be by log-length skidding. Leading end of the logs would be carried free of the ground at all times except during lateral yarding. Erosion control, such as slashing or retaining tops, would be required within cable skidding corridors where excessive soil disturbance may be of an extent to cause erosion. The contract administrator would monitor conditions and recommend erosion control as needed.
  - 14) Slash disposal: Limit the combination of disturbance and scarification to 30 to 40 percent of the harvest units. No dozer piling on slopes over 35 percent; no excavator piling on slopes over 40 percent, unless the operation can be completed without causing excessive erosion. Consider lopping and scattering or jackpot burning on the steeper slopes. Consider disturbance incurred during skidding operations to, at least, partially provide scarification for regeneration.
  - 15) Retain 5 to 10 tons per acre of large woody debris on Douglas-fir habitat types within the project area and 11 to 22 tons per acre of large woody debris on all other habitat types. Maintain a feasible majority of all fine litter 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 slash on site; 2) 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.
  - 16) Install and maintain adequate road drainage to control erosion and comply with forestry Best Management Practices and maintain concurrent with hauling operations. To maintain drainage features and avoid rutting, the department would limit the season of road use to dry, frozen or adequately snow covered conditions.

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## Soils References

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## **Attachment D – Water Resources**

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## St. Mary's Timber Sale – Water Resources and Fisheries Analysis

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### Analysis Prepared By:

**Name: Marc Vessar**

**Title: Forest Hydrologist, Montana DNRC**

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### Introduction

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The following analysis will disclose anticipated effects to water resources within the St. Mary's Timber Sale project area. Direct, secondary, and cumulative effects to water resources of both the No-Action and Action alternatives will be analyzed.

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### Issues and Measurement Criteria

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

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

#### **WATER QUALITY STANDARDS**

This portion of the Flathead River basin, including the Mission Creek drainage outside of the Mission Mountains Tribal Wilderness, is classified as B-1 by the Confederated Salish and Kootenai Tribal Council, as stated in the Water Quality Standards and Antidegradation Policy. Water classified as B-1 must be maintained suitable for drinking and culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; wildlife (birds, mammals, amphibians and reptiles); the growth and propagation of salmonid fishes and associated aquatic life; and agricultural and industrial water supply purposes.

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

All rules and regulations pertaining to the Montana SMZ Law are to be followed as well as the Forestry Best Management Practices of the Confederated Salish and Kootenai Tribes. An SMZ width of 100 feet is recommended on Class 1 and 2 streams per the CSKT Best Management Practices while Class 3 streams are recommended to have a 50-foot buffer. According to the Montana SMZ Law, a buffer width of 100 feet is required on Class 1 and 2 streams and lakes when the slope is greater than 35 percent; for slopes less than 35 percent and for Class 3 streams, an SMZ width of 50 feet is required. All SMZ widths may be extended for riparian vegetation, braided channels and/or adjacent wetlands.

#### **Forest Management Rules**

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

### Habitat Conservation Plan (HCP)

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

### Fisheries—Threatened, Endangered and Sensitive Species

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

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

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## Analysis Areas

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### Sediment Delivery

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

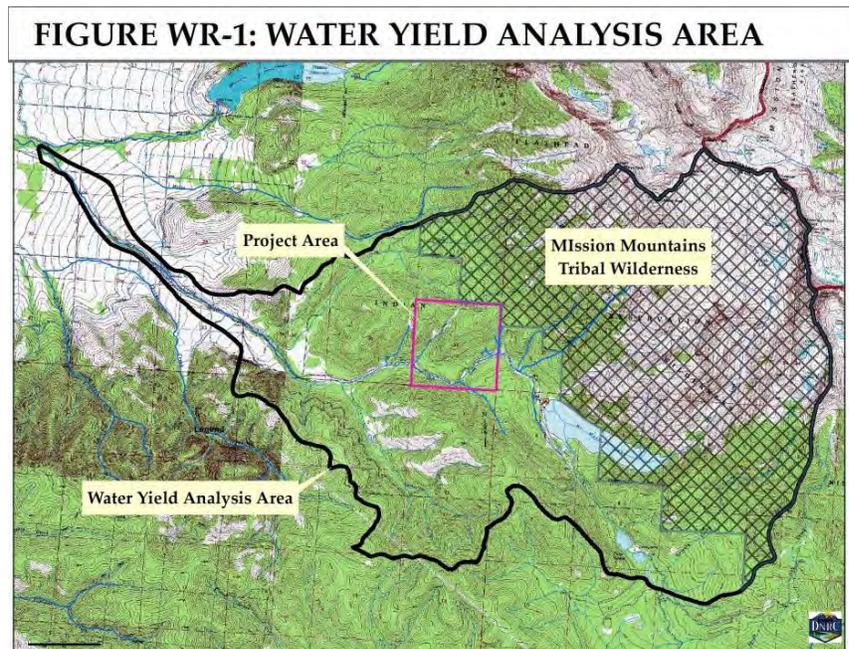
### Water Yield

The analysis area for annual water yield will include the Dry Creek 6th code watershed as shown in Figure WR-1.

### Woody Debris Recruitment

The direct/indirect analysis area for woody debris recruitment is the RMZ Class 1 streams in the project area. The cumulative effects analysis area will be the RMZs along Class 1 streams in the Dry Creek 6th-code watershed.

### Stream Temperature Increases



The analysis area for stream temperature increase will be identical to the analysis area for woody debris recruitment.

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## Analysis Methods

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### Risk Assessment Description

In terms of the risk that an impact may occur, a *low risk* of an impact means that the impact is unlikely to occur. A *moderate risk* of an impact means that the impact may or may not (50/50) occur. A *high risk* of an impact means that the impact is likely to occur.

A *very low impact* means that the impact is unlikely to be detectable or measurable, and the impact is not likely to be detrimental to the resource. A *low impact* means that the impact is likely to be detectable or measurable, but the impact is not likely to be detrimental to the resource. A *moderate impact* means that the impact is likely to be detectable or measurable, and the impact is likely to be moderately detrimental to the resource. A *high impact* means that the impact is likely to be detectable or measurable, and the impact is likely to be highly detrimental to the resource.

### Sediment Delivery

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

Potential sediment delivery from harvest units will be evaluated from a risk assessment. This risk assessment will use the soil information provided in Attachment C: SOILS ANALYSIS and the results from soil monitoring on past DNRC timber sales.

Sediment sources from in-channel sources will be addressed qualitatively by identifying stream segments with atypical levels of instability and assessing the risk of adverse impacts from each alternative using the Risk Assessment Descriptions above.

### Water Yield

A DNRC hydrologist completed a coarse filter qualitative assessment of watershed conditions and cumulative effects as outlined in the Forest Management Rules (ARM 36.11.423) concerning watershed management.

Tree canopy reduction by timber harvest activities, tree mortality or wildfire can affect the timing of runoff, increase peak flows and increase the total annual water yield of a particular drainage. Increased water yield can increase stream channel scour and in-stream sediments that impact water quality.

Due to a large portion (51%) of the watershed lying within the boundaries of the Mission Mountains Tribal Wilderness and nearly all runoff waters being captured and routed by the concrete-lined Dry Creek Canal, annual water yield will be primarily qualitatively discussed. Changes to the existing conditions from the proposed action will be estimated and disclosed using the ECA (Equivalent Clearcut Acres) method, as outlined in Forest Hydrology, Part II (Haupt et al, 1974).

ECA is a function of total area roaded, harvested, or burned; percent of crown removed during harvesting or wildfire; and amount of vegetative recovery that has occurred in the harvested or burned areas. As live trees are removed, the water that would have otherwise evaporated and transpired, either saturates the soil, or is translated to runoff. This method also estimates the recovery of these increases as new trees revegetate the site and move toward preharvest water use.

### Woody Debris Recruitment

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

### **Stream Temperature Increases**

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

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## **Existing Conditions**

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### **General Description**

#### ***Dry Creek Watershed***

Dry Creek is the main channel of a 16,313-acre watershed that contributes surface flow to Mission Creek. Annual precipitation in the watershed ranges from 16 inches at its lowest elevations to over 100 inches near in the Mission Mountains Tribal Wilderness. Average annual precipitation is approximately 47 inches per year. The elevation ranges from 3,040 feet above sea level at the confluence with Mission Creek to approximately 9,000 feet above sea level at the watershed divide on Grey Wolf Peak. Ownership within the watershed is 90 percent CSKT, 5 percent state lands managed by DNRC, and 5 percent private non-industrial ownership. Approximately 51 percent of the watershed is within the Mission Mountains Tribal Wilderness.

Dry Creek has very limited flow because nearly all of the discharge from St. Mary's Lake (reservoir) is routed into the parallel Dry Creek Canal. Flow in Dry Creek is a result of overflow from the canal or from spring and small channels that contribute from the south. Streams on the north side of the stream are either discontinuous or contribute directly into the canal.

Dry Creek may contain westslope cutthroat trout although the habitat is marginal due to the limited water within the state managed parcel. Within the project area, none of the tributaries to the canal or Dry Creek are fish-bearing.

### **Sediment Delivery**

#### Roads

A field review was completed of the haul route to identified potential sediment sources from roads. Existing roads on the state parcel showed very little evidence of potential sediment delivery to streams; however the two streams showed evidence of minor amounts of delivery as a result of road maintenance and use. Both streams contribute all of their surface flow to the Dry Creek Canal and therefore do not impact fisheries resources. Other potential sediment delivery along the haul route would be on county maintained crossing structure.

#### Proposed Units

The erosion risk for landtypes in the project area with proposed timber harvest is low (see Attachment xx: Soils Analysis). No mass wasting sites or unstable soils were observed in any of the proposed harvest areas.

#### In-Channel Sources

In-channel sources of sediment in tributaries to Dry Creek are limited to small locations of erosion at outcurves and constrictions. Despite having a steep gradient in some reaches, no substantial scouring or depositional features were identified to indicate channel instability.

### **Water Yield**

A review of the most recent aerial photos (2013 NAIP photography) indicates that less than an estimated 15% of the watershed has been harvested and is varying stages of reforestation. The area with the most harvest is also the area with the lowest precipitation which would result in less detectable increases in annual water yield.

Using the average precipitation of 47 inches per year, approximately 4500 acres would need to be in clearcut condition to generate a 10% annual water yield increase. The current condition is approximated to be well below this level.

After reviewing the beneficial uses, existing channel conditions, and existing watershed condition per ARM 36.11.423, the threshold of concern for the Dry Creek watershed threshold was set at 14 percent. These threshold values expect a low degree of risk of adverse impacts to beneficial uses due to water-yield increases, as described in ARM 36.11.423(f)(iv).

### **Recruitable Woody Debris**

Large woody debris recruitment to streams is important to maintain channel form and function and as a component of fish habitat. According to ARM 36.11.425, DNRC will establish a RMZ '...when forest management activities are proposed ...on sites that are adjacent to fish bearing streams and lakes.' One reason for the RMZs is to retain adequate levels of large woody debris recruitment to the stream channel. Site potential tree height (SPTH) is the method used to identify RMZ width according to ARM 36.11.425 (5). The RMZ width for this project will be 100 feet for all Class 1 streams.

### **Stream Temperature Increases**

No temperature data is available for Dry Creek. Additionally, the streamflow from the majority of the state parcel would be delivered directly into the Dry Creek Canal.

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## **Environmental Effects**

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

#### **Sediment Delivery, Water Yield, Recruitable Woody Debris and Stream Temperature Increases**

##### ***Direct and Secondary***

Under this alternative, no timber harvesting or related activities would occur. Water Quality would continue as described in the existing conditions. No increased risk of increases or reductions in annual water yield or ECA would result from this alternative

##### ***Cumulative***

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

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**

Approximately 518 acres would be commercially harvested under this alternative. Approximately 330 acres would be treated with a seed tree prescription (retaining ~12 trees per acre) and 188 acres would be treated with a shelterwood prescription (retaining ~35 trees per acre). Approximately 220 acres would be completed using ground based equipment and 298 acres would be harvested using skyline cable systems. Harvesting

would not occur in any SMZs except for the Class 3 SMZs on the western edge of the parcel. Approximate miles of road activities include:

- 3.9 miles of new temporary road construction
- 1.5 miles of existing road would be maintained or have drainage improvements installed as necessary to protect water quality.

### ***Issues Dismissed From Further Analysis***

After considering the extent of the proposed actions listed above, the resource variables of fisheries habitat woody debris recruitment and stream temperature increases were dismissed from further analysis. All woody debris recruitment and stream shading (the effect mechanism which tends to have the greatest effect on stream temperature) to Class 1 and 2 streams in the project area is generally expected to occur within 100 feet of these streams. Because harvest is not proposed within the RMZ of Class 1 streams, no effect is expected to the woody debris recruitment in downstream fish-bearing reaches. For this project area, impacts to stream temperature in Class 1 streams are unlikely to affect downstream fish-bearing reaches due to collection of surface flow in the Dry Creek Canal. The retention of all riparian vegetation within 50 feet of a stream is expected to ensure levels of stream shading that are very similar to the existing condition (USFWS and DNRC 2010). This proposal would retain all vegetation within 100 feet of any Class 1 or Class 2 stream; therefore, no foreseeable measurable or detectable, direct or indirect impacts to water quality or fisheries resources would be expected to occur. No additional cumulative effects to these resources would be expected as a result of implementing the Action Alternative.

### ***Direct and Secondary Sediment Delivery***

#### Roads

Existing roads would have drainage improvements and BMP upgrades as necessary to minimize sediment delivery potential to surface water.

New road construction would be located away from streams except to cross the Class 3 tributary with a 24" corrugated metal pipe. This CMP would be removed after harvest activities are completed. The CMP installation would be completed in a dewatered condition which would minimize the risk of sediment delivery during installation. Although forestry BMPs would be followed to minimize sediment delivery, a high risk of a short-term increase in sediment would be expected following this work. The increase in sediment would be short-lived and would have low level impacts to beneficial uses present.

#### Proposed Units

Past monitoring of DNRC timber harvests has shown erosion on approximately 6 percent of the sites monitored, although no water-quality impacts from the erosion were found (DNRC 2011). These sites were harvested during the summer period, and the erosion was attributed to inadequate skid-trail drainage. Displacement was limited to main skid trails that occupy less than 2% of the harvest units." (DNRC 2011). By minimizing displacement, less erosion would likely occur compared to other harvest methods with more extensive disturbance (DNRC 2011).

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

Harvesting is not proposed within 100 feet of Class 1 and 2 streams and would be expected to have a low risk of very low impacts from sediment delivery. Harvesting within the SMZ of the Class 3 stream is proposed using skyline yarding methods. The partial harvest would be conducted by hand felling and yarding trees out

of the SMZ without crossing the channel. Potential sediment delivery would have a moderate risk of occurring resulting in low impacts to water quality.

### In-Channel Sources

Direct and indirect effects of the Action Alternative to in-channel sources of sediment would be limited to actions that would exacerbate the existing sediment sources including increases in annual water yield that would destabilize channels. Due to the limited tributary area directly connected to Dry Creek, a low risk of very low impacts to Dry Creek would result from the implementation of this alternative. Because DNRC would incorporate BMPs into the project design as required by ARM 36.11.422 (2) and all laws pertaining to SMZs would be followed, smaller tributaries would expect a moderate risk of low channel impacts resulting from the proposed harvest. A low risk of low long-term impacts to water quality or beneficial uses due to increased sediment delivery would be expected.

### **Water Yield**

Approximately 518 acres would be harvested using conventional ground-based and cable yarding methods, and approximately 479 ECA would be generated from these activities in the Dry Creek 6th- code watershed. Additionally, approximately 12 ECA would be generated due to road construction activities. This level of harvest would result in a modelled annual water yield increase of approximately 0.6 percent. This level of increase would be expected to result in a low risk of low impacts to Dry Creek. The small Class 3 tributary on the western portion of the project area would have a moderate risk of low impacts related to annual water yield increases.

### ***Cumulative Sediment Delivery***

Under this alternative, the proposed timber-harvesting and road-construction activities would occur. Although a high risk of short-term impacts would be expected from the CMP installation, a moderate risk of low long-term cumulative impacts from increases in sediment delivery as a result of timber harvesting and roadwork would be expected because of the BMP application and adequate stream buffers to filter potential displaced soil.

### **Water Yield**

If this alternative were selected, the estimated cumulative water-yield increase in the Dry Creek 6th code watershed would increase by approximately 0.6 percent. Considering the current ECA condition of the watershed, this level would remain below the threshold set in accordance with ARM 36.11.425(g). A low risk of low impacts to water quality in Dry Creek and a moderate risk of low impacts in the smaller Class 3 subwatershed would result from the implementation of this alternative.

### ***Cumulative Effects Summary***

Because all timber-harvesting activities would follow BMPs as required by ARM 36.11.422 a moderate risk of low cumulative impacts would be expected to occur under this alternative. This expectation includes (1) implementation of a no-harvest RMZ along Class 1 and 2 streams; (2) soil disturbance associated with road work and CMP installation and removal; and, (3) increases in annual water yield.

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## **Water Resources Mitigations**

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

- Follow all appropriate Forestry Best Management Practice
- Follow all mitigation measures listed in the Soil Analysis

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## **Water Resources References**

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- Haupt, H.F., et al., 1974. Forest Hydrology Part II Hydrologic Effects of Vegetation Manipulation. USDA Forest Service, Region 1. Missoula, Montana.
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- USFWS and DNRC. 2010. Montana Department of Natural Resources and Conservation Forested Trust Lands Habitat Conservation Plan, Final Environmental Impact Statement, Volumes I and II. U.S. Department of Interior, Fish and Wildlife Service, Region 6, Denver, Colorado, and Montana Department of Natural Resources and Conservation, Missoula, MT. September 2010.



## **Attachment E – Wildlife**

## St. Mary's Timber Sale Project – Wildlife Analysis

### Analysis Prepared By:

**Name: Leah Breidinger**

**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 and connectivity. The proposed activities could decrease mature forested cover, which could reduce habitat connectivity and suitability for wildlife species associated with mature forest.
- Canada lynx. The proposed activities could reduce landscape connectivity and the availability of suitable Canada lynx habitat, reducing the capacity of the area to support Canada lynx.
- Grizzly bears. The proposed activities could alter grizzly bear cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats, and/or by increasing risk of human-caused bear mortality.
- Fishers. The proposed activities could reduce the availability and connectivity of suitable fisher habitat and increase human access, which could reduce fisher habitat suitability and increase trapping mortality.
- Flammulated owls. The proposed activities could alter the structure of flammulated owl preferred habitat, which could reduce habitat suitability for flammulated owls.
- Pileated woodpeckers. The proposed activities could reduce tree density and alter the structure of mature forest stands, which could reduce habitat suitability for pileated woodpeckers.
- Big game winter range. The proposed activities could reduce cover, which could reduce the quality of big game winter range habitat.

## 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 Final Environmental Impact Statement and Habitat Conservation Plan (USFWS and DNRC 2010)*, *the Endangered Species Act*, *the Migratory Bird Treaty Act*, and *the Bald and Golden Eagle Protection Act*.

## Analysis Areas

### Direct and Secondary Effects Analysis Area

The direct and indirect effects of the proposed activities on all species/issues were analyzed within the Project Area (*FIGURE WI-1*), which consists of 637 acres of DNRC-managed lands in Section 36, T18N, R19W.

### 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 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. The Medium and Large CEAAs are managed primarily by the Confederated Salish and Kootenai Tribes (CSKT) with 91.2% and 94.8% of the Medium and Large CEAAs, respectively, managed by CSKT. The eastern portions of both analysis areas consist of CSKT Mission Mountain Wilderness and Wilderness Buffer Zone lands (*CSKT 2005*). These areas contain few roads and consist primarily of high alpine habitat. Detailed descriptions of each analysis area are located in the affected environment section for each issue or species evaluated (e.g., pileated woodpecker etc.).

**Table WI-1– Descriptions of the Project Area and cumulative effects analysis areas.**

Analysis Area Name	Description	Total Acres	Issues/Species Analyzed
Project Area	DNRC managed lands in Section 36 T18N R19W	637	Direct & indirect effects for all issues/species
Medium CEEA	Portions of the Dry Creek Subwatershed	13,268	mature forest cover & connectivity, pileated woodpeckers, flammulated owls, big game winter range
Large CEEA	Portions of the St. Mary's Grizzly Bear Subunit west of Falls Creek and portions of the Dry Creek Subwatershed	26,260	Grizzly bears, fishers

## 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, aerial photograph analysis, and consultation with professionals. The coarse-filter wildlife analysis section includes analyses of the direct, secondary, and cumulative effects of the proposed alternatives of mature forest habitats. Old-growth stands were not present in the Project Area.

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. Timber sales that occurred on private lands and CSKT lands are accounted for in analyses of aerial photographs and DNRC is currently unaware of any proposed or ongoing projects on other ownerships. Recent DNRC timber sale projects ( $\leq 10$  years) that could contribute to cumulative effects are summarized in the following table.

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

Sale Name	Agency	Harvest Year	Project Area	Medium CEEA	Large CEEA
St. Mary's Salvage	DNRC	1999	85	85	85

## Coarse Filter Wildlife Analysis

**Issue**

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

**Introduction**

Mature forests characterized by large-diameter trees and dense canopy cover provide many wildlife species with food, shelter, breeding sites, and travel corridors. Historically, the spatial configuration of mature forested habitat in the western United States was shaped by natural disturbance events, primarily wildfire, blowdown, and pest outbreaks. These events resulted in a mosaic-like spatial configuration of forest patches varying in age, species composition, and development. Spatial configuration, including patch size and connectivity of forested habitat, is important for many wildlife species. Patch size may affect the distribution of wildlife species that are attracted to, or avoid forest edges. Additionally, connectivity of mature forested habitat may facilitate movements of wildlife species that avoid openings in canopy cover. For example, discontinuous mature forested habitat would negatively affect movements of fisher, which avoid large openings in canopy cover. Timber harvest, like wildfire and blowdown, is a disturbance event that often creates open patches of young, early-successional habitats. Forest management considerations for wildlife species dependent on mature forested habitat include providing well-connected patches of habitat with  $\geq 40\%$  canopy cover.

**Analysis Area**

The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 13,268-acre Medium CEAA as described in *TABLE W-1* and depicted in *FIGURE W-1*. The Medium CEAA is defined by geographic features and provides a reasonable analysis area to assess the impact of the proposed activities on wildlife species in the vicinity of the Project Area.

**Measurement Criteria**

Factors considered in the analysis include: 1) the degree of timber harvesting, 2) availability and patch size of mature forested habitat ( $\geq 40\%$  canopy cover, trees  $> 9$  inches dbh average), 3) open and restricted road density, and 4) the availability of potential travel corridors. Mature forested habitat is defined here and in the remainder of the document as forest stands with  $\geq 40\%$  canopy cover comprised primarily of trees that are on average  $> 9$  inches dbh. Forested stands containing trees of at least this size and density were considered adequate for providing minimal conditions necessary to facilitate movements of wildlife species that benefit from well-connected mature forest conditions.

**Affected Environment**

The Project Area currently contains approximately 567 acres of mature stands composed primarily of mixed ponderosa pine and Douglas-fir stands with some western red cedar stands near creeks (*TABLE WI-3*). This habitat is continuous, thus connectivity of mature forests for wildlife is high. The remaining acres consist primarily of mature ponderosa stands containing  $< 40\%$  mature canopy cover as well as a few stands that were harvested in 1999. The Project Area does not occur in any particular area of documented importance for habitat connectivity; however, the parcel is adjacent to the CSKT Mission Mountain Wilderness and ridgelines and creeks in the parcel may facilitate movement of wildlife to this area. There is only one open road present along Dry Creek, thus roads have had little effect on habitat connectivity. Open and total road density is 1.2 miles/square mile.

The Medium CEAA contains a moderate amount of mature forested habitat (*TABLE WI-3*). The largest patches are found in the western portion of the Medium CEAA at elevations below high alpine habitat associated with East and West Saint Mary's peaks and Wolf Peak in the Mission Mountains. Overall, connectivity of mature forested habitat in the western portion of the Medium CEAA is high (*FIGURE WI-1*). Open and total road density is low in the Medium CEAA at 0.8 miles/square mile.

**Table WI-3— Average patch size and acreage of mature forested habitat (≥40% canopy cover, >9 inches dbh) pre- and post-harvest in the Project Area and Medium CEAA for the St. Mary's Timber Sale. Percent of the total corresponding analysis area is in parentheses.**

Mature Forest Attribute	Project Area		Medium CEAA	
	Existing	Post-Harvest	Existing	Post-Harvest
Acres of mature forest	567 (89.1%)	95 (14.9%)	5,616 (42.3%)	5,149 (38.8%)
Average patch size (acres)	567	95	296	271
Number of patches	1	1	19	19

### **Environmental Effects – Mature Forest Cover and Connectivity**

#### **No-Action Alternative: Direct and Secondary Effects**

None of the proposed forest management activities would occur. In the short-term, no changes to the amount, quality, or spatial arrangement of mature forested habitat would occur. In the long-term and in the absence of natural disturbance, the availability and connectivity of mature forested wildlife habitat may increase as stands age.

#### **No-Action Alternative: Cumulative Effects**

None of the proposed forest management activities would occur. Mature forested habitat availability and stand characteristics would not be affected by the DNRC St. Mary's Timber Sale; however, mature forest stands may be affected by other projects on other ownerships in the Medium CEAA. In the short-term, no changes to the amounts, quality, or spatial arrangement of mature forested habitat would occur. In the long-term and in the absence of natural disturbance and forest management activities, the availability and connectivity of mature forested wildlife habitat would increase as stands age.

#### **Action Alternative: Direct and Secondary Effects**

The proposed activities would occur in 474 (83.5%) of the 567 acres of mature stands available in the Project Area. These stands would retain approximately 10-30% mature canopy cover post-harvest, reducing habitat availability and patch size for species that prefer dense mature stands (*TABLE WI-3*). However, the desired future condition for these stands is ponderosa pine, which is typically a more open forest type and the harvest would remove encroaching Douglas-fir. Approximately 7 acres of riparian habitat associated with stream SMZs in the Project Area would be harvested, but vegetation retention measures would apply (See *WATER RESOURCES* for additional information). Approximately 4.8 miles of roads would be constructed or receive maintenance, allowing them to become drivable; however, these roads are temporary. All drainage structures would be pulled and a combination of berms and obliteration would be used to ensure that these roads cannot be driven post-harvest. Connectivity of upland mature canopy forest within the proposed Project Area would be reduced, but a 300-foot wide travel corridor would remain along Dry Creek. Thus, since: 1) the abundance of mature forested habitat would decrease by 474 (83.5% of existing mature forest), creating an open conditions more typical of ponderosa pine stands; 2) mature forested habitat would be fragmented decreasing average patch size to 95 acres; 3) no permanent road are proposed for construction; and 4) stand density would be restored to a more typical physiognomy for ponderosa pine stands post-harvest; moderate adverse direct or indirect effects to mature forested habitat abundance, suitability, or connectivity would be anticipated as a result of the Action Alternative.

#### **Action Alternative: Cumulative Effects**

The proposed activities would affect 474 acres of the 5,616 acres (8.4%) of mature forested habitat available in the Medium CEAA. Post-harvest, these acres would not provide mature forested habitat for wildlife, causing average patch size to decrease (*TABLE WI-3*). Reductions in the availability of suitable mature forested habitat would be additive to harvest activities that are proposed or ongoing in the Medium CEAA, although DNRC is unaware of any projects at this time. Approximately 7 acres of riparian habitat associated with stream

SMZs in the Project Area would be harvested, but retention measures would apply (see WATER RESOURCES section in this document for additional information). No permanent roads are proposed for construction. Overall, connectivity of upland mature forest within the Medium CEAA would be reduced; especially between the Powers and Mikes creeks drainages. However, travel in the Dry Creek drainage would still be feasible due to the retention of a 300-foot wide corridor along Dry Creek. Thus, since: 1) the abundance of mature forested habitat in the Medium CEAA would decrease by 474 acres (8.4% of existing mature forest); 2) average patch size of mature forested habitat would decrease by 25 acres; 3) no permanent roads would be constructed; and 4) stand density would be restored to a more typical physiognomy for ponderosa pine stands post-harvest; minor adverse cumulative effects to mature forested habitat abundance, suitability, or connectivity would be anticipated as a result of the Action Alternative.

### 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 –provides an analysis of the anticipated effects for each species.

**Table WI-4 –Anticipated Effects of the St. Mary's Timber Sale 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)
<b>Threatened and Endangered Species</b>	
<b>Grizzly bear</b> <i>(Ursus arctos)</i> Habitat: Recovery areas, security from human activity	[Y] <b>Detailed Analysis Provided Below.</b> The Project Area is considered grizzly bear non-recovery occupied habitat associated with the Northern Continental Divide Ecosystem (NCDE) ( <i>USFWS 1993, Wittinger 2002</i> ).
<b>Canada lynx</b> <i>(Felix lynx)</i> Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zone	[Y] <b>Detailed Analysis Provided Below.</b> The Project Area contains approximately 281 acres of suitable lynx habitat.
<b>Sensitive Species</b>	
<b>Bald eagle</b> <i>(Haliaeetus leucocephalus)</i> Habitat: Late-successional forest more than 1 mile from open water	[N] No bald eagle nests occur within 2.5 miles of the Project Area. However, St. Mary's Lake is located within one mile of the Project Area. If nesting pairs are documented in the vicinity of the Project Area timing restrictions and additional mitigations would apply.
<b>Black-backed woodpecker</b> <i>(Picoides arcticus)</i> Habitat: Mature to old burned or beetle-infested forest	[N] No recently (<5 years) burned areas occur within 0.25 miles of the Project Area. Thus, no direct, indirect, or cumulative effects to black-backed woodpeckers would be expected to occur as a result of either alternative.
<b>Coeur d'Alene salamander</b> <i>(Plethodon idahoensis)</i> Habitat: Waterfall spray zones, talus near cascading streams	[N] No moist talus or streamside talus habitat occurs in the Project Area. Thus, no direct, indirect, or cumulative effects to Coeur d'Alene salamanders would be expected to occur as a result of either alternative.
<b>Columbian sharp-tailed grouse</b> <i>(Tympanuchus Phasianellus columbianus)</i> Habitat: Grassland, shrubland, riparian, agriculture	[N] No suitable grassland communities occur in the Project Area. Thus, no direct, indirect, or cumulative effects to Columbian sharp-tailed grouse would be expected to occur as a result of either alternative.
<b>Common loon</b> <i>(Gavia immer)</i>	[N] No suitable lake habitat occurs within 500 feet of the Project Area. Thus, no direct, indirect, or cumulative effects to common

<b>Species/Habitat</b>	<b>[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)</b>
Habitat: Cold mountain lakes, nest in emergent vegetation	loons would be expected to occur as a result of either alternative.
<b>Fisher</b> ( <i>Martes pennanti</i> ) Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian	<b>[Y] Detailed Analysis Provided Below</b> – Approximately 281 acres of suitable fisher habitat occur within the Project Area.
<b>Flammulated owl</b> ( <i>Otus flammeolus</i> ) Habitat: Late-successional ponderosa pine and Douglas-fir forest	<b>[Y] Detailed Analysis Provided Below</b> – Approximately 356 acres of flammulated owl habitat types occur in the Project Area.
<b>Gray Wolf</b> ( <i>Canis lupus</i> ) Habitat: Ample big game populations, security from human activities	<b>[N]</b> Wolves may use habitat in the vicinity of the Project Area. Disturbance associated with timber sales at den and rendezvous locations can adversely affect wolves; however, timing restrictions would apply if den or rendezvous sites are documented ( <i>ARM 33.11.430(1)(a)(b)</i> ). Thus, negligible adverse direct, indirect, or cumulative effects to wolves would be anticipated as a result of the Action Alternative. No direct, indirect, or cumulative effects would be anticipated as a result of the No Action Alternative.
<b>Harlequin duck</b> ( <i>Histrionicus histrionicus</i> ) Habitat: White-water streams, boulder and cobble substrates	<b>[N]</b> No suitable stream habitat occurs in the vicinity of the Project Area and harlequin ducks have not been observed in the area ( <i>MNHP data, January 21, 2015</i> ). Thus, no direct, indirect, or cumulative effects to harlequin ducks would be expected to occur as a result of either alternative.
<b>Northern bog lemming</b> ( <i>Synaptomys borealis</i> ) Habitat: Sphagnum meadows, bogs, fens with thick moss mats	<b>[N]</b> No suitable wetlands occur within the Project Area. Thus, no direct, indirect, or cumulative effects to northern bog lemmings would be expected to occur as a result of either alternative.
<b>Peregrine falcon</b> ( <i>Falco peregrinus</i> ) Habitat: Cliff features near open foraging areas and/or wetlands	<b>[N]</b> Although present in the landscape, large cliffs and rock outcrops were not observed in the Project Area or within 0.5 miles of the Project Area. Additionally, peregrine eyries have not been documented in the vicinity of the Project Area ( <i>MNHP data, January 21, 2015</i> ). Thus, no direct, indirect, or cumulative effects to peregrine falcons would be anticipated as a result of either alternative.
<b>Pileated woodpecker</b> ( <i>Dryocopus pileatus</i> ) Habitat: Late-successional ponderosa pine and larch-fir forest	<b>[Y] Detailed Analysis Provided Below</b> – Approximately 574 acres of pileated woodpecker habitat occur in the Project Area.
<b>Townsend's big-eared bat</b> ( <i>Plecotus townsendii</i> ) Habitat: Caves, caverns, old mines	<b>[N]</b> 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.
<b>Wolverine</b> ( <i>Gulo gulo</i> ) Habitat: Alpine tundra and high-elevation boreal forests that maintain deep persistent snow into late spring	<b>[N]</b> No high-elevation habitat with persistent spring snowpack occurs in the Project Area. However, wolverines have been observed in the Mission Mountains and may travel through the area at any time ( <i>MNHP data, January 21, 2015</i> ). Thus, negligible adverse direct, indirect or cumulative adverse effects to wolverines would be expected to occur under the proposed action. No direct, indirect, or cumulative effects would be anticipated as a result of

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)
	the No Action Alternative.
<b>Big Game Species</b>	
<b>Elk</b>	[Y] <b>Detailed Analysis Provided Below</b> – The Project Area contains potential elk, mule deer, and white-tailed deer winter range habitat.
<b>Whitetail</b>	
<b>Mule Deer</b>	

## Threatened and Endangered Species

### GRIZZLY BEAR

#### Issue

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

#### Introduction

Grizzly bears are opportunistic omnivores that inhabit a variety of habitats in Montana. Preferred grizzly bear 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*). Forest management considerations for grizzly bears include minimizing potential for conflicts with humans, minimizing adverse effects to vegetation and cover, minimizing access and the construction of new roads, and reducing disturbance levels during the non-denning season, especially in the spring and fall periods when grizzly bears have important nutritional demands.

#### Analysis Area

The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 26,260-acre Large CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The Large CEAA is defined by geographic features and approximates the home range size of a female grizzly bear in northwest Montana.

#### 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. Visual screening was estimated by evaluating forest stand size class and the total crown density of all trees in the stand using GIS and SLI data. Seedlings/sapling stands were included in estimates of visual screening cover if they were >4 feet tall and contained ≥350 trees/acre. On non-DNRC lands the acreage of stands with ≥40% canopy cover provided by trees >9 inches dbh on average was queried to estimate the availability of visual screening cover.

#### Existing Environment

The Project Area is considered grizzly bear non-recovery occupied associated with the NCDE (*USFWS 1993, Wittinger 2002*). The Project Area does not occur in an important linkage zone for grizzly bears (*Servheen et al. 2003*); however, the Project Area is adjacent to the 91,778-acre CSKT Mission Mountain Tribal Wilderness, which provides important habitat for grizzly bears. Approximately 627 acres (98.5% of Project Area) possess

cover in amounts capable of providing visual screening for grizzly bears, which would allow grizzly bears to travel freely in the Project Area, should they be present. Riparian habitat can provide important foraging areas for bears, especially in the spring (*Servheen 1983*), and is available in the Project Area along Dry Creek and other small unnamed streams throughout the Project Area. The parcel is located at a low elevation, and is considered potential grizzly bear spring habitat. Open road density in the Project Area is 1.2 miles/square mile, providing limited accessibility to the parcel.

The Large CEAA contains a variety of age classes of forested habitat as well as some riparian habitat and wet meadows, which are primarily associated with Dry Creek and Mission Creek. High-elevation habitat in the Mission Mountains likely provides important foraging opportunities for insects in late summer and in the fall. Ownership in the Large CEAA consists primarily of CSKT Lands, with a large portion of these lands designated wilderness. The majority of visual screening is located in low-elevation portions of the Large CEAA located below 6,500 feet (34.6%). Road density is low at 0.6 miles/square mile (all open roads).

### **Environmental Effects- Grizzly Bears**

#### **No-Action Alternative: Direct and Secondary Effects on Grizzly Bears**

None of the proposed forest management activities would occur. In the short-term, no changes to grizzly bear habitat would be expected. Visual screening, risk of displacement, and open and restricted road density would remain the same. However, in the long-term and in the absence of natural disturbance, visual screening may increase as stands age increasing the availability of visual screening. Thus no adverse 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 Bears**

None of the proposed forest management activities would occur. No changes to human-caused mortality risk, risk of displacement, or road density associated with the St. Mary's Timber Sale would occur, but ongoing and proposed forest management projects within the CEAA could affect these attributes. In the short-term no additional cumulative effects to visual screening would occur. However, in the long-term and in the absence of natural disturbance, the availability of visual screening may increase as stands age.

#### **Action Alternative: Direct and Secondary Effects on Grizzly Bears**

Grizzly bear hiding cover would be reduced for 10-20 years on approximately 506 acres (80.6%) of the 627 acres of visual screening available in the Project Area. Harvesting associated with the Action Alternative would increase sight distances within proposed harvest units. However, patches of cover would be retained such that no point in the harvest units would be greater than 600 feet to screening cover. Approximately 7 acres of riparian habitat would be harvested, but vegetation retention measures would apply (see WATER RESOURCES analysis). Additionally, burning proposed for approximately 135 acres may improve foraging opportunities for bears and visual screening would be maintained along all open roads. However, proposed harvesting would temporarily (1 to 3 years) increase traffic on 1.2 miles of existing roads in addition to 4.8 miles of temporary roads. These new roads would be closed with berms and portions would also be obliterated to ensure that these roads cannot be driven post-harvest. If present in the vicinity of the Project Area, grizzly bears could be displaced from portions of the Project Area by forest management activities for up to 3 years; although spring timing restrictions would be enforced from April 1 – June 15 to provide security for grizzly bears in the spring. Thus, since: 1) canopy cover and shrubs providing visual screening and hiding cover would be removed, but the units are designed such that no point would be greater than 600 feet from cover; 2) temporary motorized disturbance would increase on 1.2 miles of existing roads and 4.8 miles of temporary roads; 3) road density would not change post-harvest; and 4) approximately 7 acres of riparian habitat would be harvested; moderate adverse direct or indirect effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the Action Alternative.

#### **Action Alternative: Cumulative Effects on Grizzly Bears**

The proposed activities would affect 506 acres (5.6%) of the 9,073 acres of visual screening available in the Large CEAA. Harvesting associated with the Action Alternative would increase sight distances within proposed harvest units. However, cover patches would be retained such that no point in these units would be greater than 600 feet to screening cover. Approximately 7 acres of riparian habitat associated with small streams would be harvested, but vegetation retention measures would apply to maintain low sight distances in these areas. Proposed harvesting would increase traffic on open roads between the Project Area and Highway 93 as well as 5.6 miles of restricted and temporary roads for up to 3 years. Access by the general public would remain restricted on newly constructed roads the project and 4.8 miles of temporary roads would be effectively closed post-harvest. Reductions in visual screening and riparian habitat would be additive to any proposed or ongoing projects; however, DNRC is unaware of any proposed or ongoing projects at this time. Grizzly bears could be temporarily displaced by forest management activities associated with the proposed St. Mary's Timber Sale for up to 3 years; however, activities would be restricted from April 1 – June 15 to protect bears in the spring. Thus, since: 1) canopy cover and shrubs providing visual screening would be removed from approximately 506 acres (5.6%) of potential visual screening in the Large CEAA; 2) temporary motorized disturbance would increase on 5.6 miles of restricted and temporary roads as well as open roads in the vicinity of the Project Area; 3) road density would not change; and 4) riparian harvest would occur but vegetation retention measures would apply; minor adverse cumulative effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the Action Alternative.

## CANADA LYNX

### Issue

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

### Introduction

Canada lynx are medium-size cats that prey primarily on snowshoe hares, and they are federally listed as a threatened species (*Ruediger et al. 2000*). Lynx foraging habitat in western Montana consists of a mosaic of young coniferous stands and mature forested stands with high levels of canopy cover, which provide snowshoe hare habitat (*Squires et al. 2010, Squires et al. 2013*). Retaining habitat connectivity of both summer and winter lynx foraging habitat is important since winter corridors may provide local connectivity while summer corridors are more likely to facilitate long-distance dispersal (*Squires et al. 2013*). Forest management considerations for lynx include providing a mosaic of well-connected young and mature lynx habitat patches containing high horizontal cover.

### Analysis Area

The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 26,260-acre Large CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The large CEAA approximates the size of a lynx home range, is centered on the project area, and is defined according to geographic features (i.e., ridgelines), 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 classes, 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 stands with  $\geq 40\%$  canopy cover provided by trees  $>9$  inches dbh on average was queried to estimate potential lynx habitat.

### Existing Environment

The Project Area contains suitable lynx habitat (*TABLE WI-5*). The stands remaining in the Project Area consist of 356 acres of dry ponderosa pine and Douglas-fir stands that are not preferred lynx cover types. Suitable lynx habitat is discontinuous across the Project Area and is located on cool north-facing slopes. Dry Creek is considered suitable lynx habitat and is a potential connectivity corridor for lynx.

The Large CEAA contains suitable lynx habitat (*TABLE WI-5*). The remaining portions of the CEAA consist primarily of high alpine habitat in the Mission Mountains that do not provide vegetation likely to support lynx as well as some logged stands with  $<40\%$  canopy cover. In the vicinity of the Project Area and in surrounding lands, connectivity of lynx habitats is high, potentially enabling lynx travel throughout western portion of the Large CEAA.

**Table WI-5— Estimated acreage of lynx habitat that would remain in the Project Area and Large CEAA post-harvest. Values in parentheses refer to the percentage of the total potential lynx habitat<sup>a</sup> that each lynx habitat class represents.**

Lynx Habitat Category	Project Area		Large CEAA	
	Existing	Post-Harvest	Existing	Post-Harvest
Other Suitable (DNRC)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Winter Foraging (DNRC)	281 (100.0%)	96 (34.2%)	281 (3.3%)	96 (1.1%)
Temporary Non-habitat (DNRC)	0 (0%)	185 (65.8%)	0 (0%)	185 (2.2%)
Additional Potential Habitat – non-DNRC Ownership	0 (0%)	0 (0%)	8,275 (96.7%)	8,275 (96.7%)
Grand Total - Suitable Lynx Habitat <sup>b</sup> (All Ownerships)	281 (100.0%)	96 (34.2%)	8,556 (100.0%)	8,371 (97.8%)

<sup>a</sup>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).

<sup>b</sup>Total suitable lynx habitat describes all lynx habitat categories that contain structural attributes necessary for lynx use (i.e., sum of summer forage, winter forage, other suitable lynx habitat classes).

### Environmental Effects

#### No-Action Alternative: Direct and Secondary Effects on Canada Lynx

None of the proposed forest management activities would occur. In the short-term, lynx habitat availability and connectivity would not change. In the long-term and in the absence of natural disturbance, winter foraging habitat availability would increase due to natural forest succession while summer foraging habitat availability would decrease due to the lack of new regenerating stands. Connectivity may also increase in the long-term due to increasing canopy cover over time.

#### No-Action Alternative: Cumulative Effects on Canada Lynx

None of the proposed forest management activities would occur. The availability of suitable lynx habitat and landscape connectivity in the Lynx CEAA would not be affected by the proposed DNRC St. Mary's Timber Sale. In the short-term, no changes to lynx habitat would be anticipated. In the long-term and in the absence of natural disturbance, winter foraging habitat would become more prevalent over time due to natural forest

succession while summer foraging habitat would become less prevalent due to the absence of regenerating stands. Connectivity may also increase due to increasing canopy cover in the understory and overstory.

### **Action Alternative: Direct and Secondary Effects on Canada Lynx**

The proposed activities would affect 185 acres (65.8%) of the 281 acres of suitable lynx habitat available in the Project Area. After harvest, these acres would be temporarily unsuitable for lynx use due to lack of canopy cover in the understory and overstory (*TABLE WI-5*). To ensure that forest structural attributes preferred by snowshoe hares remain following harvest, dense patches of advanced regeneration would be retained where possible within portions of lynx winter forage habitat that are not proposed for prescribed burning. Additionally, 5 to 22 tons/acre of coarse woody debris would be retained in accordance with DNRC Forest Management Rules (*ARM 36.11.414*) and retention of downed logs  $\geq 15$  inch diameter would be emphasized. Lynx habitat connectivity would be reduced; however, overall, suitable lynx habitat would remain continuous due to the retention of a 300-foot wide corridor along Dry Creek facilitating travel in the drainage. If present in the vicinity of the Project Area, lynx could be temporarily displaced by forest management activities for up to 5 years due to disturbance caused by motorized activities. Thus, since: 1) lynx suitable habitat availability would be reduced by 185 acres (65.8% of existing habitat in the Project Area); 2) patches of shade-tolerant trees advanced regeneration would be retained where feasible; and 3) landscape connectivity would be reduced; moderate adverse direct and indirect effects to Canada lynx associated with landscape connectivity and availability of suitable habitat would be anticipated as a result of the Action Alternative.

### **Action Alternative: Cumulative Effects on Canada Lynx**

The proposed activities would affect 185 acres (2.2%) of the 8,556 acres of suitable lynx habitat available in the Large CEAA. These acres would be temporarily unsuitable for lynx use due to lack of canopy cover in the understory and overstory. Patches of shade tolerant trees and approximately 5 to 22 tons/acre of coarse woody debris would be retained and downed logs  $\geq 15$  inch diameter would be emphasized. Lynx habitat connectivity would be slightly reduced; however, overall connectivity of lynx habitat would remain high. Connectivity in riparian areas would be retained due to the retention of 300-foot wide corridors along major streams in the Large CEAA. Changes to lynx habitat availability and connectivity would be additive to past, proposed, and ongoing project (see *TABLE WI-2*). Lynx could be temporarily displaced by forest management activities associated with the St. Mary's Timber Sale and other ongoing activities for approximately 3 years. Thus, since: 1) lynx suitable habitat availability would be reduced by up to 185 acres (2.2% of potentially suitable lynx habitat in the Large CEAA); 2) patches of advanced regeneration and shade-tolerant understory trees would be retained where feasible; and 3) landscape connectivity would be slightly reduced, but overall connectivity would remain high; minor adverse cumulative effects to Canada lynx associated with landscape connectivity and suitable habitat type availability would be anticipated as a result of the Action Alternative.

## **Sensitive Species**

### **FISHERS**

#### **Issue**

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

#### **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, 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 26,260-acre Large CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The Large 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 fisher and multiple female fishers, 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 (upland, riparian), 3) landscape connectivity, and 4) human access. Fisher habitat classifications considered in the analysis include: 1) upland fisher habitat, and 2) riparian fisher habitat, which are defined according to proximity of the stand to streams. Riparian fisher habitat is located within 100 feet of Class 1 streams or within 50 feet of Class 2 streams (*ARM 36.11.440(b)*). The remaining fisher habitat is considered upland fisher habitat. Habitat structure considered appropriate for fisher use includes stands with 40-100% total stocking density. Potential fisher habitat (riparian, upland) on other ownerships was identified by identifying mature forested habitat ( $\geq 40\%$  cover, trees  $> 9$  inches dbh average) below 6,000 feet elevation in proximity to perennial and intermittent streams.

### Existing Environment

Fisher habitat is present in the Project Area and Large CEAA (*TABLE WI-6*). In the Project Area, suitable stands of Douglas-fir, grand fir, and western red cedar are located on cool north facing slopes and are interspersed with dry ponderosa pine and Douglas-fir stands that do not provide suitable structure for fisher use.

In the Large CEAA potential fisher habitat is located on cooler slopes in the western portion of the CEAA. The eastern portion of the CEAA consists primarily of high alpine habitat in the Mission Mountains with sparsely distributed trees. Overall, open road density and trapping risk are low in both the Project Area and Large CEAA.

**Table WI-6 –Fisher Habitat and Road Density in the Project Area and Large CEAA and anticipated effects of the St. Mary's Timber Sale, including potential habitat on non-DNRC ownership. Values in parentheses refer to the percentage that each fisher habitat type represents within the larger analysis area.**

Fisher Habitat Attribute	Project Area		Large CEAA	
	Existing	Post-Harvest	Existing	Post-Harvest
Fisher Habitat	281 (44.2%)	96 (15.1%)	8,639 (32.9%)	8,454 (32.2%)
Fisher Riparian Habitat	29 (4.6%)	29 (4.6%)	471 (1.8%)	471 (1.8%)
Open Road Density (miles/square mile)	1.2	1.2	0.6	0.6
Fisher Habitat Harvest (% of available habitat)	185 (65.8%)		185 (2.1%)	

### Environmental Effects

#### No-Action Alternative: Direct and Secondary Effects on Fishers

None of the proposed forest management activities would occur. The level of motorized access would not change and no additional risk associated with trapping would be expected. In the short term, no changes to fisher habitat availability or connectivity would occur in the Project Area. In the long term and in the absence of natural disturbance, fisher habitat suitability and connectivity may increase as stands age, the availability of large-dbh trees increases, and mature canopy cover increases.

#### **No-Action Alternative: Cumulative Effects on Fishers**

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the Large CEAA may influence fisher habitat availability, habitat structure, and landscape connectivity. The level of motorized access would not change and no additional risk associated with trapping would be expected; thus, no cumulative effects would be anticipated. In the short term, no changes to fisher habitat availability or connectivity associated with the St. Mary's Timber Sale would occur. In the long term and in the absence of natural disturbance, fisher habitat suitability and connectivity may increase as stands age, the availability of large-dbh trees increases, and mature canopy cover increases.

#### **Action Alternative: Direct and Secondary Effects on Fishers**

The proposed activities would affect fisher habitat (TABLE WI-6) and all affected habitat would be unsuitable for fisher use due to reduced canopy cover and retention of ponderosa pine, considering that open ponderosa pine stands are typically avoided by fishers (*Schwartz et al. 2013*). Fisher riparian habitat would not be affected. The availability of some important habitat characteristics (i.e., snags, coarse woody debris) could be reduced by harvest activities; although retention of dead material and live snag recruitment trees would meet DNRC Forest Management Rules (*ARM 36.11.411, ARM 26.11.414*). Approximately 4.8 miles of temporary roads are proposed for construction, thus trapping risk associated with human access would increase slightly as it would be easier to hike into the Project Area until vegetation grows in the road. However, no permanent roads are proposed for construction. Connectivity of mature forested habitats suitable for fisher use would decrease under the Action Alternative, although travel across the parcel would still be possible via a 300-foot wide riparian corridor along Dry Creek. If present in the vicinity of the Project Area, fishers could be temporarily displaced by forest management activities approximately 3 years. Thus, since: 1) habitat availability would be reduced by 185 acres (65.8%), but some snags and coarse woody debris would be retained; 2) riparian fisher habitat harvest would not occur; 3) landscape connectivity would be reduced; 4) trapping risk would increase slightly due to the construction of 4.8 miles of temporary roads; and 5) the area in general has a limited capacity to support fisher due to the dominance of dry ponderosa pine stand types in the Project Area; moderate adverse direct and indirect effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the Action Alternative.

#### **Action Alternative: Cumulative Effects on Fishers**

Fisher habitat affected by the proposed activities would become unsuitable for fishers post-harvest (TABLE WI-6). The availability of some important habitat characteristics (i.e., snags, coarse woody debris) could be reduced by harvest activities; although retention of some dead material and live snag recruitment trees would be required to meet DNRC Forest Management Rules (*ARM 36.11.411, ARM 26.11.414*). Connectivity of fisher habitats would be reduced, but travel corridors associated with riparian habitat would be maintained. Approximately 5.6 miles of temporary and restricted roads would be used, increasing trapping risk. However, 4.8 miles of road would be effectively closed via obliteration and the use of berms to prevent motorized access. Any adverse effects to fisher would be additive to any proposed or ongoing sales in the Large CEAA, although DNRC is unaware of any such projects at this time. Fishers displacement associated with the proposed St. Mary's Timber Sale and any other activities in the CEAA could occur for up to 3 years. Thus, since: 1) habitat availability would decrease by 185 acres (2.1% of available habitat), but snags and coarse woody debris would be retained (*ARM 36.11.411, ARM 26.11.414*); 2) riparian harvest would not occur; 3) landscape connectivity would be reduced in the vicinity of Dry Creek; 4) approximately 5.6 miles of temporary and restricted roads would be constructed, but no long-term changes in open road density would occur; and 5) the Large CEAA has a limited capacity to support fishers due to the prevalence of dry Douglas-fir and ponderosa pine habitat

types; minor adverse cumulative effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the Action Alternative.

## FLAMMULATED OWL

### Issue

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

### Introduction

Flammulated owls are small, migratory, insectivorous forest owls that inhabit mature, dry stands of ponderosa pine and Douglas-fir forests with an open physiognomy (*Linkhart and McCallum 2013*). Flammulated owls are secondary cavity nesters, and in Montana, typically nest in large-diameter ponderosa pine or Douglas-fir cavities excavated by pileated woodpeckers or northern flickers (*Seidensticker et. al 2013*). Forest management considerations for flammulated owls include providing open stands of ponderosa pine and Douglas-fir and retaining large snags for nesting. Timber harvest may affect the structure of timber stands and reduce the availability of snags, potentially reducing habitat suitability for flammulated owls.

### Analysis Area

The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 13,268-acre Medium CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The Medium CEAA is defined according to ridgelines and creeks, which provides a reasonable analysis area for local flammulated owls that could be affected by project-related activities.

### Measurement Criteria

Factors considered in the analysis include: 1) the degree of harvesting, and 2) the structure of flammulated owl preferred habitat. In the Project Area, SLI data were used to identify preferred flammulated owl habitat types (*ARM 36.11.403(28)*). Stands were considered suitable for flammulated owl use if the stocking density of trees >9 inches dbh was in the poorly-stocked class (10-39% canopy cover). On non-DNRC lands, stands containing 10-39% canopy cover that were composed primarily of trees >9 inches dbh below 6,000 feet were considered likely to contain habitat types preferred by flammulated owls as well as matrix habitat.

### Existing Environment

The Project Area contains 356 acres (55.8% of Project Area) of cover types preferred by flammulated owls. This habitat is composed primarily of mixed Douglas-fir and ponderosa pine stands with some western larch. All of these stands are mature (> 9 inches dbh), but the stocking density is high and thus the stands are not likely to be used by flammulated owls.

The Medium CEAA contains approximately 1,974 acres (14.9% of Medium CEAA) of mature open forested conditions (10-39% canopy cover, 9 inches dbh average). These stands are located in the western portion of the CEAA; the eastern portion of the CEAA (33.5% of CEAA) consists primarily of alpine and subalpine habitat that does not provide flammulated owl habitat. Considering the low road density and that the Mission Mountain Wilderness occurs in the vicinity, ample snags are likely available for nesting habitat.

### Environmental Effects

#### **No-Action Alternative: Direct and Secondary Effects on Flammulated Owls**

None of the proposed forest management activities would occur. In the short-term, no change in the availability of flammulated owl habitat would occur. In the long-term and in the absence of natural disturbance, the suitability of flammulated owl habitat may decrease as stand density increases and Douglas-fir continues to grow in the understory.

**No-Action Alternative: Cumulative Effects on Flammulated Owls**

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the Medium CEAA may affect the suitability of flammulated owl habitat; however, no adverse effects associated with the St. Mary's Timber Sale would occur. In the short-term, no change in the availability of flammulated owl habitat would occur. In the long-term and in the absence of natural disturbance, the availability of flammulated owl habitat may decrease as stand density increases and Douglas-fir continue to grow in the understory of many stands.

**Action Alternative: Direct and Secondary Effects on Flammulated Owls**

Timber harvest would occur in 328 of the 356 acres (92.2%) of preferred flammulated owl cover types available in the Project Area. The proposed activities would open stands to 10-30% canopy cover in these acres, improving stand structure suitability for flammulated owls. Additionally, the proposed harvest would favor leaving ponderosa pine and Douglas-fir while removing shade-tolerant trees, which is preferable for flammulated owls (*ARM 36.11.437(b)*). Some snags could be removed by the proposed harvest, but at least 2 large snag and 2 large snag recruitment tree per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). Additionally, the majority of flammulated owl habitat would be burned, which may increase insect foraging opportunities. Disturbance associated with harvesting could adversely affect flammulated owls for approximately 3 years, should they be present in the Project Area. Thus, since: 1) changes in stand structure and cover type would generally increase flammulated owl habitat suitability, and 2) snags would be retained to meet DNRC administrative rules (*ARM 36.11.411*), minor beneficial direct and indirect effects to flammulated owl habitat suitability would be anticipated as a result of the Action Alternative.

**Action Alternative: Cumulative Effects on Flammulated Owls**

The proposed activities would occur in 328 acres of potential flammulated owl habitat in the Medium CEAA. The proposed activities would open stands to 10-30% canopy cover, favor retention of ponderosa pine and Douglas-fir, and retain patches of regenerating conifers, improving stand structure suitability for flammulated owls (*ARM 36.11.437(b)*). Additionally, burning proposed for approximately 120 acres of flammulated owl habitat in the Project Area may improve insect foraging opportunities. The availability of suitable flammulated owl habitat in the Medium CEAA is expected to increase by 328 acres, from 1,974 acres to 2,302 total acres (17.4% of Medium CEAA). Changes in flammulated owl habitat suitability would be additive to proposed and ongoing activities occurring in the Medium CEAA, although DNRC is currently unaware of such projects. The proposed activities could disturb flammulated owls for up to 3 years should they be present in the vicinity of the Project Area. Thus, since 1) changes in structure and cover type would generally increase flammulated owl habitat suitability, and 2) snags would be retained to meet DNRC administrative rules (*ARM 36.11.411*), minor beneficial cumulative effects to flammulated owl habitat suitability would be anticipated as a result of the No-Action Alternative.

**PILEATED WOODPECKERS****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 role in mature forests because they excavate large cavities that are often used in subsequent years by a variety of wildlife species for nesting and roosting. Pileated woodpeckers require mature forest stands with large-diameter ( $\geq 20$  inch dbh) dead or defective trees for nesting and foraging and the density of pileated woodpeckers is positively correlated with the amount of dead and dying wood in a stand (*McClelland 1979*). Timber harvest may remove large-diameter trees necessary for nesting and fragmentation can make birds more vulnerable to predation as they travel between habitat patches (*Bull and Jackson 2011*). Forest management considerations for pileated woodpeckers include retaining dense

patches of old and mature coniferous forest with abundant large snags and coarse-woody debris for foraging, roosting, and nesting.

### **Analysis Area**

The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 13,268-acre Medium CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The Medium CEAA is defined according to geographic features. This scale provides a sufficient area to support multiple pairs of pileated woodpeckers (*Bull and Jackson 2011*).

### **Measurement Criteria**

Factors considered in the analysis include: 1) the degree of harvesting and 2) the structure of pileated woodpecker preferred habitat types. On DNRC-managed lands, sawtimber stands  $\geq 100$  years old within preferred pileated cover types (*ARM 36.11.403(58)*) with  $\geq 40\%$  canopy closure were considered potential pileated woodpecker habitat. On non-DNRC lands, the stands considered potential pileated woodpecker habitat were mature forest stands ( $\geq 40\%$  canopy cover,  $>9$  inches dbh average) below 6,000 feet elevation.

### **Existing Environment**

The Project Area contains 574 acres (90.2% of Project Area) of suitable pileated woodpecker habitat. This habitat is composed of Douglas-fir, ponderosa pine, and some larch stands. Pileated woodpeckers were not observed during field visits, but foraging on snags was observed and snag availability is moderate.

The Medium CEAA contains 5,173 acres (39.0% of Medium CEAA) of potential pileated woodpecker habitat located at low-elevation portions of the CEAA. The northeastern approximately 33.5% of the Medium CEAA consists of alpine and subalpine habitat in the Mission Mountains that is not likely to support pileated woodpeckers. Open road density in the Medium CEAA is 0.8 miles/square mile, limiting opportunities for firewood cutting. Considering the low open road density and that portions of the Medium CEAA area are a part of the CSKT Mission Mountain Wilderness, snags for foraging and nesting are likely abundant.

### **Environmental Effects**

#### **No-Action Alternative: Direct and Secondary Effects on Pileated Woodpeckers**

None of the proposed forest management activities would occur. In the short-term, no changes to pileated woodpecker habitat would be anticipated. However, in the long-term, and in the absence of natural disturbance, pileated woodpecker habitat availability and connectivity may increase due to natural succession and aging of timber stands.

#### **No-Action Alternative: Cumulative Effects on Pileated Woodpeckers**

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the Medium CEAA could change pileated woodpecker habitat availability. In the long-term, and in the absence of natural disturbance, pileated woodpecker habitat availability and connectivity may increase due to natural succession and aging of timber stands.

#### **Action Alternative: Direct and Secondary Effects on Pileated Woodpeckers**

The proposed activities would occur in 453 acres (79.0%) of the 574 acres of pileated woodpecker habitat available in the Project Area. The proposed activities would open stands to 10-30% canopy cover causing the structure of these stands to become unsuitable for appreciable use by pileated woodpeckers. Snags would be removed by the proposed harvest, but at least 2 large snags and 2 large snag recruitment trees per acre ( $>21$  inches dbh) would be retained and all snags cut for safety reasons would be left in the harvest unit (*ARM 36.11.411*). Disturbance associated with harvesting could adversely affect pileated woodpeckers on portions of the Project Area for approximately 3 years, should they be present in the Project Area. Thus, since: 1) forest structural changes would occur, but mitigation would include retention of snags and coarse woody debris (*ARM 36.11.411*, *ARM 36.11.414*); and 2) harvesting would reduce pileated woodpecker suitable habitat

availability by 453 acres (79.0%); 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.

### **Action Alternative: Cumulative Effects on Pileated Woodpeckers**

The proposed activities would occur in 453 acres (8.8%) of the 5,173 acres of potential pileated woodpecker habitat in the Medium CEAA reducing habitat availability. 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) would be retained (*ARM 36.11.411*). Changes in pileated woodpecker habitat suitability would be additive to proposed and ongoing activities occurring in the Medium CEAA, although DNRC is currently unaware of such projects. Disturbance associated with the proposed activities could adversely affect pileated woodpeckers in the vicinity of the Project Area for up to 3 years. Thus, since: 1) structural changes would occur, but mitigations would include retention of snags and coarse woody debris; and 2) harvesting would reduce pileated woodpecker suitable habitat availability by 453 acres (8.8%) within the Medium CEAA; minor adverse cumulative effects to pileated woodpecker habitat suitability would be anticipated as a result of the Action Alternative.

## **BIG GAME**

### **ELK, WHITE-TAILED DEER, AND MULE DEER WINTER RANGE**

#### **Issue**

The proposed activities could reduce cover, which could reduce the quality of big game winter range habitat.

#### **Introduction**

Elk, mule deer, and white-tailed deer require areas with adequate amounts of cover and forage at lower elevations during winter. Effective big game winter range contains ample mid-story and overstory, which can ameliorate severe winter conditions by reducing wind velocity and providing snow intercept, enabling big game to move across the landscape, and by improving access to forage with less energy expenditure. Forest management considerations for big game include providing adequate hiding cover and ample overstory, which lessen the effects of harsh winter weather conditions.

#### **Analysis Area**

The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 13,268-acre Medium CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The Medium CEAA is defined according to geographic features including watershed boundaries, which, provides a reasonable analysis area for local animals that could be influenced by project-related activities.

#### **Measurement Criteria**

Factors considered in the analysis include: 1) the degree of timber harvesting and 2) the availability and structure of big game winter range. Forested habitat ( $\geq 40\%$  canopy cover,  $>9$  inch dbh average) was considered capable of providing minimal conditions capable of providing thermal cover for big game in the Medium CEAA.

#### **Existing Environment**

The Project Area provides winter range for wintering deer and elk and recent tracks and scat were observed in area in January, mostly on south facing slopes and ridgelines that retained little snow. The Project Area is connected to low elevation winter range in the Mission Valley via Dry Creek. Desirable winter range habitat attributes found in the Project Area include low elevation (3,700-4,800 feet), steep slopes, and appreciable amounts of canopy cover. Approximately 567 acres (89.1% of Project Area) contain mature canopy cover composed primarily of Douglas-fir, ponderosa pine, grand fir, and some western larch.

The Medium CEAA also contains elk, mule deer, and white-tailed deer winter range. Frequently used portions of the winter range are likely located in areas with high canopy cover and white-tailed deer are common in the fields near the Mission Valley. High-elevation portions of the Medium CEAA may be used by big game if snowpack is low; however, above 6,000 feet in the Missions Mountains canopy cover is sparse providing little thermal cover for wintering big game. Approximately 5,616 acres (54.7% analysis area) of mature forested habitat ( $\geq 40\%$  canopy cover,  $>9$  inch dbh average) occur in the Medium CEAA and provides thermal protection for big game. Residential development is mostly absent from the Medium CEAA, which reduces the likelihood of big game displacement due to human activity (Vore 2012). Additionally portions of the Medium CEAA are a part of the Mission Mountain Wilderness, providing security for wintering game animals.

### **Environmental Effects**

#### **No-Action Alternative: Direct and Secondary Effects on Big Game**

None of the proposed forest management activities would occur. No changes in disturbance levels would occur. In the short term, no change in the availability of thermal cover would occur. In the long term and in the absence of natural disturbance, thermal cover may increase as stands age and canopy cover increases.

#### **No-Action Alternative: Cumulative Effects on Big Game**

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects within the Medium CEAA may disturb wintering big game or reduce thermal cover availability; however, no adverse effects associated with the St. Mary's Timber Sale would occur. In the short term, no change in the availability of thermal cover associated with the St. Mary's Timber Sale would occur. In the long term and in the absence of natural disturbance, thermal cover may increase as stands age and canopy cover increases.

#### **Action Alternative: Direct and Secondary Effects on Big Game**

Canopy cover would be reduced in mature forested habitat from 50 to 80% to approximately 10-30% in 474 acres (83.5%) of mature forested habitat, reducing the capacity of these acres to provide snow intercept and reduce wind velocity. Considering that canopy cover would be reduced below 70% in these harvest units, white-tailed deer would likely not use the harvest units post-harvest when snow accumulation is high. However, elk and mule deer may continue using these areas, if snow conditions and temperatures are favorable. Additionally, all harvest units are designed such that no point in the project area is greater than 600 feet to a topographic break or hiding cover patch, facilitating movement of animals through the project area. Additionally, approximately 135 acres of habitat north of Dry Creek are proposed for burning, which would increase forage availability and quality when conditions are favorable. In other areas, conifers would be retained throughout the harvest units, providing some residual cover and needle-foraging opportunities. Winter logging may occur, but would not be required and wintering animals could be displaced for up to 3 winters by the proposed activities. Thus, since: 1) canopy cover would be reduced on 474 acres, (83.5% of existing mature forested habitat); 2) regenerating conifers would be retained and burning would increase forage quantity and quality weather permitting, 3) displacement of big game would be temporary (up to 3 years), 4) connectivity would be retained at a reduced level along riparian areas, and 5) visual screening will be maintained along open roads; moderate adverse direct and indirect effects to big game winter range quality and wintering animals would be anticipated as a result of the Action Alternative.

#### **Action Alternative: Cumulative Effects on Big Game**

The proposed harvest would reduce canopy cover to 10-30% within 474 (8.4%) of the 5,616 acres of mature habitat available in the Medium CEAA. However, all harvest units are designed such that no point is greater than 600 feet to hiding cover or a topographic break and regenerating conifers would be retained where feasible. Burning is proposed for approximately 135 acres of habitat north of Dry Creek, which would increase forage availability when mild weather permits use of the area. Reductions in thermal cover would be additive to any proposed and ongoing activities in the Medium CEAA, although DNRC is currently unaware of such projects. Winter logging may occur, but would not be required and wintering animals could be displaced for up

to 3 winters by the proposed activities. Displacement would be additive to any displacement associated with other activity in the Medium CEAA. Connectivity would be reduced within the Project Area, but connectivity of mature canopy cover would be retained along riparian corridors. Thus, since: 1) 474 acres of mature forested habitat would be removed (8.4% of mature forested habitat); 2) prescribed burns would increase forage and regenerating conifers would be retained where feasible; 3) displacement of big game would be additive to other sources of disturbance, but would occur for a short period of time (3 years); 4) the proposed activities would retain a riparian travel corridor across winter range; and 5) visual screening will be maintained along open roads; minor adverse cumulative effects to big game winter range quality and wintering animals would be anticipated as a result of the Action Alternative.

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## Wildlife Mitigations

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- If a threatened or endangered species is encountered, consult a DNRC biologist immediately. Similarly, if undocumented nesting raptors or wolf dens 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 36.11.444(2)* and *GB-PR2 (USFWS and DNRC 2010)*.
- 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.
- Restrict public access at all times on restricted roads that are opened for harvesting activities. Effectively close all restricted roads following harvest completion.
- To retain visual screening for grizzly bears, design clearcut and seed tree units such that vegetation or topographic breaks be no greater than 600 feet from any point in the unit as per *GB-NR4 (USFWS and DNRC 2010)*. Prohibit cutting and motorized activities within hiding cover leave patches.
- In harvest units 1, 8, 9, 12, and 13 retain patches of advanced regeneration of shade-tolerant trees as per *LY-HB4 (USFWS and DNRC 2010)*. Retention patches may be located outside of areas proposed for burning.
- Retain visual screening along roads where possible to increase security for wildlife.
- Retain at least 2 snags and 2 snag recruits per acre, particularly favoring ponderosa pine and Douglas-fir for retention. If snags are cut for safety concerns, they must be left in the harvest unit. Retain 10-22 tons/acre of coarse-woody debris as described in the *SOILS ANALYSIS* in this document.

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Figure WI-1 –Wildlife analysis areas and harvest units for the St. Mary's Timber Sale.

