Flatlander Timber Sale
Environmental Assessment

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Environmental Assessment

Project Name: Flatlander
Proposed Implementation Date: August 2022
Proponent: Hamilton Unit, Southwest Land Office, Montana DNRC
County: Missoula

Type and Purpose of Action

Description of Proposed Action:

The Hamilton Unit of the Montana Department of Natural Resources and Conservation (DNRC) is proposing the Flatlander timber sale. The project is located approximately three miles southeast of Lolo, MT (refer to Attachments vicinity map A-1 and project map A-2) and includes the following sections:

<table>
<thead>
<tr>
<th>Beneficiary</th>
<th>Legal Description</th>
<th>Total Acres</th>
<th>Treated Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Buildings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSU 2nd Grant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSU Morrill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern College-MSU/Western College-U of M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montana Tech</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Montana</td>
<td>11N 20W Sec. 12 &amp; 24</td>
<td>1,280</td>
<td>324</td>
</tr>
<tr>
<td>School for the Deaf and Blind</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pine Hills School</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veterans Home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Land Trust</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquired Land</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Objectives of the project include:
- Improve timber stand growth and productivity by removing trees with poor form and/or vigor.
- Improve resistance to future insect or disease attack.
- Reduce fuel loading and ladder fuels by thinning suppressed and intermediate crown classes.
- Increase the growth and vigor of regeneration.
- Maximize revenue over the long-term for the School Trust accounts from the timber resources and provide a sufficient amount of sawlog volume to contribute to the DNRC’s sustained yield as mandated by State Statute 77-5-222, MCA.
Proposed activities include:

<table>
<thead>
<tr>
<th>Action</th>
<th>Quantity</th>
</tr>
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<tbody>
<tr>
<td><strong>Proposed Harvest Activities # Acres</strong></td>
<td></td>
</tr>
<tr>
<td>Clearcut</td>
<td></td>
</tr>
<tr>
<td>Seed Tree</td>
<td></td>
</tr>
<tr>
<td>Shelterwood</td>
<td></td>
</tr>
<tr>
<td>Selection</td>
<td>324</td>
</tr>
<tr>
<td>Commercial Thinning</td>
<td></td>
</tr>
<tr>
<td>Salvage</td>
<td></td>
</tr>
<tr>
<td><strong>Total Treatment Acres</strong></td>
<td>324</td>
</tr>
<tr>
<td><strong>Proposed Forest Improvement Treatment # Acres</strong></td>
<td></td>
</tr>
<tr>
<td>Pre-commercial Thinning</td>
<td></td>
</tr>
<tr>
<td>Planting</td>
<td></td>
</tr>
<tr>
<td><strong>Proposed Road Activities # Miles</strong></td>
<td></td>
</tr>
<tr>
<td>New permanent road construction</td>
<td>1.64</td>
</tr>
<tr>
<td>New temporary road construction</td>
<td></td>
</tr>
<tr>
<td>Road maintenance</td>
<td></td>
</tr>
<tr>
<td>Road reconstruction</td>
<td>3.62</td>
</tr>
<tr>
<td>Road abandoned</td>
<td></td>
</tr>
<tr>
<td>Road reclaimed</td>
<td></td>
</tr>
</tbody>
</table>

| Other Activities                                  |          |

| **Duration of Activities:** 2022 - 2026            |          |
| **Implementation Period:** August 2022             |          |

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

The DNRC would manage lands involved in this project in accordance with:
- The State Forest Land Management Plan (DNRC 1996),
- Administrative Rules for Forest Management (ARM 36.11.401 through 471),
- All other applicable state and federal laws.
Project Development

SCOPING:
- **DATE:**
  - August 31, 2021
- **PUBLIC SCOPED:**
  - The scoping notice was posted on the DNRC Website: [http://dnrc.mt.gov/public-interest/public-notices](http://dnrc.mt.gov/public-interest/public-notices)
  - Adjacent landowners were scoped. The mailing list of parties receiving initial scoping notices for this project is located in the project file at the Hamilton Unit Office.
  - Scoping notices were sent to parties listed on the DNRC statewide scoping list.
  - A notice was placed in the *Bitterroot Star* in August of 2022.
- **AGENCIES SCOPED:**
  - FWP, tribes, USFWS
- **COMMENTS RECEIVED:**
  - None of the tribes identified a specific cultural resource concern.
  - Comments from FWP were received. Comments and responses are listed in Attachment B.
  - Comments from neighboring landowners and other private citizens were received. Comments and responses are listed in Attachment B.

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

**INTERDISCIPLINARY TEAM (ID):**
- Project Leader: Thayer Jacques
- Archeologist: Patrick Rennie
- Wildlife Biologist: Garrett Schairer
- Hydrologist: Andrea Stanley
- Soil Scientist: Andrea Stanley
- Decision Maker: Jon Hayes

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

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

- **Montana Department of Fish, Wildlife and Parks (DFWP)** - A Stream Protection Act Permit (124 Permit) is required from DFWP for activities that may affect the natural shape and form of a stream’s channel, banks, or tributaries.
  - DNRC has been granted a 124 permit for the temporary crossing of a class 2 channel to access proposed Unit 1.

- **Local Flood Plain Administrator** - Most of the project area is within the Bitterroot floodplain. A floodplain permit is required for the following activities: road reconstruction, new permanent road construction, temporary roads/main skid trails, slash piles.
  - DNRC has been granted a floodplain permit for the above listed activities.

**ALTERNATIVES CONSIDERED:**

**No-Action Alternative**: No commercial harvest of timber would occur. No road maintenance, road reconstruction, or new road construction would occur.

**Action Alternative**

- DNRC would harvest approximately 2.5 MMBF from approximately 324 acres using an individual tree selection prescription. A ground-based harvest system would be utilized. Slash would be piled and burned post-harvest.

- Approximately 3.62 miles of road reconstruction and 1.64 miles of new road construction activities would take place to improve logging access to the DNRC parcel and to bring existing roads up to BMP standards.

**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:

- Timber harvesting and road building/reconstruction may introduce or spread noxious weeds in the project area.
- Insects may continue to cause mortality in the overstory.
- Stands are currently overstocked. These conditions lead to reduced growth and vigor as well as the probability of increased fire behavior.

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

- Favor the largest ponderosa pine trees with good vigor for leave trees to improve overall stand growth and vigor.
- Wash equipment prior to entering the harvest area to limit weed seed dispersal.
- Spray and implement bio-control for weeds post-harvest, as needed.
- Grass seed newly disturbed road surfaces, burn pile areas, and skid trails to limit the area available for weeds to become established.

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

**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:

- Proposed activities could alter mature forested habitats and/or landscape connectivity, which could affect species that rely on these mature forested habitats, and/or connectivity and the ability of wildlife requiring corridors to move through the landscape.
- Proposed activities could alter important habitats for avian species and/or negatively influence avian diversity.
- Proposed activities could negatively affect bald eagles by reducing nesting and perching structures and/or disturbing nesting bald eagles.
- Proposed activities may alter flammulated owl habitat by reducing canopy closure and increasing tree spacing while potentially removing snags needed by flammulated owls for nesting.
- Proposed activities could reduce suitable nesting and foraging habitat for pileated woodpeckers, which could alter pileated woodpecker use of the area.
- Proposed activities could remove forest cover on big game winter range, which could reduce the carrying capacity of the winter range.
- Proposed activities could remove big game security cover, which could affect hunter opportunity and local quality of recreational hunting.
Recommended Mitigation Measures for Wildlife- The analysis and levels of effects to wildlife are based on implementation of the following mitigation measures.

- A DNRC biologist will 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.
- Motorized public access will be restricted at all times on restricted roads that are opened for harvesting activities; signs will be used during active periods and a physical closure (gate, barriers, equipment, etc.) will be used during inactive periods (nights, weekends, etc.). These roads and skid trails would be reclosed to reduce the potential for unauthorized motor vehicle use.
- Snags, snag recruits, and coarse woody debris will be managed according to ARM 36.11.411 through 36.11.414, particularly favoring ponderosa pine. No harvest of existing snags would occur. Clumps of existing snags could be maintained where they exist to offset areas without sufficient snags. Coarse woody debris retention would emphasize retention of downed logs of 15-inch diameter or larger.
- Minimize potential for disturbance to nesting bald eagles and numerous avian species by restricting activities in section 24 between February 1 and August 15 unless the nest is documented as abandoned or the fledglings have fledged.
- Contractors and purchasers conducting contract operations will be prohibited from carrying firearms while on duty.
- Food, garbage, and other attractants will be stored in a bear-resistant manner.
- Provide connectivity by maintaining corridors of unharvested and/or lighter harvested areas along riparian areas.

FOR COMPLETE WILDLIFE ANALYSIS SEE ATTACHMENT D.

SOILS:

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

- Soil and vegetation disturbance from harvest activities may result in temporary increased risk of erosion.
- Direct impacts by physical disturbance would likely occur by ground-based yarding

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

- The Contractor and Sale Administrator should agree to a general skidding plan prior to equipment operations. Skid trails would be mitigated following harvesting and yarding operations with grass seeding, weed spraying, and slash.
• To prevent soil compaction ground-based mechanical felling and yarding would be restricted to one or more of the following conditions:
  o Soil moisture content at 4-inch depth less than 20% oven-dry weight.
  o Minimum frost depth of 4 inches.
  o Minimum snow depth of 18 inches of loose snow or 12 inches packed snow.

• An average minimum of 4.5 tons/acre of coarse and fine woody debris would be maintained within harvest areas to meet the concentration for the DF/PHMA habitat type recommended by Graham et al (1994). Any existing CWD shall be left in place.

FOR COMPLETE SOILS ANALYSIS SEE ATTACHMENT D.

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

• Harvest activities may increase sedimentation into existing water sources.
• Stream temperature and large woody debris recruitment may be affected by harvest operations.

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

• All BMP’s, SMZ requirements, Wetland requirements, and floodplain regulations would be applied and administered during harvest operations.
• Site modifications including temporary roads and grading swale crossings would be conducted such that base flood elevations would not be adversely affected.
• Channel migration zone harvest prescription of 50% basal area retention would be applied.
• Upgrade road drainage as needed to restore/maintain BMPs.

FOR COMPLETE WATER RESOURCES ANALYSIS SEE ATTACHMENT F.

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

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

• Harvest activities may increase sedimentation into existing water sources.

Recommended Mitigation Measures for Fisheries Resources- The analysis and levels of effects to fisheries resources are based on implementation of the following mitigation measures.
• No additional project-specific mitigations necessary beyond the project design and commitments listed earlier in the water resources analysis.

FOR COMPLETE FISHERIES RESOURCE ANALYSIS SEE ATTACHMENT F.

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

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

• Harvest activities could affect the viewshed of neighboring landowners.
• Harvest activities would include road reconstruction and new road construction.
• Harvest activities would produce ground disturbance such as skid trails and landing areas.

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

• No harvest will occur west of Sin-Tin-Tin-Em-Ska Creek in section 12 and the northwest corner of section 24.
• A 100 foot no harvest visual buffer would be applied along the western property line near Wyns Way.
• A 50 foot (SMZ) no cut buffer would be placed along the Bitterroot river.
• All roads and disturbed areas would be grass seeded. Landing piles would be burned and landing areas would be grass seeded.
• Hauling would utilize existing roads. New road construction would be minimized to allow for a maximum skidding distance of 1300 feet.
• Any additional temp roads constructed would be scarified and seeding after harvest operations.

Existing Conditions
The project area is located approximately ½ mile behind a locked gate. The project area is visible from Wyn’s Way, Highway 93 to the west, and private parcels scattered around the perimeter of the sections. The surrounding private property consists mainly of agriculture fields and riparian areas. There are two existing roads located in the project area.

- VISUAL QUALITY

No-Action Alternative:
No timber harvesting, road reconstruction, or new road construction would occur.
**Action Alternative:**

**Direct, Secondary, and Cumulative Effects**
The proposed activities would reduce stocking in the overstory. Road reconstruction, new road construction, skid trails, and landings would be utilized for harvest operations.

Through the proposed sale area, slash from the harvest would be noticeable yet temporary. 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.

The proposed Action Alternative would be expected to have low direct, indirect, or cumulative effects based on the following:

- All roads and disturbed areas would be grass seeded.
- No harvest areas and no harvest buffers would be utilized to mitigate visual effects to neighboring landowners.
- The treatment prescription would leave the largest trees on site resulting in an open park-like stand.
- Seedlings and saplings along with pockets of pulp-size material would remain.

**-NOISE**

**No-Action Alternative:**
No timber harvesting, road reconstruction, or new road construction would occur.

**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 could be expected to be present for the entire season of harvest, typically from mid-June through mid-March of the following year, for the duration of the harvest of two to three years during the general “work week”.

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:**
The tribes were scoped but none identified a specific cultural resource concern. A Class I (literature review) level review was conducted by the DNRC staff archaeologist for the area of potential effect (APE). This entailed inspection of project maps, DNRC's sites/site leads database, land use records, General Land Office Survey Plats, and control cards. The Class I
search revealed that no cultural or paleontological resources have been identified in the APE. Because of the dynamic nature of the Bitterroot River floodplains, no additional archaeological investigative work will be conducted in response to this proposed development. However, if previously unknown cultural or paleontological materials are identified during project related activities, all work will cease until a professional assessment of such resources can be made.

**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:**
- State Forest Land Management Plan EIS, DNRC 1996, sets the strategy that guides DNRC forest management decisions statewide.

**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 3A, which encompasses portions of Missoula County. Currently, this Airshed does contain impact zones.

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

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

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

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

**-SLASH BURNING**

**No-Action Alternative:**
No slash would be burned within the project areas. Thus, there would be no effects to air quality within the local vicinity and throughout Airshed 3A.

**Action Alternative:**

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

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

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

**-DUST**

**No-Action Alternative:**
No increased dust would be produced as a result of the proposed timber sale. Current levels of dust would be produced in the area.

**Action Alternative:**

**Direct, Secondary, and Cumulative Effects**
Harvesting operations would be short in duration. Dust may be created from log hauling on portions of native surface roads during summer and fall months. Contract clauses would provide for the use of dust abatement or require trucks to reduce speed if necessary to reduce dust near any affected residences.
Thus, direct, secondary, and cumulative effects to air quality due to harvesting and hauling associated with the proposed action would be minimal.

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

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

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

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

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

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

**Action Alternative:**

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

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

**RECREATION (including access to and quality of recreational and wilderness activities):**
The area is used for hiking, hunting, and general recreating. Currently, roads through the area are closed to motorized use and used only for administrative purposes. There would be no change in road closure status.

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

- Logging activities could adversely affect recreation in the area.

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

- Signs would be posted indicating that log truck traffic and timber harvesting is present in the area.
- If necessary, a slower speed limit may also be imposed in the timber harvest contract.
• Log hauling and harvesting activities would take place during the general “work week”.

Existing Conditions
The area is used for hiking, hunting, and general recreating. Currently, roads through the area are closed to motorized use and used only for administrative purposes. There would be no change in road closure status. Access for general recreation by the public is only from the Bitterroot River or through adjacent private property. In addition, hunting access can be obtained through Block Management.

No-Action Alternative:
There would be no change from existing conditions. Therefore, there would be no measurable direct, secondary, or cumulative impacts on recreation from this proposed action.

Action Alternative:

Direct, Secondary, and Cumulative Effects
During harvesting operations, recreation may be adversely affected due to noise and equipment in the area. Direct, secondary, and cumulative effects would be temporary during harvesting.

<table>
<thead>
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<th>Will Alternative result in potential impacts to:</th>
<th>Impact</th>
<th>Can Impact Be Mitigated?</th>
<th>Comment Number</th>
</tr>
</thead>
<tbody>
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<td>Direct</td>
<td>Secondary</td>
<td>Cumulative</td>
</tr>
<tr>
<td></td>
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<td>No Low Mod High</td>
<td>No Low Mod High</td>
</tr>
<tr>
<td>No-Action</td>
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<td>X</td>
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<tr>
<td>Health and Human Safety</td>
<td>X</td>
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</tr>
<tr>
<td>Industrial, Commercial, and Agricultural</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Activities and Production</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Quantity and Distribution of Employment</td>
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<td>Local Tax Base and Tax Revenues</td>
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<tr>
<td>Demand for Government Services</td>
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<td>Density and Distribution of Population and</td>
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<tr>
<td>Housing</td>
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<td>Social Structures and Mores</td>
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<tr>
<td>Cultural Uniqueness and Diversity</td>
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<p>| Action                                           |        |            |            |                              |                              |                            |
| Health and Human Safety                          | X      | X          | X          | Yes                          | 1                            |
| Industrial, Commercial, and Agricultural         | X      | X          | X          |                              |                              |                            |
| Activities and Production                        |        |            |            |                              |                              |                            |</p>
<table>
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<tr>
<th>Will Alternative result in potential impacts to:</th>
<th>Impact</th>
<th>Can Impact Be Mitigated?</th>
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<td>Quantity and Distribution of Employment</td>
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<tr>
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<td>Demand for Government Services</td>
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**Comment Number 1:**

**Impact**

Log truck traffic in the area would increase for the duration of the timber sale, which could cause a low impact to human safety.

**Mitigations:**

- Signs would be posted indicating that log truck traffic and timber harvesting is present in the area.
- If necessary, a slower speed limit may also be imposed in the timber harvest contract.
- Log hauling would take place during the general “work week”.

**Comment Number 2:**

**Impact**

According to the Montana Bureau of Business and Economic Research a general rule of thumb is that for every one million board feet of sawtimber harvested in Montana, ten person years of employment occur in the forest products industry.

This harvest is viewed as a continuation of a sustained yield and as such would not create any new jobs but rather sustain approximately 25 person years of employment in the forest products industry. Additionally, local businesses, such as hotels, grocery stores, and gas stations would likely receive additional revenues from personnel working on the proposed project. This would be a positive low impact to quantity and distribution in the area.

**Mitigations:**

- This impact would be positive, and mitigations would not be necessary.
LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: (includes local MOUs, management plans, conservation easements, etc.):
None.

OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES: 
The proposed action has a projected harvest volume of 2.5 MMBF. This volume is worth approximately $350/MBF delivered to a forest products manufacture site at current market prices. Delivered to market, the proposed action has a total revenue value of an estimated $875,000. 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 $131,250 and $306,250.
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 Trust Lands Program was 1:2.07. This means that, on average, for every $1.00 spent in costs, $2.07 in revenue was generated. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return.

Currently the Sustained yield and target harvest from Trust Lands is 60.0 MMBF, which represents approximately 16.4% of timber harvested in the state of Montana. This project would provide approximately 2.5 MMBF of timber towards the annual sustained yield target thus helping sustain current mill capacity.

Environmental Assessment Checklist Prepared By:

Name: Thayer Jacques
Title: Hamilton Unit Forester
Date: April 25, 2022

Finding

Alternative Selected
Action alternative

I have decided to approve the Proposed Action with all mitigations and controls recommended in the EA Checklist and is hereby adopted. My decision is based on a thorough review of the environmental assessment and the following conclusions arrived at through that review:

1) I conclude that the proposed action will achieve the project objectives of a) Improve timber stand growth and productivity and b) improve resistance to future insect or
disease attack and c) reduce fuel loading and ladder fuels and d) increase the growth and vigor of regeneration and finally e) maximize revenue over the long-term for the School Trust accounts from the timber resources and provide a sufficient amount of sawlog volume to contribute to the DNRC’s sustained yield as mandated by State Statute 77-5-222, MCA.

2) I further conclude that, by virtue of design, mitigations and controls adopted and integrated into the proposed action, the project objectives will be achieved in a manner that avoids significant adverse impacts to the human and physical environment.

I am also satisfied that the proposed action has been developed through an appropriate process involving public participation, interdisciplinary methods and inter-entity consultations; that it reflects understandings, conclusions and agreements arrived at through such collaborative work; and that it is true and faithful to the trust land mission provided by the Montana Constitution and forestry laws of the State of Montana, as well as principles laid out in the State Forest Land Management Plan and Rule under which policy the trust land forestry mission is pursued.

**Significance of Potential Impacts**
I am satisfied that all pertinent resources and environmental values have been properly identified and studied through the project development process. Based on my review of the environmental analysis, I have concluded that the proposed action will not cause any significant adverse impacts - direct, secondary or cumulative - on the human and physical environment.

With respect to the significance of potential impacts, I find there are none that should be regarded as severe, enduring, geographically widespread or frequent.

Further, I find that the quantity and quality of the various resources, including any that may be considered unique or fragile, will not be adversely affected to a significant degree and that the seven criteria for determining significance of impacts contained in ARM 26.2.644 have been addressed completely. I find in the proposed action no precedent for 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 some adverse impacts are avoided altogether by means of project design and that others are controlled and mitigated to the extent that they do not become significant.

The analysis of identified issues did not disclose any reason compelling the DNRC to not implement the timber sale.

The Action Alternative includes mitigation activities to address environmental and human concerns identified during both the Public Scoping phase and the project analysis.

**Need for Further Environmental Analysis**

- [ ] EIS
- [x] More Detailed EA
- [x] No Further Analysis
Environmental Assessment Checklist Approved By:
   Name: Jon M. Hayes
   Title: SWLO Forest Management Program Manager
   Date: April 27, 2022
   Signature: /Jon M. Hayes/
Attachment A - Maps
Flatlander Timber Sale Vicinity Map

Name: Flatlander Timber Sale
Legal: 11N 20W Sec. 12 and 24

Produced by Montana Department of Natural Resources and Conservation 2013
Datum: NAD 1983 Montana State Plane
A-2: Flatlander Timber Sale Project Map
A-3: Flatlander Timber Sale Section 12 Unit Map
Attachment B – Scoping Comments
INTRODUCTION

This section contains information on interactions with and additional comments related to the Flatlander Timber Sale received during the scoping period.

The comments received are presented below, as well as the DNRC’s responses. The specific comment is presented first and the DNRC’s response to address this comment is presented in underlined italic font below it.

Comments received from Torrey Ritter MTFWP:

Overall, I think the proposed harvest looks really good and I don’t have any major concerns. I especially appreciate the attention to detail in avoiding wetland swales and old river channels that, while seemingly disconnected from the main river, are still important wetland types. These features are especially vital to wildlife during runoff periods when the main river becomes a difficult place for many river-dwelling species to forage and find shelter. I also think this harvest has the potential to invigorate aspens stands and deciduous shrubby areas that are important for many birds and small mammals yet are being shaded out by dense ponderosa pine. Hopefully, the disturbance of the logging equipment will prompt some fresh suckering of aspens and the open canopy will promote establishment of more deciduous shrubs in the midstory and understory.

Just for context, these two sections are in some of the most important habitats in western Montana as laid out in the State Wildlife Action Plan (SWAP). The properties contain Community Types of Greatest Conservation Need (wetlands, riparian areas, and floodplain) and are included in the Bitterroot – Clark Fork Riparian Corridor Terrestrial Focal Area. This focal area is considered Tier I, the highest priority, and even within that category this focal area is one of greatest concern in the state. The language in the SWAP reads:

“This high biodiversity area is an important north-south migration corridor for songbirds and owls and part is designated as an Important Bird Area (IBA) by the National Audubon Society. It is a major breeding area for Lewis’s woodpeckers and numerous great blue heron rookeries are found throughout the area. The riparian corridor is very wide in places, and mostly continuous throughout the length of the Focal Area.”

Species of Concern (SOC) in this focal area are primarily dependent on: a) active floodplain processes that produce diverse river-bottom wetlands (these should be unaffected by the proposed timber harvest), and b) diverse forest stands that provide plenty of large-diameter trees, live trees with dead parts, snags, and downed wood (affected by timber harvest).

The Bitterroot River floodplain in this focal area has been highly impacted by development and bank hardening which have diminished natural floodplain processes and fragmented river-bottom forests. These two DNRC sections sit in the middle of the largest intact swath of Bitterroot River floodplain remaining today. This is the reason the proposed timber harvest has garnered attention from FWP’s nongame program.
In general, we appreciate the conservative harvest proposed that focuses only on ponderosa pine and leaves lots of trees in place including most of the large-diameter ponderosa pine. We recommend all ponderosa pine greater than 27” dbh be maintained as potential current or future nest trees for pileated woodpeckers. Pileated woodpeckers are a SOC and a keystone species whose cavities are used by dozens of other species long after the pileated woodpeckers are done with them. These large diameter trees are rare on the landscape but their towering height, large-diameter branches, and potential for creation of future large-diameter snags make them especially important to preserve, not only for pileated woodpeckers but for all the other species that use large trees disproportionate to their abundance on the landscape like other cavity nesters, owls, large carnivores, brown creepers, eagles and other raptors, and great blue herons.

**DNRC Response:**

*The treatment prescriptions for each unit are focused on leaving the largest trees and “thinning from below”. DNRC would allow for a small number of larger (27”- 29”) trees for removal. Any trees larger than 30” would be retained. These larger trees identified for removal would show evidence of insects or poor form/vigor. The larger trees removed would be located in clumps where DNRC would leave neighboring trees in the clumps. Any large trees in the open (not located within a clump) would be retained regardless of form or vigor.*

As we talked about in a previous email, due to this area’s importance to cavity nesting species, including many SOC, we request that no standing dead trees or live trees with dead parts be toppled or removed as part of this timber harvest except to protect the safety of logging crews. Besides cavity nesters, these large dead and dying trees provide roosting and nesting sites for many other bird and mammal species as well as bats, which are of particular concern with the arrival of White Nose Syndrome in Montana and are at high abundance in the Bitterroot River bottom where these sections are located. If standing dead trees need to be knocked down for safety, we request they be left in place. Fallen, large, dead ponderosas are valuable foraging sites for woodpeckers and amphibians and provide cover for small mammals and herptiles moving among the various wetlands these areas provide.

**DNRC Response:**

*All existing snags would be maintained. Only snags that are a safety concern for contractors would be removed with approval from the forest officer. Any snags felled for safety reasons would be left on-site.*

Other than those two suggestions (retention of large trees and as many dead and dying trees as possible), we have a few more specific recommendations:

1) Cut unit boundary adjustments = please see attached shapefile for a few suggested cut unit boundary adjustments to avoid harvest near important seasonal wetlands in the floodplain. The suggested boundary changes also exclude stands of large ponderosa pine that we propose should be left alone.
White are my suggested boundary adjustments, see attached shapefile as well.
**DNRC Response:**

*DNRC will focus to leave more trees in these areas and will leave all trees greater than 17”. We estimate with the added leave trees, that only a maximum of 30% of the trees will be removed in this area. We will focus the leave trees closest to the wetland boundary.*

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2) **Small tree clumps =** Please see the photo below for an example of small, dense ponderosa pine stands that are found in small patches throughout the two sections. While seemingly insignificant and even “unhealthy” from a forestry perspective, these dense stands of ponderosa pine are important roost sites for small owls and for various other birds when they need to escape bitter cold temperatures or winds. We request that these clumps be maintained in the cut units.

**DNRC Response:**

*DNRC will agree to leave these clumps of mainly “pulp size” material to provide additional cover. We know that you have offered to identify these clumps on the ground for retention.*
3) Additional large tree retention near SMZ’s = We request that all medium and larger ponderosa pines (>12" dbh preferred, but definitely anything >20" dbh) be retained within 100 ft of the SMZ along the south and east boundaries of Unit 8, the west boundary of Unit 1, and the east boundary of Units 5 and 6. This is to protect important perching sites for ospreys, kingfishers, and owls that heavily use large trees on the edge of openings near water. This is also meant to preserve trees that have the highest chance of falling into water flow pathways where they can be recruited into downed wood in the stream, which is important for fish habitat and for active floodplain processes. 
   a) Similarly, all larger ponderosa pine that are located in or directly adjacent to open meadows should be retained to the greatest extent possible due to their disproportionately high use by raptors, bears, and other species.

   **DNRC Response:**

   Units have been modified since we received this comment. Unit 8 has been dropped from the project due to the proximately of an occupied bald eagle nest. Based on RMZ requirements, DNRC would leave at minimum 50% of all trees within 115’ of these class 1 streams. DNRC would add additional leave trees >20” within these streamside buffers. Focus for removal will be trees with poor form or vigor.

   Additional large trees in and around meadows would be marked to leave. Focus for removal would be trees with poor form or vigor.

4) Leave as much downed woody debris >12” DBH as possible. Downed woody debris (DWD) is important for biological and physical processes in the area. DWD, especially larger debris, provides critical foraging resources for woodpeckers and songbirds and foraging and nesting areas for small mammals, which in turn support raptor species like owls. Furthermore, DWD provides cover and thermal regulation for amphibian species when it is located within ~100 m of a water body. DWD is also important for floodplain processes as it is pick up and moved by floodwaters where it can be recruited into the river channel. This is more important in areas with relatively little DWD around, and obviously not as important in areas like the south end of Section 12 where DWD is highly abundant.

   **DNRC Response:**

   DNRC would leave all current downed material on site. Also, see discussion of CWD in “Soils Analysis” appendix E.

5) Operating periods = Avoid any work from March 1 to August 1st to avoid disturbing nesting birds. Bald eagles and most owls begin forming territories in January and February and some owls and woodpeckers begin nesting by early to mid-March. Most young should be fledged from any nests in these parcels by mid-July. However, bats may still be using snags for maternity roosts in mid-July and western toads will be on the move in terrestrial environments from mid-July to late August. Therefore, winter or late fall operating periods would be ideal.
DNRC Response:

There would be no hauling activities from section 24 from Feb. to Aug. per bald eagle nest restrictions (see Appendix D Wildlife Analysis. DNRC would focus on winter logging if soils conditions allow. Any operations during the spring and summer would be focused on working in one section at a time to minimize impact across the entire project area. DNRC anticipates, because all units are tractor units, that all logging activity could be completed in one year to minimize prolonged impact. (Also, see Appendix D Wildlife analysis).

6) Where applicable, remove encroaching conifers from aspen stands and deciduous shrubby areas to enhance these habitat types for the wide variety of species that use them. Conifer in-growth is a persistent problem for aspen stands across Montana. We request that foresters look for opportunities to enhance these habitats as part of the timber harvest project. Large-diameter ponderosa pines (>20” dbh) in these habitat types should be exempt from any enhancement project as their value to wildlife supersedes any detriment they might cause to deciduous forests and shrubby areas. Higher densities of ponderosa pine could be removed from around deciduous stands to offset retaining more trees around SMZs (because of suggestions #3 above), in boundary unit adjustments (suggestion #1), or to retain more large-diameter ponderosa pine in general throughout the parcels.

DNRC Response:

DNRC would look to remove additional trees <20” in these areas. Keep in mind that DNRC must maintain a minimum of 50% of the basal area to meet floodplain concerns.

Comments received from MTFWP:

Dear Mr. Jacques:

Montana Fish, Wildlife & Parks (FWP) appreciates the opportunity to comment during the scoping period for the Montana Department of Natural Resources and Conservation’s (DNRC’) proposed Flatland Timber Sale in the northern Bitterroot Valley. The Bitterroot River flows south to north through both parcels that would be harvested during this project, and these river-bottom parcels encompass highly important habitat types for many nongame species associated with the river and its floodplain, including many Montana Species of Concern1. Additionally, the DNRC parcels in this area are a critical part of a larger landscape consisting of open and protected lands that form a bridge of intact habitat connecting the Sapphire Mountains and Bitterroot Mountains via the Bitterroot Valley bottom. Some lands to the south and many to the east are protected from development by conservation easements. Elk, deer, moose, bears, mountain lions, and wolves cross these properties during seasonal movements and dispersal events. Therefore, these parcels are not only important because of the habitats they provide within their boundaries, but also because of the role they play in connecting to other lands in one of the last areas of contiguous, unfragmented habitat in the Bitterroot Valley bottom.

1 A native animal (or plant) breeding in Montana and considered to be “at risk” due to declining population trends, threats to its habitats, and/or restricted distribution. Montana’s SOC listing highlights species in decline and encourages conservation efforts to reverse population declines and prevent the need for future listing as Threatened or Endangered Species under the Federal Endangered Species Act. Further information available at https://fwp.mt.gov/conservation/species-of-interest (accessed 23 Sep 2021).
Given the relatively undeveloped nature of the surrounding area, these parcels are particularly valuable for wildlife that thrive with low amounts of human disturbance and large tracts of diverse and well-connected habitats. The parcels are characterized by large-diameter ponderosa pine and cottonwood trees with patches of aspen and deciduous shrubs. The parcels are innervated by side channels, backwaters, sloughs, oxbow ponds, and wetland swales characteristic of historic river channels with a mosaic of wetland types and hydroperiods. The proximity of large-diameter trees and multiple age and height classes of vegetation to wetlands increases the value of those forests (and individual trees) for nongame wildlife. These parcels represent some of the most important and biodiverse habitats that DNRC manages in this region.

FWP notes that the project area lies entirely within the Bitterroot River Important Bird Area as identified by the Audubon Society. Per the Audubon Society’s description of this IBA:

More than 240 species of birds have been recorded within the IBA, with at least 115 species breeding. Numbers of Lewis’s Woodpeckers and Red-naped Sapsuckers in the cottonwood forest along the river exceed the respective thresholds for an IBA of Continental significance. Other species of conservation concern that nest here include Bald Eagle, Northern Harrier, Wilson’s Phalarope, Short-eared Owl, Pileated Woodpecker, Willow Flycatcher, and Red-eyed Vireo.³

The parcels are also part of the Bitterroot-Clark Fork Riparian Corridor Focal Area under Montana’s State Wildlife Action Plan (SWAP; MFWP 2015⁴). This is a Tier I focal area (the highest tier) and was delineated based on the importance of the area to resident and migratory birds. The mature and old-growth ponderosa pine stands, extensive deciduous bottomland forests, and variety of wetlands are key habitat types that resulted in the designation of this focal area. Under the SWAP, some key species we are concerned about in this area are Lewis’s woodpecker, pileated woodpecker, great blue heron, western toad, brown creeper, and various bat and owl species.

DNRC Response:

See Wildlife Analysis attachment D

FWP acknowledges the difficulty DNRC faces in accommodating game, nongame, and fisheries resource needs while meeting school revenue objectives. We recommend careful timing of logging activities around big game hunting and nongame nesting seasons if possible. Staggering the project so that both parcels are not impacted simultaneously might be one way to reduce the impact.

DNRC Response:

² https://mtaudubon.org/birds-science/iba/, also see https://mtaudubon.org/birds-science/iba/maps/ (accessed 24 Sep 2021)
³ https://www.audubon.org/important-bird-areas/bitterroot-river (accessed 24 Sep 2021)
There would be no hauling activities from section 24 from Feb. to Aug. per bald eagle nest restrictions (see Appendix D Wildlife Analysis. DNRC would focus on winter logging if soils conditions allow. Any operations during the spring and summer would be focused on working in one section at a time to minimize impact across the entire project area. DNRC anticipates, because all units are tractor units, that all logging activity could be completed in one year to minimize prolonged impact. (Also, see Appendix D Wildlife analysis).

While the removal of canopy cover may benefit elk and deer by increased understory forage production, the removal of coniferous trees would reduce security habitat and create short-term disturbances in use. Both parcels abut the Sapphire Block Management Area\(^5\) (BMA); a portion of the northern parcel is managed under BMA access rules while the south parcel is not, the latter being accessible via float-in on the Bitterroot River and/or permissive access from surrounding landowners. Elk especially are known to cause damage to standing and stored crops (e.g., haystacks) on the Sapphire Ranch and surrounding properties. Logging activities are likely to cause shifts in elk use of the BMA and surrounding lands, potentially impacting hunter success and shifting elk use to neighboring lands where they may cause more damage and be less available for harvest.

**DNRC Response:**

*See Wildlife Analysis attachment D*

FWP looks forward to continued engagement with the DNRC as this project moves forward. We request that FWP be allowed to review the draft environmental assessment (EA) for this project. We would expect to submit more detailed and specific comments related to timber management once we have had a chance to review the EA and associated maps of cut units and wetland buffers. In the coming months, we would be exploring these parcels more fully to help identify key habitat patches and potential impacts with the goal of helping inform timber management practices that would meet DNRC’s sustainable yield goals and help address neighbors’

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\(^5\) A cooperative program between private landowners and FWP, Block Management helps landowners manage hunting activities and provides the public with free hunting access to private land, and sometimes to adjacent or isolated public lands. See [https://fwp.mt.gov/hunt/access/blockmanagement/about](https://fwp.mt.gov/hunt/access/blockmanagement/about) (accessed 24 Sept 2021).
Comments received from Landowner Helena MaClay:

Hello,

I am one of the owners of Maclay Ranch LLC. You were kind enough to send us a notice about the Flatlander Timber Sale. We are very interested in the proposal to log Sections 12 and 24, T11N, R20W. Is there a package of information you could supply us? Have you met with other area landowners or organizations? Please let us know if there are such meetings scheduled, and please provide us copies of the information, including power point presentations, that you have given to members of the public or others.

Here are some initial questions.

1. Is there an inventory of wildlife on the affected lands, including maps of nests for eagles, osprey, and other significant components that has been consulted when designing this timber harvest? Please provide it.

**DNRC Response:**

*See Wildlife Analysis attachment D*

2. What effort is or will be made to protect/enhance the bird habitat? Some years ago, the Audubon Society noted the area is Important Bird Habitat. There are over 50 riverine birds and others that use these lands which enjoy the relatively “unimproved” conditions and the lack of public road access.

**DNRC Response:**

*See Wildlife Analysis attachment D. Road status will not change. All roads will remain gated and closed to public use.*

3. Please provide a map of the proposed timber harvest units and the prescription for each harvest unit. Provide the approximate number of board feet of each species of timber to be harvested from the units.

**DNRC Response:**

*See Attachment A Maps. Estimated harvest volume is 2.5 million board feet from 324 acres. The treatment will be the same for all units: use individual tree selection to “thin from below” leaving the largest, healthiest ponderosa pine trees on site. A minimum of residual basal area of 60 would be maintained. All trees over 30” would be retained. No existing snags would be removed. Regeneration would be protected during harvest operations. Only ponderosa pine would be harvested. Hardwoods (aspen and cottonwood) would remain.*
4. Provide a summary of the expenses estimated to be associated with the timber harvest; estimates of the value of the harvested timber; and estimates of net monetary proceeds to the State. What quantifiable non-monetary benefits will the State and its property and wildlife receive as a result of this project? When?

**DNRC Response:**

See “other appropriate social and economic circumstances” page 15. See Wildlife Analysis Attachment D.

5. Provide the timeline for harvest, both beginning and end, plus the timeline for slash disposal if done by burning, and re-planting.

**DNRC Response:**

*DNRC anticipates a contract period of June/July 2022 – October 2025. DNRC does not anticipate actual harvests operations lasting more than one year once operations commence. The actual start date would be determined once a successful bidder/contractor is identified. Slash will be burned in the fall before runoff season after the completion of harvest. Grass seeding will take place spring or fall after completion of harvest.*

6. Where will timber harvested be processed? How will slash be handled?

**DNRC Response:**

*Timber will be processed on-site at landing locations (mainly in existing open meadows and along roads). See above about slash disposal.*

7. Provide the transportation map to and from the harvest units and route(s) out to public roads. Identify the locations of the 3 miles of roads that will be “improved” and how they are to be improved. Describe the location and nature of the approximately 1.0-1.5 miles of new road construction. What will happen to each road after construction is completed? That is, will it remain open, or will it be “put to bed?”

**DNRC Response:**

*See appendix A Maps. Existing roads (bright green) on the map would be improved. New roads (pink) would remain after harvest. All roads will be grass seeded after operations. All roads will remain closed to the public. The haul route will use the existing road north to Sapphire Ranch road and then west out to the highway through the existing green brush gate. Unit 5 and 6 will use Sapphire Ranch road for hauling.*
8. Will there be continued public access to the state lands after the harvest is completed? Will public access be increased as a result of the harvest?

**DNRC Response:**

*Current means of access for the public will remain unchanged. Roads will remain closed to the general public. Access for the public will be via block management or from the Bitterroot River.*

9. What impacts on wildlife do you anticipate will spill over onto adjacent lands? For example, will there be increased elk population that will pressure adjacent lands? Or will the lack of existing cover for elk encourage them to go elsewhere?

**DNRC Response:**

*See Appendix D Wildlife Analysis.*

10. How will game hunting be handled during the harvest period?

**DNRC Response:**

*Due to restriction on hauling from section 24, some operations may occur during archery season in order to complete the project as quickly as possible. Soil conditions would most likely limit any operations after October in the fall. DNRC would focus on winter operations if conditions allow.*

**Comments received from Landowner Frank Heston:**

Dear Mr. Jacques;

My name is Frank Heston, owner of property at 17600 Wyns Way, Florence. My property is located on Section 23, T11N, R20W, and borders the State Land on Section 24.

Thank you for the notice of August 31, 2021, regarding your proposed timber sale East of my home. I appreciate your desire to harvest and thin the forest, to improve the forest health, reduce the fire danger, and provide weed control.

What is your current idea of the road into Section 24? Is your thought to prepare a road from Section 12 South to Section 24, or is your plan to come directly from the highway to Section 24?

**DNRC Response:**

*DNRC would utilize the existing road through section 13 to access/haul from section 24 north to section 24. Hauling would not utilize Wyns Way.*
I do have one request. Please protect the forest close to the Western edge of Section 24, to protect our property values of homes on Gardner Lane and Wyns Way.

**DNRC Response:**

*See “Aesthetics” page 8 for a discussion about “no harvest areas” and the “no cut visual buffer” near Wyns Way. See Attachment A Maps for unit locations.*

**Comments received from Landowner Mary Ann Bonjorni:**

As an livestock association range rider for the past 22 years, I have witnessed firsthand the negative effects of noxious weeds on habitat.

I support this proposed project if there is an overt commitment to control noxious weeds from the onset. I do not support this project without a secured commitment to control noxious weeds.

**DNRC Response:**

*See Attachment C Vegetation Analysis “mitigations”. DNRC has been in contact with the grazing licensee to coordinate weed spraying efforts before operation begin. DNRC would collect forest improvement fees from each load of timber that is harvested. These funds can be used to address noxious weeds issues following the harvest.*
Attachment C – Vegetation Analysis
Flatlander Timber Sale – Vegetation Analysis

Analysis Prepared By:
Name: Thayer Jacques
Title: Hamilton Unit Forester, Montana DNRC

Introduction

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

Issues

- Timber harvesting and road building/reconstruction may introduce or spread noxious weeds in the project area.
- Insects may continue to cause mortality in the overstory.
- Stands are currently overstocked. These conditions lead to reduced growth and vigor as well as the probability of increased fire behavior.
- There is concern the proposed project could negatively impact populations of threatened, endangered, or sensitive plant species.

Regulatory Framework

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

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

DNRC Forest Management Rules
DNRC Forest Management Rules (ARM 36.11.401 through 450) are the specific legal resource management standards and measures under which DNRC implements the SFLMP and subsequently its forest management program. The Forest Management Rules were adopted in March 2003 and provide the legal framework for DNRC project-level decisions and provide field personnel with consistent policy and direction for managing
forested state trust lands. Project design considerations and mitigations developed for this project must comply with applicable Forest Management Rules.

**Montana Best Management Practices (BMPs) for Forestry**

Montana BMPs consist of forest stewardship practices that reduce forest management impacts to water quality and forest soils. The implementation of BMPs by DNRC is required under ARM 36.11.421. Key forestry BMP elements include: streamside management; road design and planning; timber harvesting and site preparation; stream crossing design and installation; winter logging; and hazardous substances storage, handling, and application.

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**Analysis Areas**

**Direct and Secondary Effects Analysis Area**
The proposed treatment areas—Approximately 324 acres

**Cumulative Effects Analysis Area**
The proposed project area—11N 20W Sec. 12 & 24 1,280 acres

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**Existing Conditions**

**Noxious Weeds**
Current noxious weeds occurring in the project section are knapweed (Centaurea maculosa), houndstongue (Cynoglossum officinale L), and cheatgrass (Bromus tectorum). Knapweed and cheatgrass was found in the open meadow areas. Spotty houndstongue infestations were found within undisturbed forest sites, possibly transported by wildlife. Animal vectors and recreation are the most likely reasons for the existing noxious weeds and the potential future spread and introduction of noxious weeds. Seeding of roads followed by roadside, spot herbicide treatments, and release of bio-control insects can be most effective in reducing the spread of noxious weeds.

**Rare Plants**
A query of the Montana Natural Heritage Program listed the following species of concern as possibly existing within the project area: Chaffweed (Centunculus minimus), Stalk-leaved Monkeyflower (Mimulus amplius), Toothcup (Rotala ramosior), Woolly Clover (Trifolium microcephalum), Pointed Broom Sedge (Carex scoparia), and Shining Flatsedge (Cyperus bipartitus). None of these plants were observed within the proposed harvest units.

**Standard Vegetative Community**
- **Stand History/Past Management**
  
  Based on tree cores taken during timber cruising, the estimated origination date of stands in the project area is approximately 1900. The habitat types identified within the project area place them within the warm dry ponderosa pine type. Historically, this type was subject to low intensity fires at a frequency of 10 to 30 years. The treatment prescriptions for proposed harvest units was designed to mimic this low intensity frequent fire interval. The project area currently and historically has been grazed from June to September each year.
Current stand conditions
The current stand condition in the project area is a result of past timber management and wildfire activity and/or suppression. The habitat types identified in the project area are Pinus ponderosa/Festuca idahoensis (ponderosa pine/Idaho fescue) and Pinus ponderosa/Agropyron spicatum (ponderosa pine/bluebunch wheatgrass).

Current stands are composed primarily of ponderosa pine with open meadows interspersed throughout. In addition to ponderosa pine, there are also pockets of quaking aspen and black cottonwood. The dominant and codominant layer of the overstory contains ponderosa pine with diameters ranging from 17" to 30"+. The intermediate layer contains ponderosa pine with diameters ranging from 8" to 15". The understory is comprised mainly of seedling/sapling ponderosa pine forming patches in the larger canopy openings. Current stocking levels are medium stocked (40% - 69%) to well stocked (+70%). Where sufficient light is available, ground vegetation consists mainly of grasses and forbs. Snags are currently scattered throughout the proposed units. Average down woody debris approximately 5 tons/acre.

Overall stand health is good. There are scattered pockets (5 to 10 trees) of mortality due to bark beetle in the overstory. No insect/disease effects were observed in the understory trees.

Table V-1 – Current and appropriate cover type for the Flatlander Timber Sale Project Area.

<table>
<thead>
<tr>
<th>Cover Type</th>
<th>Current Acres</th>
<th>Current Percent of Project Area</th>
<th>Desired Future Condition (DFC)</th>
<th>Acres</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subalpine fir</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Douglas-fir</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Lodgepole pine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed conifer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ponderosa pine</td>
<td>670</td>
<td>52%</td>
<td>542</td>
<td>42%</td>
<td></td>
</tr>
<tr>
<td>Western larch/Douglas-fir</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western white pine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-stocked</td>
<td>192</td>
<td>15%</td>
<td>192</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Non-forest</td>
<td>178</td>
<td>14%</td>
<td>178</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Other (hardwoods)</td>
<td>240</td>
<td>19%</td>
<td>240</td>
<td>19%</td>
<td></td>
</tr>
</tbody>
</table>
Old Growth

Old Growth is identified and analyzed using criteria outlined in Green et al. (ARM 36.11.403). Stand level inventories of the project area were queried to identify potential old growth and old growth stands. This query resulted in no stands that were identified as old growth. This data was field verified using cruising data from the inventory of the sale area.

The proposed prescription was designed to meet standards for old growth restoration treatments, according to ARM 36.11.418, using individual tree selection. The project would retain sufficient large live trees to meet the old growth definition in ARM 36.11.403.

Environmental Effects

No Action Alternative: Direct and Secondary Effects and Cumulative Effects

Under the No Action Alternative, natural processes would continue to have a direct influence on forest conditions. Areas of overstocking would continue to have negative effects on tree health and vigor. In addition, overstocking would continue increase the risk of crown fires.

With no action, noxious weeds may continue to spread. Grazing licensees would be required to continue weed control efforts consistent with their use.

Action Alternative: Direct, Secondary, and Cumulative Effects

Noxious Weeds

Implementation of the action alternative would involve ground-disturbing activities that have the potential to introduce or spread noxious weeds in susceptible habitat types. For the action alternative, an Integrated Weed Management (IWM) approach was considered for treatment of existing and prevention of potential noxious weeds. For this project: prevention, revegetation of new roads/disturbed areas, and weed control measures (herbicide treatments and biocontrol) are considered the most effective weed management treatments.

Herbicide application would be completed, as needed, in disturbed areas to reduce weed spread and promote desired vegetation for weed competition. Herbicide would be applied according to labeled directions, laws, and rules, and would be applied with adequate buffers to prevent herbicide runoff to surface water resources. Implementation of IWM measures listed in the mitigations are expected to reduce existing weeds, limit the possible spread of weeds, and improve current conditions to promote existing native vegetation. More weed control would occur compared to the no-action alternative and grass and competitive vegetation would increase along roads.

Overall cumulative effects of increased noxious weeds within the project area are expected to be low, based on implementing prevention measures to reduce new weeds (herbicide application and biocontrol), by cleaning equipment, and planting grass on roads and in disturbed areas (burn piles, landings, temp trails, temp roads) to compete against weeds.
Rare Plants
*Direct, Secondary, and Cumulative*
No rare plants were observed within the proposed cutting units.

The proposed action would be expected to have no to low direct, indirect, and cumulative impacts on rare plants.

Standard Vegetative Community
*Direct, Secondary, and Cumulative*
The proposed action alternative would treat approximately 324 acres out of the 1280 acre project area. The treatment prescription would use individual tree selection to focus on harvesting trees mainly in the intermediate and codominant layers. The goal would be to leave the largest, healthiest ponderosa pine trees with a minimum residual basal area of 60. Trees with poor form and growth (forked tops, crook, sweep, flat tops and showing signs of little to no growth) would be removed. Advanced regeneration would be protected during operations. Post-harvest stands would appear more open and park like. Young, vigorous ponderosa pine would remain present in the understory to eventually replace the trees removed from the overstory. All current snags and at least 2 snag recruits per acre would be retained. In accordance with ARM 36.11.410 and ARM 36.11.414 the majority of fine slash foliage and approximately 3 to 8 tons of coarse woody debris would be left scattered on the forest floor in all harvest units.

The proposed action would be expected to result in low to moderate direct, indirect, and cumulative impacts on forest vegetation beyond those projected for the no action alternative.

Old Growth
*Direct, Secondary, and Cumulative*
Currently, there are no stands within the proposed harvest units that have been identified as old growth.

The proposed prescription was designed to meet standards for old growth restoration treatments, according to ARM 36.11.418, using individual tree selection. The project would retain sufficient large live trees to meet the old growth definition in ARM 36.11.403.

The proposed action would be expected to have no direct, indirect, and cumulative impacts on old growth.

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**Vegetation Mitigations**

- Favor the largest, healthiest ponderosa pine trees for retention. Leave a minimum residual basal area of 60 to meet old growth standards.

- Wash equipment prior to harvest to limit weed seed dispersal.

- Use herbicide application and biocontrol to limit spread of existing weeds.

- Plant grass along new roads and in disturbed areas to limit the resources available for weeds to become established.
Snags, snag recruits, and coarse woody debris would be managed according to ARM 36.11.411 through 36.11.414. All existing snags would be maintained. Coarse woody debris retention would emphasize retention of downed logs of 15-inch diameter or larger.

**Vegetation References**

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


Montana Administrative Rules for Forest Management. 36.11.401 (50)

Attachment E – Wildlife Analysis
Flatlander – Wildlife Analysis

Analysis Prepared By:

Name: Garrett Schairer
Title: Wildlife Biologist, Montana DNRC

Introduction

The following sections disclose the anticipated direct, indirect, and cumulative effects to wildlife resources from the proposed action in the project area and cumulative-effects analysis areas described for each resource category. Past and ongoing activities on all ownerships, as well as planned future agency actions, have been considered in each cumulative-effects analysis for each resource topic.

Issues

Proposed activities could alter mature forested habitats and/or landscape connectivity, which could affect species that rely on these mature forested habitats, and/or alter connectivity and the ability of wildlife requiring corridors to move through the landscape.

Proposed activities could alter important habitats for avian species and/or negatively influence avian diversity.

Proposed activities could negatively affect bald eagles by reducing nesting and perching structures and/or disturbing nesting bald eagles.

Proposed activities may alter flammulated owl habitat by reducing canopy closure and increasing tree spacing while potentially removing snags needed by flammulated owls for nesting.

Proposed activities could reduce suitable nesting and foraging habitat for pileated woodpeckers, which could alter pileated woodpecker use of the area.

Proposed activities could remove forest cover on big game winter range, which could reduce the carrying capacity of the winter range.

Proposed activities could remove big game security cover, which could affect hunter opportunity and local quality of recreational hunting.

Regulatory Framework

Various legal documents dictate or recommend management direction for terrestrial wildlife species and their habitats on state trust lands. The documents most pertinent to this project include DNRC Forest Management Rules, DNRC Forested Trust Lands Final Environmental Impact Statement and Habitat Conservation Plan (USFWS and DNRC 2010), the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act.
Analysis Areas

The discussions of existing conditions and environmental effects within each subsection pertain to land areas of 2 different scales. The first scale of analysis is the Project Area (1,251 acres), which includes the DNRC-managed lands in sections 12 and 24 in T11N, R20W where activities are being proposed. The second scale is the cumulative-effects analysis area, which refers to a broader surrounding landscape useful for assessing cumulative effects to wildlife and habitat. For this proposed project, two distinct cumulative-effects analysis areas were identified. The first cumulative effects analysis area includes the project area and those lands within 1 mile of the project area (9,563 acres). This area includes 1,251 acres (13%) that are managed by DNRC and 8,321 acres (87%) that are privately owned, which is split between small and large private ownerships. The second cumulative effects analysis area is approximately 47,137 acres and includes the area bounded by Davis Creek, Davis Point, the USFS boundary down to Eightmile Creek to the Bitterroot River to Sweeney Creek to the USFS boundary to Mormon Creek, Lolo Creek and back to the Bitterroot River. This cumulative effects analysis area is mostly in private ownership (44,084 acres, 94%) with lesser amounts of DNRC-managed lands (2,902 acres, 6%) and trace amounts of FWP-managed lands, DOT-managed lands, USFS-managed lands, and local government-managed lands.

Analysis Methods

Analysis methods are based on DNRC State Forest Land Management Rules, which are designed to promote biodiversity. In the fine-filter analysis, individual species of concern are evaluated. These species include wildlife species federally listed under the Endangered Species Act, species listed as sensitive by DNRC, and species managed as big game by the Montana Dept. of Fish Wildlife and Parks (DFWP).

For each species or habitat issue, existing conditions of wildlife habitats are described and compared to the anticipated effects of the no-action alternative and the proposed action alternative to determine the foreseeable effects to associated wildlife habitats. To assess the existing condition of the project area and surrounding landscape as well as related effects associated with the proposed action alternative, a variety of techniques were used. Field visits, scientific literature, SLI data, review of aerial photographs, USFS VMAP (v16), review of current MNHP data (MNHP data accessed 3/3/22), and consultations with other professionals provided information for the following discussion and effects analysis. Specialized methodologies, where applicable, are discussed under the species or issue in which they occur. Species were dismissed from further analysis if habitat did not exist in the project area or if the habitat would not be appreciably modified by any alternative. Throughout this analysis, effects associated with mature forest cover are evaluated using a 40% canopy cover threshold. The >40% value was selected because it serves as a useful minimum at a point which stands begin to provide snow interception, hiding cover, and security for many species of wildlife.

Coarse Filter Wildlife Analysis

DNRC's principal means of managing for biodiversity is by taking a ‘coarse-filter approach’, which favors an appropriate mix of stand structures and compositions on state lands (ARM 36.11.404). Appropriate stand structures are based on ecological characteristics (e.g., land type, habitat type, disturbance regime, unique characteristics). A coarse-filter approach assumes that if landscape patterns and processes are maintained like those endemic species evolved with, the full complement of species will persist, and biodiversity will be maintained. This coarse-filter approach supports diverse wildlife populations by managing for a variety of forest...
structures and compositions that approximate historic conditions across the landscape. DNRC cannot assure that the coarse-filter approach will adequately address the full range of biodiversity; therefore, DNRC also employs a ‘fine-filter’ approach for threatened, endangered, and sensitive species (ARM 36.11.406). The fine-filter approach focuses on a single species’ habitat requirements and helps ensure that special habitat needs of these rare or sensitive species are not overlooked.

**MATURE FORESTED HABITATS AND LANDSCAPE CONNECTIVITY**

**Issue**

Proposed activities could alter mature forested habitats and/or landscape connectivity, which could affect species that rely on these mature forested habitats, and/or alter connectivity and the ability of wildlife requiring corridors to move through the landscape.

**Introduction**

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

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

**Analysis Area**

Direct and indirect effects were analyzed for activities conducted in the 1,251-acre project area. Cumulative effects were analyzed on a 47,137-acre area described above in the Analysis Areas portion of this analysis. This scale of analysis would be large enough to support a diversity of species that use mature forested habitats and/or require connected forested habitats.

**Analysis Methods**

Direct and indirect effects, as well as cumulative effects, were analyzed using a variety of information obtained from field evaluations, aerial photograph interpretation, USDA remotely sensed data, and a GIS analysis of available habitats. Factors considered within the cumulative effects analysis area included the amounts of mature forest cover with >40% canopy closure, amount of riparian habitats, levels of human developments, motorized access, and visual screening, and levels of potential human disturbance.
Affected Environment

The project area is situated in the lower elevations of the Bitterroot drainage and is dominated by moderately warm and dry forest types. Elevations range from roughly 3,160 to 3,420 feet and the project area is on generally flat ground. The project area currently contains approximately 718 acres (57% of project area) of mature stands (100-plus years in age) of ponderosa pine and cottonwood stands that have a reasonably closed canopy. No stands in the project area meet the definition of Old Growth (Green et al. 1992; see Vegetation section for additional details). Currently, forested areas cover much of the project area (1,067 acres, 85%), facilitating some use by those species requiring connected-forested conditions and/or forested-interior habitats. Across the forested habitats, small openings exist including several from past timber management activities and other natural openings but are insufficient to be mapped separately. Approximately 940 acres of the project area (75%) currently possess greater than 40% overstory canopy cover in mature forest patches, including riparian habitats along the Bitterroot River and numerous side channels and other riparian features. These forested habitats along the riparian areas associated with the Bitterroot River likely provides some additional connectivity for a variety of species that need connected forested habitats. Thus, connectivity within the project area through these mature forested patches is reasonably intact; natural openness of certain habitats in the project area may slightly reduce connectivity for those species relying on the densest stands of mature timber.

Fire has historically played an important role in shaping vegetation community types in the Bitterroot area (Losensky 1997 -- Climatic Section M332B). Fire played a variable role in these communities, with frequent, non-lethal fires in the lower elevations (average fire frequencies between 5-20) to mixed severity in the mid-slopes dominated by Douglas-fir and western larch/Douglas-fir (average fire frequencies between 30-85 years on Douglas-fir and 70-200 years on western larch/Douglas-fir stands) to stand replacement fires in areas dominated by lodgepole pine, Engelmann spruce, and subalpine fir (average fire frequencies between 120-350 years). Historically, the project area likely saw frequent fires that reduced understory vegetation but were not lethal, stand replacing fires; as such, park-like stands of ponderosa pine were likely found in the project area.

Within the project area there are no open roads, but there are 2 neighboring owners with easements across portions of the project area. If these are considered open roads, the open road density would be 0.6 miles per square mile (simple linear calculation). Approximately 2.1 miles of low standard, restricted roads used for administrative uses are present in the project area, yielding a total road density of 1.7 miles per square mile. Collectively, the project area has relatively limited potential for human disturbance due to the lack of roads, somewhat limited access to the general public (limited walk-in hunting access, float-in access, and access from adjacent private ownerships), and considerable visual screening.

A portion of the 8,931 acres (19% of cumulative effects analysis area) of forested habitats currently possessing greater than 40% overstory canopy cover on other ownerships in the cumulative effects analysis area are likely providing habitat for those species requiring mature, forested habitats and/or forested connectivity. Conversely, much of the 38,206 acres (81% of cumulative effects analysis area) of shrubs, herbaceous areas, poorly stocked forested stands, open water, agricultural fields, and recently burned or harvested stands on other ownerships in the cumulative effects analysis area is likely too open to be useful for these species requiring forested habitats. Past timber management, recent wildfires, human developments, roads, and the natural openness of certain habitats in the cumulative effects analysis area has influenced landscape-level connectivity in the cumulative effects analysis area. Generally, the project area along with the privately owned section between the 2 DNRC-managed parcels comprise most of the forested habitats associated with the
Bitterroot River in the vicinity and is surrounded by naturally occurring, open habitats, human developments, or agricultural fields. Beyond these sections, the riparian habitats associated with the Bitterroot River are narrower and occur immediately adjacent to the river. Collectively, connectivity across the cumulative effects analysis area is moderately intact and likely provides a suitable network of cover capable of facilitating movements of many terrestrial species across the local landscape, but may be limited for species requiring larger home ranges, such as grizzly bears or fisher, given the nature of this reasonably isolated patch of forested habitats in a matrix of open habitats and developed lands.

Open road densities in the cumulative effects analysis area are rather high (243.6 miles, 3.3 miles per square mile, simple linear calculation), but in areas with considerable private ownership, verifying the status of existing roads can be problematic. Certainly, this estimate is high and if all these roads were restricted, which would be an understatement, then the total road density estimate would be 3.3 miles per square mile which could facilitate considerable non-motorized human access. Neither is terribly accurate, but both point to the potential for considerable human access and associated human disturbance to the cumulative effects analysis area.

**Environmental Effects - Mature Forested Habitats and Landscape Connectivity**

**No Action Alternative: Direct and Indirect Effects**

No timber management nor associated road construction or use would occur. Stands providing forested cover that may be functioning as corridors, including along riparian areas, would not be altered. No changes to the amount of the project area meeting the old stand definition would occur. No changes in human developments, motorized access, or visual screening would occur. No changes in wildlife use would be expected. Over time and in the absence of natural disturbance events, the abundance of dense mature forest could increase. No adverse direct or indirect effects to wildlife requiring mature forests or landscape connectivity would be anticipated under this alternative. Thus, no direct or indirect effects to mature forested habitats and landscape connectivity would be expected since: 1) no changes to existing forested stands with >40% canopy closure would occur; 2) no changes to riparian habitats would occur, 3) no changes to human developments, motorized access, or visual screening would occur, and 4) no changes in potential for human disturbance would be anticipated.

**No Action Alternative: Cumulative Effects**

No appreciable changes to existing stands would be anticipated. Stands providing forested cover that may be functioning as corridors, including along riparian areas, would not be altered. Past harvesting, recent wildfires, and any ongoing harvesting have reduced the amount of mature, forested habitats in a portion of the cumulative effects analysis area. Across the cumulative effects analysis area, continued successional advances would continue moving existing stands toward mature forests. Stands in the project area would continue to contribute to the amount of mature forested stands in the cumulative-effects analysis area. No appreciable changes in the existing open habitat types would be anticipated. No further changes in human developments, motorized access, or visual screening would occur. No further changes in wildlife use would be expected. Thus, no further cumulative effects to mature forested habitats and landscape connectivity would be expected since: 1) no changes to existing forested stands with >40% canopy closure would occur; 2) no changes to riparian habitats would occur, 3) no changes to human developments, motorized access, or visual screening would occur, and 4) no changes in potential for human disturbance would be anticipated.

**Action Alternative: Direct and Indirect Effects**

Approximately 260 acres (36%) of existing mature ponderosa pine stands with a closed canopy would be harvested. These stands would receive a treatment that would reduce overall density, but would retain
considerable numbers of ponderosa pine and all cottonwood and aspen along with the majority of existing snags and sub merchantable trees. Meanwhile, no alterations to the remaining 458 acres of mature ponderosa pine and cottonwood stands, as well as the other ponderosa pine, cottonwood, and aspen stands. Overall habitat quality for those species relying on mature, closed-canopied forested habitats would be reduced, but potential continued use would be possible. In general, habitats for those species adapted to more-open forest conditions similar to historic conditions would increase in parts of the project area, meanwhile habitats for wildlife species that prefer dense, mature forest conditions would be reduced in those same parts of the project area. Although proposed treatments on 346 acres (28% of the project area) would create more open stands, corridors would be retained, particularly along riparian areas and draws. Riparian habitats associated with the Bitterroot River and Sin-tin-tin-em-ska Creek would be retained with proposed 50 foot no harvest buffer along both water courses; from 50 feet to a minimum of 115 feet from the streams a minimum of 50% of the trees ≥8” dbh would be retained as well. Furthermore, beyond the 115-foot mark and out to the edge of the channel migration zone, a minimum of 50% of existing basal area would be retained (see Water Quality and Quantity section for more detailed information). This retention requirement would occur on roughly 117 acres (34%) of the proposed units. Generally, some reductions in canopy cover would be possible, but mitigations would retain many of the habitat attributes characteristics presently found in those areas, particularly those associated with the riparian features in the project area. No changes to the amount of the project area meeting the old growth stand definition would occur; proposed prescriptions would retain sufficient large live trees to meet the old growth definition in ARM 36.11.403 (see Vegetation section for more details). No changes in legal motorized public access would occur in the project area. Additionally, the only permanent human development constructed with the proposed work would be roughly 1.57 miles of new restricted roads; these new restricted roads could increase non-motorized human activity in the project area beyond the proposed timber management activities. Contract stipulations would minimize the presence of human-related attractants for the duration of the proposed activities. Some changes in visual screening would occur within individual units, but the combination of irregular-shaped units, riparian areas, un-harvested patches throughout the project area, and distance from open roads would minimize the effects of the reductions in visual screening. Short-term increases in disturbance potential associated with proposed timber management, road construction, and use would occur with proposed activities in the project area, but overall, a negligible increase in potential human disturbance would be anticipated following proposed treatments. Thus, a low risk of adverse direct and indirect effects to mature forested habitats and landscape connectivity would be expected since: 1) proposed activities would reduce canopy cover in a low to moderate amount of the project area, but corridors would be retained; 2) minor changes riparian forested stands associated with the Bitterroot River and associated creeks and wetlands would occur, 3) increased human developments in the form of restricted roads, could facilitate human activity, but no changes in human-related attractants would occur; 4) no changes to legal motorized public access would occur; 5) visual screening in portions of the project area could be reduced, but some visual screening would be retained across the project area; and 6) a short-duration increase in disturbance potential would occur, but overall a negligible long-term increase in overall potential for human disturbance would be anticipated.

**Action Alternative: Cumulative Effects**

Modifications to mature, forested habitats associated with this alternative would be additive to losses associated with past harvesting activities, ongoing harvesting, and recent wildfires in the cumulative effects analysis area. There would still be roughly 8,671 acres (18%) of moderately or highly stocked forested habitats in the cumulative effects analysis area that may be providing habitats for species requiring mature forested habitats and/or connected forests for movements through the landscape. Connectivity of forested habitats in
the cumulative effects analysis area would persist and generally the ability for species requiring forested corridors along riparian areas would persist. Minor increases in human developments would occur with the proposed construction of roughly 1.57 miles of restricted roads, which would result in a slight increase in potential for human disturbance. Within the cumulative effects analysis area, this increase would add to the total roads, but the total road density would still be 3.3 miles per square mile following proposed activities. Minor reductions in visual screening in a small portion of the cumulative effects analysis area would be anticipated. No changes in the presence of human-related attractants would occur. Short-term increases in disturbance potential would occur with proposed activities in a small portion of the cumulative effects analysis area, but overall, a negligible increase in potential human disturbance would be anticipated following proposed. Thus, a minor risk of adverse cumulative effects to mature forested habitats and landscape connectivity would be expected since: 1) proposed activities could reduce stand density in a small portion of the cumulative effects analysis area, but the amount of overall forested cover would not appreciably change and corridors would be maintained; 2) negligible changes in riparian habitats would be anticipated, 3) minor increases in human developments that might facilitate human activities would occur, but no changes in human-related attractants would occur; 4) no further changes to motorized public access would occur; 5) visual screening in a small portion of the cumulative effects analysis area would be reduced, but considerable visual screening would persist across the cumulative effects analysis area; and 6) a short-duration increase in disturbance levels would be anticipated, but negligible long-term increase in overall potential for human disturbance would be anticipated.

AVIAN DIVERSITY

Issue
Proposed activities could alter important habitats for avian species and/or negatively influence avian diversity.

Introduction
In the arid western United States, riparian habitats tend to support some of the highest avian diversity (Knopf et al 1988, O'Neil et al 2001). Riparian areas tend to have mesic vegetative communities and associated wildlife species that generally differ from those upland surrounding areas. These areas typically contain diverse and complex forest structural components that provide forage, cover, and nest sites for wildlife, while also potentially providing travel or migratory corridors for a variety of species.

Analysis Area
Direct and indirect effects were analyzed for activities conducted in the 1,251-acre project area. Cumulative effects were analyzed on a 47,137-acre area described above in the Analysis Areas portion of this analysis. This scale of analysis would be large enough to support a diversity of avian species.

Analysis Methods
Direct and indirect effects, as well as cumulative effects, were analyzed using a variety of information obtained from field evaluations, aerial photograph interpretation, USDA remotely sensed data, and a GIS analysis of available habitats. Factors considered within the cumulative effects analysis area included changes in upland and riparian habitats; loss of cottonwood habitats; level of habitat fragmentation; levels of human developments; and levels of motorized human access.
Affected Environment

The project area occurs in the lower elevations of the Bitterroot drainage and is dominated by moderately warm and dry forest types with some moderately cool and moist forest types. The project area currently contains approximately 1,061 acres of forested habitats including 735 acres of ponderosa pine in and saw timber categories of varying stocking densities and 326 acres of cottonwood and aspen in sawtimber and pole timber size classes also in varying stocking densities. Additionally, there are roughly 190 acres of non-forested types including shrublands/rangelands, grasslands, wetlands, and open water. Collectively the project area provides a varied suite of habitats that likely supports a diverse array of avian wildlife species. The project area is mostly within the Bitterroot River Important Bird Area as identified by the Audubon Society (National Audubon Society, 2018). Audubon noted that more than 240 species of birds have been recorded within this IBA, with at least 115 species breeding. Furthermore, the project area is in the Bitterroot-Clark Fork Riparian Corridor Focal Area as identified in Montana's State Wildlife Action Plan (MFWP 2015). This area was identified as an area with high biodiversity and is within an important north-south migration corridor for numerous avian species. The mature ponderosa pine, extensive deciduous bottomland forests, and variety of wetlands were key habitat attributes that led to the designation of this 372 square mile focal area that follows the Bitterroot River and a portion of the lower Clark Fork River.

A portion of the 8,931 acres (19% of cumulative effects analysis area) of forested habitats currently possessing greater than 40% overstory canopy cover on other ownerships in the cumulative effects analysis area are likely providing habitat for those avian species requiring forested habitats and/or forested connectivity. Conversely, much of the 38,206 acres (81% of cumulative effects analysis area) of shrubs, herbaceous areas, poorly stocked forested stands, open water, agricultural fields, and recently burned or harvested stands on other ownerships in the cumulative effects analysis area is likely providing habitats for those avian species that rely on more open or specialized habitats found in those areas. Habitats that have resulted from past harvesting or recent wildfires will continue developing towards mature forested habitats at the expense of burned habitats or more open, earlier successional stages of forest development. The presence of the Bitterroot River adds to the avian diversity in the area and had a considerable effect on the delineation of the focal area. As indicated in the mature forested habitats and landscape connectivity section, open roads and levels of motorized human access are difficult to quantify in lands dominated by private ownership, but the levels of existing roads in the cumulative effects analysis area indicate considerable potential for non-motorized access at a minimum and likely considerable motorized access as well. Within the cumulative effects analysis area, considerable human development has occurred in the past that has increased human access and disturbance vectors while fragmenting existing habitats and affecting avian diversity. Roughly 23,396 acres (50% of the cumulative effects analysis area) fall within the Bitterroot-Clark Fork Riparian Corridor Focal Area. In this focal area, FWP identified the main threats as: housing development, dewatering, cottonwood tree removal, pollution from urban runoff and superfund sites, habitat fragmentation, and impacts from illegal OHV use (MFWP 2015).

Environmental Effects- Avian Diversity

No Action Alternative: Direct and Indirect Effects

No timber management nor associated road construction or use would occur. No appreciable changes to existing forested, rangeland/shrubland, riparian, or cottonwood habitats would occur. No changes in human developments or motorized access would occur. No appreciable changes in wildlife use would be expected. Thus, no direct or indirect effects to avian diversity would be expected since: 1) no changes to existing forested, rangeland/shrubland, riparian or cottonwood habitats would occur; 2) no further fragmentation of habitats would occur; and 3) no changes to human developments or motorized access would occur.
No Action Alternative: Cumulative Effects

No timber management nor associated road construction or use would occur in the project area. No appreciable changes to existing forested, rangeland/shrubland, riparian, or cottonwood habitats would occur. No further changes in human developments or motorized access would occur. Any ongoing or future human developments in the vicinity would continue along with ongoing successional advances in those recently harvested or burned stands. No appreciable changes in wildlife use would be expected. Thus, no direct or indirect effects to avian diversity would be expected since: 1) no appreciable changes to existing forested, rangeland/shrubland, riparian or cottonwood habitats would occur; 2) no further fragmentation of habitats would occur; and 3) no changes to human developments or motorized access would occur.

Action Alternative: Direct and Indirect Effects

Approximately 346 acres (28%) of existing ponderosa pine stands would be treated. Within the proposed units, overall density would be reduced, but activities would retain considerable numbers of ponderosa pine trees and all cottonwood and aspen along with the majority of existing snags and sub merchantable trees. Meanwhile, no alterations to the remaining 396 acres of ponderosa pine stands, 326 acres of cottonwood and aspen stands as well 190 acres of shrubland/rangeland and grassland habitats would occur. Proposed treatments would move stands towards historic conditions under which the species has evolved. Species that prefer closed canopy ponderosa pine stands would see a decrease in habitat quality while others would see an increase in available habitats (such as those preferring more open stands of ponderosa pine, younger stands of in the seedling or sapling size classes, or potentially aspen and cottonwood stands). Proposed timber management could release existing aspen or cottonwood stands that may be repressed by the overstory ponderosa pine canopy. Thus, there may be small areas where increases in cottonwood or aspen could be possible. Short-term changes in canopy closure could alter the way the proposed units would be used by avian species in the project area, but no appreciable long-term fragmentation effects would be anticipated. No changes in legal motorized public access would occur in the project area. Additionally, the only permanent human development constructed would be roughly 1.57 miles of new restricted roads; this could lead to an increase in non-motorized human activity in the project area beyond the proposed timber management activities. Riparian habitats associated with the Bitterroot River and Sin-tin-tin-em-ska Creek would be retained with proposed 50 foot no harvest buffer along both water courses; from 50 feet to a minimum of 115 feet from the streams a minimum of 50% of the trees ≥8” dbh would be retained as well. Furthermore, beyond the 115-foot mark and out to the edge of the channel migration zone, a minimum of 50% of existing basal area would be retained (see Water Quality and Quantity section for more detailed information). This retention requirement would occur on roughly 117 acres (34%) of the proposed units. Generally, some reductions in canopy cover would be possible, but mitigations would retain many of the habitat characteristics presently found in those areas, particularly those associated with riparian habitats that are likely contributing to the existing diversity of avian species. Since the stands would continue to exhibit forested habitats with a more open canopy similar to other existing stands in the project area, no appreciable effect on habitat fragmentation would be anticipated. Short-term increases in disturbance potential associated with proposed timber management, road construction, and use would occur with proposed activities in the project area, but overall, a negligible increase in potential human disturbance would be anticipated following proposed treatments. Thus, a minor risk of adverse direct and indirect effects to avian diversity would be expected since: 1) some reductions in canopy closure in ponderosa pine stands would occur, but mitigations would retain a fairly sizable number of trees in the areas closer to the waterbodies; 2) no appreciable changes to existing cottonwood or aspen stands would occur and proposed harvesting of ponderosa pine may increase
patch sizes of cottonwood and/or aspen where they may be suppressed by the pine overstory; 3) no further habitat fragmentation effects would be anticipated; 4) no permanent developments outside of 1.57 miles of low standard forest road would be constructed that would reduce habitat quality for avian species; and 5) no changes to motorized access would occur.

**Action Alternative: Cumulative Effects**

Modifications to existing forested stands of ponderosa pine in a small portion of the cumulative effects analysis area could alter overall habitat availability and would be additive to past losses associated with timber management and recent wildfires in the cumulative effects analysis area. Considerable upland and riparian forested habitats would persist in the cumulative effects analysis area; a slight increase in habitats for those species preferring more open stands of ponderosa pine or stands with greater availability of seedling or sapling size classes would occur in a small portion of the cumulative effects analysis area. Additionally, a slight increase in aspen or cottonwood stands could be possible where proposed activities might release existing aspen or cottonwood stands that may be repressed by the overstory ponderosa pine canopy. Thus, there may be small areas where increases in cottonwood or aspen could be possible. Short-term changes in canopy closure could alter the way avian species use small portions of the cumulative effects analysis area, no appreciable long-term fragmentation effects would be anticipated. No further changes in legal motorized public access would occur. Additionally, the only permanent human development constructed would be roughly 1.57 miles of new restricted roads; this could lead to an increase in non-motorized human activity in the project area beyond the proposed timber management activities. Mitigations within proposed units would be expected to retain many of the habitat characteristics presently found in those areas particularly in the riparian habitats that are likely contributing to the existing diversity of avian species. No appreciable effects to habitat fragmentation would be anticipated since stands would continue to exhibit forested conditions and would be similar to other existing stands in the vicinity. Short-term increases in disturbance potential associated with proposed timber management, road construction, and use would occur within a small portion of the cumulative effects analysis area, but overall, a negligible increase in potential human disturbance would be anticipated during or following proposed treatments. Thus, a minor risk of adverse cumulative effects to avian diversity would be expected since: 1) some reductions in canopy closure in ponderosa pine stands would occur in a small portion of the cumulative effects analysis area, but those areas would have mitigations that would retain a fairly sizable number of trees in the areas closer to the waterbodies; 2) negligible increases in cottonwood and aspen stands could be possible in a small portion of the cumulative effects analysis area; 3) no further habitat fragmentation effects would be anticipated; 4) no permanent developments outside of 1.57 miles of low standard forest road would be constructed that would reduce habitat quality for avian species; and 5) no changes to motorized access would occur.

**Fine Filter Wildlife Analysis**

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, species of concern identified through public scoping, and species managed as big game by DFWP. In western Montana, 3 terrestrial species that could be affected by forest management activities are federally classified as threatened: Canada lynx, grizzly bear, and yellow-billed cuckoo. Additionally, DNRC considers numerous sensitive species that may have specific habitat requirements and/or could potentially be affected by timber management activities (see Table below).
The potential for direct, indirect, and cumulative effects was considered for the endangered, threatened, and sensitive species included in the table below. The assessment rationale for each species is presented in each corresponding rationale cell in the table. For bald eagles, flammulated owls, pileated woodpeckers, big game security, and big game thermal cover, potential for adverse effects was present, therefore, more detailed analyses for each of these species are included below.

### Table WI-1 – Anticipated Effects of the Flatlander Project on wildlife species

<table>
<thead>
<tr>
<th>Species/Habitat</th>
<th>Potential for Impacts and Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[Y/N] Potential Impacts and Mitigation Measures</td>
</tr>
<tr>
<td></td>
<td>N = Not Present or No Impact is Likely to Occur</td>
</tr>
<tr>
<td></td>
<td>Y = Impacts May Occur (Explain Below)</td>
</tr>
<tr>
<td></td>
<td>L = Low Potential for Effects</td>
</tr>
<tr>
<td><strong>Threatened and Endangered Species</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Grizzly bear</strong></td>
<td></td>
</tr>
<tr>
<td>(Ursus arctos)</td>
<td>[N ] The project area is 20 miles south of the Northern Continental Divide Ecosystem grizzly bear recovery area and is 33 miles southwest of ‘occupied’ grizzly bear habitat as mapped by grizzly bear researchers and managers to address increased sightings and encounters of grizzly bears in habitats outside of recovery zones (Wittinger et al. 2002). The project area is also 7 miles east of the unoccupied Bitterroot Ecosystem grizzly bear recovery area. Grizzly bears are infrequent visitors to the Bitterroot drainage but have been documented in the vicinity in the past. Individual animals could occasionally use the project area while dispersing or possibly foraging. The vicinity of the project area could serve as part of a corridor that could facilitate the movement of grizzly bears from the NCDE to the unoccupied Bitterroot recovery zone. Extensive use of the project area and vicinity would not be anticipated given the extensive human disturbance in the area, lack of larger areas of suitable cover, lack of potential denning habitats, and limited foraging areas. Grizzly bears could be displaced by project-related disturbance if they are in the area during proposed activities. However, given their large home range sizes, and manner in which they use a broad range of forested and non-forested habitats, the proposed activities and alterations of forest vegetation on the project area would have negligible influence on grizzly bears.</td>
</tr>
<tr>
<td><strong>Canada lynx</strong></td>
<td></td>
</tr>
<tr>
<td>(Felix lynx)</td>
<td>[N ] The project area occurs outside of the elevations and habitat types where lynx are commonly found in Montana. No lynx habitats were identified in the project area and lynx are not expected to use the project area. Thus, no direct, indirect, or cumulative effects to Canada lynx would be expected under either alternative.</td>
</tr>
<tr>
<td><strong>Yellow-Billed Cuckoo</strong></td>
<td></td>
</tr>
<tr>
<td>(Coccyzus americanus)</td>
<td>[N ] Western Montana is on the northern edge of the yellow-billed cuckoo range and no direct records of breeding exist in Montana. Yellow-billed cuckoos have only been detected in western Montana twice in the last 20 years (all in June) and appear transitory in nature. While some suitable deciduous riparian habitats exist in the project area, no changes to the deciduous component would occur under either alternative. Seasonal restrictions under the action alternative on much of the project area would prohibit activities during June and early July when yellow-billed cuckoos might pass through, thus negligible</td>
</tr>
</tbody>
</table>
potential disturbance to cuckoos would be possible. Thus, negligible direct, indirect, or cumulative effects to yellow-billed cuckoos would be expected to occur as a result of either alternative.

<table>
<thead>
<tr>
<th>Sensitive Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bald eagle</strong></td>
</tr>
<tr>
<td><em>Haliaeetus leucocephalus</em></td>
</tr>
<tr>
<td>Habitat: Late-successional forest less than 1 mile from open water</td>
</tr>
<tr>
<td>[ Y ] Detailed analysis provided below.</td>
</tr>
<tr>
<td><strong>Black-backed woodpecker</strong></td>
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<tr>
<td><em>Picoides arcticus</em></td>
</tr>
<tr>
<td>Habitat: Mature to old burned or beetle-infested forest</td>
</tr>
<tr>
<td>[ N ] No preferred, recently (less than 5 years) burned areas are in the project area. Thus, no direct, indirect, or cumulative effects to black-backed woodpeckers would be expected to occur as a result of either alternative.</td>
</tr>
<tr>
<td><strong>Fisher</strong></td>
</tr>
<tr>
<td><em>Pekania pennanti</em></td>
</tr>
<tr>
<td>Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian</td>
</tr>
<tr>
<td>[ N ] No suitable fisher cover types exist in the project area. Thus, no direct, indirect, or cumulative effects to fisher would be expected to occur as a result of either alternative.</td>
</tr>
<tr>
<td><strong>Flammulated owl</strong></td>
</tr>
<tr>
<td><em>Otus flammeolus</em></td>
</tr>
<tr>
<td>Habitat: Late-successional ponderosa pine and Douglas-fir forest</td>
</tr>
<tr>
<td>[ Y ] Detailed analysis provided below.</td>
</tr>
<tr>
<td><strong>Fringed myotis</strong></td>
</tr>
<tr>
<td><em>Myotis thysanodes</em></td>
</tr>
<tr>
<td>Habitat: low elevation ponderosa pine, Douglas-fir and riparian forest with diverse roost sites including outcrops, caves, mines.</td>
</tr>
<tr>
<td>[ N ] Fringed Myotis are year-round residents of Montana that use a variety of habitats, including deserts, shrublands, sagebrush-grasslands, and forested habitats. They overwinter in caves, mines, crevices, or human structures. Fringed myotis forage near the ground or near vegetation. No known caves, mines, crevices, or other structures used for roosting occur in the project area or immediate vicinity. Fringed myotis have not been documented in the vicinity of the project area. Proposed activities could disturb fringed myotis should they be in the area. Changes in vegetation structural attributes could change overall prey availability, but considerable foraging habitats would persist in the project and cumulative effects analysis areas. Overall, no appreciable changes to fringed myotis use of the project area or cumulative effects analysis areas would be anticipated.</td>
</tr>
</tbody>
</table>
### Hoary bat
(Lasiurus cinereus)

**Habitat:** Low elevation ponderosa pine, Douglas-fir, and riparian forest with diverse roost sites including outcrops, caves, mines

Hoary bats are summer residents (June-September) across a variety of forested habitats in Montana. Hoary bats frequently forage over water sources near forested habitats. Hoary bats are generally thought to roost alone in, primarily in trees, but will use also use caves, other nests, and human structures. Hoary bats have been documented in the vicinity of the project area. Some use by Hoary bats use could be possible given the varied habitats in the project area and the proximity to the Bitterroot River and numerous other smaller wetlands. Individual trees and snags in the existing forested habitats could be used for roosting. No known caves or other structures used for roosting occur in the project area or immediate vicinity. Proposed activities associated with the action alternative could disturb hoary bats should they be in the area. Seasonal restrictions associated with that alternative on much of the project area would prohibit activities during June and early July would limit potential disturbance to hoary bats during a portion of their seasonal stay. Some loss of potential roosting habitats could occur with the proposed harvesting of some ponderosa pine under the action alternative, but considerable amounts of ponderosa pine and all existing hardwoods and the majority of snags would persist in the project following proposed activities. Similarly, within the cumulative effects analysis areas considerable potential roost habitats would persist under both alternatives. No changes in foraging habitats would be anticipated under either alternative. Overall, negligible changes to Hoary bat use of the project area or cumulative effects analysis areas would be anticipated.

### Peregrine falcon
(Falco peregrinus)

**Habitat:** Cliff features near open foraging areas and/or wetlands

No preferred cliffs or suitable rock outcrops suitable for use by peregrine falcons occur on, or within 1 mile of the proposed project area. Thus, no direct, indirect, or cumulative effects to peregrine falcons would be anticipated as a result of either alternative.

### Pileated woodpecker
(Dryocopus pileatus)

**Habitat:** Late-successional ponderosa pine and larch-fir forest

Detailed analysis provided below.

### Townsend’s big-eared bat
(Plecotus townsendii)

**Habitat:** Caves, caverns, old mines

No suitable caves or mine tunnels are known to occur in the project area or vicinity. Townsend’s big-eared bats have not been documented in the vicinity of the project area. Thus, no direct, indirect, or cumulative effects to Townsend's big-eared bats would be anticipated as a result of either alternative.

### Wolverine
(Gulo gulo)

**Habitat:** Alpine tundra and high-elevation boreal and coniferous forests that maintain deep persistent snow into late spring

Generally wolverines are found in sparsely inhabited remote areas near tree line characterized by cool to cold temperatures year-round and rather deep and persistent snow well into the spring (Copeland et al. 2010). The availability and distribution of food is likely the primary factor in the large home range sizes of wolverines (Banci 1994). The project area is generally below the elevations where wolverines tend to be located. No areas of deep persistent spring snow occur in the project area. Individual animals could occasionally use lands in the project area while dispersing or possibly foraging, and they could be displaced by...
Flatlander

Montana Department of Natural Resources and Conservation

project-related disturbance if they are in the area during proposed activities. However, given their large home range sizes (~150 sq. mi. -- Hornocker and Hash 1981), and manner in which they use a broad range of forested and non-forested habitats, the proposed activities and alterations of forest vegetation on the project area would have negligible influence on wolverines. Thus, minimal direct, indirect or cumulative effects to wolverines would be anticipated.

<table>
<thead>
<tr>
<th>Big Game Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elk</td>
</tr>
<tr>
<td>[ Y ] Big game winter range exists in the project area. Potential big game security habitat exists in the project area - Detailed analyses provided below.</td>
</tr>
<tr>
<td>Moose</td>
</tr>
<tr>
<td>Mule Deer</td>
</tr>
<tr>
<td>White-tailed Deer</td>
</tr>
</tbody>
</table>

Sensitive Species

BALD EAGLES

Issue

Proposed activities could negatively affect bald eagles by reducing nesting and perching structures and/or disturbing nesting bald eagles.

Introduction

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

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the project area within 2.5 miles of the nests associated with the Lolo Creek Mouth, Carlton-MPG, and Schroeder bald eagle territories. Cumulative effects were analyzed on the combined home ranges of these bald eagle territories. This cumulative effects analysis area includes the likely nesting home range area used by the pairs of eagles, considering the size of such areas typically used by eagles breeding in western Montana.

Analysis Methods

Direct and indirect effects, as well as cumulative effects, were analyzed using a variety of information obtained from field evaluations, aerial photograph interpretation, USDA remotely sensed data, and a GIS analysis of available habitats. Factors considered in this analysis include human disturbance levels, levels of human access, and availability of snags and large, emergent trees with stout horizontal limbs for nests and perches.
**Existing Environment**

The project area is completely within the home ranges associated with the Lolo Creek Mouth, Carlton-MPG, and Schroeder bald eagle territories along the Bitterroot River. While the nest sites associated with these territories have moved some through time, these territories have generally been in the vicinity for numerous years. The aquatic habitats associated with these territories include Bitterroot River and numerous smaller streams, ponds, wetlands, and sloughs. Aquatic and terrestrial prey species are fairly common in the home range. The terrestrial habitats incorporated by these territories is a coniferous/deciduous mixture along the riparian areas, with coniferous forests, rangelands/shrublands, and grasslands in the upland areas. Within the home ranges, black cottonwood is the deciduous tree of primary importance to bald eagles, while large emergent conifers also provide important nesting, roosting, and perching habitats. Human disturbance, including timber harvesting, agricultural activities, Highway 93, numerous residential homes and other developments, and recreational activities along the river are potential sources of disturbance to the nesting territories. Numerous large emergent trees are available across portions of the home ranges, but logging and other human developments in the last 100 years has likely reduced some of these attributes while others have experienced mortality and are declining in quality.

**Environmental Effects-Bald Eagles**

**No Action Alternative: Direct and Indirect Effects**

No direct or indirect effects to bald eagles would be anticipated since: 1) no changes to human disturbance levels would occur; 2) no changes in human access would occur; and 3) no changes in the availability of large, emergent trees suitable for perching or nesting would be expected.

**No Action Alternative: Cumulative Effects**

No cumulative effects to bald eagles would be anticipated since: 1) no changes to human disturbance levels would occur; 2) no changes in human access would occur; and 3) no changes in the availability of large, emergent trees would be expected.

**Action Alternative: Direct and Indirect Effects**

No timber management activities would occur in the nest area or primary use area associated with the bald eagle territories. A portion of the haul route for unit 7 in section 24 (63% of proposed units) goes through the primary use area associated with the Schroeder bald eagle territory. No use of this road for commercial forest management would occur during the nesting season (February 1- August 15) while the territory is active. Proposed activities on 346 acres (100% of proposed units) would occur in the home range areas associated with the bald eagle territories. Proposed activities could occur when soils are dry, frozen, or snow covered. Thus, the proposed activities outside of the nest and primary use areas could occur during the bald eagle nesting season (February 1- August 15), or the non-nesting (August 16-February 1) season. Minor disturbance to bald eagles could occur for any activities that could be conducted during the nesting period in the home ranges. Given the proximity to Highway 93, Bitterroot River, numerous residences and other human developments, and a variety of other human disturbance vectors, any potential disturbance from proposed activities would be expected to have negligible effects to the nesting pairs should they occur during the nesting season. Conversely, no disturbance to bald eagles would be anticipated should those activities be conducted during the non-nesting period. Minor reductions in the availability of large snags or emergent trees that could be used as nest or perch trees could occur in the home ranges. No changes in human access to the home ranges would occur, thereby limiting potential for introducing additional human disturbance to the territories. Thus, a minor risk of direct and indirect effects to bald eagles would be anticipated since: 1) disturbance could
be slightly elevated within the home ranges during operations, should they occur during the nesting period; 2) no appreciable change in human access within the project area would occur; and 3) minor reductions in the availability of large, emergent trees could occur in the home ranges.

**Action Alternative: Cumulative Effects**

Nesting bald eagles in these territories would continue to experience varying levels of disturbance. Any potential disturbance and/or noise from the proposed activities would be negligible, and no changes in bald eagle behavior would be anticipated. Negligible reductions in emergent trees or snags could occur on a small portion of each of the home ranges, which would be additive to past and ongoing activities within the home ranges. Thus, a minor risk of cumulative effects to bald eagles would be anticipated since: 1) disturbance would be slightly elevated within the territories during proposed activities; 2) no changes in human access within the territories would occur; and 3) negligible changes in the availability of large, emergent trees would be expected.

**FLAMMULATED OWLS**

**Issue**

Proposed activities may alter flammulated owl habitat by reducing canopy closure and increasing tree spacing while potentially removing snags needed by flammulated owls for nesting.

**Introduction**

Flammulated owls are tiny, migratory, insectivorous forest owls that inhabit old, open stands of warm-dry ponderosa pine and cool-dry Douglas-fir forests in the western United States. In Montana, flammulated owls appear to initiate nesting later than most of the other owl species; they generally initiate nesting in May, and nestlings usually fledge during August. In general, preferred habitats have open to moderate canopy closure (30-50 percent) with at least 2 canopy layers and are often near small clearings. They are secondary cavity nesters and usually nest in cavities excavated by pileated woodpeckers or northern flickers in 12-25" dbh ponderosa pine, Douglas-fir, or aspen. Without disturbance, Douglas-fir encroach upon ponderosa pine stands resulting in increased stand density and decreased habitat quality for flammulated owls. Periodic, low intensity under burns can increase habitat suitability and sustainability by reducing the density of understory seedlings and saplings, stimulating shrub growth, and by protecting large dominant trees from ladder fuels and competition with other mature trees.

**Analysis Area**

Direct and indirect effects were analyzed for activities conducted in the 1,251-acre project area. Cumulative effects were analyzed on the 9,563-acre cumulative effects analysis area described above in the Analysis Areas portion. This area includes enough area to support several pairs of flammulated owls (McCallum 1994).

**Analysis Methods**

To assess potential flammulated owl habitat on the project area, SLI data were used to identify stands in preferred habitat types (ARM 36.11.403(31)). Direct and indirect effects, as well as cumulative effects, were analyzed using a variety of information obtained from field evaluations, aerial photograph interpretation, USDA remotely sensed data, and a GIS analysis of available habitats. Factors considered within the cumulative effects analysis area included the degree of harvesting and the amount of continuous forest within the cumulative effects analysis area.
Existing Environment

Flammulated owls have been documented in the vicinity. There are approximately 647 acres (52% of the project area) of potential flammulated owl habitats in ponderosa pine stands across the project area, however these areas are intermixed with cottonwood and aspen stands that are generally moister than stands where flammulated owls are found; flammulated owls are generally not found in humid or mesic pine forests such as those along the river (McCallum 1994). Some suitable habitats may exist on a portion of the 605 acres (7% of non-DNRC-managed lands) of open and closed forested habitats on other ownerships in the cumulative effects analysis area, but many of these stands area also close to the river and may be too humid and moist for extensive flammulated owl use. The majority of the cumulative effects analysis area (7,297 acres, 88%) is in open habitats including rangeland/shrubland, agricultural fields, water, developed areas, and other non-forested habitat types that are not suitable nesting or high-quality foraging habitats. Similarly, the 594 acres of deciduous forests in the area are not suitable for flammulated owls. A portion of the forested habitats in the cumulative effects analysis area has been harvested in the relatively recent past, potentially improving flammulated owl habitat by creating foraging areas and reversing a portion of the Douglas-fir encroachment and opening up stands of ponderosa pine; however, retention of large ponderosa pine was not necessarily a consideration in some of these harvest units, thereby minimizing the benefits to flammulated owls. Generally, modern fire suppression has allowed Douglas-fir in-growth to create denser stands of ponderosa pine and Douglas-fir in portions of the cumulative effects analysis area, which has reduced habitat quality for flammulated owls through time.

Environmental Effects-Flammulated Owl

No Action Alternative: Direct and Indirect Effects

Existing flammulated owl habitats in the project area would persist. Thus, a negligible risk of adverse direct and indirect effects to flammulated owls would be anticipated since: 1) no disturbance to flammulated owls would be anticipated; and 2) no changes to potential nesting habitats would be anticipated.

No Action Alternative: Cumulative Effects

Existing flammulated owl habitats would persist. Any ongoing and/or proposed harvesting in the cumulative effects analysis area could continue altering flammulated owl habitats and/or introducing potential disturbance to flammulated owls. Thus, a negligible risk of adverse cumulative effects to flammulated owls would be anticipated since: 1) no further disturbance to flammulated owls would be anticipated; and 2) no further changes to potential nesting habitats would be anticipated.

Action Alternative: Direct and Indirect Effects

Flammulated owls can be tolerant of human disturbance (McCallum 1994), however the elevated disturbance levels associated with proposed activities could negatively affect flammulated owls should activities occur when flammulated owls are present. Proposed activities would likely overlap the nesting and fledging periods. Proposed seasonal restrictions for section 24 (217 acres, 63% of proposed units) would limit potential disturbance during the nesting season in that portion of the project area. Proposed treatments could reduce the number of large trees and limited snags in the project area that may be suitable for nesting, but numerous snags would be retained, thus a reduction in potential nesting substrates could occur. Proposed activities on 329 acres of potential flammulated owl habitats (51% of the habitats in the project area) would open the canopy while favoring ponderosa pine. Elements of the forest structure important for nesting flammulated owls, including snags, coarse woody debris, numerous leave trees, and snag recruits would be retained in the proposed units. The more open stand conditions, the retention of fire adapted tree species, and the
maintenance of snags would move the project area toward historical conditions over the long-term, which is preferred flammulated owl habitat. Thus, a minor risk of adverse direct and indirect effects would be expected to flammulated owls since: 1) the potential exists to disturb flammulated owls; 2) harvesting would open denser stands up while retaining elements of forest structure used for foraging and nesting by flammulated owl, improving overall flammulated owl habitat conditions in the project area.

**Action Alternative: Cumulative Effects**

Disturbance in flammulated owl habitats would be possible on a small portion of the cumulative effects analysis area. Proposed activities associated with this alternative would increase the amount of the cumulative effects analysis area that has been recently harvested, which would add to the amount of foraging habitats available, but possibly at the expense of losing a minor amount of snags and large trees important for nesting. Overall, no change in the amount of potential flammulated owl habitats would exist on DNRC-managed lands or any other ownerships; a slight improvement in habitat quality at the cumulative-effects analysis level could be realized with this alternative and the more historic conditions likely after proposed activities. Thus, a negligible risk of adverse cumulative effects to flammulated owls would be expected since: 1) harvesting could disturb flammulated owls in a small portion of the cumulative effects analysis area should activities occur during the period when flammulated owls are in the vicinity; and 2) harvesting would improve the quality and sustainability of flammulated owl habitat on a portion of the cumulative effects analysis area by making this area more representative of historic conditions.

**PILEATED WOODPECKERS**

**Issue**

Proposed activities could reduce suitable nesting and foraging habitat for pileated woodpeckers, which could alter pileated woodpecker use of the area.

**Introduction**

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

**Analysis Area**

Direct and indirect effects were analyzed for activities conducted in the project area (1,251 acres). Cumulative effects were analyzed on the 9,563-acre cumulative effects analysis area described above in the Analysis Areas portion of this analysis. This scale includes enough area to support several pairs of pileated woodpeckers (Bull and Jackson 1995).
Analysis Methods

To assess potential pileated woodpecker nesting habitats on DNRC-managed lands in the cumulative effects analysis area, SLI data were used to identify sawtimber stands with more than 100 square feet of basal area per acre, were older than 100 years old, had greater than 40-percent canopy closure, and were occurring below 5,000 feet in elevation. Foraging habitats were defined as areas that did not meet the definition above but included the remaining sawtimber stands below 5,000 feet in elevation with greater than 40-percent canopy cover. To assess habitat on other ownerships in the cumulative effects analysis area, aerial photographs and USDA remotely sensed data were interpreted to assess forest stands. Where stands appeared to meet the minimum potential foraging habitat parameters, pileated woodpecker habitat was considered present. Potential foraging and nesting habitat were not differentiated on other ownerships for this analysis due to data limitations. Direct and indirect effects, as well as cumulative effects, were analyzed using a variety of information obtained from field evaluations, aerial photograph interpretation, USDA remotely sensed data, and these mapped potential habitats. Factors considered included the amount of potential habitat, degree of harvesting, and the amount of continuous forested habitat.

Existing Environment

In the project area, potential pileated woodpecker nesting habitat exists on approximately 718 acres (57% of the project area). These habitats are dominated by ponderosa pine and cottonwood. Additionally, 222 acres (18% of the project area) of sawtimber stands, dominated by ponderosa pine and cottonwood exist in the project area, which may be potential foraging habitats. In the cumulative effects analysis area, some suitable habitats likely exist on a portion of the 938 acres of reasonably closed forested habitats on other ownerships in the cumulative effects analysis area (11% of non-DNRC lands). The majority of the cumulative effects analysis area (7,297 acres, 88%) is in open habitats including rangeland/shrubland, agricultural fields, water, developed areas, and other non-forested habitat types that are not suitable pileated woodpecker habitats.

Environmental Effects-Pileated Woodpecker

No Action Alternative: Direct and Indirect Effects

A negligible risk of adverse direct and indirect effects to pileated woodpeckers would be expected since: 1) no harvesting would occur; 2) no changes in the amount of continuously forested habitats would be anticipated; 3) no appreciable changes to existing pileated woodpecker habitats would be anticipated; and 4) long-term, succession-related declines in the abundance of shade-intolerant tree species, which are valuable to pileated woodpeckers, would be anticipated.

No Action Alternative: Cumulative Effects

No further disturbance of pileated woodpeckers would occur. Continued use of the cumulative-effects analysis area by pileated woodpeckers would be expected at similar levels as presently occurring. Thus, a negligible risk of adverse cumulative effects to pileated woodpeckers would be expected since: 1) no further changes to existing habitats would occur; 2) no further changes to the amount of continuously forested habitats available for pileated woodpeckers would be anticipated; and 3) long-term, succession-related changes in the abundance of shade-intolerant tree species, which are valuable to pileated woodpeckers, would occur.

Action Alternative: Direct and Indirect Effects

Pileated woodpeckers can be tolerant of human activities (Bull and Jackson 1995) but might be temporarily displaced by any proposed activities that could occur during the nesting period. Proposed activities would likely overlap the nesting and fledging periods. Proposed seasonal restrictions for section 24 (217 acres, 63% of
proposed units) would limit potential disturbance during the nesting season in that portion of the project area. Proposed timber management would reduce forested habitats for pileated woodpeckers in the project area. Roughly 245 acres (34%) of the potential nesting habitat along with 85 acres (38%) of potential foraging habitats would be opened up with proposed treatments. Some of these acres could be dense enough to receive some use by foraging pileated woodpeckers following proposed treatments, but most of these stands would be temporarily unsuitable for pileated woodpeckers due to the openess of the stands following proposed treatments. Quality of these potential pileated woodpecker habitats would be reduced for 20-40 years, depending on the density of trees retained. Elements of the forest structure important for nesting pileated woodpeckers, including snags, coarse woody debris (5-10 tons per acre), numerous leave trees, and snag recruits would be retained in the proposed units. Larger live trees would be preferred for retention, but some would be removed. Since pileated woodpecker density is positively correlated with the amount of dead and/or dying wood in a stand (McClelland 1979), pileated woodpecker densities in the project area would be expected to be reduced on 346 acres. The silvicultural prescriptions would retain healthy ponderosa pine while promoting the growth and/or regeneration of many of these same species, which would benefit pileated woodpeckers in the future by providing nesting, roosting, and foraging habitats. Thus, a minor risk of adverse direct and indirect effects to pileated woodpeckers would be anticipated since: 1) proposed activities would reduce the amount of continuous-forested habitats available; 2) potential nesting habitats and foraging habitats would be removed; 3) a few snags and some snag recruits may be removed; however, mitigation measures to retain snags and snag recruits would be included, and 4) proposed treatments would promote seral species in the project area.

**Action Alternative: Cumulative Effects**

Reductions in pileated woodpecker habitat quality and the amount of continuously forested habitats available for pileated woodpeckers would occur in the project area. Snags (a minimum of 2 snags greater than 21 inches dbh per acre), coarse woody debris (5-10 tons per acre), numerous leave trees, and snag recruits (a minimum of 2 trees per acre greater than 21 inches dbh) would be retained in the proposed areas to provide foraging and nesting structure when the canopy closure recovers to the point of encouraging pileated woodpecker use; however, future recruitment of these attributes may be reduced in a portion of the area by the proposed activities. Modifications to pileated woodpecker habitats under this alternative would be additive to habitat losses associated with past harvesting and human development; continued use of the cumulative effects analysis area would be anticipated, but likely at a slightly reduced level. Continued maturation of stands across the cumulative-effects analysis area would provide future pileated woodpecker habitats. Thus, a minor risk of adverse cumulative effects to pileated woodpeckers would be anticipated since: 1) proposed activities would further alter the amount of continuously forested habitats available in the cumulative-effects analysis area; 2) potential nesting and foraging habitats would be modified, but some habitats would persist in the cumulative-effects analysis area; 3) snags and snag recruits in the cumulative effects analysis area could be reduced and coarse woody debris levels would increase, but much of this increase would be in the smaller size classes, which are of lower quality to pileated woodpeckers; however, mitigation measures to retain snags and snag recruits would be included; and 4) proposed treatments would promote seral species in a portion of the cumulative effects analysis area.

**BIG GAME**

**BIG GAME WINTER RANGE**
**Issue**

Proposed activities could remove forest cover on big game winter range, which could reduce the carrying capacity of the winter range.

**Introduction**

Winter ranges enable big game survival by minimizing the effects of severe winter weather conditions. Areas where these species winter are typically found at low to mid elevations (~3,000 to 6,500 ft.) and possess moderate to steep slopes – particularly associated with southerly or westerly exposures. Winter ranges tend to be relatively small areas that support large numbers of big game, which are widely distributed during the remainder of the year. These winter ranges are relatively disturbance-free and have adequate midstory and overstory to reduce wind velocity and intercept snow. Densely stocked thickets of conifer regeneration and densely forested mature stands provide thermal protection and hiding cover, which can reduce energy expenditures and stress associated with cold temperatures, wind, and human-caused disturbance. Areas with mature forest cover are also important for snow interception, which makes travel and foraging less stressful for big game during periods when snow is deep. Snow depths differentially affect big game; white-tailed deer are most affected, followed by mule deer, elk, and then moose. Thus, removing cover that is important for wintering big game through forest management activities can increase their energy expenditures and stress in winter, but may increase forage production for use on summer range. Reductions in cover could ultimately result in a reduction in winter range carrying capacity and subsequent increases in winter mortality within local big game herds.

**Analysis Area**

Direct and indirect effects were analyzed for activities conducted in the 1,251-acre project area. Cumulative effects were analyzed on the combined winter ranges in the 47,137-acre cumulative effects analysis area described above in the Analysis Areas portion of this analysis. This scale includes enough area to support a couple of elk herds.

**Analysis Methods**

Direct and indirect, as well as cumulative effects, were analyzed using the DFWP winter range maps, field evaluations, aerial photograph interpretation, and a review of habitat components. Factors considered in the analysis include the amount of cover removal on the winter range, amount of mature forested habitat on the winter range, and levels of human disturbance.

**Existing Environment**

Montana Department of Fish, Wildlife, and Parks identified white-tailed deer (1,251 acres) winter range in the project area; while elk winter range was not noted in the project area, the area supports a resident, non-migratory elk herd that uses the area year-long thus the project area will be considered to contain elk winter range as well. These winter ranges in the project area are part of larger winter ranges in the area. In the project area, mature ponderosa pine stands are providing attributes facilitating use by wintering big game. Approximately 940 acres of the project area (75%) appear to be providing snow intercept and thermal cover attributes for big game. Evidence of winter and non-winter use by deer and elk was noted during field visits.

Within the cumulative-effects analysis area, big game species are fairly common and winter range for deer, elk, and moose are fairly widespread. Roughly 39,859 acres (85%) of white-tailed deer winter range, 16,712 acres (35%) of mule deer winter range, 26,689 acres (57%) of elk winter range, and 1,377 acres (3%) of moose winter range exists in the cumulative effects analysis area. Within the cumulative effects analysis area,
approximately 8,931 acres (19%) appears to have sufficient canopy closure to provide thermal cover and snow intercept for big game. In the recent past, timber harvesting and recent wildfires has reduced thermal cover and snow intercept; ongoing timber management across the winter range could continue altering these attributes while potentially disturbing wintering big game. Sizable portions of the cumulative effects analysis area are in non-forested, herbaceous, or shrublands/rangelands, which would not be expected to provide thermal cover or snow intercept in the future. Human disturbance within the winter range is relatively high and is associated with residential development, recreational use, agricultural operations, and numerous roads, including Highway 93.

**Environmental Effects-Big Game Winter Range**

**No Action Alternative: Direct and Indirect Effects**

No direct or indirect effects to big game winter range and thermal cover would be anticipated since: 1) no further changes in the amount of mature-forested habitats in the winter range would be anticipated; 2) no further changes in thermal cover and snow intercept would be anticipated; and 3) human disturbance levels would not change.

**No Action Alternative: Cumulative Effects**

Continued winter use of the larger winter ranges would be expected. No further changes in thermal cover and snow intercept would be anticipated. Human disturbance levels would be anticipated to continue at current levels. No appreciable changes to big game distribution or habitat use would be anticipated. Thus, no cumulative effects to big game winter range or thermal cover would be expected since: 1) no further changes in the amount of mature-forested habitats in the winter range would be anticipated; 2) no further changes in thermal cover and snow intercept would occur; and 3) human disturbance levels would not change.

**Action Alternative: Direct and Indirect Effects**

Proposed activities could occur in the winter, and disturbance created by mechanized logging equipment and trucks could temporarily displace big game animals during periods of operation for up to 4 years; no disturbance or displacement of big game would be anticipated with activities conducted during the non-winter period. No public motorized access would be allowed in the project area while proposed activities would be underway, thus no added risk of displacement would be present. Minor positive, short-term benefits would be anticipated as big game may concentrate feeding activity on felled treetops, limbs, and slash piles during nighttime and quiet periods when logging operations would be shut down during the winter. Increasing short-term forage availability in this manner could partially offset some of the effects associated with temporary displacement caused by logging disturbance. There could be short-term added risk of disturbance and displacement of wintering animals that could result in moderate adverse effects associated with logging operations and road use in the project area. However, no long-term disturbance or displacement effects to winter range carrying capacity or factors that would create long-term displacement or reduced numbers of big game would be anticipated.

Proposed activities would occur on roughly 346 acres (28%) of white-tailed deer and elk winter range; proposed activities would reduce canopy closure and potential winter use by big game on roughly 330 acres (35%) that likely have attributes facilitating considerable winter use by big game. Following proposed activities, canopy densities in these stands providing snow intercept and thermal cover would be reduced, reducing habitat quality for wintering big game. In general, it could take 30 to 50 years for these stands to regenerate and attain a size capable of providing thermal cover for big game. Proposed activities would not prevent big game movement through the project area appreciably in winter and could stimulate browse production in the
units. Within proposed units, individual trees and patchy tree retention would remain, which would continue to provide limited escape cover and visual screening. No long-term effects to winter range carrying capacity or factors that would create long-term habitat reduction or reduced numbers of big game would be anticipated. Thus, a minor risk of adverse direct or indirect effects to big game winter range and thermal cover would be anticipated since: 1) the relatively short-term that proposed activities could create disturbance in this area; 2) proposed activities would alter a moderate amount of the stands that are providing thermal cover and snow intercept habitats for big game species; and 3) portions of winter ranges for several species of big game would be altered.

**Action Alternative: Cumulative Effects**

Proposed activities could occur in the winter, and disturbance created by mechanized logging equipment and trucks in a small part of the cumulative effects analysis area could temporarily displace big game animals during periods of operation for up to 4 years; no disturbance or displacement of wintering big game would be anticipated with activities conducted during the non-winter period. Any potential disturbance and displacement could be additive to any displacement associated with ongoing activities in the cumulative effects analysis area and any other disturbances that may be affecting wintering big game. Similarly, any timber management activities that may be occurring in the cumulative effects analysis area could continue altering big game winter range and/or disturbing wintering big game. Proposed activities would occur on roughly 346 acres (<1%) of white-tailed deer winter range; proposed activities would reduce canopy closure and potential winter use by big game on roughly 330 acres (4%) that likely have attributes facilitating considerable winter use by big game. Modifications to thermal cover and snow intercept in the project area would further reduce the amount of the larger winter range providing these attributes for big game. Continued use of the larger winter range would be expected and no appreciable long-term cumulative effects to winter range carrying capacity or factors that would create long-term displacement or reduced numbers of big game detectable at the scale of an elk herd unit would be anticipated. Thus, a minor risk of adverse cumulative effects to big game winter range or thermal cover would be anticipated since: 1) the relatively short-term that logging activities would create disturbance in a small portion of the cumulative effects analysis area; 2) habitats providing big game snow intercept and thermal cover on a small percentage of the larger winter range would be altered; 3) relatively small amounts of winter ranges for several species of big game would be altered.

**BIG GAME SECURITY HABITAT**

**Issue**

Proposed activities could remove big game security cover, which could affect hunter opportunity and local quality of recreational hunting.

**Introduction**

Timber harvesting can increase vulnerability of big game animals by changing the size, structure, juxtaposition, and accessibility of areas that provide security during hunting season (Hillis et al. 1991). As visibility and accessibility increase within forested landscapes, moose, elk, and deer have a greater probability of being observed and, subsequently, harvested by hunters, or they may become displaced or reduced in numbers due to lowered effective carrying capacity of the local habitat. Reduced cover attributable to logging and roads can also influence the effective use of habitat for big game species; particularly highly social species such as elk (Lyon et al. 1985). Big game security habitat are nonlinear blocks of hiding cover that are more than 0.5 mile from open roads and are a minimum of 250 acres in size. For this analysis, cover was considered generically
as big game cover for deer, elk, and moose. Because elk are highly social, wide-ranging species, providing for their cover needs helps ensure that habitat needs for other ungulates, such as deer and moose are met as well. Because of their smaller size and behavioral differences, mule deer and white-tailed deer are able to use smaller cover patches more effectively for escape and security. Moose are a solitary, wide-ranging species capable of effectively using relatively small cover patches, and the hunting season for moose is heavily regulated, greatly reducing risk of overharvest by humans. Therefore, for this analysis it is assumed that if available security cover would provide for the needs of elk, it would also generally be adequate to meet the needs of moose, mule deer, and white-tailed deer.

Analysis Area

Direct and indirect effects were considered at the scale of the project area (1,251 acres). Cumulative effects were analyzed on the 47,137-acre area described above in the Analysis Areas portion of this analysis. This scale includes enough area to support hundreds of elk.

Analysis Methods

Direct and indirect effects, as well as cumulative effects, were analyzed using a variety of information obtained from field evaluations, aerial photograph interpretation, USDA remotely sensed data, and a GIS analysis of available habitats. Big game security habitat was defined as forest habitat (≥40-percent canopy cover) that is ≥250 acres and located >0.5 mile s from open roads (Hillis et al. 1991). Cumulative effects were evaluated against a threshold value of 30% security cover within an analysis area the size of an elk herd home range (Hillis et al. 1991). Factors considered in the analysis include the open road density, non-motorized access levels, amount of hiding cover and security habitats present, potential human disturbance levels, and alterations to big game survival.

Existing Environment

Roughly 940 acres (75%) in the project area appear to be providing hiding cover for big game. Within the project area there are no open roads, but there are 2 neighboring owners with easements across portions of the project area. For this analysis, we will consider those as restricted roads since the general public does not have access, so the open road density in the project area is 0 miles per square mile (simple linear calculation). Approximately 2.1 miles of low standard, restricted roads used for administrative uses are present in the project area, yielding a total road density of 1.7 miles per square mile. Since no open roads are immediately near the project area, all 940 acres of existing hiding cover would be suitable security habitats. Moderate levels of non-motorized access to the project area exists, with access via the Block Management Program to Section 12, float-in access to both sections from the Bitterroot River, as well as varying access from neighboring private owners. Generally, the project area is in a landscape where elk and other big game have access to relatively high-quality forage resources in an area with rather limited hunting pressure, which has facilitated an increase in resident, non-migratory elk and big game populations. Relatively limited hunting pressure has led to population increases. The combination of a sizable elk herd that uses a variety of very visible habitats in an area with a sizable hunting population likely leads to an increased hunting pressure on the limited accessible public lands in the vicinity. The project area is in deer and elk hunting district 260, which is an archery-only district on public lands (MFWP 2022).

Hiding cover varies within the cumulative effects analysis area with the recent modifications from timber management, wildfires, and other human activities coupled with the natural openness of portions of the area. Hiding cover likely exists on much of the 8,931 acres (19%) of forested habitats on other ownerships within the cumulative effects analysis area. In the cumulative effects analysis area, access for recreational hunting
appears relatively good, with numerous roads but given the number of individual private owners granting differing levels of recreational hunting access, the overall potential access for hunting is somewhat unknown. Within the cumulative effects analysis area, there are 6 large blocks (total of 7,319 acres; 16%) of hiding cover that are larger than 250 acres in size. Given the uncertainty with the status of the roads in the cumulative effects analysis area (see Mature Forested Habitats and Landscape Connectivity section), for this analysis it was assumed that general public access on the majority of the existing roads were restricted, and the existing patches of hiding cover are providing adequate suitable security habitats for big game. These blocks of habitat extend beyond the cumulative effects analysis area and contributes to larger blocks of potential security habitats in the Sapphire and Bitterroot mountains on the Bitterroot National Forest. Collectively, the cumulative effects analysis area has extensive open habitats and considerable private ownership, which has limited big game security habitats; roughly 16% of the cumulative effects analysis area supports big game security habitats, which is below the 30% threshold recommended by Hillis et al. (1991).

Environmental Effects-Big Game Security Habitat

No Action Alternative: Direct and Indirect Effects

None of the proposed forest management activities would occur in the project area. No risk of adverse direct or indirect effects to big game security habitat would be expected since: 1) no changes in existing security habitat would be anticipated and continued maturation of forest cover would improve big game security habitat; 2) the level of public access to the project area would not change; and 3) no appreciable changes to big game survival would be anticipated.

No Action Alternative: Cumulative Effects

No further changes in big game security habitat would be anticipated. Past harvesting, recent wildfires, and ongoing timber management have altered big game security habitats and allowed increased human access; continued maturation in previously harvested stands and burned stands in the cumulative-effects analysis area would improve hiding cover in those areas. No other changes in disturbance and potential mortality due to hunting would be anticipated. Thus, no further adverse cumulative effects to big game security habitat would be anticipated since: 1) no changes in open roads or motorized access would occur; 2) no changes in non-motorized human access would be anticipated; 3) no further reductions in hiding cover or security habitats would occur, but hiding cover across the cumulative effects analysis area would continue to improve; 4) no further disturbance to big game would occur, and 5) relatively low levels of security habitat and hiding cover would persist in the cumulative effects analysis area.

Action Alternative: Direct and Indirect Effects

During proposed activities, disturbance from motorized equipment could disturb or displace big game animals in the area for up to 4 years, and habitats in the vicinity may temporarily be unusable due to the level of noise and human activity. No changes in open roads or motorized access would occur. During all phases of the proposed project, any roads opened with project activities would be restricted to the public and would be closed after the completion of activities. Proposed construction of 1.57 miles of new, restricted roads and improvements to permanent, restricted roads could facilitate slight increases in nonmotorized access using mountain bikes, horses, and/or foot travel. Additionally, contractors would be prohibited from carrying firearms while on duty, which would further reduce human access to some of these security habitats. Minimal long-term effects to big game would be attributable to the overall increases in restricted road density to 2.9 miles per square mile that would occur following proposed activities. No improvements or reductions in recreational
hunter access would occur that would change big game vulnerability or ability to manage populations in the area.

Tree density within proposed units would be reduced on roughly 346 acres, including roughly 330 acres (35% of existing security cover) of forested stands in the project area contributing to big game security habitats. Hiding cover would be reduced within the proposed units but would improve as trees and shrubs become reestablished in the openings over the next 10-20 years; however, some cover for big game would persist that could benefit big game during the hunting season in the project area. The retention of structure within proposed units and unharvested areas between the various units would reduce the potential effects of the hiding cover reductions. Overall, changes to sight distance and hiding cover would have negligible effects to big game vulnerability risk in the project area given the archery only hunting regulations in the district, and continued use of the project area during all seasons would be anticipated. Within proposed units, individual trees, pockets of advanced regeneration, existing hardwood trees, and retention buffers along riparian areas would remain, which would continue to provide some amount of escape cover and visual screening for big game animals. Continued use of the project area by the suite of big game species currently found in the project area would be likely. Collectively, a minor risk of adverse effects to big game security habitat would be anticipated that would affect big game vulnerability risk in the project area for 10 to 20 years since: 1) no changes in open roads or motorized access for the general public would be anticipated that would increase hunter access; 2) minor increases in nonmotorized access could increase human access on 1.57 miles of new, restricted roads; 3) a low to moderate amount of big game hiding cover and big game security habitat (35%) in the project area would be altered; 4) disturbance could occur on the project area for up to 4 years, and 5) negligible changes in big game survival would be anticipated with increased access and visibility.

**Action Alternative: Cumulative Effects**

Any short-term disturbance (up to 4 years of potential disturbance) associated with proposed forest management activities would be additive to existing disturbance in the cumulative effects analysis area, which could increase the potential for temporary displacement of big game animals sensitive to the increased presence of humans and motorized activities. If present in the area, some individuals could be displaced into places with lower quality habitat, and/or be pressed into nearby areas possessing greater inherent risk of human or predator-caused mortality. Additionally, any displacement could move big game onto neighboring landowners where an increase in big game damage conflict issues could arise with agricultural activities. Overall, moderate temporary effects associated with disturbance and displacement of big game would be possible.

No changes would be anticipated in open roads or motorized access for the public that would influence big game vulnerability. Proposed road construction (1.57 miles) and improvements to permanent, restricted roads could facilitate an increase in nonmotorized traffic to a small portion of the cumulative effects analysis area. No appreciable changes to recreational hunter access would occur that would change big game vulnerability or ability to manage populations in the area.

Approximately 330 acres of hiding cover and big game security habitats in the project area would be altered with the proposed activities. These habitats would likely continue to provide big game security habitats; collectively no changes in the amount of the cumulative effects analysis area providing big game security habitats would be anticipated. Continued maturation in previously harvested stands and recently burned stands across the cumulative effects analysis area would improve hiding cover in those older units; hiding cover and connected forest patches would remain in the cumulative effects analysis area, which would maintain suitable cover conditions for moose, elk, and deer. Reductions in tree densities on 346 acres in a small part of the
cumulative effects analysis area could make big game animals more detectable by humans in those areas altered, which would result in negligible added risk of mortality, particularly in fall during the big game hunting season; the archery only regulations in effect in the project area would offset most of the losses in effectiveness of hiding cover that could occur. It could take 10-30 years for the proposed units to recover the quality of hiding cover that exists currently. Overall, measurable reductions in big game numbers would not be expected at the cumulative effects analysis area unit or hunting district scale. In general, minor adverse cumulative effects to big game security habitats or survival would be anticipated that would affect big game using the cumulative effects analysis area for 10 to 30 years since: 1) no changes in open roads or motorized access for the general public that would increase hunter access would be expected; 2) changes to nonmotorized access would be minor; 3) quality of hiding cover on 346 acres would be reduced; 4) minor changes to the quality of big game security habitats would be anticipated and at the cumulative effects analysis area level big game security habitats would continue to be underrepresented; and 5) disturbance could occur in the cumulative effects analysis area for up to 4 years.

Wildlife Mitigations

- A DNRC biologist will 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.

- Motorized public access will be restricted at all times on restricted roads that are opened for harvesting activities; signs will be used during active periods and a physical closure (gate, barriers, equipment, etc.) will be used during inactive periods (nights, weekends, etc.). These roads and skid trails would be reclosed to reduce the potential for unauthorized motor vehicle use.

- Snags, snag recruits, and coarse woody debris will be managed according to ARM 36.11.411 through 36.11.414, particularly favoring ponderosa pine. Clumps of existing snags could be maintained where they exist to offset areas without sufficient snags. Coarse woody debris retention would emphasize retention of downed logs of 15-inch diameter or larger.

- Minimize potential for disturbance to nesting bald eagles and numerous avian species by restricting activities in section 24 between February 1 and August 15 unless the nest is documented as abandoned or the fledglings have fledged.

- Contractors and purchasers conducting contract operations will be prohibited from carrying firearms while on duty.

- Food, garbage, and other attractants will be stored in a bear-resistant manner.

- Provide connectivity by maintaining corridors of unharvested and/or lighter harvested areas along riparian areas, ridge tops, and saddles.
Wildlife References


McClelland, B.R. 1979. The pileated woodpecker in forests of the Northern Rocky Mountains. Pages 283-299 in Role of insectivorous birds in forest ecosystems. Academic Press.


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.

Attachment E – Soils Analysis
SOIL DISTURBANCE AND PRODUCTIVITY:

Soil Disturbance and Productivity Existing Conditions:

The project is west of the Bitterroot River and mostly located within the Bitterroot Floodplain. Underlying rocks are alluvium transported and deposited by the river. Sloughs, creeks, wetlands, and ponds occupy many of the lower areas shaped by abandoned river courses and flood channels. The proposed harvest areas are located on mostly flat topography with shallow swales throughout. The soils are a complex of Riverun/Gash/Curlow series stratified coarse sands and sandy gravels with shallow topsoils (See table below and Figures 1 and 2 for mapped soil units within project area). No unique or unstable terrain were observed within the project area.

Ground cover includes grasses, shrubs, and riparian vegetation. Deciduous trees (cottonwood and aspen), shrubs, and sedges occur in low-lying areas within the project area such as swales and flood channels within the floodplain.

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<th>WHC</th>
<th>Slopes</th>
<th>Erosion Hazard</th>
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</thead>
<tbody>
<tr>
<td>151A - Riverrun-Gash complex</td>
<td>alluvium</td>
<td>0-4 inches gravelly sandy loam</td>
<td>3 inches</td>
<td>0 - 2%</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>146A - Curlow-Riverrun complex</td>
<td>alluvium</td>
<td>0-16 inches silt loam</td>
<td>6 inches</td>
<td>0 - 2%</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>150A - Riverrun complex</td>
<td>alluvium</td>
<td>0-4 inches gravelly sandy loam</td>
<td>3 inches</td>
<td>0 - 2%</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>160A - Riverrun-Gash-Curlow complex</td>
<td>alluvium</td>
<td>0-4 inches gravelly sandy loam</td>
<td>3 inches</td>
<td>0 - 2%</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

*WHC = water holding capacity

Existing and past disturbances – Section 12

The project area has the following recorded existing and past disturbances:

Past harvests:

- Timber Permit (2000)

The section also includes road access easements for adjacent land and a power line easement.

Existing and past disturbances – Section 24

The project area has the following recorded existing and past disturbances:

Past harvests:

- Section 24 Timber Permit (2011) – blowdown salvage sale
- Florence Blow Down (2007) – blowdown salvage sale

Both sections are included in an active grazing license. No overgrazing observed. Riparian conditions are good.
Figure 1: Soil units within Section 12 of T11N R20W. Map includes LiDAR imagery (DNRC 2019).
Figure 2: Soil units within Section 24 of T11N R20W. Map includes LiDAR imagery (DNRC 2019).
Existing coarse woody debris (CWD) counts within the harvest areas completed in January 2022 range from 0 to 28 tons/acre. The average of 20 CWD counts in Section 12 is 7.3 tons/acre (range 0-28 tons/acre). The average of 15 counts in Section 24 is 2.7 tons/acre (range 0-5.2 tons/acre).

### Section 12 (n=20)
- Range 0-28 tons/acre
- Average 7.3 tons/acre

### Section 24 (n=15)
- Range 0-5.2 tons/acre
- Average 2.7 tons/acre

<table>
<thead>
<tr>
<th>Soil Disturbance and Productivity</th>
<th>Direct</th>
<th>Secondary</th>
<th>Cumulative</th>
<th>Can Impact Be Mitigated?</th>
<th>Comment Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No-Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Disturbance (Compaction and Displacement)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>NA</td>
<td>1</td>
</tr>
<tr>
<td>Erosion</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>NA</td>
<td>1</td>
</tr>
<tr>
<td>Nutrient Cycling</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>NA</td>
<td>1</td>
</tr>
<tr>
<td>Slope Stability</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>NA</td>
<td>1</td>
</tr>
<tr>
<td>Soil Productivity</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>NA</td>
<td>1</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Disturbance (Compaction and Displacement)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Y</td>
<td>2-6</td>
</tr>
<tr>
<td>Erosion</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Y</td>
<td>2-6</td>
</tr>
<tr>
<td>Nutrient Cycling</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Y</td>
<td>7</td>
</tr>
<tr>
<td>Slope Stability</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Y</td>
<td>8</td>
</tr>
<tr>
<td>Soil Productivity</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Y</td>
<td>2-7</td>
</tr>
</tbody>
</table>
Comments:
1. Implementation of the No-Action Alternative would result in no new soil resource impacts in the project area. Soil resource conditions would remain similar to those currently at the site.

2. Soil and vegetation disturbance from harvest activities may result in temporary increased risk of erosion.

3. Soil disturbance and erosion risk increases with slope and the project area topography is flat with swales. Equipment including skidders and harvesters would minimize swale crossings and use existing crossings or areas where slopes are more gradual and therefore less vulnerable to disturbance. Existing crossings from past harvest activities have been observed within harvest units.

4. Direct impacts by physical disturbance would likely occur by ground-based yarding. All expected impacts are expected to be less than 12.2% and would be minimized by use of existing roads, skid trails, and swale crossings. This disturbance rate estimate is based off previous soil disturbance monitoring of timber sales completed by the DNRC (DNRC, 2011).

5. Temporary road construction is proposed as an optional part of the proposed project. Temporary roads will meet forestry BMPs and Missoula County floodplain regulations. Temporary roads would be scarified and grass seeded (reclaimed) after completion of use.

6. Applicable state plans, rules, and practices have guided project planning and would be implemented during project activities, including the Montana Code Annotated (specifically Title 77, Chapter 5), the Administrative Rules of Montana (specifically Rule Chapter 36.11), the Montana Forest Best Management Practices, and the State Forest Land Management Plan.

7. In the interest of maintaining native CWD concentrations critical to ecosystem functions including soil nutrient cycling and wildlife refuge – we plan to retain CWD at concentrations represented in counts completed in January 2022. The average of 20 CWD counts in Section 12 is 7.3 tons/acre (range 0-28 tons/acre). The average of 15 counts in Section 24 is 2.7 tons/acre (range 0-5.2 tons/acre). According to Graham et al. (1994), an average minimum of 4.5 tons/acre of CWD would be a desired post-harvest condition to maintain forest productivity for this forest habitat type.

8. Unstable slopes were not observed on site. The project is anticipated to have no risk to slope stability.

Soil Mitigations:

- The Contractor and Sale Administrator should agree to a general skidding plan prior to equipment operations. Skid trails would be mitigated following harvesting and yarding operations with grass seeding, weed spraying, and slash.

- To prevent soil compaction ground-based mechanical felling and yarding would be restricted to one or more of the following conditions:
  - Soil moisture content at 4-inch depth less than 20% oven-dry weight.
  - Minimum frost depth of 4 inches.
  - Minimum snow depth of 18 inches of loose snow or 12 inches packed snow.
An average minimum of 4.5 tons/acre of coarse and fine woody debris would be maintained within harvest areas to meet the concentration for the DF/PHMA habitat type recommended by Graham et al (1994). Any existing CWD shall be left in place. See comment 7 above.

Soil References:
Attachment F – Water and Fisheries Resources Analysis
WATER QUALITY AND QUANTITY:

Water Quality and Quantity Existing Conditions:

The project is located west of the Bitterroot River and within the Bitterroot Floodplain and watershed. Sin-tin-tin-em-ska Creek occurs in the western part of the project area. The general area contains several relict and overflow channels and meander features that may be active during flood events or during periods with high water table. Some of these features meet the definitions of a stream. Other features located at the topographic lows (swales) are wetlands.

The proposed harvest areas are located on higher terrace sites that are relatively dry and not occupied by wetland vegetation. Much of this ground is still within elevations that would be submerged during a base flood event and are within the floodplain. Several of the low spots adjacent to the harvest areas are occupied by cottonwood, aspen, dogwood, and sedge vegetation communities. Some of these wetlands are adjacent wetlands and have an SMZ extended to include this area. Other wetlands are isolated and are marked for equipment exclusion unless dry or frozen.

The table below summarizes some of the limitations of project activities near the Bitterroot River. A channel migration zone has been delineated for the Bitterroot River within harvest units as applicable. These areas have additional tree retention. This migration zone was determined by Boyd et al. (2021) in a channel migration zone study completed for Missoula County.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Ordinary high-water mark (OHWM) to 50 feet</th>
<th>50 feet to 115 feet</th>
<th>115 feet to edge channel migration zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest</td>
<td>No harvest</td>
<td>Retain 50% of trees with DBH ≥ 8&quot;.</td>
<td>Retain 50% of basal area volume</td>
</tr>
<tr>
<td>Equipment</td>
<td>No equipment operation unless from an existing road or if above established road and toe of road is ≥25’ from OHWM</td>
<td>Equipment ops ok if dry, frozen, or over snow.</td>
<td>Equipment ops ok if dry, frozen, or over snow.</td>
</tr>
<tr>
<td>roads</td>
<td>Use existing only</td>
<td>Use existing only. No new roads proposed.</td>
<td>Would use existing + proposed new and optional temp</td>
</tr>
<tr>
<td>Slash piles</td>
<td>none</td>
<td>No</td>
<td>yes</td>
</tr>
<tr>
<td>Log decking</td>
<td>none</td>
<td>No</td>
<td>yes</td>
</tr>
</tbody>
</table>

Sin-tin-tin-em-ska Creek will have similar project limitations to those of the Bitterroot River including a 50-foot no harvest buffer from the OHWM, and retention of 50% of trees with DBH ≥ 8 inches in the zone that is 50 to 115 feet from the OHWM.

Activities within the floodplain include precautions to not raise local base flood elevation (BFE). Road grading, improvements, new road construction, and temporary road construction would be conducted such that the risk of increase of BFE are avoided.

The proposed haul route would use an existing road with newly constructed side roads that crosses the state-owned sections and private land. Temporary roads may also be constructed and include a temporary log
crossing on a Class 2 stream. This temporary crossing has been designed to minimize excavation and channel and bed disturbance.

Trapping has been permitted on Section 12 as recent as 2020. Evidence of recent beaver occupancy within the riparian areas near the project area were not observed.

Figure 1: Observed streams within Section 12 of T11N R20W. Map includes LiDAR imagery (DNRC 2019).
Figure 2: Observed streams within Section 24 of T11N R20W. Map includes LiDAR imagery (DNRC 2019).
<table>
<thead>
<tr>
<th>Water Quality &amp; Quantity</th>
<th>Impact</th>
<th>Can Impact Be Mitigated?</th>
<th>Comment Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Direct</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>Cumulative</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N O</td>
<td>Low</td>
<td>Mod</td>
</tr>
<tr>
<td>No-Action</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Quality</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Water Quantity</td>
<td>X</td>
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<td>Water Quality</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Quantity</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

1. With no action, no timber harvesting or related activities would occur. Water quality conditions would likely continue under its current condition. Similarly, no risk of change of current fluctuations in annual water yield or stream flow would result.

2. Applicable state plans, rules, practices, and commitments have guided project planning and would be implemented during project activities, including the Montana Code Annotated (specifically Title 77, Chapter 5), the Administrative Rules of Montana (specifically Rule Chapter 36.11), the Montana Forest Best Management Practices, the State Forest Land Management Plan, Montana Stream Protection Act, and Missoula Floodplain regulations.

3. Changes to stream flow hydrology (water quantity or water flow) would not be detectible with the Action Alternative. Studies correlating vegetation harvest and treatment with streamflow yield have suggested approximately 15-20% of the watershed vegetation must be harvested to have a measurable increase in water yield in similar mountain environments (Stednick, 1996; and Bosch and Hewlett, 1982). The watershed area of the Bitterroot River and Sin-tin-tin-em-ska Creek above the project area is large enough that the proposed vegetation removal of the project area is much less than the 15%.

**Water Quality & Quantity Mitigations:**

- All BMP’s, SMZ requirements, Wetland requirements, and floodplain regulations would be applied and administered during harvest operations.
- Site modifications including existing road improve, proposed new road construction, and optional temporary roads and grading swale crossings would be conducted such that base flood elevations would not be adversely affected.
- Channel migration zone harvest prescription of 50% basal area retention would be applied.
- Upgrade road drainage as needed to restore/maintain BMPs.

**Water Resources References:**


https://www.missoulacounty.us/government/health/health-department/missoula-valley-water-quality-district/reports/channel-migration-zone

Stednick, J.D. 1996. Monitoring the effects of timber harvest on annual water yield. J. Hydrology 176:79-95
FISHERIES:

The Bitterroot River occurs east of the project area and supports a cold-water fishery that includes both bull trout and westslope cutthroat trout. Bull trout are currently listed as a threatened species under the Endangered Species Act and westslope cutthroat trout is a sensitive species. The proposed haul route would not cross the Bitterroot River. The perennial tributaries occurring within the project sections are also presumed to carry fish including bull trout and westslope cutthroat trout.

Comments: 1. The proposed harvest would comply with the Watershed, Fisheries, and Threatened and Endangered Species Resource Management Standards contained in the Forest Management ARM. No timber harvest or new road construction is planned in SMZ or in the immediate vicinity of the Bitterroot River. Based on this harvest design and limiting operation to winter or dry site conditions, there is minimal risk of direct, indirect, or cumulative effects to fish habitat.

Based on the proposed Action Alternative, no foreseeable direct, indirect, or cumulative effects to fisheries resources are anticipated with an action or no-action alternative due to the following factors:

- No proposed introduction, removal, or suppression of native or non-native species would occur.
- No known unnatural fish passage barriers are present on DNRC ownership in the project area.
- The project design and compliance with applicable regulations and commitments.
- Riparian setbacks and tree retention prescriptions would mitigate the risk of loss of coarse woody debris recruitment to fish-bearing streams.

**Fisheries Mitigations:**
No additional project-specific mitigations necessary beyond the project design and commitments listed earlier in the water resources analysis.