Environmental Assessment Checklist

Project Name: Starvation Timber Sale Project
Proposed Implementation Date: June 2025 – June 2035
Proponent: Missoula Unit, Southwest Land Office, Montana DNRC
County: Missoula

Type and Purpose of Action

Description of Proposed Action:

The Missoula Unit of the Montana Department of Natural Resources and Conservation (DNRC) is proposing the Starvation Timber Sale Project. The project is located approximately 1 aerial mile east of the town of Clinton, MT, between the Starvation and Wallace Creek drainages (refer to Attachments vicinity map **A** and project map **A-1**) and includes the following sections:

Beneficiary	Legal Description	Total Acres	Treated Acres
Common Schools	**Section 36 T12N R17W**	**640**	**510***
Public Buildings			
MSU 2nd Grant			
MSU Morrill			
Eastern College-MSU/Western College-U of M			
Montana Tech			
University of Montana			
School for the Deaf and Blind			
Pine Hills School			
Veterans Home			
Public Land Trust			
Acquired Land			

*Total treated acres equal the total acres with proposed treatment units. Proposed activities (table 2) include multiple treatment units that may overlap other treatment units.

Objectives of the project include:

- Generate revenue for the Common Schools Trust.
- Improve stand health and vigor by reducing basal area and preferring early seral species for retention (ponderosa pine (*Pinus ponderosa)* and western larch (*Larix occidentalis)*).

- Improve growth and vigor in naturally regenerated stands by reducing competition and basal area.
- Prefer unhealthy, suppressed Douglas-fir (*Pseudotsuga menziesii)* for removal before economic value is lost to insect and disease damage.
- Reduce fuel loading and the likelihood of a stand replacing fire.

Proposed activities include:

Action	Quantity
Proposed Harvest Activities	# Acres
Clearcut	
Seed Tree	8
Shelterwood	
Selection	246
Old Growth Maintenance/Restoration	
Commercial Thinning	
Salvage	
Total Treatment Acres	**254**
Proposed Forest Improvement Treatment	# Acres
Pre-commercial Thinning	**72**
Site preparation(scarification)	
Site preparation(burning/herbicide)	**151**
Planting	**151**
Proposed Road Activities	# Miles
New permanent road construction	1.0
New temporary road construction	0.6
Road maintenance	9.1
Road reconstruction	2.5
Road abandoned	
Road reclaimed	
Other Activities	

Duration of Activities:	10 years
Implementation Period:	2025-2035

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) (DNRC 2003),
- The Montana DNRC Forested State Trust Lands Habitat Conservation Plan (HCP) (DNRC 2010)
- All other applicable state and federal laws.

Project Development

SCOPING:

- DATE:
  - August 15th, 2024
- PUBLIC SCOPED:
  - The scoping notice was posted on the DNRC Website: https://dnrc.mt.gov/News/scoping-notices
  - The scoping notice was sent to 64 adjacent landowner addresses (Montana Cadastral) within a 1-mile radius of the project location. The scoping notice was publicly posted at the Clinton Market and Clinton Post Office. One mailed scoping notice was returned as undeliverable. DNRC Forest Management Bureau additionally sent scoping notices to interested parties enrolled on the statewide scoping list and unit-specific timber list.
  - The comment period was extended to September 27th to accommodate comments from Fish, Wildlife and Parks (FWP).
- AGENCIES SCOPED:
  - FWP
  - Statewide Tribal Agencies
  - Internal Department of Natural Resources and Conservation Staff
  - United States Bureau of Land Management
- COMMENTS RECEIVED:
  - One comment was received from FWP via email about the quality of the wildlife connectivity and habitat in the Project Area and to recommend following suggested protocols to reduce human/bear interactions
- DNRC Responses:
  - The DNRC would like to thank all parties for their comments. All comments were taken into consideration during project planning and development.
  - FWP: Impacts of the Action Alternative to wildlife habitat can be found in the Wildlife Section. Reduction of potential human/bear interactions are addressed in DNRC's Habitat Conservation Plan commitments related to grizzly bear.

DNRC specialists were consulted, including:

Clark Cederberg – Project Lead/Forester
Patrick Rennie – Archaeologist
Garrett Schairer – Wildlife Biologist
Andrea Stanley – Soils Scientist/Hydrologist/Fisheries

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

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

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

- **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 2010). As a member, DNRC must submit a list of planned burns to the Airshed Group's Smoke Monitoring Unit describing the type of burn to be conducted, the size of the burn in acres, the estimated fuel loading in tons/acre, and the location and elevation of each burn site. The Smoke Monitoring Unit provides timely restriction messages by airshed. DNRC is required to abide by those restrictions and burn only when granted approval by the Smoke Monitoring Unit when forecasted conditions are conducive to good smoke dispersion.

ALTERNATIVES CONSIDERED:

No-Action Alternative:

- No commercial harvest, road construction, road maintenance/improvement, noxious weed management, pre-commercial thinning, tree planting, natural regeneration, tree planting site preparation, or road maintenance/improvement would occur at this time.

Action Alternative

- A commercial timber harvest would take place to harvest approximately 1.2 million board feet (MMBF) of timber. Timber would be harvested using a combination of ground-based, skyline, and/or tethered harvest methods. Silvicultural prescriptions would be developed to meet DNRC desired future conditions (DFCs) (DNRC, 2003).
- Approximately 1 mile of new permanent road construction and 0.6 miles of new temporary road construction would take place (newly constructed roads would be open for administrative use only).
- Road maintenance and improvements would take place on existing roads used (approximately .9.1 miles) for log hauling and timber-harvest.
- Road reconstruction would occur on approximately 2.5 miles of existing road.
- Precommercial thinning of approximately 72 acres would be conducted to improve the growth and vigor of advanced regeneration.
- Herbicide application would occur as needed during project implementation for the control of invasive species.
- Slash pile burning would occur in compliance with the Control of Timber Slash and Debris law.
- Prescribed broadcast burning/herbicide would occur to meet site preparation objectives prior to planting of early serial species such as western larch (WL) and ponderosa pine (PP).

Impacts on the Physical Environment

Evaluation of the impacts on the No-Action and Action Alternatives including **direct, secondary, and cumulative** impacts on the Physical Environment.

VEGETATION:

The Project Area falls within climatic section 332B- Bitterroot - Blackfoot, which was historically 79% forested. (Losensky, 1997). The Project Area is approximately 2.5 air miles from the town of Clinton, MT and can be accessed via Wallace Creek Rd (Map Attachment A-1). The Project Area contains mature mixed ponderosa pine/Douglas-fir forest on south facing aspects and mature Douglas-fir forest with small patches of western larch on the north aspects ranging in elevation between 4200-5300'. Sub-merchantable mixed conifer stands separate each of the north facing units which were likely harvested during the most recent entry into the area. The Project Area is generally isolated from the general public, however, public foot traffic is able to enter the Project Area from adjacent public parcels. Only a small portion of the Project Area (NW corner) can be seen from the I-90 corridor viewshed and the town of Clinton. The Mile Marker 124 fire burned a large portion of the south facing aspect of section 36 in 2007. These areas currently lack conifer regeneration through much of the affected area. Native bunchgrasses and shrubs, particularly snowbrush ceanothus *(Ceanothus velutinus)* occupy much of the available growing space in these areas. Noxious weeds currently occupy much of the other available growing areas that were impacted by the fire and are present in some of the forested units as well.

History:

Recent harvests within the Project Area: Harvest history for this tract goes back to 1948. 1200 MBF was harvested from the Project Area in 1948. Christmas trees were harvested in 1950 and 1956. In 1969, right-of-way clearing removed 3 MBF and another large timber sale harvested approximately 2700 MBF in 1991. The most recent timber sale was the Starving Cramer timber sale in 2008. This sale was a salvage harvest which removed approximately 222 MBF of sawlogs following the Mile Marker 124 fire of 2007.

Vegetation Existing Conditions:

For descriptive purposes, SLI (stand level inventory) delineated stands within the Project Area have been grouped within their respective proposed harvest units. Descriptions of the current stand conditions coincide with the proposed Action Alternative harvest units (Map A-1: Timber Sale Harvest Units). Table T-1 describes the expected impacts of the Action Alternative to the Montana DNRC's desired future conditions (DFCs). The DFC represents the cover type that DNRC aims to manage toward within a given stand in order to implement its coarse- filter approach to managing for biodiversity (ARM 36.11.404). All proposed silvicultural harvest prescriptions have been designed to move the stands toward the appropriate DFC (see attached prescriptions).

Unit 1:

Proposed harvest unit 1 is composed of two smaller, well-stocked, two-storied Douglas-fir (DF) stands. The overstory composition consists of approximately 90% DF and 10% ponderosa pine (PP). PP only exists as a dominant or co-dominant species in the stand and is not represented in the mid-story or understory of the unit. Average stand diameter is approximately 17" dbh (diameter breast height) with larger diameter trees towards the higher elevations of the unit. The lower, steeper, proposed skyline portion of the unit has well-established DF regeneration in canopy gaps and along old skid trails where previous ground disturbance occurred. The DF in the proposed unit is currently exhibiting signs of defoliators, possible root rot, and has poor crown vigor. Many of the individual DF, and especially groups of DF, have low live crown ratios (<30%) or dead tops. Several individual trees within the proposed unit are dead, dying, or will likely succumb within the next few years if left untreated.

Unit 2:

Proposed harvest unit 2 is composed of a well-stocked, single storied, western larch (WL)/DF stand. The average diameter of the stand is approximately 20" dbh. The overstory is comprised of 82% DF and 18% WL. WL is only present in the mid/lower elevation stands of the unit, while the upper most elevations of the stand are stocked 100% DF. Some natural DF regeneration is present in the understory; however, the stand lacks natural WL regeneration and is currently too shaded for the establishment of early seral seedlings. The DF in the proposed unit exhibits low vigor and signs of budworm and/or other defoliator damage. DF live crown ratios are well below 30% in individuals, and especially in groups. Several individual trees within the proposed unit are dead, dying, or will likely succumb within the next few years if left untreated.

Unit 3:

Proposed harvest unit 3 is composed of a poorly stocked, two-aged, WL/DF stand. The overstory is comprised of approximately 57% DF, 36% WL, and 7% lodgepole pine (LPP) with an average diameter of 10" dbh. The desired future conditions for this stand call for lodgepole pine to occupy the site. However, most of the LPP is dead with only 7% of the overstory containing live LPP. The high fuel load within this stand can be attributed to the abundance of downed dead wood, primarily, LPP. The significant amounts of large dead and down LPP would contribute to a high intensity burn should this area be subjected to a wildfire. This could result in significant soil degradation and damage, or death of the other conifers present in this stand if a wildfire were to occur. The DF in this stand is of poor vigor and exhibits signs of pest damage from defoliators. Many of the individual DF trees and some of the WL in the stand have poor live crown ratios below 30%. Several individual trees within the proposed unit are dead, dying, or will likely succumb within the next few years if left untreated.

Unit 4:

Proposed harvest unit 4 is comprised of two smaller, medium-well stocked, WL/DF stands. Both stands are two-storied with an average diameter of approximately 12” dbh. The proposed unit is approximately 89% DF, 10% WL, and 1% PP. The WL in the unit exhibits good vigor with many dominant trees more than 100’ tall. The DF is poor/average vigor and has been significantly impacted by defoliators. Portions of the stand have died, and the downed dead wood has created high fuel loads, particularly in the patches of WL within the stand. DF live crown ratios are well below 30% in individuals, and especially in groups. Several individual trees within the proposed unit are dead, dying, or will likely succumb within the next few years if left untreated.

Unit 5:

Proposed treatment unit 5 is comprised of two PP stands separated on the ground by the main haul route. The northern stand is a poorly stocked, two-aged stand that features a dominate sawtimber overstory and a sub-merchantable understory. Portions of this stand were critically impacted by the Mile Marker 124 wildfire in 2007. The remaining overstory trees are primarily scattered across the stand in densely packed groups of DF and PP. While the PP in the stand exhibits good form and vigor, many of the DF exhibit poor form and pest damage. The average diameter of this stand is approximately 13” dbh and is stocked at approximately 25 TPA.

The southern stand within this proposed harvest unit is largely dominated by PP (73%) with scattered DF (27%) throughout the stand. This stand is single storied, medium stocked, and the PP exhibits good form and vigor. The DF that has grown up to the overstory position to compete with the pine is of lower quality and shows signs of defoliator damage. The average diameter of this stand is approximately 16” dbh. The understory of this stand is dominated by bunchgrasses and lacks PP regeneration, however there are some scattered pockets of DF regeneration. This stand lacks any substantial amount of coarse woody debris, and the understory is primarily open and undisturbed with a thick duff layer.

Unit 6:

Proposed harvest unit 6 is comprised of several single storied, PP stands in the upper elevations of the unit. The proposed tractor logging portions of unit 6 are comprised of approximately 64% DF and 33% PP and is stocked at 54 tpa on average. The PP in these stands exhibit good form and vigor. DF is also present in the overstory as a co-dominate species. Approximately 40% of the DF in the stand exhibits good vigor and has an adequate live crown ratio. The remainder of the DF are lacking healthy live crowns due to tightly packed groups and defoliator damage. The average diameter in these stands is approximately 16” dbh.

The stands in the lower portions of the unit are medium stocked, two storied, PP stands. The overstory of these stands are comprised of PP (61%) and DF (38%) and are stocked at 72 tpa on average. PP is the dominate overstory species and DF occupies the mid-layer of the canopy and is a co-dominate in portions of these stands. 40% of the DF in the stand exhibits good vigor and has an adequate live crown ratio. The remainder of the DF are lacking healthy

live crowns due to tight spacing between individuals and damage from defoliators. The average diameter in these stands is approximately 14" dbh.

All of the stands within proposed unit 6 lack adequate natural regeneration likely due to a lack of sufficient disturbance (upper/lower stands) and a lack a penetrating sunlight (lower stands) below the canopy.

Harvest Unit	Habitat Group	Fire Regime	Current Cover Type	Age Class (years)	DFC	RX	Acres
1	Moderately warm and dry (westside)	Low	Douglas Fir	100-149	Ponderosa Pine	Individual/Select Tree Harvest	37
2	Moderately warm and dry (westside)	Low	Western Larch/Douglas Fir	100-149	Douglas Fir	Individual/Select Tree Harvest	14
3	Moderately warm and dry (westside)	Low	Douglas Fir	100-149	Lodgepole Pine	Seed Tree	8
4	Moderately warm and dry (westside)	Low	Western Larch/Douglas Fir	100-149	Western Larch/Douglas Fir	Individual/Select Tree Harvest	25
5	Moderately warm and dry (westside)	Low	Ponderosa Pine	100-149	Ponderosa Pine	Individual/Select Tree Harvest	100
6	Moderately warm and dry (westside)	Low	Ponderosa Pine	40-99	Ponderosa Pine	Individual/Select Tree Harvest	70

T 1: Unit desired future conditions and current habitat types.

Fire Hazard/Fuels:

Most of the Project Area (approximately 60%) is located within the Montana Forest Action Plan's risk priority area. The proposed harvest units within the Project Area continue to increase in crown continuity and high amounts of dead and dying fuel loading, especially in proposed units 3 and 4. The fuel loading is exacerbated on steep slopes. This poses a major hazard to adjacent landowners in the event of a sustained crown fire. High severity fire effects would be expected in a large portion (>40%) of the Project Area accompanied with high mortality of the

stand in the event of a wildfire with no management (No-Action Alternative). Implementation of the Action Alternative would be expected to increase the risk of wildfire within the first 2-3 drying seasons following harvest (logging slash); however, the severity would be expected to be less severe, and the risk would decrease.

Insects and Diseases:

Insect and disease damage has recently impacted the vigor of a substantial amount (greater than 50%) of the Douglas-fir; notably root-rot and defoliators. Western spruce budworm (*Choristoneura occidentalis)* appears to be impacting a majority of the Douglas-fir. Signs of infestation are apparent in the crowns of trees as the crowns appear thin, scorched, or stripped of foliage (Peterson et al. 2011). In addition to defoliators, root rot may be present in some portions of the stands. Small patches of dead trees can be observed via satellite imagery of the Project Area. From the ground, rounded, flat, and shrubby crowns can be observed in the Douglas-fir (Hagle, 2004). Uprooted trees can be observed with root breakage close to the bole of the fallen trees. Both of the aforementioned forest health issues are native to mixed conifer forests of western Montana. While there is no cure for the pests, prevention is possible through appropriately prescribed silvicultural treatments that target trees showing signs and symptoms of forest health issues. The proposed silvicultural treatments of the Action Alternative are designed to address these forest health concerns by removing trees that show signs of infestation from insects and disease.

Sensitive/Rare Plants:

Montana Natural Heritage Program (MNHP) was used to survey the proposed Project Area accompanied by Forester ground observations. There were no observed or recorded TES or species of concern identified in the Project Area. However, there was an observation recorded in proximity to the proposed Project Area. Alpine collomia (*Collonia debilis var. camporum)*, a state SOC, was recorded with the MNHP in 1963. The observation was approximately 1.8 miles north of the proposed Project Area, along the haul route through Wallace creek. It would be expected that hauling would have no impact on this plant species (MNHP, retrieved Dec. 2nd, 2024).

Noxious Weeds:

Noxious weeds are present in the Project Area. The primary species are spotted knapweed (*Centaurea maculosa*) and cheatgrass (*Bromus tectorum*). Both noxious weeds can be seen growing along the established roads, however, knapweed is also occupying large open areas within the south facing stands inside the proposed Project Area.

Vegetation	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Current Cover/DFCs	**X**					**X**				**X**			**N/A**	**1**
Age Class	**X**					**X**				**X**			**N/A**	**2**
Old Growth	**X**				**X**				**X**				**N/A**	**3**
Fire/Fuels	**X**				**X**				**X**				**N/A**	**4**
Insects/Disease		**X**				**X**				**X**			**N/A**	**5**
Rare Plants	**X**				**X**				**X**				**N/A**	
Noxious Weeds		**X**				**X**				**X**			**N/A**	**6**
Action														
Current Cover/DFCs		**X**				**X**				**X**			**Y**	**1**
Age Class		**X**			**X**				**X**				**Y**	**2**
Old Growth	**X**				**X**				**X**				**N/A**	**3**
Fire/Fuels		**X**				**X**				**X**			**Y**	**4**
Insects/Disease		**X**				**X**				**X**			**Y**	**5**
Rare Plants	**X**				**X**				**X**				**N/A**	
Noxious Weeds			**X**			**X**				**X**			**Y**	**6**

T2: Impacts of action and no-action alternatives on vegetation within Project Area.

Comments:

1) Units 1-3: Without active management (No-action Alternative). Stands within proposed units 1-3 would remain in their current cover type of later seral species and would not be expected to move toward their DFC (desired future conditions) without a natural disturbance such as a wildfire. Silvicultural prescriptions of the Action Alternative were developed to emulate natural disturbances and move the stands in units 1-3 towards the DNRC DFC.

Unit 4-6: Without active management in proposed units 4-6, shade tolerant species would be expected to outcompete seral species, moving further away from the DFC of the stand and changing the historic cover type and species composition. Silvicultural prescriptions for this unit were developed to maintain the desired future conditions for the unit.

2) Without active management (No-Action Alternative), stands within units 1-4 would continue to have high mortality among mature Douglas-fir, the oldest age class, from insect and disease damage induced by low vigor and competition as well as wind throw of stems with Armillaria root-rot. The loss of the older age class DF would alter stand structure and drive the stand toward a younger age-class stand over a long term. Silvicultural prescriptions of the Action Alternative were developed to remove the DF susceptible to or currently dying. It would be expected that stands within unit 3, under the Action Alternative, would produce a younger age class in later seral species such as Douglas-fir, ponderosa pine,

and western larch. Proposed silvicultural prescriptions of the Action Alternative were developed to move units 1-4 toward uneven management and in the future to represent all age classes and maintain species diversity.

Units 5-6: Silvicultural prescriptions for the Action Alternative would reduce the basal area by harvesting trees of all age classes. Age class distribution would not be expected to change with the No-Action Alternative or the Action alternative.

3) No old growth occurs within the Project Area as defined by Green et al. (1992). Portions within all units, while not meeting Green et al. minimums, exhibit attributes of large diameter (>20in dbh) trees. Silvicultural prescriptions of the Action Alternative were developed to retain the large ponderosa pine and a few scattered large Douglas-fir (>20-in dbh) throughout all units.

4) Under the No-Action Alternative, the Project Area would continue to have crown continuity and high amounts of dead and dying fuel loading. This poses a major hazard to adjacent stands and landowners in the event of a sustained crown fire. The proposed Action Alternative would reduce crown continuity and would be expected to reduce the severity of a wildfire. However, fine fuels from harvesting and pre-commercial thinning would be expected to increase the rate of surface fire spread for a few years after harvesting. The increase of fine fuel loading would be short in duration (1-3 years after the proposed project implementation of each project). Forest floor plants such as forbs and grasses would also likely experience more growth contributing to the fine fuel load.

5) Without active management (No-Action Alternative) insect and disease would continue to cause mortality within the Project Area. Silvicultural prescriptions of the Action alternative were developed to salvage infested trees as well as increase health and vigor of the residual stand by reducing tree competition, thus increasing the remaining trees' resiliency to insects and pathogens. It would be expected that implementation of the Action Alternative would result in a decrease in the effects of insects/disease.

6) Past disturbances have transported and spread noxious weeds along many roads and trails within the Project Area. Under the No-Action Alternative noxious weed management would continue to be conducted by the adjacent landowners and the DNRC based on priorities and funding available. The Action Alternative would continue to implement herbicide application (weed spraying) in the Project Area to reduce the spread of weeds along roads. However, noxious weeds would continue to occur and are likely to increase on state and adjacent lands, spread by wind, animals, equipment operation, and fire disturbance. Project Areas would be monitored for noxious weeds after implementation and herbicide would be applied using an Integrated Weed Management (IWM) approach. It would be expected that implementation of IWM measures listed in the mitigations would reduce existing weeds, moderate the possible spread of weeds, and improve current conditions to promote existing native vegetation.

Vegetation Mitigations:

- Favor seral trees such as ponderosa pine and western larch for leave tree selection to move stands toward a more historic species composition and the DNRC's Desired Future Condition. If planting is needed post-harvest, planting of seral species (WL, PP) in treatment areas to promote the DFC (desired future condition).

- Harvest prescriptions would be implemented to move most stands toward uneven-aged management and residual stands would represent multiple age classes.

- Excessive slash would be piled and burned following the proposed harvest activities. Logging damaged advanced regeneration will be slashed to reduce fuel loading in harvest units.

- If any species of concern or potential species of concern are encountered during activities associated with this project, activities within the immediate vicinity would cease until DNRC evaluates the occurrence and develops appropriate site-specific mitigations to protect the species and its habitat.

- Monitor the stand post-harvest for infestation and/or infection of forest pests and pathogens. Trees damaged from harvesting with the potential to become infested will be removed.

- Equipment cleaning prior to harvest will reduce the potential for the spread of noxious weeds. Project Areas would be monitored for noxious weeds after harvest implementation and herbicide would be applied using an Integrated Weed Management (IWM) approach.

Vegetation References:

Alpine Collomia — Collomia debilis var. camporum. *Montana Field Guide*. Montana Natural Heritage Program (MNHP). Retrieved on December 2, 2024, from https://FieldGuide.mt.gov/speciesDetail.aspx?elcode=PDPLM02011

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Losensky, John B. 1997. *Historical Vegetation of Montana*. MT DNRC. 28pp

Pederson, L., N. Sturdevant, D. Blackford. 2011. *Western spruce budworm management*. Chapter 6.1 Forest insect and disease management guide for the northern and central Rocky Mountains. USDA Forest Service, Northern Region, State and Private Forestry. 10 pp.

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SOIL DISTURBANCE AND PRODUCTIVITY:

Soil Disturbance and Productivity Existing Conditions:

The project is located in the southern foothills of the Garnet Range and approximately one mile east of the Clark Fork River. Underlying geology is Precambrian age, quartzites and argillites that are thin-bedded and fractures. No especially unique or unstable geology observed in the Project Area. Shallow soils and rock outcrops are common on this steep terrain, and generally rippable as observed on existing roads. Soils are shallow to deep very gravelly loams (mainly Winkler series) on slopes ranging mainly between 30-60%. Soils are derived from underlying sedimentary and metasedimentary rock (quartzite/argillite).

- The proposed harvest areas on the south-facing slopes are Winkler very gravelly sandy loam on 30 to 60 percent slopes (131). Low erosion risk (Kf and Kw < 0.23 in upper 10 inches of the soil profile).
- The proposed harvest areas on the north-facing slopes are Winkler-Kadygulch complex soils on 30 to 60 percent slopes (133). These soils have a slightly higher risk of erosion compared to the north-facing soils with moderate erosion factors (Kf and Kw range between 0.10 and 0.32 in the upper portion of the soil profile).
- Proposed harvest units 3 and 4 are in Evaro gravelly loam on 30 to 60 percent slopes (37). These soils are also a moderate erosion risk (erosion factors Kf and Kw range between 0.10 and 0.28 in the upper portion of the soil profile).

Soils on the southern aspects are droughty and would be slow to regenerate tree seedlings due to the relative aridity and slope angles of these areas. The poor conifer regeneration in the area of the *Mile Marker 124 Fire* (2007) could be at least partially attributed to poor soil quality and heat exposure. These areas are moderately steep (30-60%) and southeast facing at elevations between 4200 and 5200 feet and are currently heavily grassed and/or covered with Ceanothus velutinous. Retaining some shade as tree cover, slash, and coarse woody debris as described in the proposed silvicultural treatments can help extend soil moisture reserves and moderate surface temperatures in the drier months. The project area is not currently grazed by cattle.

Soil Disturbance and Productivity	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Physical Disturbance (Compaction and Displacement)	**X**				**X**				**X**				**N/A**	**1**
Erosion	**X**				**X**				**X**				**N/A**	**1**
Nutrient Cycling	**X**				**X**				**X**				**N/A**	**1**
Slope Stability	**X**				**X**				**X**				**N/A**	**1**
Soil Productivity	**X**				**X**				**X**				**N/A**	**1**
Action														

Soil Disturbance and Productivity	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Physical Disturbance (Compaction and Displacement)		**X**				**X**				**X**			**Y**	**2, 3, 4**
Erosion		**X**				**X**			**X**				**Y**	**2, 3**
Nutrient Cycling		**X**				**X**				**X**			**Y**	**2, 5, 7, 8**
Slope Stability	**X**				**X**				**X**				**N/A**	**6**
Soil Productivity		**X**				**X**				**X**			**Y**	**2, 5, 7, 8**

T 3: Proposed Action and No-Action impacts on soil disturbance and productivity.

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. 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, the DNRC Trust Lands Habitat Conservation Plan, and the State Forest Land Management Plan.

3. In proposed harvest units with combined harvest methods (ground, line-based, and potentially tethered) risk of excessive displacement and erosion of soils increase with slope. Soils on the southern aspects are droughty and would be slow to regenerate if lost. Soil and vegetation disturbance from harvest activities may result in temporary increased risk of erosion.

4. Direct impacts by physical disturbance would likely occur by the proposed ground-based yarding. The net observable soil impact within harvest units treated with ground-based yarding system(s) are expected to be less than 13.2% of the Project Area and would be minimized by use of existing roads and skid trails. This disturbance rate estimate is based off previous soil disturbance monitoring of timber sales completed by the DNRC (DNRC, 2011).

5. According to Graham et al. (1994), a minimum of 7 tons/acre of coarse woody debris (CWD) would be a desired post-harvest condition to maintain forest productivity for this forest habitat type. The Action Alternative would moderately impact the direct effects of nutrient cycling, including increasing or maintaining CWD concentrations per mitigation described below.

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

7. Site preparation by prescribed burning may occur in the Project Area. These activities would be directed by the Forest Officer and are not anticipated to cause detrimental disturbance to Project Area soils. Areas with these types of slight disturbances can be quickly revegetated by tree seedlings and native vegetation (per State Forest Land Management Plan).

8. Site preparation by herbicide application may occur in the Project Area. These activities would be directed by the Forest Officer and risk to soil resources would depend on type of herbicide, timing of application, location and extent of application, and method of application. These risks are assumed to be moderated to low when used according to label recommendations and safety precautions; and applied under the supervision of a licensed and insured applicator.

Soil Mitigations:

- BMP's would be implemented on all roads and within the units. A portion of lopped and scattered slash would be left in the units to mitigate erosion risks and retain nutrients on-site.

- Ground-based logging equipment (tractors, skidders, and mechanical harvesters) would be limited to slopes less than 45% unless not causing excessive disturbance.

- The Contractor and Sale Administrator would agree to a general skidding plan prior to equipment operations. Skid trails would be mitigated as needed and concurrent with harvesting and yarding operations with water bars and/or slash.

- The properties of the soils in the proposed harvest units make limiting harvest operations to dry or frozen conditions critical for preserving soil productivity. 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.

- For nutrient retention, a minimum of 7 tons/acre of coarse and fine woody debris would be left on site (or return-skidded from landings). Existing CWD on site would remain undisturbed as much as possible.

- If herbicide is used for site preparation ensure the herbicide used is for intended use (site preparation, tree plantings, weed control, etc.), and label recommendations and safety precautions are followed. All herbicide application would occur under the supervision of a licensed and insured applicator. A record of herbicide quantities, label requirements, and application conditions in project file to allow for post-monitoring and/or follow-up would be documented.

Soil References:

DNRC, 2011. DNRC compiled soils monitoring report on timber harvest projects, 2006-2010, 1st Edition. Department of Natural Resources and Conservation, Forest Management Bureau, Missoula, MT.

Graham, R.T., Harvey, A.E., Jorgensen, M.F., Jain, T.B., and Page-Dumrose, D.S., 1994, Managing Course Woody Debris in Forests of the Rocky Mountains. U.S., Forest Service Research Paper INT-RP-477. Intermountain Research Station. 16p.

WATER QUALITY AND QUANTITY:

Water Quality and Quantity Existing Conditions:

The majority of the proposed harvest area is in the Starvation Creek watershed. The remaining portion of the proposed harvest area is on north facing slopes that drain towards an unnamed draw that drains towards the Clinton District Irrigation Canal but has no surface connection. Starvation Creek is a perennial stream that carries Westslope Cutthroat Trout based on FWP data (FWP, 2024). Proposed harvest areas (unit 6) are adjacent to an unnamed Class 1 tributary to Starvation Creek. This tributary is assumed to not carry fish based on channel size and grade. Proposed harvest areas would remain outside the SMZ and RMZ of this channel. Additional harvest areas occur near ephemeral Class 3 streams that occur in a draw that drains towards Starvation Creek; however the stream channels do not maintain a surface connection.

The proposed haul route is adjacent to Wallace Creek for approximately 1 mile east of the reservoir located on the main channel east of Clinton, MT. Fish are assumed to not be present in Wallace Creek based on fish distribution mapped by Montana Fish Wildlife and Parks (FWP), however the reservoir is reported to carry Westslope Cutthroat Trout (FWP, 2024). Wallace Creek is listed as impaired due to contamination associated with local mining history (DEQ, 2013). Several mines and a mill to process copper ore was located adjacent to the creek (DEQ, 2013). The millsite is now operated as a gravel pit (DEQ, 2013).

Water Quality & Quantity	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Water Quality	**X**					**X**			**X**				**Y**	**1**
Water Quantity	**X**				**X**				**X**				**N/A**	**1**
Action														
Water Quality		**X**				**X**				**X**			**Y**	**2, 3, 5**
Water Quantity	**X**				**X**				**X**				**N/A**	**3, 4**

T 4: Proposed Action and No-Action impacts on water quality and quantity.

Comments:

1. With no action, no timber harvesting or related activities would occur. Water quality conditions would likely persist similar to its current condition, including identified

washout/gullying delivery to Wallace Creek from the haul route. With no action there would be no risk of change to current fluctuations in annual water yield or stream flow.

2. 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, the DNRC Trust Lands Habitat Conservation Plan, and the State Forest Land Management Plan.

3. An existing road fill washout/gulley occurs where the road outside of County maintenance and immediately adjacent to Wallace Creek approximately 0.5 miles east of the Wallace Creek reservoir. Repair of the spot would require redirecting/relieving road drainage above the washout, and replacement of road fill and armoring with rock and/or high-root strength vegetation such as woody shrubs. See mitigation listed below.

4. Changes to steam flow hydrology (water quantity or water flow) are not expected to be detectible with the Action Alternative within Starvation Creek or the unnamed tributary north of the proposed Project Area. Proposed harvest areas would affect less than 10% of each watershed. 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). Post-harvest we expect at least 90% of vegetation within the watershed to remain when combined with non-treatment areas. Therefore, streamflow change is not expected to be observable or present a risk to water and riparian resources.

5. Site preparation by chemical herbicide application could have an adverse direct effect on water resources if transported or delivered to surface waters. These risks are assumed to be moderated to low when herbicide use, and application are according to label recommendations and safety precautions; and applied under the supervision of a licensed and insured applicator.

Water Quality & Quantity Mitigations:

- Implement sediment control BMPs at stream crossings during the proposed project hauling operations. Options for sediment control include slash filter windrow, straw or wood waddles, and/or silt fence. Remove temporary control BMPs and stabilize captured sediment (i.e., by shaping or grass seeding) at the conclusion of the proposed project hauling operations.

- If prescribed burning is applied to the Project Area and excavated perimeter line (hand line) is installed, installation of water bars in initial excavation work would occur as needed.

- If herbicide is used for site preparation ensure herbicide is used is for intended use (site preparation, tree plantings, weed control, etc.). Completed herbicide application would occur under the supervision of a licensed and insured applicator. Clearly documented

and field-marked communication on the location of sensitive, non-target areas, that must be avoided and/or buffered during application including lakes, streams, irrigation ditches, SMZs, wetlands, and/or other bodies of water would occur. A record of herbicide quantities, label requirements, and application conditions in the project file to allow for post-monitoring and/or follow-up would be documented.

Water References:

Bosch, J.M. and J.D. Hewlett. 1982. A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration. J. Hydrology, 55: 3-23.

Montana DEQ. 2013. Bonita-Superior Metals TMDLs. Helena, MT: Montana Dept. of Environmental Quality.

Montana Fish, Wildlife and Parks. 2013. Montana's Fisheries Information System (MFISH). http://fwp.mt.gov/fishing/mFish/. Accessed 2/20/2013.

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

FISHERIES:

Fisheries Existing Conditions: Fisheries populations are present in Starvation Creek and the reservoir on Wallace Creek.

No-Action: No direct or indirect impacts would occur to affected fish species or affected fisheries resources beyond those described in Fisheries Existing Conditions. Cumulative effects (other related past and present factors; other future, related actions; and any impacts described in Fisheries Existing Conditions) would continue to occur.

Action Alternative (see Fisheries table below):

Fisheries	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Sediment	**X**				**X**				**X**				**N/A**	**1**
Flow Regimes	**X**				**X**				**X**				**N/A**	**1**
Woody Debris	**X**				**X**				**X**				**N/A**	**1**
Stream Shading	**X**				**X**				**X**				**N/A**	**1**
Stream Temperature	**X**				**X**				**X**				**N/A**	**1**
Connectivity	**X**				**X**				**X**				**N/A**	**1**
Populations	**X**				**X**				**X**				**N/A**	**1**

Fisheries	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Action														
Sediment		**X**				**X**				**X**			**Y**	**2**
Flow Regimes	**X**				**X**				**X**				**N/A**	**3**
Woody Debris	**X**				**X**				**X**				**N/A**	**4**
Stream Shading	**X**				**X**				**X**				**N/A**	**4**
Stream Temperature	**X**				**X**				**X**				**N/A**	**4**
Connectivity	**X**				**X**				**X**				**N/A**	**4**
Populations	**X**				**X**				**X**				**N/A**	**4, 5**

T 5: Action and No-Action Alternative impacts on fisheries.

Comments:

1. With no action, no timber harvesting or related activities would occur. Existing conditions would likely persist similar to its current condition.
2. Proposed timber haul route would be adjacent to fish-bearing waters along Wallace Creek Road. Short-term increases in sediment turbidity may occur during hauling.
3. As is discussed in the Water Resources section of this analysis, changes to stream flow hydrology are not expected to be detectible in fish-bearing streams with the Action Alternative.
4. Woody debris, stream shading, stream temperature, and habitat connectivity would not be affected by the proposed project.
5. Proposed timber harvest activities are not expected to have a direct effect on fisheries resources including habitat qualities due to the following factors:
   - No known fish passage barriers are present on DNRC ownership in the Project Area.
   - No riparian timber harvest is proposed as a part of the Action Alternative.
   - Proposed timber harvest units are greater than 1,000 feet from any known fish-bearing waterbody.

Fisheries Mitigations:

- Effects to fish and fish habitat from the proposed project are limited to where the haul route runs adjacent to Wallace Creek and Reservoir. Potential effects would be minimized with maintenance and improvement of road drainage BMPs during implementation of the proposed project (Action Alternative).

WILDLIFE:

Evaluation of the impacts of the No-Action and Action Alternatives including **direct, indirect, and cumulative** effects on Wildlife.

Wildlife Existing Conditions: The Project Area is a mix of forested ponderosa pine and Douglas-fir saw timber stands, younger seedling/sapling ponderosa pine and Douglas-fir stands, as well as non-stocked stands resulting from wildfire activity and past timber management. The Project Area contains habitat for a diverse array of wildlife that rely on the upland coniferous forests of western Montana. Grizzly bears may use the vicinity of the Project Area during the non-denning period. Little or no use of the Project Area by wolverine would be anticipated. Portions of the Project Area are within the home range associated with the Rock Creek Mouth bald eagle territory. Potential habitat exists for flammulated owls and pileated woodpeckers in the Project Area. Potential fringed myotis and Townsend's big-eared bat foraging habitats may exist in the Project Area; some potential hoary bat roosting habitats could exist in the Project Area. Big game summer range as well as white-tailed deer, mule deer, elk, and moose winter ranges exist in the Project Area. The Project Area is on the edge of the area the Lower Blackfoot herd utilizes; habitats in the Project Area could serve as winter range or summer range for bighorn sheep. Habitats in the Project Area contribute to big game security habitats in the vicinity.

No-Action: No potential for disturbance to wildlife would be anticipated. No timber management or associated activities would be conducted, thus no appreciable changes to existing habitats would occur. Continued maturation could improve grizzly bear and pileated woodpecker habitats, as well as big game winter and summer range attributes, but could reduce habitat quality for flammulated owls and big game forage attributes over the long term. No changes to large diameter trees or snags would occur in the Project Area. Non-forested habitats would likely persist in the old Mile Marker 124 fire burn scar. Generally, negligible direct, indirect, or cumulative effects to wildlife would occur.

Action Alternative (see Wildlife table below):
Roughly 254 acres of forested habitats, including 61 acres (47%) of existing mature Douglas-fir and ponderosa pine stands with reasonably closed canopies would be commercially harvested. In general, habitats for those species adapted to more-open stands of ponderosa pine and Douglas-fir similar to areas that historically experienced frequent, low-intensity, under burns and somewhat less frequent mixed-severity burns would increase in the Project Area. Conversely habitats for wildlife species that prefer somewhat dense, mature Douglas-fir and ponderosa pine stands would be reduced. Across proposed units, reductions in canopy cover would be anticipated, but proposed prescriptions would retain numerous large trees, which could continue to provide habitats for a variety of wildlife species that rely on larger ponderosa pine and Douglas-fir. Some reductions in visual screening would occur. Prescriptions would retain at least 2 large snags and 2 large recruitment trees per acre (both >21 inches dbh where they exist, otherwise next largest size class available) and where sufficient snags are not available additional large leave trees would be retained to meet this requirement. Proposed pre-commercial thinning could reduce some horizontal cover; proposed herbicide application would further reduce horizontal cover and remove grass and shrubs for up to 3 years that may be forage or structure used by wildlife species. Anticipated regeneration would improve hiding cover and forage resources in the near-term. Short-term increases in disturbance potential associated with proposed road construction and use, timber management, site preparation, and pre-commercial thinning would be anticipated, but overall, a negligible increase in potential human disturbance would be anticipated following proposed treatments. No changes in legal motorized public access would occur in the Project Area. Contract stipulations would minimize the presence of human-related attractants for the duration of the proposed activities.

Wildlife	Effects								Can Impact be Mitigated?	Comment Number
	Direct and Indirect				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High		
Threatened and Endangered Species										
Grizzly bear *(Ursus arctos)* Habitat: Recovery areas, security from human activity		**X**				**X**			**Y**	**1**
Canada lynx (*Felix lynx)* Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zone	**X**				**X**					**2**
Yellow-Billed Cuckoo (*Coccyzus americanus*) Habitat: Deciduous forest stands of 25 acres or more with dense understories and in Montana these areas are generally found in large river bottoms	**X**				**X**					**2**
Wolverine *(Gulo gulo)* Habitat: Alpine tundra and high-elevation boreal forests that maintain deep persistent snow into late spring		**X**				**X**				**3**
Sensitive Species										
Bald eagle *(Haliaeetus leucocephalus)* Habitat: Late-successional forest less than 1 mile from open water		**X**				**X**			**Y**	**4**
Black-backed woodpecker *(Picoides arcticus)*	**X**				**X**					**2**

Wildlife	Effects								Can Impact be Mitigated?	Comment Number
	Direct and Indirect				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High		
Habitat: Mature to old burned or beetle-infested forest										
Fisher *(Martes pennanti)* Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian	**X**				**X**					**2**
Flammulated owl *(Otus flammeolus)* Habitat: Late-successional ponderosa pine and Douglas-fir forest		**X**				**X**			**Y**	**5**
Fringed myotis (*Myotis thysanodes*) Habitat: low elevation ponderosa pine, Douglas-fir and riparian forest with diverse roost sites including outcrops, caves, mines		**X**				**X**			**Y**	**6**
Hoary bat (*Lasiurus cinereus*) Habitat: coniferous and deciduous forests and roost on foliage in trees, under bark, in snags, bridges		**X**				**X**			**Y**	**7**
Peregrine falcon *(Falco peregrinus)* Habitat: Cliff features near open foraging areas and/or wetlands	**X**				**X**					**2**
Pileated woodpecker *(Dryocopus pileatus)* Habitat: Late-successional ponderosa pine and larch-fir forest			**X**			**X**			**Y**	**8**

Wildlife	Effects								Can Impact be Mitigated?	Comment Number
	Direct and Indirect				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High		
Townsend's big-eared bat *(Plecotus townsendii)* Habitat: Caves, caverns, old mines	**X**				**X**					**9**
Big Game Species										
Elk		**X**				**X**			**Y**	**10,11**
Whitetail deer		**X**				**X**			**Y**	**10,11**
Mule Deer		**X**				**X**			**Y**	**10,11**
Moose		**X**				**X**			**Y**	**10,11**
Bighorn Sheep		**X**				**X**			**Y**	**12**

T 6: Action and No-Action impacts on wildlife.

Comments:

W-1 The Project Area is 16 miles south of the Northern Continental Divide Ecosystem grizzly bear recovery area, and 16 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). Individual animals could use the Project Area throughout the non-denning period; FWP data indicates the area is used by grizzly bears and that forested areas in the vicinity offer bedding and hiding cover. Approximately 275 acres (43%) of the Project Area appear to have sufficient cover to potentially serve as hiding cover for grizzly bears. The Project Area contains no open roads, but existing open habitats as well as proximity to numerous forms of human disturbance likely reduces overall usefulness of the Project Area for grizzly bears. No grizzly bear security habitats (≥ 0.3 miles from roads receiving motorized use and ≥2,500 acres in size) exist in the Project Area and the Project Area does not contribute to any blocks of security habitats in the vicinity either.

Grizzly bears could be affected directly through increased road traffic, noise, and human activity, and indirectly by altering the amount of hiding cover and forage resources in the Project Area. Proposed activities could occur during the denning period or the non-denning period. Proposed activities conducted in the denning period would not be expected to disturb grizzly bears; some disturbance to grizzly bears would be possible with proposed activities that may occur during the non-denning period. Overall, the proposed activities would occur in areas where grizzly bear use would be anticipated, thus potential for disturbance and displacement of grizzly bears would be anticipated.

Approximately 1.0 mile of new permanent road and 0.6 miles of temporary roads would be constructed with the proposed activities. No changes in open road density or motorized public access would be anticipated. Negligible changes to non-motorized public access could occur, thus no appreciable changes in contact between humans and grizzly bears would occur. Hiding cover would be reduced on most of the 185 acres (67%) of hiding cover proposed to receive commercial treatments. Meanwhile, proposed activities in habitats that are not presently providing hiding cover (74 acres) would slow the development of those attributes into the future. Some hiding cover in the form of brush, shrubs, and sub-merchantable trees would persist in several of the units, albeit at a reduced level from the existing condition. Additional reductions in

grizzly bear hiding cover would occur with the proposed pre-commercial thinning, including roughly 56 acres that are currently providing hiding cover, but hiding cover would be expected to persist in those areas. Proposed herbicide application on 151 acres would reduce some minimal hiding cover and remove potential forage resources for up to 3 years. Anticipated regeneration over the next 5-15 years in areas proposed for herbicide application would be expected to improve hiding cover for grizzly bears should they be in the vicinity. Overall, hiding cover would increase through time across all proposed units as young trees and shrubs regenerate over the next 5 to 15 years. Generally, reductions in hiding cover would occur, but would not alter any grizzly bear security habitats in the vicinity. Any unnatural bear foods or attractants (such as garbage) would be kept in a bear resistant manner. Any added risk to grizzly bears associated with unnatural bear foods or attractants would be minimal. Continued use of the Project Area and cumulative effects analysis area by grizzly bears would be anticipated at levels similar to present.

W-2 The Project Area is either out of the range of the normal distribution for this species or suitable habitat is not present. Thus, no direct, indirect, or cumulative effects would be anticipated.

W-3 Generally wolverines are found in sparsely inhabited remote areas near treeline 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 potentially deep persistent spring snow occur in the vicinity. Individual animals could occasionally use lands in the Project Area while dispersing or possibly foraging, and they could be displaced by 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 the 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.

W-4 Portions of the Project Area are within the home range associated with the Rock Creek Mouth bald eagle territory. This territory experiences considerable levels of human disturbance associated with Highway 90, the Montana Rail Link railroad, human residences, agricultural operations, timber management, and various forms of summer and winter recreation. Topography between the Project Area and the portion of the Project Area within the home range largely screens the nest site from the Project Area. Proposed activities could occur during the nesting season (February 1-August 15), or the non-nesting (August 16-February 1) season. Negligible disturbance to bald eagles could occur for any activities that could be conducted during the nesting period. 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 in the Project Area that could be used as nest or perch trees in the home range could occur, but any reductions would be fairly distant from the existing nest and riparian areas typically used by bald eagles. Any reductions in the availability of large snags or emergent trees would only occur in a small portion of the home range, which would be additive to past and ongoing activities within the home range. No changes to human access to the home range would occur, thereby limiting potential for introducing additional human disturbance to the territory. No appreciable changes to bald eagle habitats would be anticipated from the proposed pre-commercial thinning or herbicide application.

W-5 Roughly 397 acres (62% of the Project Area) of potential flammulated owl habitats exist in the Project Area in dry ponderosa pine and Douglas-fir stands. Some suitable habitats likely

exist on a portion of the 2,447 acres (48% of non-DNRC-managed lands) of open and closed forested habitats on other ownerships in the cumulative effects analysis area; however, portions of these forested areas are not likely preferred flammulated owl habitat types. Elsewhere in the cumulative effects analysis area, some of the forested habitats have been harvested in the 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 and/or Douglas-fir was not necessarily a consideration in some of these harvest units, thereby minimizing the benefits to flammulated owls.

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 could overlap the nestling and fledgling periods, which has the potential to disturb nesting flammulated owls. Since some snags and large trees would be retained, loss of nest trees would be expected to be minimal. Proposed commercial activities on 152 acres of potential flammulated owl habitats (38% of the habitats in the Project Area) would open the canopy while favoring ponderosa pine, western larch, and Douglas-fir. The proposed treatments would reduce canopy closure and improve foraging habitats. Negligible changes to flammulated owl foraging habitats would be anticipated with the proposed pre-commercial thinning on 71 acres (18%). Prescribed herbicide application on roughly 70 acres (18%) of grass and shrubs that are lower quality foraging habitats could further reduce foraging habitats, but the anticipated regeneration in those units could improve foraging habitats more quickly than if left to natural regeneration. Overall the more open stand conditions, the retention of fire adapted tree species, and the maintenance of existing snags would move the Project Area toward historical conditions, which is preferred flammulated owl habitat. Disturbance in flammulated owl habitats would occur on a small portion of the cumulative effects analysis area and could be additive to ongoing activities in the area. Proposed activities would increase the amount of the cumulative effects analysis area that has been recently harvested, which would add to the amounts of foraging habitats available, but possibly at the expense of losing snags and large trees important for nesting. Overall, no change in the amount of potential flammulated owl habitats would occur 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.

W-6 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 been documented in the vicinity of the Project Area, and since suitable habitat exists, some use by fringed myotis is possible. Proposed activities could disturb fringed myotis should they be in the area during proposed activities. 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, negligible changes to fringed myotis use of the Project Area or cumulative effects analysis areas would be anticipated.

W-7 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, primarily in trees, but will use also use caves, other nests, and human structures. Some use of the Project Area by Hoary bats would be possible given the

varied habitats present and the proximity to the Clark Fork River, Starvation Creek, Rock Creek, and numerous other smaller riparian areas. 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. Hoary bats have been documented in the vicinity of the Project Area along Cramer Creek. Proposed activities could disturb hoary bats should they be in the area during proposed activities, but disturbance generally outside of the summer months would not be expected to disturb hoary bats. Loss of potential roosting habitats could occur, but considerable amounts of trees would persist in the project and cumulative effects analysis areas. No changes in foraging habitats would be anticipated. Overall, negligible changes to hoary bat use of the Project Area or cumulative effects analysis areas would be anticipated.

W-8 Roughly 109 acres (17% of the Project Area) of potential pileated woodpecker nesting habitat exist in the Project Area; another 158 acres (25%) of potential foraging habitats exist in the Project Area. Some suitable habitats likely exist on a portion of the 1,274 acres (25% of non-DNRC lands) of forested habitats on other ownerships in the cumulative effects analysis area. Much of the 3,828 acres (75%) of shrubs, herbaceous areas, poorly stocked forested stands, and recently harvested stands on other ownerships in the cumulative effects analysis area is likely too open to be useful to pileated woodpeckers.

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. Roughly 102 acres (94%) of the potential nesting habitat along with 127 acres (80%) of potential foraging habitats would be harvested. Most of these stands proposed for treatment would be temporarily unsuitable for pileated woodpeckers due to the openness of the stands following proposed treatments, but some use could occur depending on the density of trees retained. Overall quality of these potential pileated woodpecker habitats would be reduced for 20-40 years. Elements of the forest structure important for nesting pileated woodpeckers, including snags, coarse woody debris, numerous leave trees, and snag recruits would be retained in the proposed harvest areas. Proposed pre-commercial thinning would not affect current pileated woodpecker habitats, but could expedite the movement of those stands towards future pileated woodpecker habitats. Proposed herbicide application would also be expected to have negligible effects to pileated woodpeckers, but could also expedite the movement of those stands towards future pileated woodpecker habitats. 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 259 acres proposed for commercial treatment. In the cumulative effects analysis area, the reduction in quality on 203 acres of potential nesting habitats and 127 acres of foraging habitats would further reduce available habitats and reduce the overall quality of the cumulative effects analysis area for pileated woodpeckers. Overall, a reduction in the quality of pileated woodpecker habitats in the cumulative effects analysis area would be anticipated, but continued use would be expected.

W-9 Townsend's big eared bats are year-round residents in Montana that is closely associated with caves, caverns, old mines. Townsend's big-eared bats feed on various nocturnal flying insects near the foliage of trees and shrubs. Townsend's big-eared bats have been documented in the vicinity of the Cramer Creek to the east of the Project Area. Some use of the Project Area by Townsend's big-eared bats would be possible given the varied habitats. Trees and shrubs in the Project Area could be used for foraging. No known caves, caverns, or other structures potentially used for roosting are known to occur in the Project Area or immediate vicinity. Proposed activities could disturb Townsend's big-eared bats should they be in the area during proposed activities. Loss of potential foraging habitats could occur, but considerable amounts of trees would persist in the project and cumulative effects analysis areas. No changes in roosting

habitats would be anticipated. Overall, negligible changes to Townsend's big-eared bats use of the Project Area or cumulative effects analysis areas would be anticipated.

W-10 White-tailed deer (223 acres, 35%), mule deer (254 acres, 40%), elk (155 acres, 24%), and moose (98 acres, 15%) winter ranges exist in the Project Area. Approximately 272 acres of the Project Area (43%) appear to have sufficient canopy closure to be providing snow intercept and thermal cover attributes for big game. Evidence of 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 and elk are fairly widespread in the lower elevation areas along the Clark Fork River. Roughly 10,411 acres (23%) of white-tailed deer, 12,263 acres (28%) of mule deer, 12,776 acres (29%) of elk, and 4,572 (10%) of moose winter ranges exist in the cumulative effects analysis area. There are roughly 8,639 acres (56%) of stands dominated by Douglas-fir, Douglas-fir/western larch, and ponderosa pine on DNRC-managed lands in the cumulative effects analysis area that appear to be providing snow intercept and thermal cover attributes for big game; approximately 9,733 acres (50%) of forested habitats on other ownerships in the cumulative effects analysis area appear to have sufficient canopy closure to provide thermal cover and snow intercept for big game, however portions of these habitats may be too high in elevation to be suitable for winter thermal cover. Human disturbance within the winter range is associated with residential development, agricultural activities, recreational snowmobile use, commercial timber management, several roadways, including Highway 90, and Montana Rail Link railroad.

Proposed activities could occur during the winter or non-winter periods. Some potential for disturbance to wintering big game could occur with any activities that may occur during the winter period. Proposed activities conducted during the non-winter period would not disturb wintering big game but could disturb big game species using the Project Area during the non-winter period, however given the time of the year, the general use patterns, and the availability of other habitats in the vicinity, the potential effect to big game would be minor. Proposed commercial harvesting activities would occur on roughly 103 acres (46%) of white-tailed deer winter range, roughly 108 acres (43%) of mule deer winter range, 33 acres (21%) of elk winter range, and 32 acres (33%) of moose winter range; proposed activities would reduce canopy closure and potential winter use by big game on roughly 211 acres (78%) 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. Some pockets of cover would persist in the Project Area that likely would provide thermal cover and snow intercept capacity for big game as well as opportunities to move through the area in areas of reduced snow loads. Within the proposed units, increases in forage production could benefit big game in the short-term. In general, it could take 30 to 50 years for the stands in the proposed units to regenerate and attain a size capable of providing thermal cover for big game. Proposed pre-commercial thinning would largely occur outside of mapped winter range (5 acres of white-tailed deer and mule deer winter range potentially affected) and largely on northerly aspects where extensive use by wintering big game would be unlikely; overall proposed pre-commercial thinning would not appreciably alter winter range attributes but could shorten the time before some of these stands could provide some of these attributes in the future. Similarly, proposed herbicide application would also largely avoid mapped winter ranges (14 acres of white-tailed deer winter range, 21 acres of mule deer winter range, 35 acres of elk winter range, and 7 acres of moose winter range potentially affected) and would occur in areas where snow intercept and thermal cover was previously removed by wildfire and subsequent salvage harvesting. Overall limited use would be anticipated during the winter, but this area may provide some foraging resources for wintering big game. Proposed herbicide application would largely remove forage resources in

those units for up to 3 years, which could alter how big game use those areas in the short-term, but should not alter long-term use of the area and anticipated regeneration in those units could become large enough to start providing thermal cover and snow intercept for big game in 30-60 years. Potential disturbance to wintering big game would be additive in the cumulative effects analysis area to other forms of disturbance, including timber management, numerous open roads, and a variety of human developments and human recreation. Further reductions in thermal cover and snow intercept would be additive to losses from recent timber management, residential land clearing, and other disturbances in the cumulative effects analysis area. Continued use of the larger winter ranges would be anticipated at levels similar to present levels following proposed treatments.

W-11 The Project Area is surrounded by a large piece of The Nature Conservancy lands that are enrolled in the Block Management Program, which facilitates non-motorized public access for the purpose of recreational hunting. There are numerous access points to the BMA, including some in the vicinity of the Project Area. Hiding cover (275 acres; 43%) is somewhat limited in portions of the Project Area due to past wildfires, past timber management, as well as the natural openness of some of the habitats in the Project Area; similarly hiding cover is moderate in the cumulative effects analysis area, with many of these same limiting factors influencing big game hiding cover. There are no open roads in the Project Area. Some non-motorized access to the Project Area exists given the proximity to open roads, the 6.3 miles of restricted roads (6.3 mi./sq. mi., simple linear calculation) in the Project Area, and the proximity to lands enrolled in the Block Management Program. Approximately 291 acres of the Project Area are distant enough from open roads and has adequate cover to be considered big game security habitats; this block contributes to a 483-acre block of big game security habitats in the vicinity. A small portion of this block (24 acres) were affected by the Mile Marker 124 fire in 2007, which removed some of the hiding cover in the Project Area. In the cumulative effects analysis area, access for recreational hunting is relatively high, with many open roads that facilitate access and numerous restricted roads that could be used for non-motorized use. Within the cumulative effects analysis area, at least 4 patches (minimum of 9,719 acres; 22%) of potential security habitat exist. Two of these patches extend beyond the cumulative effects analysis area and contribute to larger blocks of potential security habitats.

Tree density within proposed commercial harvest units would be reduced on approximately 259 acres, including roughly 158 acres (54%) of forested stands in the Project Area contributing to potential big game security habitats. Overall hiding cover would be reduced within the proposed units but could improve as trees and shrubs become reestablished in the openings over the next 10-20 years. The retention of structure within proposed units and unharvested areas between the various units, including riparian habitats would reduce the potential effects of the hiding cover reductions. Some increases in sight distance in the Project Area would be anticipated; these increases in sight distances could increase big game vulnerability to hunting mortality as hunters would be able to detect big game at longer distances in proposed units. Increases in forage production in proposed units could benefit big game in the short-term. No changes in open roads or motorized access for the general public would occur. During all phases of the project, any roads opened with project activities would be restricted to the public and closed after the completion of project activities. Minor increases in non-motorized access would occur with the proposed construction of 1.0 miles of new permanent road and 0.6 miles of temporary roads. Numerous contract stipulations would minimize the effect on the existing big game security habitat by prohibiting contractors from carrying firearms while conducting contract operations and prohibiting contractors from accessing restricted areas for other purposes, such as hunting. Proposed pre-commercial thinning could further reduce hiding cover quality for big game, including on 46 acres (16%) contributing to potential big game security habitats, but

cover would be expected to persist in proposed pre-commercial thinning units and in un-treated portions of the Project Area. Negligible changes in hiding cover and/or security habitats would be anticipated from the proposed herbicide application; anticipated regeneration over the next 5-15 years in units proposed to receive herbicide application could improve hiding cover and security habitats. Collectively, the alterations of cover could reduce the quality of big game security habitat in a small portion of the cumulative effects analysis area and would be additive to past reductions in the cumulative effects analysis area. No changes in public, motorized access or non-motorized access would be expected, which would not affect big game vulnerability in the cumulative effects analysis area. Hiding cover on a small amount (204 acres) of potential big game security habitats would be altered. Overall minor effects to big game security habitats would be expected given the small amount of area that would be altered, the location of those changes, the lack of changes in open roads in the Project Area, and the levels of use by big game in the vicinity; big game security habitats would persist in the cumulative effects. Negligible effects to big game survival would be anticipated.

W-12 The Lower Blackfoot bighorn sheep herd inhabits the vicinity of the Project Area and this herd may occasionally use the Project Area during the winter or non-winter periods. Generally, this population of sheep appears to be relatively stable to increasing given the limited hunting access (MFWP 2010). The Project Area is located in the mid elevations in the vicinity and likely serves as summer and winter range. Big horn sheep winter range tends to be low-elevation, south-facing slopes with escape cover in proximity to foraging areas (MFWP 2010). Portions of the Project Area likely provide these attributes in most normal winters; steeper terrain in the vicinity provide big horn sheep escape cover. Forage for big horn sheep in the Project Area has likely been reduced with modern fire suppression, Douglas-fir encroachment, and weed infestation. Ongoing timber management in the cumulative effects analysis area could be disturbing big horn sheep and/or altering existing habitats. Proposed activities that may occur during the winter months could disturb or displace wintering bighorn sheep. Similarly, any bighorn sheep use during the nonwinter period could be disturbed by proposed activities during those time periods, but would occur when sheep are likely using higher elevations. Generally, proposed activities could introduce noise and disturbance to bighorn sheep in the vicinity. Proposed activities would mimic natural fire regimes and could reverse some of the big horn sheep habitat degradation due to fire suppression and conifer encroachment that has occurred in the vicinity. Some increases in forage production could be possible with the increases in grasses that could develop under park-like ponderosa stands in the Project Area, but would be partially offset by the proposed herbicide application which would reduce forage resources for up to 3 years on roughly 151 acres of the Project Area. No long-term disturbance or loss of winter range attributes would occur and overall continued use of the vicinity by bighorn sheep would be expected following proposed activities.

Wildlife Mitigations:

- A DNRC biologist would be consulted if a threatened or endangered species is encountered to determine if additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (ARM 36.11.428 through 36.11.435) are needed.
- Motorized public access would be restricted at all times on restricted roads that are opened for harvesting activities; signs would be used during active periods and a physical closure (gate, barriers, equipment, etc.) would 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 would be managed according to *ARM 36.11.411* through *36.11.414*, particularly favoring western larch and 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.
- Contractors and purchasers conducting contract operations would be prohibited from carrying firearms while on duty.
- Food, garbage, and other attractants would be stored in a bear-resistant manner.
- Should a raptor nest be identified in or near project activities, activities will cease and a DNRC biologist would be contacted. Site-specific measures would be developed and implemented to protect the nest and birds prior to re-starting activities.
- Provide connectivity by maintaining corridors of unharvested and/or lighter harvested areas along riparian areas, ridge tops, and saddles.

Wildlife References

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AIR QUALITY:

Air Quality	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Smoke	**X**				**X**				**X**				**N/A**	**1**
Dust	**X**				**X**				**X**				**N/A**	**2**
Action														
Smoke		**X**				**X**			**X**				**Y**	**1**
Dust		**X**				**X**			**X**				**Y**	**2**

T 7: Action and No-Action impacts on air quality.

Comments:

1) Under the Action Alternative, slash piles consisting of tree limbs and tops and other vegetative debris would be created throughout the Project Area during timber harvesting. These slash piles would be burned at minimum 1-year post harvest during an approved open burn window. Following harvesting operations, prescribed fire may be used to prep soils for early seral species planting.
2) Dust could be created during hauling activities; however, the Action Alternative will have a low risk of direct, indirect, and cumulative effects on air quality by implementing the listed air quality mitigations.

Air Quality Mitigations:

- 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 only burn on approved days.
- Dust abatement will be applied as needed during hauling operations if excessive dust is created.

ARCHAEOLOGICAL SITES / AESTHETICS / DEMANDS ON ENVIRONMENTAL RESOURCES:

Will Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Historical or Archaeological Sites	**X**				**X**				**X**				**N/A**	**1**
Aesthetics	**X**				**X**				**X**				**N/A**	**1**
Demands on Environmental Resources of Land, Water, or Energy	**X**				**X**				**X**				**N/A**	
Action														
Historical or Archaeological Sites	**X**				**X**				**X**				**N/A**	**1**
Aesthetics		**X**				**X**			**X**				**Y**	**2**
Demands on Environmental Resources of Land, Water, or Energy	**X**				**X**				**X**				**N/A**	

T 8: Action and No-Action impacts on archaeological sites, aesthetics, and environmental resources.

Comments:

1) Scoping letters were sent to those Tribes that requested to be notified of DNRC timber sales. No response was returned that identified a specific cultural resource issue. 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 results revealed that no cultural or paleontological resources have been identified in the APE, but it should be noted that Class III level inventory work has not been conducted there to date. Because the topographic setting and geology suggest a low to moderate likelihood of the presence of cultural or palaeontologic resources, proposed timber harvest activities are expected to have *No Effect* to *Antiquities*. No additional archaeological investigative work would 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.

2) The Starvation Project Area is visible from the I-90 corridor as well as the town of Clinton. The most significant changes would be expected in units 1-4, with unit 1 being visible to the public. The Project Area is surrounded by former large industrial private ownership. Past forest management has produced areas of young single-aged stands as well as younger uneven-aged stands. However, the younger appearance of some of the adjacent stands still contrasts with the size and composition of the current Project Area. Implementation of the Action Alternative would result in a visible harvest entry, visible

pre-commercial thinning, and visible temporary road construction. Visual changes within the Project Area would be expected to be similar in residual tree density and road density to the surrounding ownerships adjacent to the Project Area.

Mitigations:

- 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.
- Silvicultural treatments would attempt to emulate natural disturbances, early seral species which are more fire-resistant would be preferred for leave trees (PP and WL). Leave trees would be selected based on species form, and vigor; leaving a more natural appearance, which would decrease contrast in form, line, color, and texture between past and current management activities and ownerships. Regeneration would be monitored post-harvest, and the Project Area would be planted as needed. As regeneration grows in height and volume, it would be expected that regeneration would fill visual openings and decrease the visual lines by between ownerships. Temporary roads would be retired and restored to BMP standards post-harvest. It would be expected that the grass seed would moderate the visual impacts of the road construction, especially on cut slopes.

Impacts on the Human Population

Evaluation of the impacts on the proposed action including **direct, secondary, and cumulative** impacts on the Human Population.

Will Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Health and Human Safety	**X**				**X**				**X**				**N/A**	
Industrial, Commercial and Agricultural Activities and Production	**X**				**X**				**X**				**N/A**	
Quantity and Distribution of Employment	**X**				**X**				**X**				**N/A**	
Local Tax Base and Tax Revenues	**X**				**X**				**X**				**N/A**	
Demand for Government Services	**X**				**X**				**X**				**N/A**	
Access To and Quality of Recreational and Wilderness Activities	**X**				**X**				**X**				**N/A**	
Density and Distribution of population and housing	**X**				**X**				**X**				**N/A**	
Social Structures and Mores	**X**				**X**				**X**				**N/A**	
Cultural Uniqueness and Diversity	**X**				**X**				**X**				**N/A**	
Action														
Health and Human Safety		**X**			**X**				**X**				**Y**	**1,2,3**
Industrial, Commercial and Agricultural Activities and Production	**X**				**X**				**X**				**N/A**	
Quantity and Distribution of Employment	**X**				**X**				**X**				**N/A**	
Local Tax Base and Tax Revenues	**X**				**X**				**X**				**N/A**	
Demand for Government Services	**X**				**X**				**X**				**N/A**	
Access To and Quality of		**X**			**X**				**X**				**Y**	**1**

Will Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Recreational and Wilderness Activities														
Density and Distribution of population and housing	**X**				**X**				**X**				**N/A**	
Social Structures and Mores	**X**				**X**				**X**				**N/A**	
Cultural Uniqueness and Diversity	**X**				**X**				**X**				**N/A**	

Comments:

1) There is always inherent risk associated with starting prescribed fires. Under the Action Alternative, both prescribed fires and slash pile burning can “escape” and burn into unintended areas. The unintentional consequences of this action may pose an impact to the health and human safety if an escaped burn escalates onto adjacent landowners within the wildland-urban interface.

2) Herbicide chemicals used for site preparation have the potential to cause health concerns when used incorrectly or “off-label”. Depending on the application method used, the impacts vary. The highest risk is to applicators and/or those working directly with the herbicide.

3) The proposed Project Area is used for hiking, hunting, and general recreating by non-motorized users with a conservation license (access to Project Area is through a locked gate on an open road with no public motorized use). The DNRC does not track specific recreational activities (non-special recreation use license users) within the Trust Land ownership in the Project Area. The proposed Action Alternative would include a possible public closure during the proposed implementation of the prescribed fire and/or herbicide site preparation. A possible public closure within the vicinity of proposed burn and herbicide unit would be needed to ensure both public and DNRC personnel safety during the implementation of the proposed site preparation activities. A temporary change of recreational usage during project implementation could occur but would be short in duration.

Mitigations:

- Signs would be posted at the anticipated public entry points to inform the public of the proposed site prep activities (RX fire/chemical). No public use restrictions would be imposed during the proposed Action Alternative activities outside of the proposed prescribed RX fire and herbicide site prep. Signs would be posted indicating that log

truck traffic and logging operations are present within the Project Area during the proposed new road construction and harvest activities.

- Prescribed fire would be implemented in accordance with the burn plan developed for the Project Area. Compliance with the burn plan will incorporate the necessary measures needed to maintain control of the burn. (i.e. hand line, engines, ground personnel, etc.)

- Herbicide application would be conducted by a licensed herbicide applicator. All label instructions would be followed to minimize the potential impacts to the health and human safety of the applicator, DNRC personnel, and the public.

Other Appropriate Social and Economic Circumstances:

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. The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find a market value for stumpage. These sales have similar species, quality, average diameter, product mix, terrain, date of sale, distance from mills, road building and logging systems, terms of sale, or anything that could affect a buyer's willingness to pay.

No-Action: The No Action alternative would not generate any return to the trust at this time.

Action: The timber harvest would generate additional revenue for the Common Schools Trust. The estimated return to the trust for the proposed harvest is $67,000 based on an estimated harvest of 1.2 MMBF (8378 tons) and an overall stumpage value of $8 per ton. 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.

The proposed pre-commercial thinning, prescribed burning/herbicide site prep, and planting would initially infer costs to the Trust; however, this would be an investment in increased productivity for the stand, an improvement in forest health, and moving toward DNRC goals and objectives . It would be expected this increased productivity would result in increased merchantable volume, available later. Direct costs associated with pre-commercial thinning (PCT) are estimated to be $21,600. This figure was estimated by multiplying the estimated number of PCT acres (72) by the estimated cost of $300/acre. This estimate is assumed from recent PCT projects contracted at SWLO (Southwestern Land Office). Direct costs associated with the proposed prescribed fire site prep are estimated to be $50,000 . Direct costs associated with the proposed herbicide site prep will vary based on delivery method and chemicals used. Aerial (drone) application could be as little as $5000.

Does the proposed action involve potential risks or adverse effects that are uncertain but extremely harmful if they were to occur?
No

Does the proposed action have impacts that are individually minor, but cumulatively significant or potentially significant?
No

Environmental Assessment Checklist Prepared By:

Name: Clark Cederberg
Title: Management Forester
Date: January, 13th, 2025

Finding

Alternative Selected
Action Alternative

Significance of Potential Impacts
The EA adequately addressed the issues identified during the project development, and displayed the information needed to make the pertinent decisions.

The ID Team provided sufficient opportunities for public review and comment during project development and analysis.

For the following reasons, I find that the implementation of the Action Alternative will not have significant impacts on the physical environment:

Vegetation - The Action Alternative will bring stands back to or maintain the Desired Future Condition (DFC). This will occur in commercial harvests as well as pre-commercial thinning and prescribed fire activities. There is no Old Growth within the project area. Trees impacted by insects and disease will be removed, leaving a more resilient stand condition in the understory and overstory. Proposed site preparation, including prescribed fire, will remove shade tolerant sub-merchantable trees and promote natural regeneration of seral species. An Integrated Weed Management approach will be implemented during operations. Including washing equipment prior to harvest operations. Weed spraying will take place within harvest units by licensed applicators.

Soil Disturbance and Productivity - Leaving 7 tons/acre of large, woody debris on site will provide for long-term soil productivity. Harvest mitigation measures such as skid trail planning,

appropriate harvest system utilization and season of use limitations will limit the potential for severe soil impacts.

Water Quality and Quantity - Water Quality Best Management Practices for Montana Forests (BMPs) and the Streamside Management Zone (SMZ) law will be strictly adhered to during all operations involved with the implementation of the Action Alternative. If prescribed fire control lines are constructed, erosion control measures will be constructed concurrently.

Fisheries - Due to log hauling being the only project activity taking place near a fish-bearing stream, it is unlikely that the proposed timber sale will affect large woody debris recruitment, shade or in stream temperature in any fish-bearing streams within the project area.

Wildlife - -The anticipated impacts to Wildlife under the proposal are expected to be low, with the only exception being the pileated woodpecker. The overall quality of potential pileated woodpecker habitats is expected to be reduced for 20-40 years. Elements of the forest structure important for nesting pileated woodpeckers, including snags, coarse woody debris, numerous leave trees, and snag recruits would be retained in the proposed harvest areas. Proposed pre-commercial thinning will not affect current pileated woodpecker habitats but will expedite the movement of those stands towards future pileated woodpecker habitats. Herbicide application is also expected to have negligible effects to pileated woodpeckers, but will also expedite the movement of those stands towards future pileated woodpecker habitats

Air Quality - Burning within the Project Area will 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. Dust abatement will be applied as needed during hauling operations if excessive dust is created.

Archaeological Sites / Aesthetics / Demands on Environmental Resources - A Class I (literature review) level review was conducted by the DNRC staff archaeologist for the area of potential effect (APE). The Class I search results revealed that no cultural or paleontological resources have been identified in the APE. 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.

The Starvation Project Area is visible from the I-90 corridor as well as the town of Clinton. Visual changes within the Project Area are expected to be similar in residual tree density and road density to the surrounding ownerships adjacent to the Project Area

For the following reasons, I find that the implementation of the Action Alternative will not have significant impacts on the physical environment:

Health and Human Safety - Prescribed fire will be implemented in accordance with the burn plan developed for the Project Area. Compliance with the burn plan will incorporate the necessary measures needed to maintain control of the burn. (i.e. hand line, engines, ground personnel, etc.)

Herbicide application will be conducted by a licensed herbicide applicator. All label instructions would be followed to minimize the potential impacts to the health and human safety of the applicator, DNRC personnel, and the public.

Access To and Quality of Recreational and Wilderness Activities - A temporary public closure within the vicinity of a prescribed burn and/or herbicide application may be used to ensure the safety of both public and DNRC personnel. Any temporary change of recreational usage from the temporary closure will be short in duration.

Other Appropriate Social and Economic Circumstances - Proposed non-commercial activities will be a cost to the impacted Trusts. However, implementation of these activities increases overall health and vigor in stands, which could shorten harvest rotation, allowing for more revenue generation. Commercial activities will provide approximately 67,000 in net short-term revenue (estimated based on current stumpage rates) and an additional $3.25/ton in Forest Improvement Fees and does not limit the DNRC's options for generating revenue from these sites in the future.

Need for Further Environmental Analysis

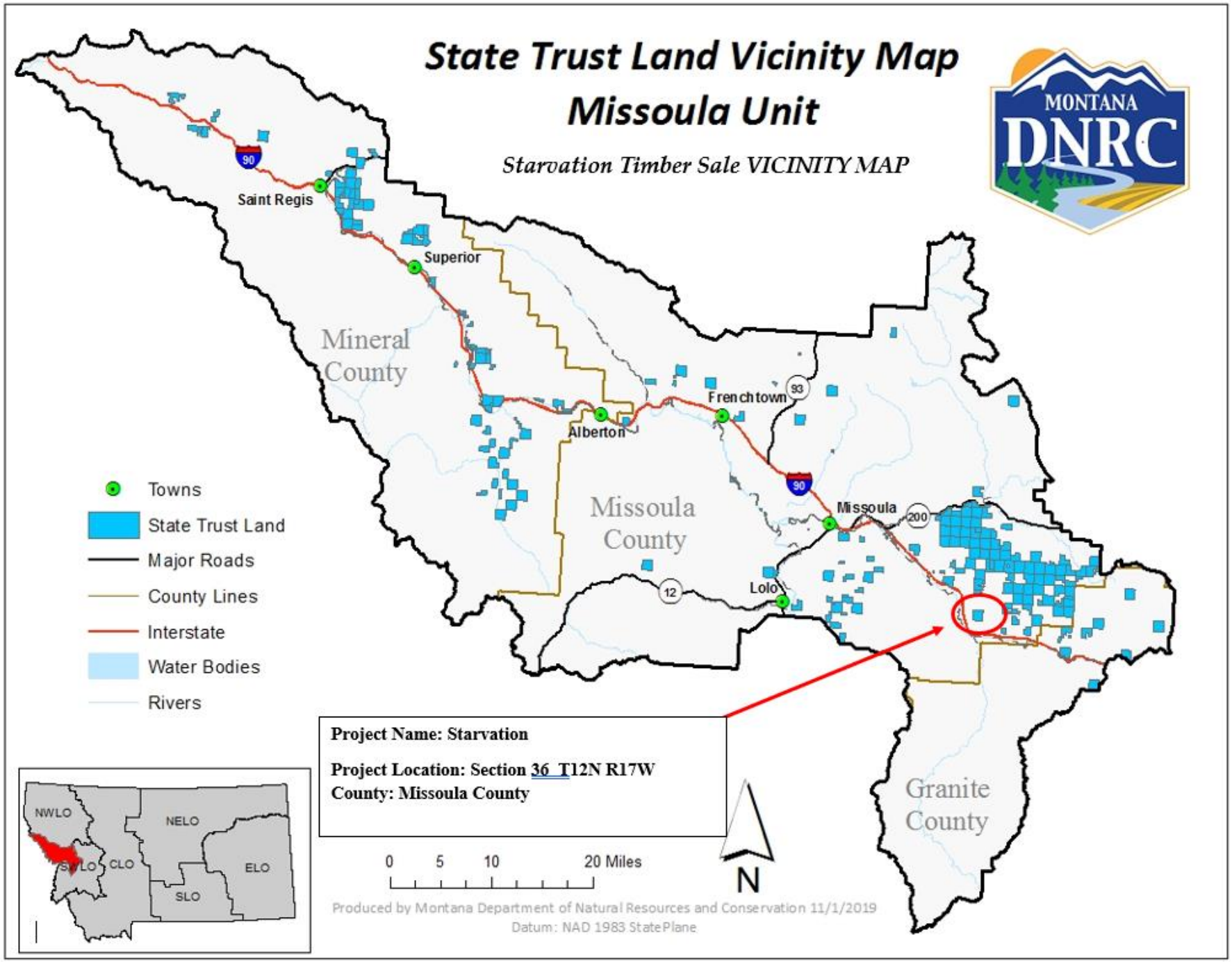
[ ]	EIS	[ ]	More Detailed EA	[X]	No Further Analysis

Environmental Assessment Checklist Approved By:

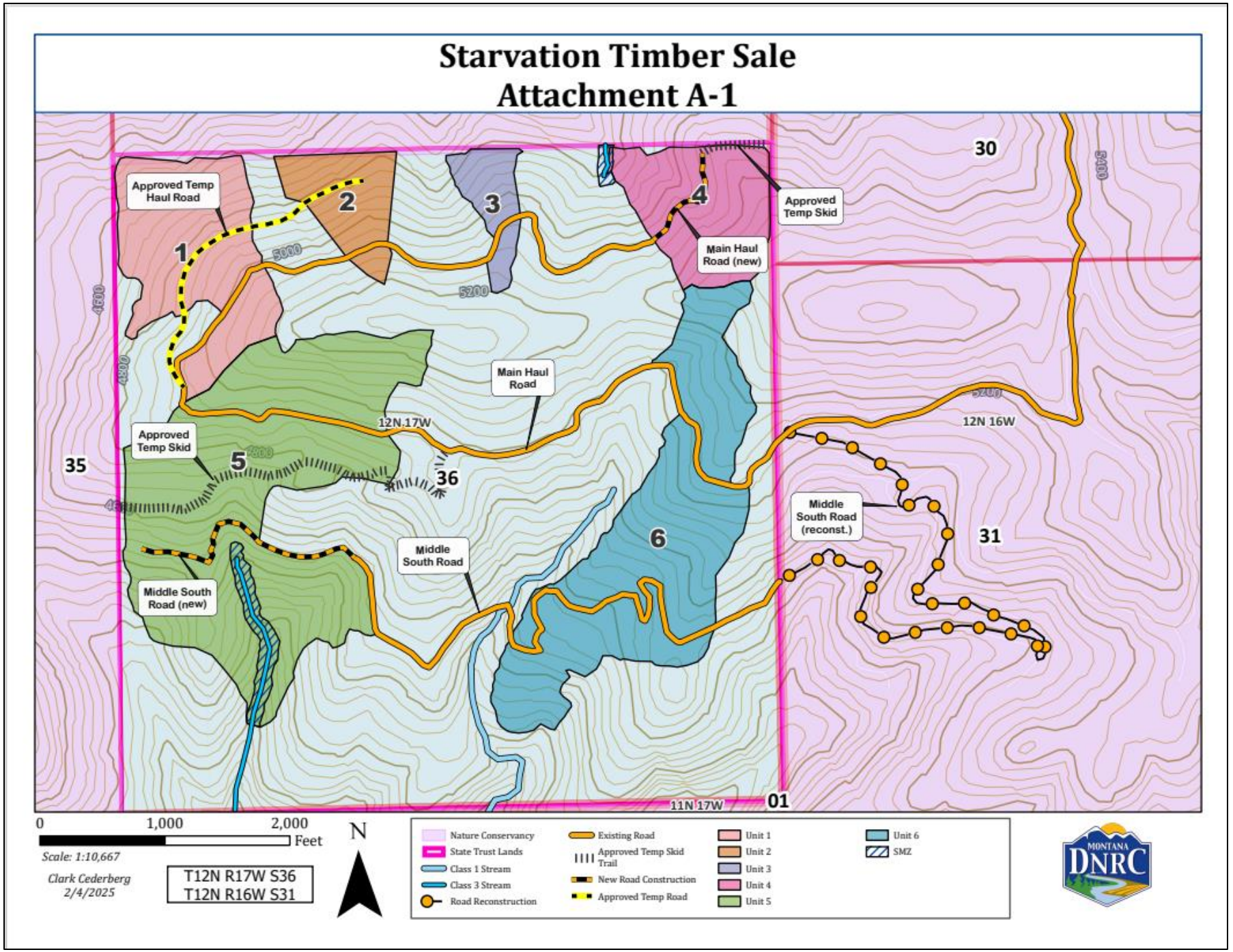
Name: Scott Allen
Title: Forest Management Supervisor Missoula Unit
Date: April 23, 2025
Signature: *Scott Allen*

Attachment A - Maps

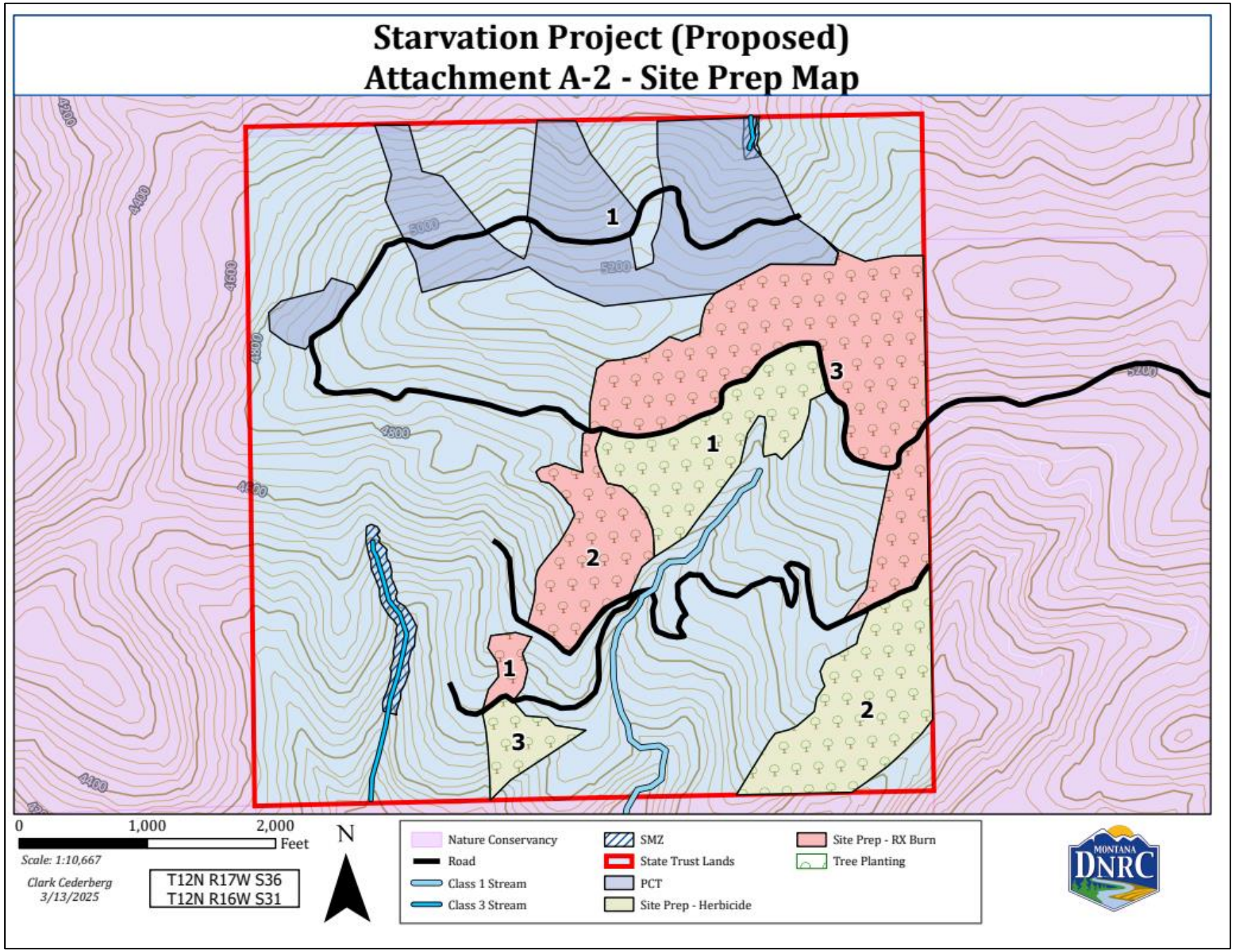
A: Timber Sale Vicinity Map



A-1: Proposed Timber Sale Harvest Unit Map



A-2: Proposed Site Prep Map



TRS: S36 T12N R17W	**ACRES: 37**
LAND OFFICE: Southwest Land Office	**EXPECTED MBF per ACRE: 7-8 MBF/ac**
UNIT OFFICE: Missoula	**EST. HARVEST VOLUME:** 296 MBF
SALE TYPE: Timber Sale	**PLANNED SALE DATE: 2025-2035, 10 yrs.**
EA/EIS NAME: Starvation	**PLANNED FY: 2025**
TIMBER SALE NAME: Starvation TS	**PROJECT PHASE: Analysis**
CUTTING UNIT: 1	**LAND OFFICE APPROVAL:**
AGE CLASS: 100-149	**ELEVATION:** 5000'
LOZENSKY TYPE Douglas-fir	**ASPECT:** Northwest
DESIRED COVER TYPE: Ponderosa Pine	**SLOPE (%):** 51-60%
HABITAT TYPE: PSME/PHMA-CARU	**FIELD CONTACT:** Cederberg C.

STAND DESCRIPTION	
Harvest unit 1 is composed of two smaller, well-stocked, two-storied Douglas-fir stands. The overstory composition consists of approximately 90% Douglas-fir and 10% ponderosa pine. Ponderosa pine only exists as a dominant or co-dominant species in the stand and is not represented in the mid-story or understory of the unit. The lower, steeper, skyline portion of the unit has well-established Douglas-fir regeneration in canopy openings and along old skid trails where previous ground disturbance occurred. The Douglas-fir in the proposed unit is currently exhibiting signs of defoliators and has poor crown vigor. Many of the individual Douglas-fir, and especially groups of Douglas-fir, have low live crown ratios (<30%) or dead tops.	

TREATMENT OBJECTIVES	**TARGET STAND CONDITIONS**
☑ Move stands toward desired future conditions	Post-harvest, unit 1 should consist of a distributed multi-storied canopy of Douglas-fir and ponderosa pine. The canopy will be patchy, as trees will be harvested individually and in groups. Conditions should mimic that of a low intensity disturbance, removing the weakest and lowest vigor trees in the stand. Only the highest quality (regardless of size class) trees should be retained. The density of leave trees should be around 30% of current stocking levels to capture all the highest risk trees, especially those that will not survive until the next entry. Ground disturbance should be sufficient (>30%) to encourage the establishment of regeneration. Large snags and snag recruits will be dispersed throughout the unit. Existing patches of advanced regeneration should remain intact.
☑ Emulate natural disturbance regimes	
☐ Promote/establish regeneration	
☑ Enhance stand growth and vigor	
☑ Address insect and disease issues	
☐ Reduce fuel loading/fire hazard	
☐ Capture value of dead/dying timber	
☑ Generate revenue for the trust beneficiaries	
☐ Other: (specify)	

PRESCRIBED TREATMENT			
Even-Aged Methods	**Uneven-Aged Methods**	**Intermediate Treatments**	**Salvage Treatments**
☐ Clearcutting	☑ Individual Tree Selection	☐ Overstory Removal	☐ Fire Salvage
☐ Seed Tree	☐ Group Selection	☐ Commercial Thinning	☐ Insect / Disease Salvage
☐ Shelterwood	☐ Old Growth Maintenance	☐ Sanitation	☐ Weather/Blowdown Salvage
☐ check if with reserves	☐ Old Growth Restoration	☐ Precommercial Thinning	☐ Other Salvage

HARVEST IMPLEMENTATION GUIDELINES	
Marking System: ☐ Cut Tree ☑ Leave Tree ☐ Sample Mark / Designate x Description ☐ Species Designation	
Number/Spacing/Size of Leave Trees:	**Retain 30% of current stocking from all size classes. Space pine at 50x50'**
Species Preference:	**Douglas-fir for removal**
Characteristics of cut or **leave** trees:	**Good vigor, well developed live crowns(>30%), minimal defects, pest free**
Number of Snags/Snag Recruits:	**2/2**
Additional Information:	

HARVEST METHOD				
Yarding: ☐ Tractor	☐ Skyline	☑ Combination	☐ Excaline	☐ Other: (specify)
Ground conditions:	☐ Dry	☐ Frozen	☐ Snow	☑ Other: (specify) As soil conditions allow.
Seasonal restrictions:	☐ Summer	☐ Winter	☑ Dates: (specify) All-Season	

Equipment types/restrictions: (rubber tires, tracks, cut-to-length, etc.) Tracks preferred to maximize disturbance
Skid trail location/spacing: Dispersed skidding where appropriate to encourage natural regeneration in openings
Additional Information: Portions of the units are tractor ground; the steeper terrain will require line or tethered equipment.

HAZARD REDUCTION / SLASH TREATMENT				
Slash disposal:	☑ Pile & burn (landings)	☐ Pile & burn (in-woods)	☐ Broadcast burn	☐ Jackpot burn
	☐ Masticate/Chip	☐ Lop & Scatter	☐ Hand Pile	☐ Other: (specify)
Nutrient Retention: Coarse woody debris (tons/ac): 5-15			☐ Return skid coarse/fine material	
Additional Information:				

SITE PREPARATION				
Method:	☑ Timber Sale/Dispersed Skidding	☐ Dozer	☐ Excavator	☐ Broadcast Burn
	☐ Slash unwanted regeneration	☐ Chemical/Herbicide	☐ Other: (specify)	
Target % scarification: 30%				
Additional Information:				

REGENERATION				
Type of Regeneration:	☑ Natural	☐ Planted	☑ Existing Advance	
Fill in below if planting:				
Estimated Number of Seedlings to Plant:				
Species:	☐ White Pine	☐ Western Larch	☐ Ponderosa Pine	☐ Douglas-fir
	☐ Spruce	☐ Lodgepole Pine	☐ Other: (specify)	
Additional Information:				

ANTICIPATED FUTURE TREATMENTS
List approximate dates of post-harvest treatments, including: Slash disposal/hazard reduction: One year, post-harvest during an open burn window Site preparation: Planting: Regeneration survey: 3 years post-harvest in natural regenerated stands

TRS: S36 T12N R17W	**ACRES: 39**
LAND OFFICE: Southwest Land Office	**EXPECTED MBF per ACRE: 6-7mbf/ac**
UNIT OFFICE: Missoula	**EST. HARVEST VOLUME:** 264 MBF
SALE TYPE: Timber Sale	**PLANNED SALE DATE: 2025-2035, 10 yrs.**
EA/EIS NAME: Starvation	**PLANNED FY: 2025**
TIMBER SALE NAME: Starvation TS	**PROJECT PHASE: Analysis**
CUTTING UNIT: 2/4	**LAND OFFICE APPROVAL:**
AGE CLASS: 100-149	**ELEVATION:** 5000
LOZENSKY TYPE Western Larch/Douglas-fir	**ASPECT:** North
DESIRED COVER TYPE: Western Larch/Douglas-fir	**SLOPE (%):** 51-60%
HABITAT TYPE: PSME/PHMA-CARU	**FIELD CONTACT:** Cederberg C.

STAND DESCRIPTION	
Harvest units 2 and 4 are comprised of stands with >10% western larch in the overstory. Douglas-fir is commonly found in the dominant and co-dominate canopy positions within the units. Both species are represented in the intermediate/suppressed canopy levels of the stands. A small portion (<1%) of the stands have sawtimber class sized ponderosa pine. Western larch is well-established and shows signs of high vigor in the stands with many trees exceeding 100' tall. The DF in the proposed unit exhibits low vigor and signs of budworm and/or other defoliator damage. DF live crown ratios are well below 30% in individuals, and especially in groups.	

TREATMENT OBJECTIVES	**TARGET STAND CONDITIONS**
☐ Move stands toward desired future conditions	Post-harvest, unit 2 and 4 should consist of a well distributed multi-storied canopy of Douglas-fir and western larch. The canopy will be patchy as trees will be harvested individually and in groups. Conditions should mimic that of a low intensity disturbance, removing the weakest and lowest vigor trees in the stand. Only the highest quality (regardless of size class) trees should be retained. The density of leave trees should be around 30% of current stocking levels to capture all high-risk trees, especially those that will not survive until the next entry. Dense patches of western larch will be opened up to allow for enough light penetration to establish regeneration within the stands. Snags and snag recruits 21"+ will be scattered throughout the units. Existing patches of advanced regeneration should remain intact.
☑ Emulate natural disturbance regimes	
☐ Promote/establish regeneration	
☑ Enhance stand growth and vigor	
☑ Address insect and disease issues	
☐ Reduce fuel loading/fire hazard	
☐ Capture value of dead/dying timber	
☑ Generate revenue for the trust beneficiaries	
☐ Other: (specify)	

PRESCRIBED TREATMENT			
Even-Aged Methods	**Uneven-Aged Methods**	**Intermediate Treatments**	**Salvage Treatments**
☐ Clearcutting	☑ Individual Tree Selection	☐ Overstory Removal	☐ Fire Salvage
☐ Seed Tree	☐ Group Selection	☐ Commercial Thinning	☐ Insect / Disease Salvage
☐ Shelterwood	☐ Old Growth Maintenance	☐ Sanitation	☐ Weather/Blowdown Salvage
☐ check if with reserves	☐ Old Growth Restoration	☐ Precommercial Thinning	☐ Other Salvage

HARVEST IMPLEMENTATION GUIDELINES	
Marking System: ☐ Cut Tree ☑ Leave Tree ☑ Sample Mark / Designate x Description ☐ Species Designation	
Number/Spacing/Size of Leave Trees:	**Retain 30% of current stocking from all size classes, Space western larch at 50x50.**
Species Preference:	**Douglas-fir for removal, low vigor western larch. Retain all pine**
Characteristics of cut or **leave** trees:	**Good vigor, well developed live crowns(>30%), minimal defects, pest free**
Number of Snags/Snag Recruits:	**2/2**
Additional Information:	**Western larch patch in SE of unit 4 marked to cut.**

HARVEST METHOD				
Yarding: ☐ Tractor	☐ Skyline	☑ Combination	☐ Excaline	☐ Other: (specify)
Ground conditions:	☐ Dry	☐ Frozen	☐ Snow	☑ Other: (specify) As soil conditions allow.
Seasonal restrictions:	☐ Summer	☐ Winter	☑ Dates: (specify) All-Season	

Equipment types/restrictions: (rubber tires, tracks, cut-to-length, etc.)
Skid trail location/spacing: Dispersed skidding where appropriate to encourage natural regeneration in openings
Additional Information: Portions of the units are tractor ground; the steeper terrain will require line or tethered equipment.

HAZARD REDUCTION / SLASH TREATMENT				
Slash disposal:	☑ Pile & burn (landings)	☐ Pile & burn (in-woods)	☐ Broadcast burn	☐ Jackpot burn
	☐ Masticate/Chip	☐ Lop & Scatter	☐ Hand Pile	☐ Other: (specify)
Nutrient Retention: Coarse woody debris (tons/ac): 5-15			☐ Return skid coarse/fine material	
Additional Information:				

SITE PREPARATION				
Method:	☑ Timber Sale/Dispersed Skidding	☐ Dozer	☐ Excavator	☐ Broadcast Burn
	☐ Slash unwanted regeneration	☐ Chemical/Herbicide	☐ Other: (specify)	
Target % scarification: 30%				
Additional Information:				

REGENERATION				
Type of Regeneration:	☑ Natural	☐ Planted	☑ Existing Advance	
Fill in below if planting:				
Estimated Number of Seedlings to Plant:				
Species:	☐ White Pine	☐ Western Larch	☐ Ponderosa Pine	☐ Douglas-fir
	☐ Spruce	☐ Lodgepole Pine	☐ Other: (specify)	
Additional Information:				

ANTICIPATED FUTURE TREATMENTS
List approximate dates of post-harvest treatments, including: Slash disposal/hazard reduction: One year, post-harvest during an open burn window Site preparation: Planting: Regeneration survey: 3 years post-harvest in natural regenerated stands

TRS: S36 T12N R17W	**ACRES: 8**
LAND OFFICE: Southwest Land Office	**EXPECTED MBF per ACRE: 3-4**
UNIT OFFICE: Missoula	**EST. HARVEST VOLUME:** 24 MBF
SALE TYPE: Timber Sale	**PLANNED SALE DATE: Analyzed 2025-2035, 10 yrs.**
EA/EIS NAME: Starvation	**PLANNED FY: 2025**
TIMBER SALE NAME: Starvation TS	**PROJECT PHASE: Analysis**
CUTTING UNIT: 3	**LAND OFFICE APPROVAL:**
AGE CLASS: 100-149	**ELEVATION:** 5000'
LOZENSKY TYPE Douglas-fir	**ASPECT:** Northeast
DESIRED COVER TYPE: Lodgepole Pine	**SLOPE (%):** 51-60%
HABITAT TYPE: PSME/PMHA-CARU	**FIELD CONTACT:** Cederberg C.

STAND DESCRIPTION	
Harvest unit 3 consists of a poorly stocked, two-aged stand dominated by Douglas-fir. Scattered lodgepole pine is present, but only occupies around 7% of the site. Western larch is well represented in two age classes in a small portion of the stand (<3 acres). The Douglas-fir in the unit is of poor vigor and exhibits signs of pest damage from defoliators. This unit has a high fuel load as the majority of the lodgepole has died and has blown over. There is some Douglas-fir regeneration scattered throughout the stand.	

TREATMENT OBJECTIVES	**TARGET STAND CONDITIONS**
☑ Move stands toward desired future conditions	Post-harvest, this stand will contain scattered western larch and Douglas-fir. Around 15-25% of the stand will be retained. Trees selected for retention will be the largest, most vigorous trees in the unit and will be well-spaced between leave trees (>50'). These individual trees will provide a seed source for establishing regeneration in the unit. The remainder of the lodgepole pine will be harvested. Ideally, post-harvest conditions will favor the establishment of lodgepole pine regeneration within portions of the unit, moving the unit closer to the DNRC's desired future conditions. It may require multiple harvest entries to achieve the DFC.
☐ Emulate natural disturbance regimes	
☑ Promote/establish regeneration	
☐ Enhance stand growth and vigor	
☑ Address insect and disease issues	
☑ Reduce fuel loading/fire hazard	
☐ Capture value of dead/dying timber	
☑ Generate revenue for the trust beneficiaries	
☐ Other: (specify)	

PRESCRIBED TREATMENT			
Even-Aged Methods	**Uneven-Aged Methods**	**Intermediate Treatments**	**Salvage Treatments**
☐ Clearcutting	☐ Individual Tree Selection	☐ Overstory Removal	☐ Fire Salvage
☑ Seed Tree	☐ Group Selection	☐ Commercial Thinning	☐ Insect / Disease Salvage
☐ Shelterwood	☐ Old Growth Maintenance	☐ Sanitation	☐ Weather/Blowdown Salvage
☐ check if with reserves	☐ Old Growth Restoration	☐ Precommercial Thinning	☐ Other Salvage

HARVEST IMPLEMENTATION GUIDELINES	
Marking System: ☑ Cut Tree ☑ Leave Tree ☐ Sample Mark / Designate x Description ☐ Species Designation	
Number/Spacing/Size of Leave Trees:	**10-20tpa. Most vigorous DF/WL for retention. (Marked)**
Species Preference:	**Douglas-fir(1st), lodgepole pine(2nd), western larch(3rd)**
Characteristics of cut or **leave** trees:	**Good vigor, well developed live crowns(>30%), minimal defects, pest free**
Number of Snags/Snag Recruits:	**2/2 where possible**
Additional Information:	**Larch marked to cut, Douglass-fir marked to leave. Some portions of the stand may lack adequate snag/snag recruit retention. Snags/Snag recruits should be retained from the largest size classes whenever possible. The majority of the snags will be located in the higher elevation portions of the unit.**

HARVEST METHOD
Yarding: ☐ Tractor ☐ Skyline ☑ Combination ☐ Excaline ☐ Other: (specify)

Ground conditions:	☐ Dry	☐ Frozen	☐ Snow	☑ Other: (specify) As soil conditions allow.
Seasonal restrictions:	☐ Summer	☐ Winter	☑ Dates: (specify) All-Season	
Equipment types/restrictions: (rubber tires, tracks, cut-to-length, etc.) tracks/whole tree yarding				
Skid trail location/spacing: Dispersed skidding where appropriate to encourage natural regeneration in openings				
Additional Information: Portions of the units are tractor ground; the steeper terrain will require line or tethered equipment.				

HAZARD REDUCTION / SLASH TREATMENT				
Slash disposal:	☑ Pile & burn (landings)	☐ Pile & burn (in-woods)	☐ Broadcast burn	☐ Jackpot burn
	☐ Masticate/Chip	☐ Lop & Scatter	☐ Hand Pile	☐ Other: (specify)
Nutrient Retention: Coarse woody debris (tons/ac): 5-15			☐ Return skid coarse/fine material	
Additional Information:				

SITE PREPARATION				
Method:	☑ Timber Sale/Dispersed Skidding	☐ Dozer	☐ Excavator	☐ Broadcast Burn
	☐ Slash unwanted regeneration	☐ Chemical/Herbicide	☐ Other: (specify)	
Target % scarification: 30%				
Additional Information:				

REGENERATION				
Type of Regeneration:	☑ Natural	☐ Planted	☐ Existing Advance	
Fill in below if planting:				
Estimated Number of Seedlings to Plant:				
Species:	☐ White Pine	☐ Western Larch	☐ Ponderosa Pine	☐ Douglas-fir
	☐ Spruce	☐ Lodgepole Pine	☐ Other: (specify)	
Additional Information:				

ANTICIPATED FUTURE TREATMENTS

List approximate dates of post-harvest treatments, including:
Slash disposal/hazard reduction: 1-year, post-harvest during an open burn window.
Site preparation: Will take place during harvest
Planting: N/A
Regeneration survey: 3 years post-harvest.

TRS: S36 T12N R17W	**ACRES: 170**
LAND OFFICE: Southwest Land Office	**EXPECTED MBF per ACRE: 3-4 MBF/ac**
UNIT OFFICE: Missoula	**EST. HARVEST VOLUME:** 532 MBF
SALE TYPE: Timber Sale	**PLANNED SALE DATE: Analyzed 2025-2035, 10 yrs.**
EA/EIS NAME: Starvation	**PLANNED FY: 2025**
TIMBER SALE NAME: Starvation TS	**PROJECT PHASE: Planning**
CUTTING UNIT: 5,6	**LAND OFFICE APPROVAL:**
AGE CLASS: 100-149	**ELEVATION:** 4800
LOZENSKY TYPE Ponderosa Pine	**ASPECT:** South
DESIRED COVER TYPE: Ponderosa Pine	**SLOPE (%):** 31-40%
HABITAT TYPE: PSME/CAGE	**FIELD CONTACT:** Cederberg C.

STAND DESCRIPTION	
Units 5 and 6 are composed of single and multi-storied ponderosa pine stands that range from poorly stocked to medium stocked. Douglas-fir is also present as a co-dominate overstory tree. The intermediate and suppressed trees in these stands are primarily Douglas-fir. Many individuals have been impacted by defoliators and exhibit low vigor in comparison to the dominate ponderosa pine. The understory consists primarily of poorly stocked Douglas-fir. Portions of these stands were impacted by the *Mile Marker 124* fire. On average, the stands in units 5/6 are stocked between 55-75 tpa.	

TREATMENT OBJECTIVES	**TARGET STAND CONDITIONS**
☑ Move stands toward desired future conditions	Post-harvest, these stands should be stocked at approximately 30-50% of their pre-harvest density. Ponderosa pine will be the preferred leave tree unless an area lacks vigorous pine. In this stand, individual, vigorous, and healthy Douglas-fir will be retained. Retained trees will be of all age classes and canopy positions, but preference for retention will depend on quality. Since most of the Douglas-fir (60%) exhibits some form of defect or health concern, these trees will be targeted for removal. Only those ponderosa pine that are of an inferior phenotype will be selected for harvest. Post-harvest, the stands will exhibit groups of retention, individual tree retention, and canopy gaps from tree removal. Sufficient ground scarification (30%+) from equipment will expose bare mineral soil to support pine regeneration.
☑ Emulate natural disturbance regimes	
☐ Promote/establish regeneration	
☑ Enhance stand growth and vigor	
☑ Address insect and disease issues	
☐ Reduce fuel loading/fire hazard	
☑ Capture value of dead/dying timber	
☑ Generate revenue for the trust beneficiaries	
☐ Other: (specify)	

PRESCRIBED TREATMENT			
Even-Aged Methods	**Uneven-Aged Methods**	**Intermediate Treatments**	**Salvage Treatments**
☐ Clearcutting	☑ Individual Tree Selection	☐ Overstory Removal	☐ Fire Salvage
☐ Seed Tree	☐ Group Selection	☐ Commercial Thinning	☐ Insect / Disease Salvage
☐ Shelterwood	☐ Old Growth Maintenance	☐ Sanitation	☐ Weather/Blowdown Salvage
☐ check if with reserves	☐ Old Growth Restoration	☐ Precommercial Thinning	☐ Other Salvage

HARVEST IMPLEMENTATION GUIDELINES	
Marking System: ☐ Cut Tree ☐ Leave Tree ☐ Sample Mark / Designate x Description ☑ Species Designation	
Number/Spacing/Size of Leave Trees:	**15-30 tpa. Variable spacing based on species/quality, largest/most vigorous retained**
Species Preference:	**Douglas-fir for removal**
Characteristics of cut or **leave** trees:	**Good vigor, well developed live crowns(>30%), minimal defects, pest free**
Number of Snags/Snag Recruits:	**2/2 where possible**
Additional Information:	**Some portions of the stand may lack adequate snag/snag recruit retention. Snags/Snag recruits should be retained from the largest size classes whenever possible.**

HARVEST METHOD				
Yarding: ☐ Tractor	☐ Skyline	☑ Combination	☐ Excaline	☐ Other: (specify)
Ground conditions:	☐ Dry	☐ Frozen	☐ Snow	☑ Other: (specify) As soil conditions allow

Seasonal restrictions:	☐ Summer	☐ Winter	☑ Dates: (specify) All-Season
Equipment types/restrictions: (rubber tires, tracks, cut-to-length, etc.) Tracks preferred to maximize scarification			
Skid trail location/spacing: Dispersed skidding where appropriate to encourage natural regeneration in openings			
Additional Information: Portions of the units are tractor ground; the steeper terrain will require line or tethered equipment.			

HAZARD REDUCTION / SLASH TREATMENT				
Slash disposal:	☑ Pile & burn (landings)	☐ Pile & burn (in-woods)	☐ Broadcast burn	☐ Jackpot burn
	☐ Masticate/Chip	☐ Lop & Scatter	☐ Hand Pile	☐ Other: (specify)
Nutrient Retention: Coarse woody debris (tons/ac): 5-15			☐ Return skid coarse/fine material	
Additional Information:				

SITE PREPARATION				
Method:	☑ Timber Sale/Dispersed Skidding	☐ Dozer	☐ Excavator	☐ Broadcast Burn
	☐ Slash unwanted regeneration	☐ Chemical/Herbicide	☐ Other: (specify)	
Target % scarification: 30%				
Additional Information:				

REGENERATION				
Type of Regeneration:	☑ Natural	☑ Planted	☐ Existing Advance	
Fill in below if planting:				
Estimated Number of Seedlings to Plant: 6900				
Species:	☐ White Pine	☑ Western Larch	☑ Ponderosa Pine	☐ Douglas-fir
	☐ Spruce	☐ Lodgepole Pine	☐ Other: (specify)	
Additional Information: Inter planting to take place in North half of unit 6, post-burn.				

ANTICIPATED FUTURE TREATMENTS
List approximate dates of post-harvest treatments, including: Slash disposal/hazard reduction: One year, post-harvest during an open burn window. Site preparation: The north half of unit 6 will be burned to prepare the seedbed, post-harvest during an open burn window. Tree Planting: inter-planting in the north half of unit 6 to be conducted in the spring, 1-year post-prescribed burn. Regeneration survey: 3 years post-harvest in natural regenerated stands. 3- years post-planting in the north half of unit 6.