Morrison Projects

Environmental Assessment

Clearwater Unit

Southwestern Land Office

Montana Department of Natural Resources and Conservation

November 2023

Environmental Assessment Checklist

Project Name: Morrison Projects
Proposed Implementation Date: November 2023
Proponent: Clearwater Unit, Southwest Land Office, Montana DNRC
County: Missoula

Type and Purpose of Action

Description of Proposed Action:

The Department of Natural Resources and Conservation (DNRC), Southwestern Land Office, Clearwater Unit, proposes to harvest timber from State owned MSU Morrill Trust Lands in parts of three (3) sections, and one (1) partial section (Common School) northeast of Potomac, MT. The proposed project area encompasses 2,001 acres within Sections 4, 8, 10, and 16 T13N, R15W located in Missoula County. The proposal would target approximately 1,364 acres for harvest. Proposal maps and a vicinity map indicating the general location of the proposed project area are shown in Attachments A-1 through A-2.

Beneficiary	Legal Description	Total Acres	Treated Acres
Common Schools	Section 16 T13N R15W	401	-
Public Buildings			
MSU 2nd Grant			
MSU Morrill	Sections 4, 8, and 10; T13N R15W	1,600	1,364
Eastern College-MSU/Western College-U of M			
Montana Tech			
University of Montana			
School for the Deaf and Blind			
Pine Hills School			
Veterans Home			
Public Land Trust			
Acquired Land			

Objectives of the project include:

- Provide continuing income for the Trust beneficiaries (mentioned above) in a manner consistent with sustained yield management principles.
- Promote long-term production of timber for generating revenue to the Trust beneficiaries.
- Manage the identified parcels intensively for healthy and biologically diverse forests to provide long-term income for the Trusts (ARM 36.11.405).

- Promote stand health by returning the stands to stocking levels and fuel loads closer to historical levels and creating healthier stands.
- Improve access and BMP compliance with new construction and road maintenance activities for the Trust lands.

Proposed activities include:

Action	Quantity
Proposed Harvest Activities	# Acres
Clearcut	
Seed Tree	
Shelterwood	
Overstory Removal	
Old Growth Maintenance/Restoration	
Commercial Thinning	
Salvage	
Selection	1,364
Total Treatment Acres	
Proposed Forest Improvement Treatment	# Acres
Pre-commercial Thinning	800
Site preparation/scarification	
Planting	
Proposed Road Activities	# Miles
New permanent road construction	3.3
New temporary road construction	0.4
Road maintenance	12.0
Road reconstruction	0.3
Road abandoned	
Road reclaimed	
Other Activities	

Duration of Activities:	Up to 72 months
Implementation Period:	November 2023 – November 2029

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

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

- The State Forest Land Management Plan (DNRC 1996),
- Administrative Rules for Forest Management (ARM 36.11.401 through 471),
- The Montana DNRC Forested State Trust Lands Habitat Conservation Plan (HCP) (DNRC 2010) and all other applicable state and federal laws.

Project Development

SCOPING:

- DATE:
  - The project was scoped on January 11, 2023.
- PUBLIC SCOPED:
  - The scoping notice was posted on the DNRC Website: http://dnrc.mt.gov/public-interest/public-notices
  - Adjacent landowners and Statewide scoping list
- AGENCIES SCOPED:
  - Montana Department of Fish, Wildlife, and Parks (FWP), Tribes on the Statewide scoping list
- COMMENTS RECEIVED:
  - How many: Three separate comments were received from: Weyerhaeuser Company, Northern Cheyenne Tribe, and FWP.
  - Concerns: Weyerhaeuser Company - In support of the project. Northern Cheyenne Tribe- Request for a Class I and Class III report. FWP - Maintain good communication throughout the project development.
  - Results: Filed Weyerhaeuser Company letter in project folder. DNRC Archeologist Patrick Rennie conducted a Class I (literature review) report and responded to the Northern Cheyenne Tribe. FWP was emailed about the plan and offered a meeting if needed.

DNRC specialists were consulted, including: SWLO Hydrologist, Andrea Stanley; SWLO Biologist, Garrett Schairer; DNRC Silviculturist, Tim Spoelma; DNRC Fisheries Biologist, Mike Anderson, DNRC Archeologist, Patrick Rennie, and other DNRC Forest Management Staff.

Internal and external issues and concerns were incorporated into project planning and design and will 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 http://dnrc.mt.gov/divisions/trust/forest-management/hcp.

- **Montana Department of Environmental Quality (DEQ)-** DNRC is classified as a major open burner by DEQ and is issued a permit from DEQ to conduct burning activities on

state lands managed by DNRC. As a major open-burning permit holder, DNRC agrees to comply with the limitations and conditions of the permit.

- **Montana/Idaho Airshed Group-** 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.

- **Montana Department of Fish, Wildlife and Parks (DFWP)-** A Stream Protection Act Permit (124 Permit) is required from DFWP for activities that may affect the natural shape and form of a stream's channel, banks, or tributaries.

ALTERNATIVES CONSIDERED:

No-Action Alternative:

- The proposed harvest, road building, and pre-commercial thinning would not occur.
- Stands would remain at overstocked levels and are currently under possible insect and disease threats.
- Road systems would not be improved and meet BMP's and drainage would not be improved.
- Overstocked stands and associated fire danger would continue.
- All pre-commercial stands would continue to grow with decreased vigor and would show continued losses within the stand.
- No money would be received by the included Trust funds from activities of this project. These stands would not be directed toward Desired Future Condition (DFC) (ARM 36.11.405).

Action Alternative:

- This proposal includes timber harvest under several sales on approximately 1,364 acres removing an estimated 5 MMBF (million board feet).
- Stands could have stocking levels decreased, infected trees could be reduced, and insect and disease losses could be salvaged.
- Road systems would be improved and meet BMP's and drainage would be improved. New roads are necessary for access and management of the DNRC.
- Treatments would assist DNRC in addressing the risk of fire growth, and it would be lessened across DNRC lands in this area.
- Pre-commercial thinning would also occur under this EA on a proposed 800 acres with a plan to increase vigor and reduce overstocking.
- Money would be received by the MSU Morrill and Common School Trusts.
- These stands would be directed toward the Desired Future Condition.

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:

Stand History/Past Management:

This area falls within climatic section 332B and was historically 79% forested (Losensky, 1997). This area includes valley bottoms as well as high elevations in the Bitterroot and Blackfoot region. The project area ranges in elevation from 4,000'-5,200'. These areas were historically dominated by large, mature ponderosa pine.

Past harvest units in these sections include West Lubrecht Timber Sale in Section 10 T13N R15W, sold on June 2,1997, cutting prescription was a commercial thin and harvested 2 MMBF. The Potomac Timber Sale in Section 4 and 8 T13N R15W, sold on August 20, 1998, cutting prescription was a commercial thin and harvested 6 MMBF. These timber sales removed suppressed and intermediate trees with very little down woody material left on the ground. Openings created in the stand regenerated well with ponderosa pine, Douglas-fir, and western larch.

Issues and Concerns:

- Regeneration in some stands of Section 8 and 10 are currently overstocked.
- Forest fuel loadings, due to dense pockets of advanced regeneration, are at moderate levels, increasing the risk of intense wildfire.
- Timber harvest and road building may result in increased spread of noxious weeds.

Vegetation Existing Conditions:

The analysis area for the standard vegetative community will contain state owned Sections 4, 8,10, and 16 T13N R15W. Forested cover dominates the sections with 2,001 acres of forest cover. Cover type for harvest units in Sections 4, 8 and 10 T13N R15W: 1,225 acres are ponderosa pine cover type, 236.4 acres are Douglas-fir cover type, 81.4 acres are Douglas-fir/Western larch cover type, 17.2 acres are western larch cover type and 7.9 acres are non-stocked, acres are minus existing roads. The proposed treatments would be a selection harvest.

The stands proposed for harvest vary in age, structure, and species composition. The age of the stands average 100-150 years old, medium stocked sawlog with ponderosa pine as the

dominant species found throughout the project area. Douglas-fir, western larch, lodgepole pine and engelmann spruce are other species found throughout the sections. Some stands in the project area contain trees of poor health and vigor. This poor health and vigor are primarily due to the ongoing Douglas-fir beetle (*Dendroctonus pseudotsugae*) and western spruce budworm (*Choristoneura occidentalis*) epidemics.

Nearly all Douglas-fir trees within the project area are suffering some level of defoliation from western spruce budworm. Across the project area, approximately 40% of the mature Douglas-fir trees have suffered heavy enough defoliation to result in top kill. Understory Douglas-fir has been defoliated throughout the project area. This resulted in top kill, tree mortality, and decreased growth rates.

Section 4, 8, 10 and 16 T13N R15W, ponderosa pine stands, covering the landscape as medium stocked sawlog that were logged in 1997 and 1998 which removed most of the suppressed and intermediate trees. Leave trees found today are co-dominant to dominant ponderosa pine with Douglas-fir and western larch with 12" to >24" DBH and 50 feet to 100 feet in height. Age class is 100-150 years old with a few dominant old ponderosa pine scattered throughout that are >150 years old.

Natural regeneration appears to occur with good success after harvest and has occurred on all aspects.

Table V-1 – Current and Desired Future Cover Type information from Stand Level Inventories (SLI)

Cover Type	Current Acres	Current Percent of Project Area	Desired Future Condition (DFC)	
			Acres	Percent
Ponderosa pine	1,225	78.1%	1,448.1	92.35%
Douglas-fir	236.4	15.1%	7.9	0.55%
Douglas-fir/Western larch	81.4	5.2%	111.9	7.1%
Western larch	17.2	1.1%	-	-
Non-stocked	7.9	0.5%	-	-
Total:	**1,567.9***	**100%**	**1,567.9***	**100%**

**Acres minus roads*

The management goal for the stands is to maintain Desired Future Conditions. Stands will be maintained with a harvest that will try and mimic historical fire conditions.

Harvest Unit	Habitat Group	Fire Regime	Current Cover Type	Age Class (years)	DFC	RX	Acres
1	Warm and Dry (westside)	Low-to-mixed	Ponderosa Pine	100-149	Ponderosa Pine	Individual/Select Tree Harvest	404
2	Warm and Dry (westside)	Low-to-mixed	Ponderosa Pine	100-149	Ponderosa Pine	Individual/Select Tree Harvest	85
3	Warm and Dry (westside)	Low-to-mixed	Ponderosa Pine	100-149	Ponderosa Pine	Individual/Select Tree Harvest	310
4	Warm and Dry (westside)	Low-to-mixed	Douglas Fir	100-149	Ponderosa Pine	Individual/Select Tree Harvest	485
5	Warm and Dry (westside)	Low-to-mixed	Ponderosa Pine	100-149	Ponderosa Pine	Individual/Select Tree Harvest	80

Silvicultural Treatments:

Selection:

Uneven-aged methods are cutting procedures that regenerate and maintain a multi-aged structure. Individual Tree Selection: would leave individual trees of all size classes are removed more or less uniformly throughout the stand, to promote growth of the remaining trees and to provide space for regeneration. Under an Individual Tree Selection, leave trees would primarily be co-dominant and dominant ponderosa pine or western larch trees in the stand with good form and vigor. Smaller DBH ponderosa pine or western larch leave trees with good form and vigor would also be lightly scattered throughout the stands. The typical application would look at leaving 40 to 80 square feet of basal area. Some stands may be reduced to 20 square feet of basal area because of previous harvests removing most of the suppressed trees and would encourage natural regeneration. Additionally, leaving trees with good wildlife characteristics, greater than 21” DBH at 2 TPA and retain 2 dead TPA greater than 21” DBH with good wildlife characteristics.

Pre-Commercial Thinning:

The removal of trees not for immediate financial return but to reduce stocking to concentrate growth on the more desirable trees. Leave trees will be selected to move stands toward the Desired Future Conditions, most of the Douglas-fir regeneration will be cut and leave ponderosa

pine regeneration. Selection prescriptions may have a pre-commercial thinning after the initial harvest to manage the regeneration within the stand. Thinning units may leave areas of shade tolerate trees and retention of scattered dense clumps of regeneration to promote wildlife habitat. This forest improvement work must be approved and funded by the MSU Morrill Trust.

Given the presence of spruce budworm, stands treated with pre-commercial thinning will undoubtably have larger openings and greater spacing than is usual. The typical spacing of pre-commercial thinning in this area ranges between 15 feet between trees (194 trees per acre) and 12 feet between trees (302 trees per acre). Fuels treatment after the pre-commercial will be done using slashing of felled trees to a level less than 18" from the ground level or hand piled and burned in the future.

Road Construction, Maintenance, and Closure:

This project plans to use roads within the area for all silvicultural uses. All roads that would be part of these proposed actions will be addressed by the forester, the soils scientist, the hydrologist, and wildlife biologist. All roads used for timber harvest will be brought up to BMP standards. Old roads that are no longer needed will be blocked, slash covered, and grass seeded to restrict vehicle traffic. New construction roads will be needed to access stands currently without roads and improve access for the DNRC for forest management or fire suppression. A new construction road to improve DNRC access will be built from Section 16 T13N R15W heading northwest, including a small segment through Lubrecht Experimental Forest in Section 9 T13N R15W, and connecting to an existing road in Section 8 T13N R15W.

Fire Hazards/Fuels:

Most of the stands were logged in 1997 and 1998, harvesting a majority of the suppressed and intermediate trees which were then whole tree skid into scattered landings. Some evidence in Section 10 of a low intensity ground fire following harvest. These sections are dry sites and have very little grass or shrubs present throughout. The main fuel load is scattered clumps of advanced regeneration in Section 10 and heavy advanced regeneration in the north portion of Section 8.

In accordance with *ARM 36.11.410* and *ARM 36.11.414* most fine slash foliage and approximately 5 to 15 tons per acre of coarse woody debris would be left scattered on the forest floor in all harvest units.

Old Growth:

No old growth stands are present on this project. Stands will be managed towards the old growth rules found in the State Forest Land Management Plan and the Habitat Conservation Plan.

Insects and Diseases:

Mountain pine beetle has reduced to endemic levels in most susceptible lodgepole pine and ponderosa pine the project area. An increase in Douglas-fir bark beetle has been observed throughout the larger older Douglas-fir trees. Western spruce budworm continues to defoliate and impact trees across all SWLO unit offices.

Rare Plants:

The Montana Natural Heritage Program shows no species of concern in the project area.

Noxious Weeds:

Noxious weeds infestations are mainly a combination of spotted knapweed (*Centaurea maculosa*), houndstongue (*Cynoglossum officinale*), orange hawkweed (*Pilosella aurantiaca*), sulphur cinquefoil (*Potentilla recta*) and areas of thistle (*Cirsium arvense*) which occur along portions of the existing access road system, open forest and rangeland sites. Knapweed is found along roadsides as well as in some forested portions of the project area. Houndstongue is found mostly along roadsides along the access haul routes. Historic cattle grazing, timber harvest activities, and recreational uses are most likely the reasons for the existing rate of spread of noxious weeds. The potential future spread, and introduction of noxious weeds may see an increase. Reseeding of roadcuts with grass seed, followed by roadside, harvest units and spot herbicide treatments, would be made on noxious weeds. Herbicide application on portions of the project sections may reduce the infestation and spread of noxious weeds. Yet weeds continue to spread by wind, animals, and vehicles.

Impacts of noxious weeds within the project areas are moderate. Weeds have spread through the project areas across ownerships over time, mainly along roadsides and open forest sites with multiple uses and by seed dispersal from wind, traffic, and wildlife. Timber harvest throughout these drainages has increased grass growth and the risk for noxious weeds to spread though ground disturbance. Within the project area, overall cumulative effects of increased noxious weeds are expected to be low to moderate, based on herbicide treatments of existing weeds along roads implementing prevention measures to reduce new weeds, by cleaning off road equipment and grass seeding roads to compete against weeds.

Environmental Effects:

No-Action Alternative:

The No-Action alternative would not change the current existing conditions within the proposed project area. The proposed management activities: selection, pre-commercial thinning, weed management, road maintenance and road construction would not occur. These stands would often remain at overstocked levels and at greater susceptibility to insects and disease. Insect and disease outbreaks in these stands would continue to exist and could spread. Concerns of

potential hazardous fuel concerns would not be treated. All pre-commercial stands would continue to grow with decreased vigor and would show increased mortality. As a result, there would be low to moderate risk of direct impacts, and no to low impacts in the secondary, and cumulative impacts to the vegetative community under the No-Action alternative. Noxious weeds would be unaffected, although, treatment of noxious weeds would likely be treated under another project if necessary.

Action Alternative:

This proposal includes timber harvest on approximately 1,364 acres removing an estimated 5 million board feet. Pre-commercial thinning will also occur under this EA on a proposed 800 acres. The DNRC would try to address the concerns within the Existing Conditions on these acres by using selection silvicultural cutting prescription. Additionally, leaving trees with good wildlife characteristics, greater than 21" DBH at 2 TPA and retain 2 dead TPA greater than 21" DBH with good wildlife characteristics.

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				Y	
Age Class	X				X				X				Y	
Old Growth	X				X				X					
Fire/Fuels			X			X				X			Y	
Insects/Disease		X				X				X			Y	
Rare Plants		X			X				X					
Noxious Weeds			X			X					X			
Action														
Current Cover/DFCs		X				X				X			Y	
Age Class			X			X				X			Y	
Old Growth		X				X				X			Y	
Fire/Fuels		X				X				X			Y	
Insects/Disease		X				X				X			Y	
Rare Plants		X				X				X			Y	
Noxious Weeds			X				X				X		Y	1.

Comments:

1. Under the Action Alternative, increased disturbance in the project area, as well as a more open canopy, could lead to an increased spread of noxious weeds. DNRC would complete herbicide treatments of spot infestations on the project and segments of the access roads on adjacent ownerships to control existing and new weeds. All off-road equipment would be washed and inspected prior to the start of work. All new roads would be reseeded to site adapted grass to reduce the threat of noxious weed spread. Project areas would be monitored for noxious weeds after implementation and herbicide

may be applied when and if needed. The grazing licensee would be responsible for noxious weed management several years post-harvest in accordance with site specific noxious weed management plans.

2. Given the previously mentioned existing environmental conditions, it is likely that a change will come to the current cover type given vegetative conditions and potential wildfire or the proposed action.

3. The State's Stand Level Inventory (SLI) identified no acres of the Project Area as "Old Growth" (as defined by Green, et. al.). The action alternative intends that stands will be managed towards the old growth rules found in the State Forest Land Management Plan and the Habitat Conservation Plan.

4. Given the previously mentioned fire hazard and fuels segment, it is likely that the existing fuels could help create a large fire within the project area. This potential wildfire could burn at an intensity that would change fuel conditions and fire hazards. Similarly, the proposed actions also would have a direct effect on the fire hazard and fuels.

5. Please see the previous portions that describe the conditions.

Vegetation Mitigations:

- Favor ponderosa pine and western larch in harvest areas and pre-commercial thinning to maintain species represented toward the accepted Desired Future Condition.
- Prescribed selection harvests to emulate natural disturbance historically present on the landscape.
- Wash off road equipment prior to harvest to limit weed seed dispersal.
- Spray weeds along roadsides to limit the spread of existing weeds.
- Grass seed newly disturbed road surfaces to limit the resources available for weeds to become established.

Recommended Mitigations and Adjustments of Treatments for the Benefit of Other Resources:

- 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.

Vegetative References:

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

Gruell, G.E., 1983. *Fire and vegetative trends in the northern Rockies: interpretations from 1871-1982 photographs*. U.S. Dept. of Agric., For. Serv., Gen Tech. Rep. INT-158. 117 pp.

Pfister, R. D., B. L. Kovalchik, S. F. Arno, and R. C. Presby. 1977. *Forest habitat types of Montana*. U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, Ogden, Utah.

Smith, D.M., B.C. Larson, M.J. Kelty, P. M.S. Ashton, 1997. *The practice of silviculture, applied forest ecology. 9th edition*. John Wiley& Sons, Inc. 537 pp.

SOIL DISTURBANCE AND PRODUCTIVITY:

Soil Disturbance and Productivity Existing Conditions:

The project area involves three sections located north of Highway 200 and south of the Blackfoot River. Most of the underlying geology is composed of Precambrian quartzite and argillite. Tertiary alluvial deposits occur lower elevations and on shallower slopes. These tertiary soils will have higher clay content and will retain moisture for longer periods when compared with the rockier soils with Precambrian parent material occurring on steeper slopes. Some of the existing roads at lower elevations rut easily (where rock aggregate has not been placed) due to this occurrence of clay. However, the proposed road construction is mainly within slopes with exposed Precambrian rocks and less in the areas where the Tertiary (and more clay rich) soils occur.

Slopes within the proposed harvest units vary with some exceeding 45%. Units 4 and 5 include proposed ground-based harvest and yarding methods on slopes greater than 45%. Harvest and yarding on these steeper slopes can be done within out excessive ground disturbance by avoiding sustained steep areas, limiting turning, optimizing favorable skidding, and limiting new disturbances by optimizing use of historic skid trails.

Based on field observations and review of available Lidar data, slopes appear stable. No unusual or unique geologic features have been observed within the project area.

Existing and past disturbances

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

- Sections 4 & 8: Potomac (Commercial Thin) ~1998
- Section 10: West Lubrecht (Commercial Thin) ~1997

The area is included in an active grazing lease. Vegetation and soils in open meadows are compromised with infestation of noxious weeds including Sulphur Cinquefoil and orange Hawkweed.

Visual review of existing coarse woody debris (CWD) within the harvest areas completed in the summer of 2023 appear to be within the range appropriate for the landscape and forest type (5 to 15 tons/acre) per Graham et al. (1994).

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**				**NA**	**1**
Erosion	**X**				**X**				**X**				**NA**	**1**
Nutrient Cycling	**X**				**X**				**X**				**NA**	**1**
Slope Stability	**X**				**X**				**X**				**NA**	**1**
Soil Productivity	**X**				**X**				**X**				**NA**	**1**
Action														
Physical Disturbance (Compaction and Displacement)			**X**			**X**				**X**			**Y**	**2, 3, 4, 5**
Erosion			**X**			**X**				**X**			**Y**	**2, 3, 5**
Nutrient Cycling		**X**				**X**				**X**			**Y**	**4, 5, 6, 7**
Slope Stability		**X**				**X**				**X**			**N**	**8**
Soil Productivity		**X**				**X**				**X**			**Y**	**4, 5, 6, 7**

Comments:

1. Implementation of the No-Action Alternative would result in no new soil resource impacts in the project area. Soil resource conditions would remain similar to those currently at the site.

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

3. Soil disturbance and erosion risk increases with slope and slopes in project area exceed 45% in some places.

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

5. Several miles of new road construction is proposed in the project areas.

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

7. According to Graham et al. (1994), a minimum of 5 tons/acre of CWD would be a desired post-harvest condition to maintain forest productivity for this forest habitat type.

8. The project could have a low risk to slope stability.

Soil Mitigations:

- BMP's would be implemented on all roads and within the units. Some slash would be left in the units to mitigate erosion risks – including along skid trails.

- 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 should agree to a general skidding plan prior to equipment operations. Skid trails would be mitigated following harvesting and yarding operations with water bars and/or slash.

- To prevent soil compaction ground-based mechanical felling and yarding would be restricted to one or more of the following conditions:
    - Soil moisture content at 4-inch depth less than 20% oven-dry weight.
    - Minimum frost depth of 4 inches.
    - Minimum snow depth of 18 inches of loose snow or 12 inches packed snow.

- A target minimum of 5 tons/acre and preferably 9 tons/acre, of coarse and fine woody debris would be maintained on site to meet the concentration for the DF/PHMA habitat type recommended by Graham et al (1994).

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:

Most of project (~90% of the harvest areas) and associated existing and proposed roads are located in the Union Creek watershed. The remaining area and a portion of the haul route are located in the upper section of a tributary to Elk Creek. Union Creek and Elk Creek are tributary to the Blackfoot River. Most of the Union Creek watershed is divided between State Trust Lands ownership and private ownership. The US Bureau of Land Management manages approximately seven percent.

Harvest areas and forest roads proposed for the project are > 0.5 miles from Union Creek. Approximately 600 acres of the southwestern portion of the project area drains to an unnamed tributary to Union Creek. All other streams or wetlands within the proposed harvest areas are

isolated do not have a surface connection (i.e., channels or scour) to other water bodies or streams except potentially during significant flood events.

The highest-order stream within the project area is an unnamed Class 1 stream that flows south through the western portion of Section 8. This stream is tributary to Union Creek. This stream carries water for most of the year, but flows become discontinuous by July. Fish are not present due to the size of the stream and non-perennial flow. The stream has a rocky bottom with good shrub cover and vertical stability. Heavy cow use is evident with hoof shear and manure along the channel. However, shrubs do not show signs of hedging. The channel begins at a wetland located in the lower elevations of a meadow located in the northwestern corner of Section 8. The wetland occurs in a gulley. The gulley appears to be the product of historic scour likely associated with the removal of a beaver dam and dewatering of beaver pond(s). The meadow has a significant infestation of Sulphur Cinquefoil.

All other streams within the project area are Class 2 or 3 streams interspersed with wetlands that occur at draw bottoms or at lower elevations within meadows.

Riparian Management Zone (RMZ) and Stream Environment Zone (SMZ) harvest is proposed with the project. Below is a brief summary of what activities could occur with the proposed project, listed by stream class or feature type:

Class 1 streams:

- 50-foot no harvest buffer from each bank.
- From 50 to 120 feet, a minimum of 50% of trees (DBH ≥ 8”) will be retained.
- Pre-Commercial Thinning (PCT) could occur outside the 50-foot no-harvest buffer.

Class 2 streams:

- No ground-based equipment within SMZ unless from existing road.
- Retain at least 50% of trees (DBH ≥ 8”) or minimum of 5 trees in SMZ per 100’ stream segment, whichever is greater.
- PCT could occur within SMZ, however retain tress near banks.

Class 3 streams:

- No ground-based equipment within 50 feet of stream bank unless from existing road.
- PCT could occur within SMZ, however retain trees near banks.

Isolated wetlands:

- Avoid equipment operation unless frozen or snow-covered.
- PCT could occur within wetland.

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**				**NA**	**1**
Water Quantity	**X**				**X**				**X**				**NA**	**1**
Action														
Water Quality		**X**				**X**				**X**			**Y**	**2, 3, 4**
Water Quantity		**X**				**X**				**X**			**Y**	**2, 3**

Comments:

1. With no action, no timber harvesting or related activities would occur. Water quality conditions would likely continue under its current condition. Similarly, no risk of change of current fluctuations in annual water yield or stream flow would result. As is mentioned in the existing water quality conditions, much of the roads that are located adjacent to streams would remain in their current condition. Proposed project activities include making permanent and temporary improvements that would benefit water quality – including adding armoring and maintaining/improving road drainage.
2. Applicable state plans, rules, practices, and commitments have guided project planning and would be implemented during project activities, including the Montana Code Annotated (specifically Title 77, Chapter 5), the Administrative Rules of Montana (specifically Rule Chapter 36.11), the Montana Forest Best Management Practices, the DNRC Habitat Conservation Plan (2010), and the State Forest Land Management Plan.
3. Changes to steam flow hydrology (water quantity or water flow) are expected to not be detectible with the Action Alternative within Union Creek or the unnamed tributaries located within the project area. The proposed project includes harvest areas that would affect approximately 28% of the watershed of the unnamed tributary located in the western portion of Section 8. Harvest prescriptions would include retention of vegetation along streams (per SMZ and RMZ commitments) and retention of some trees and shrubs on the landscape. 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 85% of vegetation within the watershed to remain when combined with non-treatment areas. Therefore, streamflow change is not expected to be observable. The potential change in streamflow to the smaller tributaries is not expected to result in a significant risk to water and riparian resources.
4. The proposed project includes new road construction and crossings of several ephemeral draws and a small, isolated, channel (i.e., no downstream channel connection beyond a wetland). These crossings would all include pipes sized appropriately to anticipated runoff and meeting Montana Forestry BMP standards. Effects to water quality would also be minimized by timing with seasonal low or no-flow conditions, limiting disturbance, and revegetating with grass seed.

Water Quality & Quantity Mitigations:

- Clean plugged culverts and replace rock armoring at road drainage structures where needed per road inventory.
- Upgrade road drainage as needed to restore BMPs.
- Adhere to applicable equipment limitations and vegetation retention requirements adjacent to streams.

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.

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

FISHERIES:

Fisheries Existing Conditions:

All streams within the three project sections are assumed to not have fish. This assumption is based on channel size and flow depths and the lack of continuous year around flow.

No-Action and **Action Alternatives:**

No foreseeable direct, indirect, or cumulative effects to fisheries resources are anticipated with an Action or No-Action Alternative due to the absence of fish. Efforts, including required riparian setbacks stipulated in SMZ law and rules, would be taken to protect the riparian areas for aquatic values.

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

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 currently contains approximately 1,526 acres (95% of project area) of mature stands (100-plus years in age) of ponderosa pine with lesser amounts of Douglas-fir and Douglas-fir/western larch stands that have a reasonably closed canopy. Grizzly bears likely use the vicinity of the project area. Potential habitat exists for flammulated owls, fringed myotis, hoary bats, and pileated woodpeckers in the project area. Big game summer range as well as white-tailed deer (107 acres) and moose (10 acres) winter ranges exists in the project area. Habitats in the project area could contribute to big game security habitats in the vicinity. The Coyote Greenough project on DNRC-managed lands is in the cumulative effects analysis area and could affect many of these same species.

No-Action Alternative: No potential for disturbance to wildlife would be anticipated. No timber management activities would be conducted, thus no appreciable changes to existing habitats would occur. Continued maturation could improve grizzly bear, pileated woodpecker habitats, and big game winter and summer range attributes, but could reduce habitat quality for flammulated owls and big game forage attributes over the long term. The ongoing Coyote Greenough project in the vicinity could continue affecting many of these species and/or their habitats. Generally, negligible direct, indirect, or cumulative effects to wildlife would occur.

Action Alternative (see Wildlife table below):
Roughly 1,485 acres of forested habitats, including 1,424 acres (93%) of existing mature ponderosa pine, Douglas-fir, and Douglas-fir/western larch stands with reasonably closed canopies would be harvested. In general, habitats for those species adapted to more-open forest conditions similar to areas that historically experienced low-intensity, under burns would increase in the project area. Meanwhile habitats for wildlife species that prefer somewhat dense, mature ponderosa pine and Douglas-fir stands would be reduced. Generally, 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. Some changes in visual screening would occur. Short-term increases in disturbance potential associated with proposed timber management, road construction, and use would occur with proposed activities in the project area, but overall, a negligible increase in potential human disturbance would be anticipated following proposed treatments. 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. Generally, the ongoing Coyote Greenough project on DNRC-managed lands in the vicinity would also have similar effects that would be additive in the cumulative effects analysis area.

Wildlife	Impact												Can Impact be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	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**				**X**			**Y**	**1**
Canada lynx (*Felix lynx)* Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zone	**X**				**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**				**X**					**2**
Sensitive Species														
Bald eagle *(Haliaeetus leucocephalus)* Habitat: Late-successional forest within 1 mile of open water	**X**				**X**				**X**					**2**
Black-backed woodpecker *(Picoides arcticus)* Habitat: Mature to old burned or beetle-infested forest	**X**				**X**				**X**					**2**
Common loon *(Gavia immer)* Habitat: Cold mountain lakes, nest in emergent vegetation	**X**				**X**				**X**					**2**
Fisher *(Martes pennanti)*	**X**				**X**				**X**					**2**

Wildlife	Impact												Can Impact be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian														
Flammulated owl *(Otus flammeolus)* Habitat: Late-successional ponderosa pine and Douglas-fir forest		**X**				**X**				**X**			**Y**	**3**
Fringed myotis (*Myotis thysanodes*) Habitat: low elevation ponderosa pine, Douglas-fir and riparian forest with diverse roost sites including outcrops, caves, mines		**X**				**X**				**X**			**Y**	**4**
Hoary bat (*Lasiurus cinereus*) Habitat: coniferous and deciduous forests and roost on foliage in trees, under bark, in snags, bridges		**X**				**X**				**X**			**Y**	**5**
Peregrine falcon *(Falco peregrinus)* Habitat: Cliff features near open foraging areas and/or wetlands	**X**				**X**				**X**					**2**
Pileated woodpecker *(Dryocopus pileatus)* Habitat: Late-successional ponderosa pine and larch-fir forest			**X**				**X**			**X**			**Y**	**6**
Townsend's big-eared bat *(Plecotus townsendii)* Habitat: Caves, caverns, old mines	**X**				**X**				**X**					**2**

Wildlife	Impact												Can Impact be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Wolverine *(Gulo gulo)* Habitat: Alpine tundra and high-elevation boreal forests that maintain deep persistent snow into late spring		**X**				**X**				**X**				**7**
Big Game Species														
Elk			**X**				**X**			**X**			**Y**	**8**
Whitetail Deer			**X**				**X**			**X**			**Y**	**8**
Mule Deer			**X**				**X**			**X**			**Y**	**8**
Moose		**X**				**X**				**X**			**Y**	**8**
Bighorn Sheep	**X**				**X**				**X**					**2**
Other														

Comments:

W-1 The project area is 14 miles southwest of the Northern Continental Divide Ecosystem grizzly bear recovery area, and 3 miles from `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 likely use the project area throughout the non-denning period. The project area contains no open roads but exists in close proximity to numerous forms of human disturbance. Roughly 864 acres of potential hiding cover exists in the project area that could contribute to a larger block of potential grizzly bear security cover in the vicinity.

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. Any potential disturbance would be additive to potential disturbance associated with e Coyote Greenough project on DNRC-managed lands in the vicinity. Overall, the proposed activities would occur in areas where low levels of grizzly bear use would be anticipated, thus minor potential for disturbance and displacement of grizzly bears would be anticipated.

About 3.25 miles of new, restricted 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 777 acres (90%) of hiding cover proposed to receive treatments, some potential hiding cover could persist where existing regeneration is denser and/or where proposed treatments may retain a higher density of trees. Meanwhile, proposed activities in habitats that are not presently

providing hiding cover (708 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; hiding cover would increase through time as young trees and shrub regeneration proceeds over the next 5 to 10 years. Additional reductions in potential grizzly bear hiding cover would occur with the proposed pre-commercial thinning. Generally, reductions in hiding cover would occur on the edge of the area contributing to the larger block of potential security habitats that extend beyond the project area and the cumulative effects analysis area. Although hiding cover would be reduced, no appreciable changes to security habitat would occur given the small area that would be altered, the location of those changes, and the lack of changes in open roads in the project area. Potential changes in grizzly bear habitat attributes would be additive to effects occurring with the Coyote Greenough project on DNRC-managed lands 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 following proposed activities.

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 Roughly 1,393 acres (87%) of potential flammulated owl habitats exist in the project area in dry ponderosa pine, Douglas-fir, and some Douglas-fir/western larch stands. There are roughly 2,834 acres of potential flammulated owl habitats on dry Douglas-fir, Douglas-fir/western larch, and ponderosa pine stands on DNRC-managed lands within the cumulative effects analysis area. Some suitable habitats likely exist on a portion of the 5,674 acres (85% of non-DNRC-managed lands) of open and closed Douglas-fir and ponderosa pine forested habitats on other ownerships in the cumulative effects analysis area. 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. Ongoing activities associated with the Coyote Greenough project on DNRC-managed lands could continue disturbing flammulated owls and/or altering flammulated owl habitats.

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 activities on 1,287 acres of potential flammulated owl habitats (92% of the habitats in the project area) would open the canopy while favoring ponderosa pine 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. 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.

W-4 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. Proposed activities could disturb fringed myotis should they be in the area. Changes in vegetation structural attributes could change overall prey availability, but considerable foraging habitats would persist in the project and cumulative effects analysis areas. Overall, no appreciable changes to fringed myotis use of the project area or cumulative effects analysis areas would be anticipated.

W-5 Hoary bats are summer residents (June-September) in Montana that use a variety of forested habitats. 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. Hoary bats have not been documented in the vicinity of the project area, but some use of the project area by Hoary bats would be possible given the varied habitats present and the proximity to the Blackfoot River and numerous other smaller streams and wetlands. Individual trees and snags in the existing forested habitats could be used for roosting. No known caves or other structures used for roosting occur in the project area or immediate vicinity. Proposed activities could disturb hoary bats should they be in the area. 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, no appreciable changes to hoary bat use of the project area or cumulative effects analysis areas would be anticipated.

W-6 Roughly 754 acres (47%) of pileated woodpecker nesting habitat exist in the project area; another 828 acres (52%) of potential foraging habitats exist in the project area. In the cumulative effects analysis area, roughly 1,418 acres (44%) of pileated woodpecker habitats exist on DNRC-managed lands dominated by ponderosa pine, Douglas-fir, and Douglas-fir/western larch. An additional 1,273 acres (40%) of potential feeding habitats exist on DNRC managed lands within the cumulative effects analysis area. The ongoing Coyote Greenough project on DNRC-managed lands in the cumulative effects analysis area is expected to remove pileated nesting and foraging habitats across the 490-acre unit in the cumulative effects analysis area. Some suitable habitats likely exist on a portion of the 3,468 acres of forested habitats on other ownerships in the cumulative effects analysis area (52% of habitats on non-DNRC lands). Much of the 3,169 acres (48%) 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 670 acres (89%) of the potential nesting habitat along with 810 acres (55%) 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. No appreciable changes to pileated woodpecker habitats would be anticipated with the proposed pre-commercial thinning. 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 1,485 acres proposed for treatment. In the cumulative effects analysis area, the reduction in quality on

670 acres of potential nesting habitats and 810 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-7 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-8 White-tailed deer (107 acres, 7%) and moose (10 acres, <1%) winter ranges exist in the project area. Approximately 1,569 acres of the project area (98%) 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 Highway 200 corridor and the Blackfoot River. Roughly 4,900 acres (14%) of white-tailed deer, 2,419 acres (7%) of mule deer, 7,760 acres (23%) of elk, and 3,329 acres (10%) of moose winter ranges exist in the cumulative effects analysis area. There are roughly 5,051 acres (76%) 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 17,770 acres (65%) 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. Human disturbance within the winter range is associated with residential development, agricultural activities, recreational snowmobile use, commercial timber management, and several roads. Ongoing activities associated with the Coyote-Greenough project on DNRC-managed lands could continue disturbing big game and/or altering big game habitats.

Hiding cover is rather abundant in the project area. There are no open roads in the project area. Non-motorized access to the project area exists given the proximity to Highway 200 with associated Block Management Area access points; the presence of roughly 8.2 miles of restricted roads (3.3 mi./sq. mi., simple linear calculation) in the project area likely facilitates non-motorized human access to the project area. A portion of the project area (39 acres; 2%) does not contain big game security habitats due to the proximity to Highway 200, however roughly 1,561 acres (98% of project area) are distant enough and contain sufficient cover to be able to contribute to a larger block of potential security habitat that extend beyond the project area. In the cumulative effects analysis area, access for recreational hunting is relatively high, with many open roads (at least 78 miles, 1.5 miles/sq. mile) that facilitate access and numerous restricted roads (at least 71 miles; 1.3 miles/sq. mile) that could be used for non-motorized use. Within the cumulative effects analysis area, 4 patches (total of 10,871 acres; 32%) of potential security habitat exist. Two of patches extend beyond the cumulative effects analysis area and

contribute to larger blocks of potential security habitats that extend beyond the cumulative effects analysis area.

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 and the availability of other habitats in the vicinity, the potential effect to big game would be minor. Proposed activities would occur on roughly 85 acres (79%) of white-tailed deer winter range and 10 acres (100%) of moose winter range; proposed activities would reduce canopy closure and potential winter use by big game on roughly 1,467 acres (93%) that likely have attributes facilitating considerable winter use by big game. Following proposed activities, canopy densities in these stands providing snow intercept and thermal cover would be reduced, reducing habitat quality for wintering big game. In general, it could take 30 to 50 years for these stands to regenerate and attain a size capable of providing thermal cover for big game. Potential disturbance to wintering big game would be additive in the cumulative effects analysis area to other forms of disturbance, including timber management (including any potential disturbance associated with the Coyote-Greenough project in the vicinity on DNRC-managed lands), numerous open roads, and a variety of human developments. Further reductions in thermal cover and snow intercept would be additive to losses from recent and ongoing 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.

Tree density within proposed units would be reduced on approximately 1,485 acres, including roughly 1,446 acres (93%) of forested stands in the project area contributing to potential big game security habitat. Hiding cover would be reduced within the proposed units but would improve as trees and shrubs become reestablished in the openings over the next 10-20 years. 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 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 approximately 3.25 miles of new, restricted 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. 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 (1,446 acres) of potential big game security habitats in the cumulative effects analysis area would be altered, but given the prescriptions, some level of cover could persist following proposed treatments. Overall negligible cumulative effects to big game security habitats would be expected given the small amount of area that would be altered, the location of those changes, and the lack of changes in open roads in the project area; big game security

habitats would persist in the cumulative effects. Negligible effects to big game survival would be anticipated.

Any pre-commercial thinning would not appreciably alter winter range attributes but could shorten the time before some of these stands provide these attributes to big game in the future; conversely proposed pre-commercial thinning could further reduce hiding cover quality for big game, but cover would be expected to persist.

Wildlife Mitigations:

- A DNRC biologist will be consulted if a threatened or endangered species is encountered to determine if additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (ARM 36.11.428 through 36.11.443) are needed.
- Motorized public access will be restricted at all times on restricted roads that are opened for harvesting activities; signs will be used during active periods and a physical closure (gate, barriers, equipment, etc.) will be used during inactive periods (nights, weekends, etc.). These roads and skid trails would be reclosed to reduce the potential for unauthorized motor vehicle use.
- Snags, snag recruits, and coarse woody debris will be managed according to ARM 36.11.411 through 36.11.413, 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 will be prohibited from carrying firearms while on duty.
- Food, garbage, and other attractants will 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 will be contacted. Site-specific measures will be developed and implemented to protect the nest and birds prior to re-starting activities.

Wildlife References

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Wittinger, W.T. 2002. Grizzly bear distribution outside of recovery zones. Unpublished memorandum on file at USDA Forest Service, Region 1. Missoula, Montana.2pp.

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					
Dust	X				X				X					
Action														
Smoke		X				X				X				
Dust		X				X				X				

Comments: Burning would be completed in accordance with the rules of the Montana Idaho Smoke Management Coordination Group.

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					
Aesthetics	X				X				X					
Demands on Environmental Resources of Land, Water, or Energy	X				X				X					
Action														
Historical or Archaeological Sites		X				X				X				
Aesthetics		X			X				X					
Demands on Environmental Resources of Land, Water, or Energy	X				X				X					

Comment: Scoping letters were sent to those Tribes that requested to be notified of DNRC timber sales. Northern Cheyenne Tribe made a request for a Class I and Class III report. 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 paleontologic resources, proposed timber harvest activities are expected to have *No Effect* to *Antiquities*. No additional archaeological investigative work will be conducted in response to this proposed development. However, if previously unknown cultural or paleontological materials are identified during project related activities, all work will cease until a professional assessment of such resources can be made.

OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA: *List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.*

- None known.

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					
Industrial, Commercial and Agricultural Activities and Production	X				X				X					
Quantity and Distribution of Employment	X				X				X					
Local Tax Base and Tax Revenues	X				X				X					
Demand for Government Services	X				X				X					
Access To and Quality of Recreational and Wilderness Activities	X				X				X					
Density and Distribution of population and housing	X				X				X					
Social Structures and Mores	X				X				X					
Cultural Uniqueness and Diversity	X				X				X					
Action														
Health and Human Safety	X				X				X					
Industrial, Commercial and Agricultural Activities and Production	X				X				X					
Quantity and Distribution of Employment		X				X			X					
Local Tax Base and Tax Revenues	X				X					X				
Demand for Government Services	X				X				X					
Access To and Quality of	X				X				X					

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**					
Social Structures and Mores	**X**				**X**				**X**					
Cultural Uniqueness and Diversity	**X**				**X**				**X**					

Comments:

1. The parcels are currently leased for grazing. That use would remain unchanged with alternative.
2. The Action Alternative would provide employment for one logging company throughout the duration of the project.

Locally Adopted Environmental Plans and Goals: *List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.*

- None

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

Action Alternative: The timber harvest would generate additional revenue for the MSU Morrill and Common School Trusts. The estimated return to the trust for the proposed harvest is approximately $500,000 based on an estimated harvest of 4 MMBF (28,000 tons) and an overall stumpage value of $17.85 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.

References

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

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

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

Environmental Assessment Checklist Prepared By:

Name: Sam Whitney
Title: Forest Management Coordinator
Date: 10/25/2023

Finding

Alternative Selected

After thorough review of the Morrison Projects Environmental Assessment (EA), project file, and public scoping, and, all applicable rules and plans, and laws, I have taken the decision to select the Action Alternative.

The Action Alternative meets the intent of the project objectives as stated in *Type and Purpose of Action* listed on page 1 of the EA. Specifically, the proposed project is expected to:

- Provide continuing income for the Trust beneficiaries (MSU Morrill and Common Schools) in a manner consistent with sustained yield management principles. This will be accomplished through the Action Alternative of this sale, and the removal of approximately 5 million board feet of sawlog.
- Promote long-term production of timber for generating revenue to the Trust beneficiaries. This will be accomplished through the Action Alternative harvest actions and through pre-commercial thinning on up to 800 acres.

- Manage the identified parcels intensively for healthy and biologically diverse forests to provide long-term income for the Trusts (ARM 36.11.405).
- Promote stand health by returning the stands to stocking levels and fuel loads closer to historical levels (Desired Future Condition) and creating healthier stands.
- Improve access and BMP compliance with new construction within section 16 T13N R15W and section 9 T13N R15W (Lubrecht Experimental Forest). Also, road maintenance activities on DNRC and Lubrecht Experimental Forest along roads accessing portions of these projects.

Significance of Potential Impacts

The EA addressed the identifiable potential resource issues through proposed mitigation measures which incorporate all applicable rules, plans, guidelines, and laws.

This approach resulted in a project in which potential effects to several resources were expected to be negligible, minimal, minor, or low. These resources may not be discussed in further detail. Others, especially ones rated with moderate concern, are discussed in further detail:

Standard Vegetative Community – Direct, indirect, and cumulative effects are expected to be low apart from the stand age class which will be moderate. These effects reflect mitigations and harvest plans designed to benefit forest conditions through promotion of increased stand health and diversity, decreased fuel loading, a probable decrease of younger age Douglas-fir, and movement towards historic/desired future conditions with an increase of the stand age that is present. This is a result of DNRC's long-term goal of reaching Ponderosa Pine Old Growth stands. Although there isn't any Old Growth stands at this time, the actions under these projects would make a move toward the appropriate Desired Future Condition and help the long-term goal to reach those Old Growth conditions.

Weeds – Direct, indirect, and cumulative effects are expected to be moderate. However, this doesn't differ from the No-Action Alternative effects. The Action Alternative would provide for more weed spraying than the No-Action Alternative. It also provides mitigations through equipment cleaning and grass seeding.

Soils – Direct, indirect, and cumulative effects are expected to be low. Proposed mitigations along with contract administration are expected to control potential soil disturbance and avoid excessive impacts.

Water Resources – Direct, indirect, and cumulative effects to sediment are expected to be low. Wetlands and small streams are present. They are not included within the activities planned.

Fisheries – There is a low risk of long-term impacts as none of the streams within the project area have fish.

Pileated Woodpecker – There is a likelihood of moderate direct and secondary effects. This is a result of Pileated Woodpecker habitats being reduced. However, potential use would occur.

Wildlife – There is a moderate risk of adverse direct and secondary effects to big game winter range. This is a result of the Coyote Greenough Projects and the Morrison Projects within the same local area. These projects would reduce overstory cover given the harvest prescriptions. This will decrease snow interception and could potentially impact big game travel. Much like Coyote Greenough Projects, Morrison Projects also have roads closed to public vehicle travel. The pre-commercial thinning "could shorten the time before some of these stands provide these attributes to big game in the future…". There would only be low cumulative impacts.

Given the expected effects, rationale, mitigations, and overall project benefits, no significant impacts are expected with the selection of the Action Alternative.

Need for Further Environmental Analysis

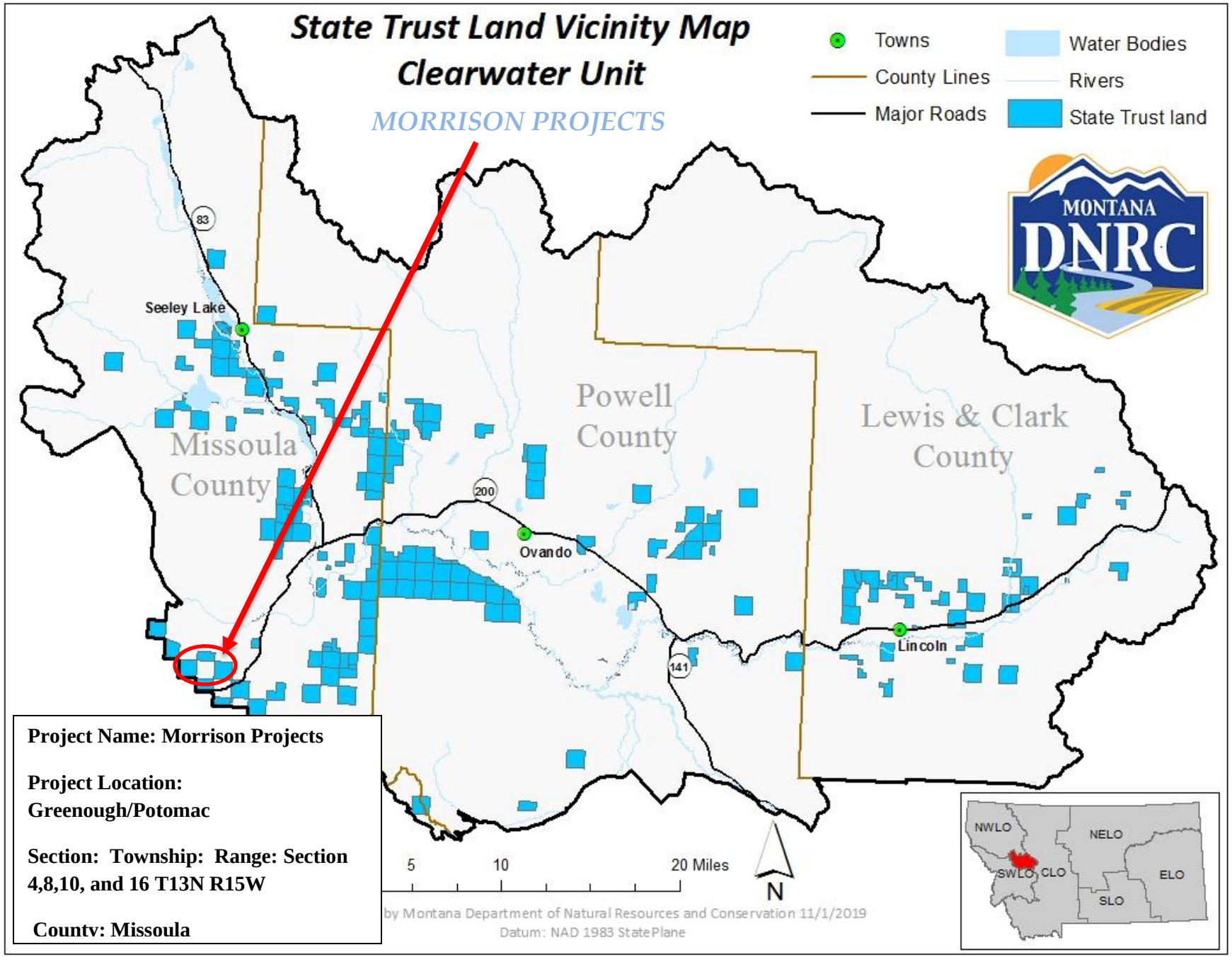
☐	EIS	☐	More Detailed EA	X	No Further Analysis

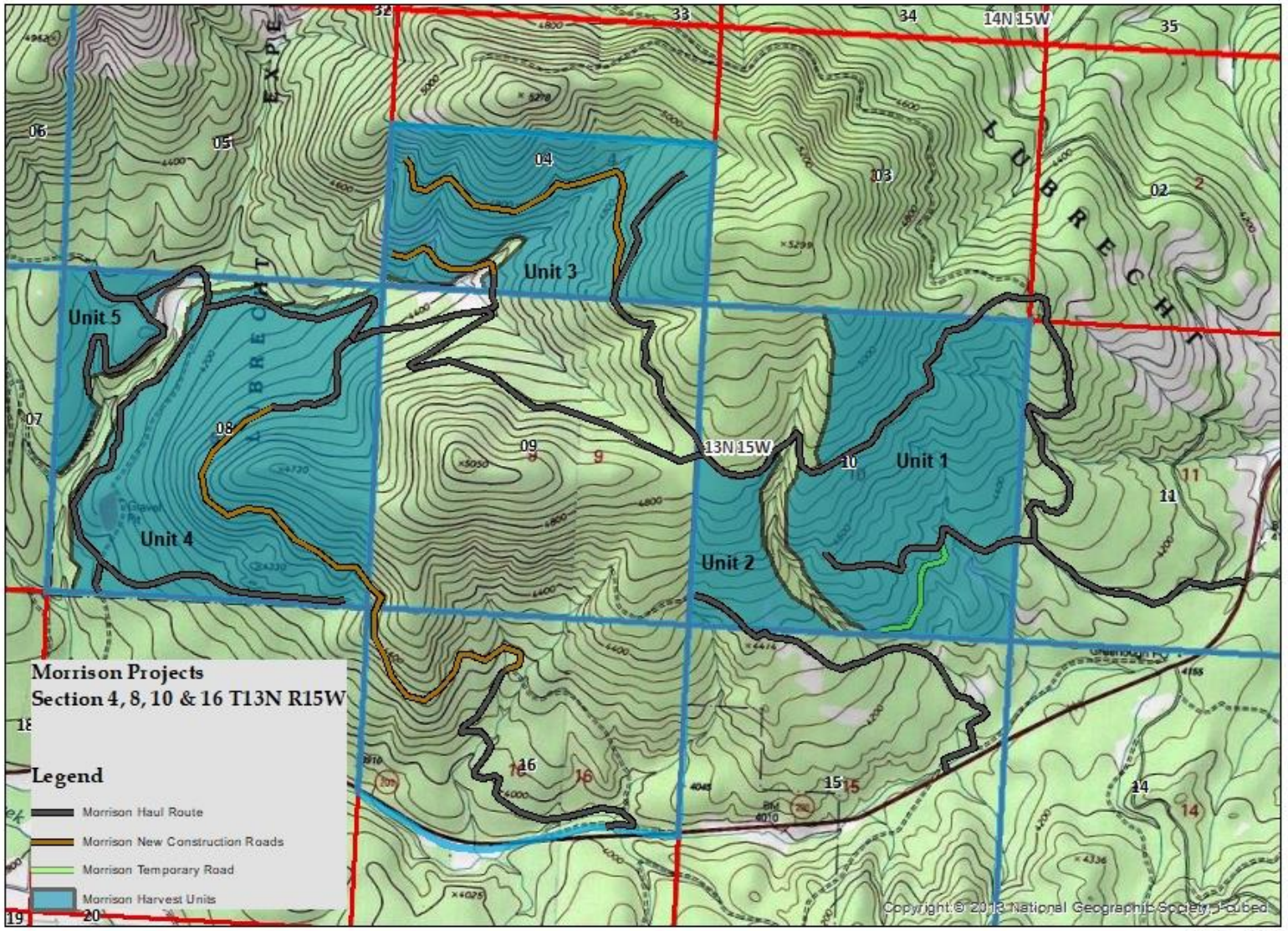
Environmental Assessment Checklist Approved By:

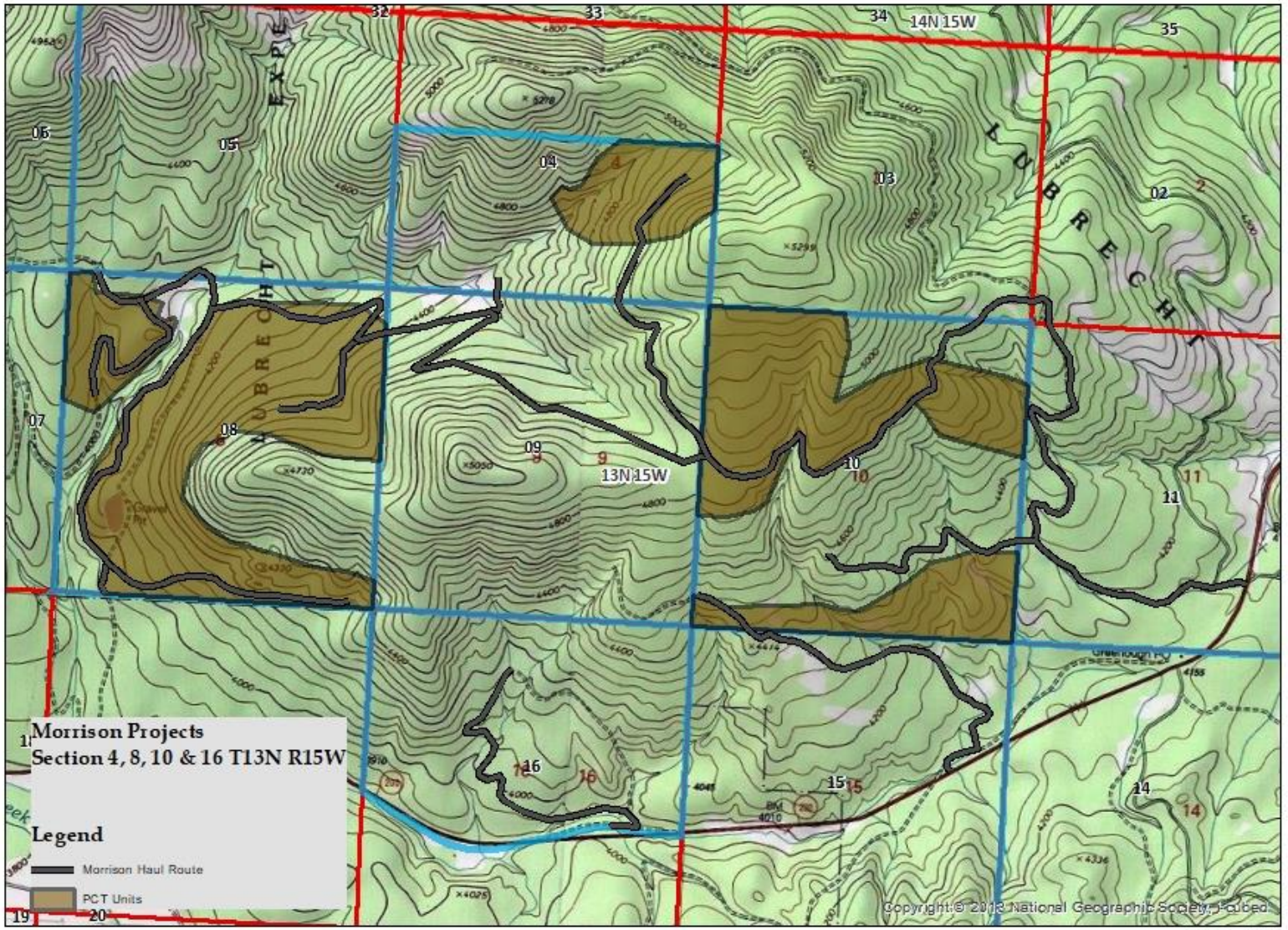
Name: Craig V. Nelson
Title: Clearwater Unit Forester Management Supervisor
Date: November 1, 2023
Signature: /s/ Craig V. Nelson

Attachment A - Maps

A-1: Timber Sale Vicinity Map




Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
14N 15W
13N 15W
Morrison Projects
Section 4, 8, 10 & 16 T13N R15W
Legend
Morrison Haul Route
Morrison New Construction Roads
Morrison Temporary Road
Morrison Harvest Units
Copyright © 2013 National Geographic Society, i-cubed
0 0.25 0.5 1 1.5 2 Miles
Whitney 2023


14N 15W
13N 15W
Morrison Projects
Section 4, 8, 10 & 16 T13N R15W
Legend
Morrison Haul Route
PCT Units
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