CLEARVIEW PROJECTS
ENVIRONMENTAL ASSESSMENT

Clearwater Unit
Southwest Land Office
Montana Department of Natural Resources and Conservation

March 2015

CLEARVIEW PROJECTS ENVIRONMENTAL ASSESSMENT

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Environmental Assessment

Project Name: Clearview Projects
Proposed Implementation Start Date: July 2015
Proponent: Clearwater Unit, Southwest Land Office, Montana DNRC
County: Missoula

Type and Purpose of Action

Description of Proposed Action:

The Clearwater Unit of the Montana Department of Natural Resources and Conservation (DNRC) is proposing the Clearview Projects. The project is located in the area of Salmon, Placid, and Seeley Lake. Please refer to vicinity map Attachment A-1 and project maps**.** This project includes the following sections:

Beneficiary	Legal Description	Total Acres	Treated Acres
Common Schools	Sections 9, 15, 16, and 23 T16N R15W	**2,391**	**1,100**
Public Buildings			
MSU 2nd Grant	Sections 4, 8, 10, 14, 24, and 26 T16N R15W	**2,185**	**475**
MSU Morrill			
Eastern College-MSU/Western College-U of M			
Montana Tech			
University of Montana			
School for the Deaf and Blind			
Pine Hills School	Sections 30 and 32 T16N R14W	**654**	**325**
Veterans Home			
Public Land Trust			
Acquired Land			

This proposal includes timber harvest under several sales on approximately 1,900 acres removing an estimated 5.5 million board feet (MMBF). Pre-commercial thinning would also occur under this EA on a proposed 1,400 acres. The following chart shows the proposed actions

Action	Quantity
Proposed Harvest Activities	
Shelterwood	≈ 470
Selection	≈ 1,175
Selection / Overstory Removal	≈ 255
Total Treatment Acres	**≈ 1,900**
Proposed Forest Improvement Treatment	
Pre-commercial Thinning	**≈ 1,400**
Planting	*As needed*

Action	Quantity
Proposed Road Activities	
New permanent road construction (closed)	10 miles
Road maintenance	16 miles
Road abandoned	6.5 miles

**Please note that these are estimates of the acreage of treatment units (harvest and forest improvement) and mileage of roads. These are not exact figures and should not be assumed to be. Old Growth Maintenance acres are included but may be categorized under other treatments and the variance within those treatments. Overstory Removal does not meet Old Growth criteria according to Green et. al..*

Objectives of these projects include:

- Maximize revenue over the long-term for trust accounts from the timber resources and provide a sufficient amount of sawlog volume to contribute to the DNRC's sustained yield as mandated by State Statute *77-5-222, MCA*.
- Manage the identified parcels intensively for healthy and biologically diverse forests to provide long-term income for the Trusts.
- Bring stands closer to historic conditions.
- Perform Old Growth maintenance treatments to reduce shade tolerant species while maintaining Old Growth status.
- Improve access and BMP compliance with new construction and road maintenance activities.
- Reduce stand densities and fuel loading conditions to help comply with the Seeley Lake Primary Line of Defense from the 2013 Seeley-Swan Fire Plan of Missoula County (DNRC is a cooperator).
- Improve stand growth and vigor and reduce the threat of future losses to fire, insects, and disease.
- Decrease visual impacts to the aesthetics of the area when viewed from areas around this sale.

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),
- ► the 2013 Seeley-Swan Fire Plan of Missoula County ,
- ► and all other applicable state and federal laws.

Project Development

SCOPING:

- DATE: **August 2010**
  - ***Please see ATTACHMENT B***

- PUBLIC SCOPED:
  - The scoping notice was posted on the DNRC Website: http://dnrc.mt.gov/PublicInterest/Notices/Default.asp
  - The Scoping Letter was posted within the *Missoulian* (August 15-22, 2010) and the *Pathfinder* (September 2, 2010).
  - It was posted at the Seeley Lake Post Office, Stoney's Quick Stop at the Clearwater Junction, and at the Clearwater Unit Office.
  - It was mailed to those listed in ***ATTACHMENT B.***
- AGENCIES SCOPED:
  - Montana Department of Fish, Wildlife, and Parks (DFWP)
  - United States Forest Service, Seeley Lake Ranger District
- COMMENTS RECEIVED:
  - How many: 2 (two) from **Confederated Salish and Kootenai Tribes**
  - Concerns:

    1) DNRC management and location of an Indian trail route.
    2) DNRC management and location of lithic scatter traces.
  - Results (how were concerns addressed): The proposed management areas are not located within areas of cultural concerns..

  - How many: 13 (thirteen) from **Montana Department of Fish, Wildlife, and Parks (DFWP)**
  - Concerns:

    Listed within ***ATTACHMENT B***.
    - Results (how were concerns addressed): These concerns were addressed in several ways.

      1) Proposed harvest areas were moved away from some areas of concern.

      2) Implementation of the Streamside Management Zone (SMZ) Law and Rules, HCP, Best Management Practices (BMP's), and all other applicable laws, rules, and plans.

      3) Some concerns were dismissed from further consideration due to: the limited scope of this document over other DNRC practices; the lack of feasibility when weighed against DNRC mandates; or DNRC's belief that through project design, site-specific measures and reviews, expected implementation of BMP's and mitigation measures adequate protection would be provided to the listed areas or topics of concern.

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

INTERDISCIPLINARY TEAM (ID):

- Project Leader: Craig V. Nelson
- Archeologist: Patrick Rennie
- Wildlife Biologist: Garrett Schairer
- Hydrologist, Fishery, & Soil Scientist: Jeff Collins

OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

(Conservation Easements, Army Corps of Engineers, road use permits, etc.)

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

Montana Department of Environmental Quality (DEQ)- DNRC is classified as a major open burner by DEQ and is issued a permit from DEQ to conduct burning activities on state lands managed by DNRC. As a major open-burning permit holder, DNRC agrees to comply with the limitations and conditions of the permit.

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

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. Culvert replacements would implement erosion control and stream protection and meet the requirements of the DFWP 124 permit issued for this project.

ALTERNATIVES CONSIDERED:

NO-ACTION ALTERNATIVE:

- The proposed harvest, road building and closures, and pre-commercial thinning would not occur.
- Stands would remain at overstocked levels and are currently under possible insect and disease threats including mountain pine beetle (*Dendroctonus ponderosae*) and spruce budworm (*Choristoneura occidentalis*).
- Road systems would be changed to improve locations and reduce unregulated use on DNRC land.
- Concerns regarding overstocked stands and associated fire danger would continue.
- DNRC would not be able to address the needs of the Seeley-Swan Fire Plan, and therefore, and the risk of fire growth would not be lessened in this area.
- All pre-commercial stands would continue to grow with decreased vigor and would show more death within the stand.
- No money would be received by School Trust funds from activities of this project.
- These stands would not be directed toward Desired Future Condition.

ACTION ALTERNATIVE:

- This proposal includes timber harvest under several sales on approximately 1,900 acres removing an estimated 5.5 MMBF.
- Stands would have stocking levels reduced and could show a decrease in losses due to insect and disease.
- Road systems would be changed to improve locations and reduce unregulated use on DNRC land.
- Treatments would assist DNRC in addressing the needs of the Seeley-Swan Fire Plan, and the risk of fire growth would be lessened across DNRC lands.
- Pre-commercial thinning would also occur under this EA on a proposed 1,400 acres with a plan to increase vigor and reduce overstocking and death.
- Money would be received by the three School Trusts (Common School, MSU 2nd Grant, and Pine Hills Permanent).
- These stands would be directed toward Desired Future Condition.

Impacts on the Physical Environment

VEGETATION:

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

- These stands will be treated in a fashion to help produce usable areas for the Primary Lines of Defense for Seeley Lake and Placid Lake communities.
- Forest management activities may adversely affect Old Growth.
- Shade tolerant species would continue to out compete seral species-removing stands from their historic cover type and species distribution.
- Young stands are currently overstocked.
- There is a concern that forest management activities may result in introduction of new weeds or increased spread of noxious weeds from the proposed forest management activities.
- There is concern the proposed project could negatively impact populations of threatened, endangered, or sensitive plant species.

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

- Favor western larch and ponderosa pine in harvest areas and pre-commercial thinnings to shift species represented toward the accepted Desired Future Condition.
- Plant western larch and ponderosa pine in planting blocks to shift species represented toward the accepted Desired Future Condition.
- Conduct Old Growth maintenance treatments to maintain Old Growth on the landscape.
- Prescribe a selection harvest in order to emulate natural disturbance historically present on the landscape.
- Wash equipment prior to harvest to limit weed seed dispersal.
- Spray weeds along roadsides to limit spread of existing weeds, while preventing weed spraying within Howell's gumweed populations.
- Plant grass on 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.

- No harvest would occur near within 100 feet of the Clearwater River or Class 1 fishery streams.

FOR COMPLETE VEGETATION ANALYSIS SEE *ATTACHMENT C*.

SOILS:

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

There is a concern that forest management activities may result in increased erosion and reduced soil productivity where excessive disturbance from compaction, displacement, or loss of nutrients occurs, depending on the extent and degree of harvest related soil effects.

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

- DNRC would implement all applicable BMP's, Montana Administrative Rules for Forest Management, and reasonable mitigation and erosion control practices during timber harvest, road maintenance, road construction and road use activities. The commitments of the DNRC HCP would be implemented on the applicable parcels.

- Limit harvest equipment and hauling operations to periods when soils are relatively dry (less than 20%), frozen or snow covered to minimize soil compaction and rutting, and to maintain drainage features. Check soil moisture conditions prior to equipment start-up.

- On tractor harvest units the logger and sale administrator would agree to a general skidding plan prior to equipment operations to limit trails to 15% or less of the harvest unit. Preference would be placed on existing skid trail use, unless the trail is too steep. Feller-bunchers may work on slopes up to 45% as long as displacement and turning is minimized to prevent excessive disturbance. Slopes over 45% are expected to be cable harvested to reduce soil impacts and improve harvest efficiency.

- On moderate to densely stocked stands, whole tree skidding can reduce slash hazard, but also remove a portion of nutrients from growing sites. Target fine slash and woody debris levels to retain 5-15 tons/acre well distributed on-site while meeting the requirements of the slash law. On thinning sites with lower basal area, retain large woody debris as feasible since it may not be possible to retain 5 tons/acre and the

  emphasis would be on providing additional coarse woody debris in the future. Slash would be placed on main skid trails to protect soils and reduce erosion potential and potential unauthorized ATV use as needed.

- Existing road segments would be improved and maintained in association with the harvest activities. Road improvements would include surface blading and installation of drainage features to control surface erosion and prevent sediment delivery to streams as needed to comply with BMP's and to protect water quality.

- Roads that would no longer be used due to relocation would be stabilized from erosion and hydrologically restored to promote conifer growth by reclaiming the road surface. Reclaimed roads would have the surface ripped to 12 inches in depth, relief culverts removed and effectively drained with waterbars, the surface grass seeded and slash applied.

- Harvest operations and road conditions would be monitored as part of the on-going project operations and repairs would be made as needed, including erosion control, culvert cleaning and re-vegetation. If cut-slope or fill-slope slumps occurred on new roads they would be stabilized to control erosion as part of the harvest project.

- Road use would be limited to dry or frozen ground conditions to reduce rutting and erosion. New road construction, including drainage features, should be completed in the fall prior to freeze-up. Road cutslopes are to be constructed at relatively stable angles as noted in contract Exhibit B. Check snow/frozen ground conditions prior to operations.

FOR COMPLETE SOILS ANALYSIS SEE *ATTACHMENT D.*

WATER RESOURCES:

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

- There is a concern that the proposed action may cause impacts to water quality from sedimentation that may occur associated with timber management activities, road construction and road use.

- There is a concern that the proposed timber harvest may cause or contribute to cumulative watershed impacts as a result of increased water yields.

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

- DNRC would implement all applicable BMP's, Montana Administrative Rules for Forest Management, and reasonable mitigation and erosion control practices during timber harvest, road maintenance, road construction and road use activities. The commitments of the DNRC HCP would be implemented on the applicable parcels.

- DNRC would locate, clearly mark and maintain suitable water resource protection boundaries including SMZ's, Riparian Management Zones (RMZ's), Channel Migration Zones (CMZ's) and Wetland Management Zones (WMZ's) adjacent to streams and wetlands consistent with State Forest Land Management rules, and the DNRC HCP where applicable.

- SMZ's vary from 50 to 100 feet in buffer width. The north boundary lines of harvest units in Section 14, T16N, R15W, are located upslope of a terrace edge that parallels the Clearwater River. A RMZ of 100 feet buffer distance (based on the forest stand potential tree height) would be designated along the Clearwater River above the river terrace edge that defines a channel migration zone. No harvest is proposed in this 100-foot. RMZ or other Class 1 stream segments.

- Limit harvest equipment and hauling operations to periods when soils are relatively dry (less than 20%), frozen or snow covered to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up.

- Construct and maintain erosion control features on trails and roads where needed. For skid trails on slopes, install waterbars or well distributed slash on trails as needed to control erosion potential and reduce potential unauthorized ATV use as needed.

- Existing road segments would be improved and maintained in association with the harvest activities. Road improvements would include surface blading and installation of drainage features to control

surface erosion and prevent sediment delivery to streams as needed to comply with BMP's, crossing design 124 permits and to protect water quality.

- All newly disturbed soils on road cuts and fills would be promptly reseeded to site adapted grasses to reduce weed encroachment and stabilize roads from erosion.

- Roads that would no longer be used due to relocation would be stabilized from erosion and hydrologically restored to promote conifer growth by reclaiming the road surface. Reclaimed roads would have the surface ripped to 12–inches in depth, relief culverts removed and effectively drained with waterbars, the surface grass seeded and slash applied.

- Harvest operations and road conditions would be monitored as part of the on-going project operations and repairs would be made as needed, including erosion control, culvert cleaning and re-vegetation.

- Road use would be limited to dry or frozen ground conditions to reduce rutting and erosion. New road construction, including drainage features, should be completed in the fall prior to freeze-up. Road cutslopes are to be constructed at relatively stable angles as noted in contract Exhibit B. Check snow/frozen ground conditions prior to operations.

FOR COMPLETE WATER RESOURCES ANALYSIS SEE *ATTACHMENT E*.

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

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

- **Riparian Large Woody Debris-** DFWP expressed concern for removal of large woody debris and snags from SMZ's or wetlands and the possible disturbance effects of harvest especially along the Clearwater River and recommended no harvest in the SMZ. DNRC would designate a RMZ width along Class 1 streams based on stand potential tree height and no harvest would occur in SMZ's or the wider RMZ width adjacent to Class 1 fisheries streams and rivers and there would be no effect on large woody debris or stream shading which may affect stream temperatures and these concerns are dismissed from further analysis.

- **Riparian Clearing by cabin owners-** A concern was expressed that vegetation clearing (mowing, pruning, firewood removal) has occurred on DNRC cabin site leases on or very near the Clearwater River shoreline and that DNRC would complete timber harvest within cabin sites. DNRC cabin lessees must comply with applicable laws, 4 sites have recently been confirmed with mowing/shoreline vegetation removal. Compliance is being reviewed by DNRC and permitting is being considered by Missoula County Conservation District. No timber harvest or shoreline alterations are proposed in the RMZ/SMZ and there would be no effects to fisheries from the proposed forest management activities.

- **Fish Habitat Connectivity-** Bull trout and westslope cutthroat trout as well as other fish species have been identified as migratory in the Clearwater River between Seeley Lake and Salmon Lake and in Owl Creek between Placid Lake and the Clearwater River. There are several existing bridge locations on the proposed haul roads across the Clearwater River and Owl Creek which don't restrict fish connectivity. No restrictions to fish connectivity were identified on the Clearwater River between Seeley Lake and Salmon Lake. However, there is a dam on the outlet of Placid Lake that limits surface flow in the summer and Owl Creek is often dewatered in segments between Placid Lake Dam and the

Clearwater River. No new road crossings of fishery streams are proposed and there would be no effects to existing crossings or fish habitat connectivity. Therefore, this concern is dismissed from further analysis.

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

- DNRC would implement all applicable BMP's, Montana Administrative Rules for Forest Management, DNRC HCP measures and reasonable mitigation and erosion control practices during timber harvest, road maintenance, road construction and road use activities to reduce sedimentation and minimize effects to fisheries.
- DNRC would locate, clearly mark and maintain suitable water resource protection boundaries including SMZ's, RMZ's, and WMZ's adjacent to streams and wetlands as consistent with State Forest Land Management rules.
- A 100 foot RMZ would be located for the proposed harvest unit adjacent to the Clearwater River in Section 14, T 16N, R15W and no harvest would occur in this RMZ.
- Existing road segments would be improved and maintained in association with the harvest activities. Road improvements would include surface blading, installation of drainage features to prevent surface erosion and sediment delivery to the stream, ditching to improve road surface stability and gravel surfacing of selected segments as needed to comply with BMP's and protect water quality.
- Road use would be limited to dry or frozen ground conditions to reduce rutting, potential erosion and sedimentation. New road construction, including drainage features, would be completed in the fall prior to freeze-up. Check snow/frozen ground conditions prior to operations. Minimal effects are expected with snow road construction.
- New roads would be closed to motor vehicles upon completion of harvest activities. Slash would be placed on main skid trails to protect soils and reduce erosion potential and unauthorized ATV use where appropriate.
- Culvert replacements would implement erosion control and stream protection and meet the requirements of the DFWP 124 permit issued for this project.

FOR COMPLETE FISHERIES RESOURCE ANALYSIS SEE *ATTACHMENT F*.

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

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

- Proposed activities could alter mature forested habitats and/or landscape connectivity, which could affect species that rely on these mature forested habitats, and/or alter connectivity and the ability of wildlife requiring corridors to move through the landscape.
- Proposed activities could alter cover, increase access, and reduce secure areas, which could affect grizzly bears by displacing them from important habitats and/or increasing risk to bears of human-caused mortality.

- Proposed activities could negatively affect Canada lynx by altering lynx summer foraging habitat, winter foraging habitat, and other suitable habitat, rendering it unsuitable for supporting lynx.

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

- Proposed activities could reduce the amount and/or quality of fisher habitats, which could alter fisher use of the area.

- Proposed activities may alter flammulated owl habitat by reducing canopy closure and increasing tree spacing, and could remove snags needed by flammulated owls for nesting.

- Proposed activities could displace gray wolves from important habitats, particularly denning and rendezvous sites, and/or alter prey availability.

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

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

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

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

- A DNRC biologist 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.
- If a wolf den is found within 1 mile of active harvest units or within 0.5 miles of a rendezvous site, cease operations and consult a DNRC wildlife biologist for appropriate site specific mitigations before resuming activities.

- 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, attractants, and other unnatural bear foods would be stored in a bear-resistant manner.
- Harvesting and thinning would be prohibited between April 1 and June 15 to minimize the potential for disturbance to grizzly bears, bald eagles, and a host of other avian species.

- Retention of patches of advanced regeneration of shade-tolerant trees, such as sub-alpine-fir, in units in lynx habitats would break-up sight distances, provide horizontal cover, and provide forest structural attributes preferred by snowshoe hares and lynx.
- Provide connectivity for fisher, Canada lynx, and a host of other species by maintaining corridors of unharvested and/or lighter harvested areas along riparian areas, ridge tops, and saddles.

FOR COMPLETE WILDLIFE ANALYSIS SEE *ATTACHMENT G*.

AESTHETICS

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

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

- There are concerns that the proposed projects and roadbuilding would impact the aesthetics of the area, especially south of Seeley Lake, Montana.

Existing Conditions

The landscapes in the greater area are influenced by glaciation (such as Seeley Lake or areas near Ovando, Montana) with steep glaciated peaks and lower rolling ridges, or have been carved and formed by the Blackfoot and Clearwater Rivers. The landscape within the project area is mountainous with deep canyons formed by the streams that still occupy the bottom areas or have remains of tarns, generally along the tops of ridges or benches within the area. The Clearwater River is located within this proposed project. The terrain gently slopes upward in a series of benches moving upward in elevation along the river. Several lakes are found within the project area with Seeley Lake and Salmon Lake being the primary ones. Benches created by the glaciers and/or the streams, are moderately to heavily timbered. Several primary road systems such as the Placid Lake Road and Highway 83 are present. Any changes within the area from these alternatives would be in addition to past harvests, road building, and other uses within the area.

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

- Use topography, openings, and other changes on the ground to make harvest and pre-commercial thinning units less visibly obtrusive.
- Varying densities and using “clumpy” spacing reduces the changes to the scenic integrity of the site.

No Action Alternative Direct, Indirect, and Cumulative Effects

The risk of direct effects would be expected to be low. Over time, tree growth would be expected to fill in current, naturally occurring openings. Due to the long period of time involved, this effect would be expected to be low. The risk of indirect effects would be expected to be insignificant.

Past forest management activity on surrounding lands, would contribute to the cumulative visual effects to project area landscape. The risk of cumulative effects would be expected to be low as disturbances from past forest management activities have mostly revegetated. A minimal amount of cumulative effects would be expected from the continued increase in vegetative growth due to the long period of time involved.

Action Alternative: Direct, Indirect, and Cumulative Effects

The timber harvest would be visible from Highway 83, but would often appear to be “an extension” of other cutting units from the past. Some of the areas of harvest would be blocked from long distance viewing due to topographic changes or potentially flatter land that would be harvested. An experienced observer or someone

who resides in the area would notice the changes to the other stands, mostly this would occur due to the decrease in stand density.

Where possible, much of the proposed cutting would be light to moderate in intensity, especially from a distant observation spot. As many of the largest trees would be left, and a random, natural spacing would be used, it would be easier to decrease contrast in form, line, color, and texture between treated and untreated stands. Silvicultural treatments would borrow extensively from the natural grassy openings and only slightly affect the texture of the seen areas. Likewise, silvicultural treatments like the ones within section 24 would decrease the hard edge that occurs when comparing DNRC harvest from former industry ground within the same section.

Harvest units within sections 9, 14, 15, and 16 would often be more noticeable than areas that play easily off of grassy ridges and openings such as in sections 24, 30, and 32. These units would be within a heavily wooded hillside that faces Seeley Lake and southbound Highway 83. These units would be less dense than the existing stands. As hillsides become steeper, it becomes easier to notice changes in the vegetation. The plan for these proposed harvest units is to work with topographical features, the minimal openings on the hillside, and to make unit boundaries that aren't constant straight lines. This area would show moderate visual impacts in the short-term. Other areas would likely see low to moderate impacts to the aesthetics.

Any change to the scenery in the area from these alternatives would be in addition to past timber harvests, road building, vegetation management (grazing, pre-commercial thinning, etc.) and fire activity within the project area. This analysis includes all past and present effects. Generally slash disappears from the site within five years, and is often covered by other vegetation within three years. Due to slash and the initial color contrasts of the slash and limited road improvement work, there would be an expected short-term impact. Cumulative effects would be expected to be low given the revegetation of the older harvests nearby, and the time period of the proposed actions.

NOISE

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

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

- There are concerns that the proposed projects and roadbuilding would impact the noise levels of the area, especially south of Seeley Lake, Montana.

Existing Conditions

Noise levels vary on the landscape and result from industrial and recreational uses in the area.

No Action Alternative: Direct, Indirect, and Cumulative Effects

Noise would not be produced by the proposed project. Other activities within the area (Highway 83, Pyramid Lumber sawmill, activity on area lakes) produce noise at this time. All direct, indirect, and cumulative effects of noise would be low.

Action Alternative: Direct, Indirect, and Cumulative Effects

Harvest activities would be quite audible, and, depending upon air conditions, equipment could be heard many miles from their location. Noise would be generated by harvest operations, harvest related traffic, road construction, and administrative oversight. This could be expected to be present for the entire season of harvest, typically from mid-June through mid-March of the following year, over the two- to three- year duration of the harvest during the general "work week".

Based on the anticipated operating periods and the short duration of the timber sale direct, indirect, and cumulative effects of noise are expected to be low.

HISTORICAL AND ARCHEOLOGICAL SITES:

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

- There are concerns that the proposed projects and roadbuilding would impact a historic trail and/or lithic scatter.

Existing Conditions
A DNRC archaeologist has reviewed the proposed project location. The area was first inspected in 1982. Several items have been found within the project area and reside outside any proposed sale/unit boundaries. These include; lithic scatter from Native Americans, relics of an old logging camp, five historic residences, and a historic trail.

No Action Alternative: Direct, Indirect, and Cumulative Effects
No impacts are expected, and low direct, indirect, or cumulative effects are expected on these sites.

Action Alternative: Direct, Indirect, and Cumulative Effects
Under the proposed action alternative, if any historical or archaeological sites are discovered during the course of the project they would be protected and a DNRC archaeologist would be notified immediately.

Therefore, the proposed action alternative would not be expected to have any direct, indirect, or cumulative effect on historical or archaeological resources.

DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR, AND ENERGY:
There would be no measurable direct, indirect, and cumulative impacts related to environmental resources of land, water, air, and energy due to the relatively small size of the timber sale project.

OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:
- Fisheries Biological Assessment & Evaluation, United States Forest Service, Lolo National Forest, Region 1, Montana. September, 2014, assess effects of DNRC Cost share Easement in the Placid Lake area.

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

- USFWS and DNRC 2010. Montana Department of Natural Resources and Conservation 'Forested Trust Lands Habitat Conservation Plan, Final Environmental Impact Statement, Volumes I and II. U.S. Department of Interior, Fish and Wildlife Service, Region 6, Denver, Colorado, and Montana Department of Natural Resources and Conservation, Missoula, MT. September 2010.

- Seeley-Swan Fire Plan 2013 Revision – *A Component of the Missoula County Wildfire Protection Plan*. Produces a cooperative and coordinated fire plan for Seeley Lake and Condon communities-at-risk to wildfire.

Impacts on the Human Population

HUMAN HEALTH AND SAFETY:
Air Quality

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

- Smoke will be produced during pile burning.
- Smoke may adversely affect the Seeley Lake Impact Zone.
- Dust will be produced during harvesting and hauling activities.

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

The project area is located within Montana Airshed 3b, which encompasses portions of Missoula County. Currently, this Airshed does contain the Seeley Lake and Missoula impact zones. Portions of this sale are within the Seeley Lake impact zone.

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

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

Slash Burning

No Action Alternative: Direct, Indirect, and Cumulative Effects

No slash would be burned within the project area. Other burning by other individuals may occur within the airshed. Thus, there would be no effects to air quality within the local vicinity and throughout Airshed 3B or the Seeley Lake Impact Zone from project-related activities but there may be minimal impacts from other uses.

Action Alternative: Direct and Indirect Effects

Slash consisting of tree limbs and tops and other vegetative debris would be piled throughout the project area during harvesting. Slash would ultimately be burned after harvesting operations have been completed. Burning would introduce particulate matter into the local airshed, temporarily affecting local air quality. Over 70% of emissions emitted from prescribed burning are less than 2.5 microns (National Ambient Air Quality PM 2.5). High, short-term levels of PM 2.5 may be hazardous. Within the typical column of biomass burning, the chemical toxics are: Formaldehyde, Acrolein, Acetaldehyde, 1, 4 Butadiene, and Polycyclic Organic Matter.

Burning within the project area would be short in duration and would be conducted when conditions favor good to excellent ventilation and smoke dispersion as determined by the Montana Department of Environmental Quality and the Montana/Idaho Airshed Group. The DNRC, as a member of the Montana/Idaho Airshed Group, would burn only on approved days.

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

Cumulative Effects

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

Dust

No Action Alternative: Direct, Indirect, and Cumulative Effects

No dust related to harvesting operations would be generated within the project area. Other dust-generating activities such as recreation may occur. Thus, there is not expected to be dust-related effects to air quality within the local vicinity and throughout Airshed 3B or the Seeley Lake Impact Zone from project-related activities. However, there may be minimal impacts from other uses.

Action Alternative: Direct, Indirect, and Cumulative Effects

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

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

Log Hauling Traffic

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

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

Existing Conditions

Log hauling traffic is common in the project area.

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

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

No Action Alternative: Direct, Indirect, and Cumulative Effects

No increase in log truck traffic would occur. Other log truck traffic would still be present due to the project area’s proximity to Highway 83. Thus, there may be minimal impacts to traffic from other users.

Action Alternative: Direct, Indirect, and Cumulative Effects

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

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

RECREATION

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

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

- There are concerns that the proposed projects and roadbuilding would impact recreation.

Existing Conditions

The area is used for hiking, hunting, cross-country skiing, snowmobiling and general recreating. Currently, a majority of the roads through the area are closed to motorized use and used only for administrative purposes.

No Action and Action Alternatives: Direct, Indirect, and Cumulative Effects

There would be no change in road closure status and the selection of either alternative would not affect the ability of people to recreate on this parcel.

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

Will the No-Action or Action Alternatives result in potential impacts to:	Impact												Can Impact Be Mitigated ?	Comment Number
	Direct				Indirect				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**					
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**			***YES***	**1**
Industrial, Commercial, and Agricultural Activities and Production	**X**				**X**				**X**					
Quantity and Distribution of Employment		**X**				**X**				**X**			***YES***	**2**
Local Tax Base and Tax Revenues	**X**				**X**				**X**					
Demand for Government Services	**X**				**X**				**X**					
Density and Distribution of Population and Housing	**X**				**X**				**X**					
Social Structures and Mores	**X**				**X**				**X**					
Cultural Uniqueness and	**X**				**X**				**X**					

Will the No-Action or Action Alternatives result in potential impacts to:	Impact												Can Impact Be Mitigated ?	Comment Number
	Direct				Indirect				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Diversity														

Comment Number 1:
Impact
Log truck traffic in the area would increase for the duration of the timber sale, which could cause a low impact to human safety.

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

Comment Number 2:
Impact
According to the Montana Bureau of Business and Economic Research a general rule of thumb is that for every million board feet (MMBF) of sawtimber harvested in Montana, ten person years of employment occur in the forest products industry.

This harvest is viewed as a continuation of a sustained yield and as such would not create any new jobs but rather sustain approximately 45 person years of employment in the forest products industry. A few short-term jobs would also be created/sustained by issuing pre-commercial thinning contracts following harvest. Additionally, local businesses, such as hotels, grocery stores, and gas stations would likely receive additional revenues from personnel working on the proposed project. This would be a positive low impact to quantity and distribution in the area.

Mitigations:
- *This impact would be positive and mitigations would not be necessary.*

LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS
(includes local MOUs, management plans, conservation easements, etc.):
- Seeley-Swan Fire Plan 2013 Revision – *A Component of the Missoula County Wildfire Protection Plan*. Produces a cooperative and coordinated fire plan for Seeley Lake and Condon communities-at-risk to wildfire.

OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:
The proposed action has a projected harvest volume of 5.5 MMBF. This volume is worth approximately $400.00/thousand board foot (MBF) delivered to a forest products manufacture site at current market prices. Delivered to market, the proposed action has a total revenue value of an estimated $2.2 million. Removing the timber sale purchaser's contracted operations and DNRC's development, administration, and operation expenses, the trust beneficiaries net between an estimated 15 and 35 percent of total delivered sawlog market value. Therefore, the proposed action may generate net income for trust beneficiaries between $1.43 and $1.87 million.

Costs related to the administration of the timber sale program are only tracked at the Land Office and Statewide level. DNRC does not track project-level costs for individual timber sales. An annual cash flow analysis is conducted on the DNRC forest product sales program. Revenue and costs are calculated by land office and statewide. These revenue-to-cost ratios are a measure of economic efficiency. A recent revenue-to-cost ratio of the Southwest Land Office was 1:1.82. This means that, on average, for every $1.00 spent in costs, $1.82 in revenue was generated. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return.

Mills in Montana need 351 MMBF per year to maintain current production levels and industry infrastructure. Currently the Sustained yield and target harvest from Trust Lands is 57.6 MMBF, which represents approximately 16.4% of timber harvested in the state of Montana. This project would provide approximately 5.5 MMBF of timber towards the sustained yield target thus helping sustain current mill capacity.

Environmental Assessment Checklist Prepared By:

Name: Craig V. Nelson
Title: Clearwater Unit, Forest Management Supervisor
Date: March 4, 2015

Finding

Alternative Selected

After thorough review of the Clearview Projects Environmental Assessment (EA), project file, and public scoping as well as all applicable rules, plans, and laws, the decision has been made 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 4 of the EA. Specifically, the proposed project is expected to:

1) Generate net income between $1.43 and $1.87 million for the trust beneficiaries.

2) Promote increased stand health and diversity, decreased fuel loading, and movement towards historic conditions through the harvest of up to 1,900 acres and pre-commercial thin of up to 1,400 acres (1,081 acres in combination with harvesting and 319 acres separately).

3) Perform Old Growth Maintenance treatments on 205 acres within the 1,900 harvest acres.

4) Improve access and BMP compliance with new construction and road maintenance activities through A) new construction of 11 miles of road, including relocation/stabilization/closure of 4 miles of road for a net new road construction of up to 7 miles and B) repair and maintenance of 10.5 miles of road that do not currently meet BMP's or DNRC guidelines.

5) Decrease visual impacts to the aesthetics of the area through use of topographical features, retention of large trees in the harvest units, uneven tree retention spacing, use of natural grassy openings to break hard visual lines, minimization of openings on hillsides, and uneven boundary lines.

Significance of Potential Impacts

The EA addressed the identified potential resource issues through proposed mitigation measures which incorporate all the 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 will not be discussed in further detail.

Others resulted in low to moderate or moderate expected effects. Specifically,

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 and provides mitigations through equipment cleaning and grass seeding (p. 8).

Standard Vegetative Community – Direct, indirect, and cumulative effects are expected to be low to moderate. These effects reflect mitigations and harvest plans designed to benefit forest conditions through promotion of increased stand health and diversity, decreased fuel loading, and movement towards historic/desired future conditions.

Old Growth – Direct, indirect, and cumulative effects are expected to be low to moderate. These effects reflect mitigations and treatments designed to benefit old growth stands through in retention of old growth classification post-harvest and a reduction in the stands' risk of insects, disease, and wildfire.

Aesthetics – Direct and indirect effects are expected to be low to moderate. Proposed mitigations are expected to lessen the potential visual impacts and the visual impacts are expected to lessen or soften over time.

Soils – Direct, indirect, and cumulative effects are expected to be low to moderate. 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 to moderate. The sites are considered resilient and the proposed mitigations are expected to address potential impacts to water quality and reduce sedimentation and therefore result in an improvement in conditions when compared to the No Action Alternative.

Fisheries – There is a moderate risk of short term and low risk of long term impacts to in-stream sediments effects to fish habitat associated with temporary increases in sediment during construction or culvert replacements. The proposed mitigations are expected to address potential impacts and the final sediment levels are expected to be lower and therefore an improvement in conditions when compared to the No Action Alternative.

Wildlife – There is a moderate risk of adverse direct or indirect effects to big game winter range. However, no long-term effect to winter range carrying capacity or factors that would create long-term displacement or reduced numbers of big game would be anticipated.

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

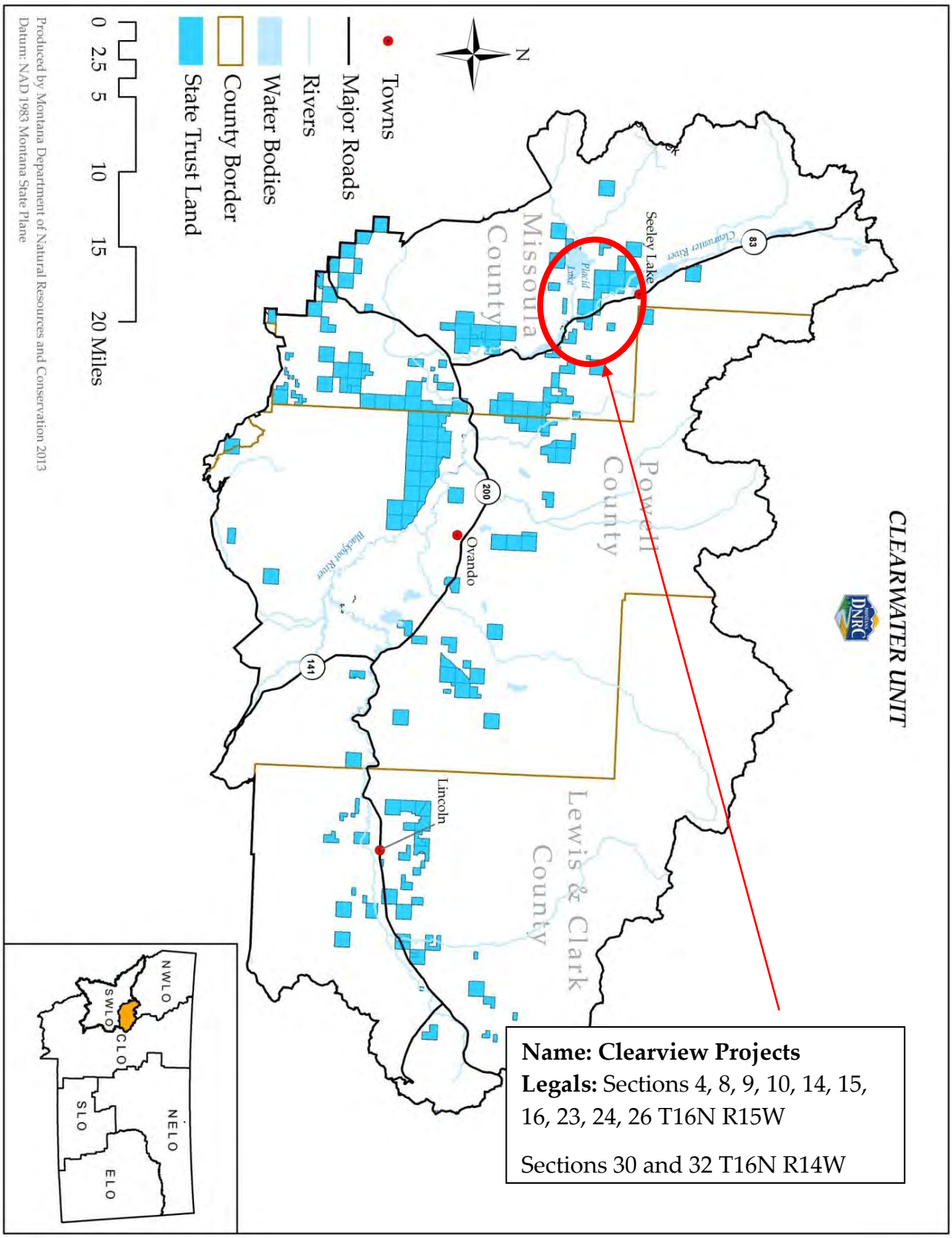
[ ]	EIS	[ ]	More Detailed EA	[X]	No Further Analysis

Environmental Assessment Checklist Approved By:

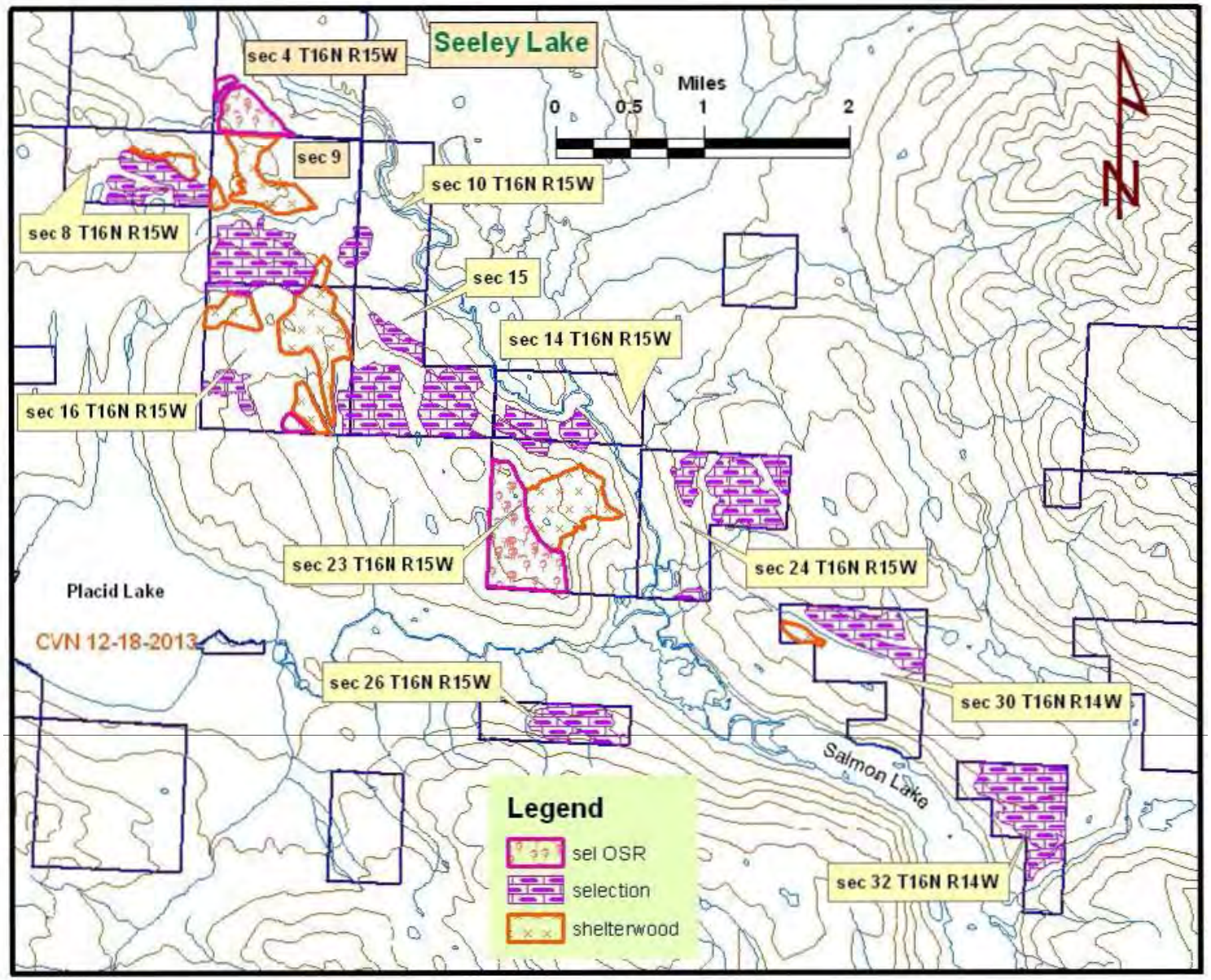
Name: Kristen S. Baker-Dickinson
Title: Clearwater Unit Manager
Date: March 17, 2015
Signature: /s/ K. Baker-Dickinson

Attachment A - Maps

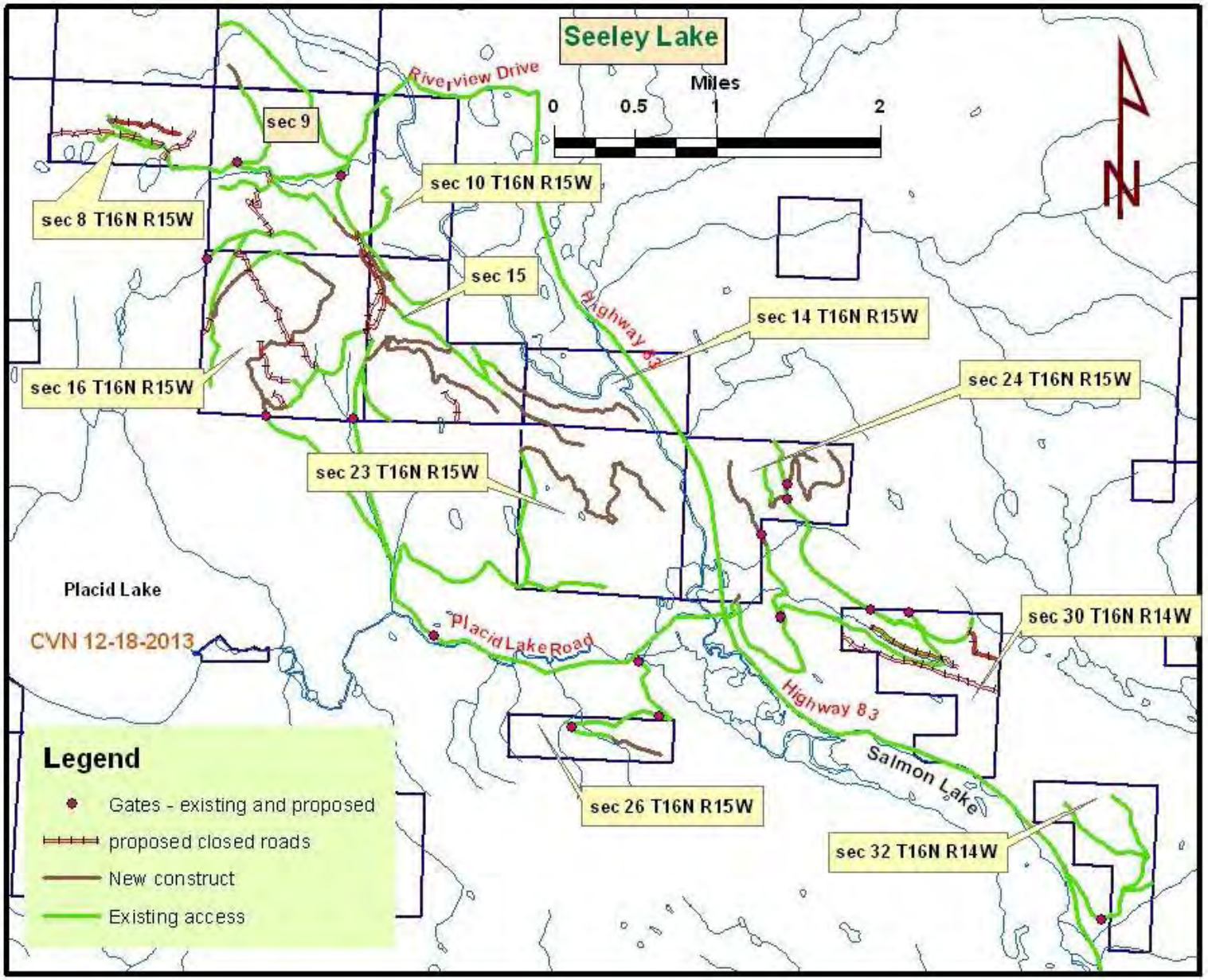
A-1: Clearview Timber Sale Vicinity Map



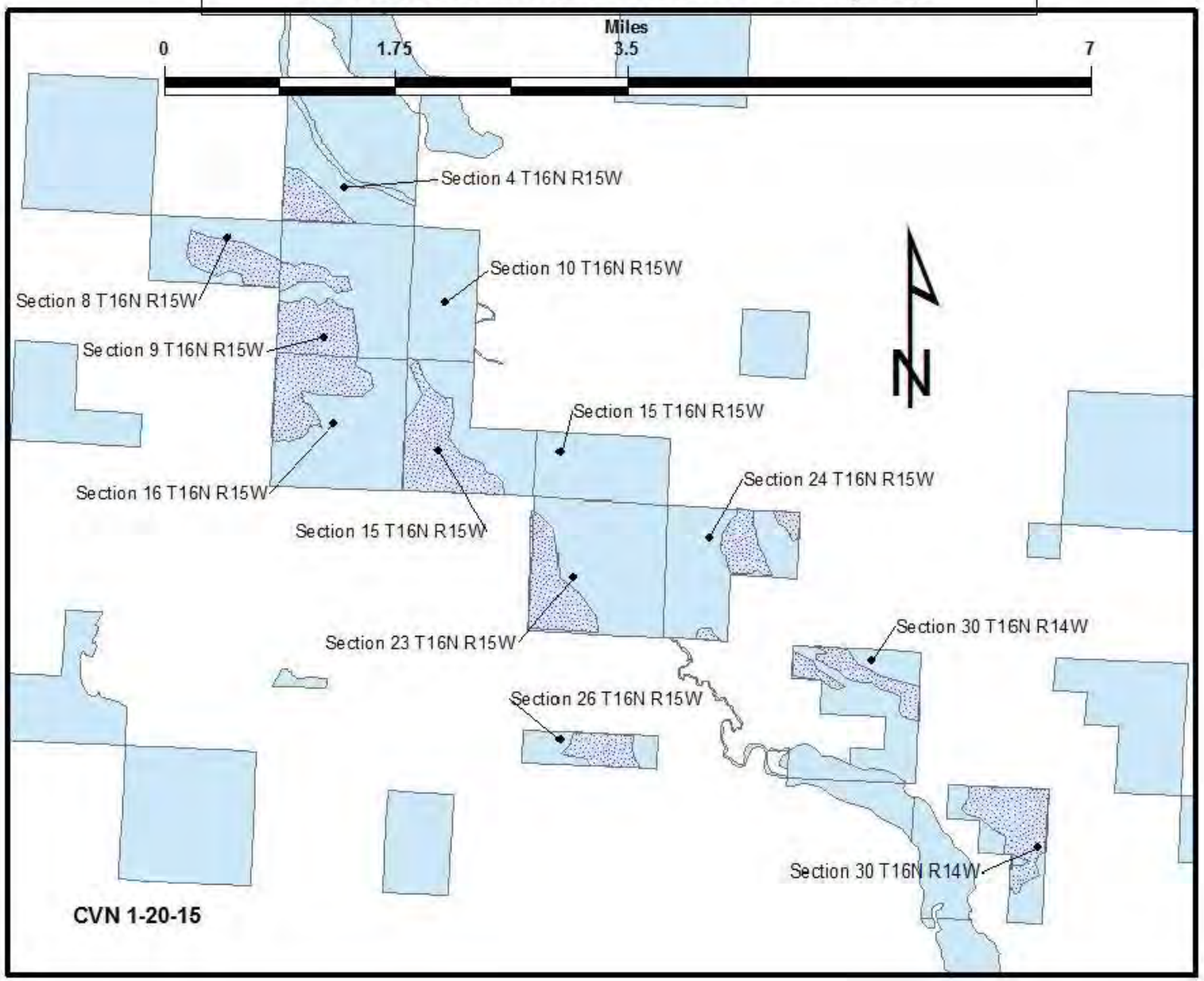
Proposed Clearview T.S. units



Proposed Clearview T.S. units



Potential PCT for Clearview Projects



Attachment B – Scoping and Responses

Initial Proposal
Clearview Timber Sales

The Montana Department of Natural Resources and Conservation, Clearwater Unit is proposing timber sales on the following state owned parcels..

Sections 4, 8, 10, 14, 24, and 26 T16N R15W: Montana State University- Agricultural College Board Trust
Sections 9, 15, 16, and 23 T16N R15W: Common Schools Trust
Sections 30 and 32 T16N R14W: Pine Hills Permanent Trust

The primary objective of this proposal is to produce funds for the above mentioned trusts. This project is planned to be developed in compliance with the State Forest Land Management Plan, Montana Administrative Rules regarding Forest Management, and the provisions of the yet to be approved DNRC Habitat Conservation Plan. The State would also use this as an opportunity to remove dying, stagnant, diseased, and overstocked trees. Many of the stands in the area are in a condition resulting from fire suppression and past logging practices. The resulting stands of small diameter saw log and regeneration are primarily Douglas-fir and other shade tolerant or short-lived trees such as lodgepole pine. Traditionally the area was primarily dominated by ponderosa pine and Western larch stands. Over the course of time, much of the winter forage areas have been over-taken by Douglas-fir. This area also has been named as a part of the P.L.O.D. (Primary Line of Defense) by the Seeley Lake Fuels Mitigation Task Force of which the DNRC is a member. The P.L.O.D. would be incorporated in the proposed harvest units to defend against wildfires that may risk the town of Seeley Lake and outlying areas in the future.

The proposed project may include harvest of approximately 5.5 million board feet of timber and could construct 11 miles of road. DNRC plans also to repair and maintain up to 10.5 miles of road that do not meet Best Management Practices or DNRC guidelines. Up to 4 miles of road may be closed. Noxious weed management, property surveys, pre-commercial thinning, and tree planting may also be involved.

The area of this proposal is bounded by Seeley Lake, Placid Lake, the Horseshoe Hills area, and the Jocko Lakes Fire. This area is known to contain numerous wildlife species and fish bearing streams run through the project area. Recently, Grizzly Bears have been sighted in this area, and protective measures to fulfill the Endangered Species Act and the DNRC Habitat Conservation Plan will be used in applicable areas. This proposal is in the general vicinity of the Clearwater River, Owl Creek, and Salmon Lake, and all recent fisheries studies would be examined.

The U.S. Forest Service is beginning the planning of a fuels treatment within the area of these timber sales. When possible, cooperation between us is planned.

The DNRC is in the scoping phase of the project environmental assessment so all volumes and acreages are preliminary estimates. We plan that this proposed action could begin to take place as early as summer 2012. In preparation for this project, specialists in forest management, wildlife biology, hydrology, soil science, and archeology will be consulted. Neighboring landowners will also be asked for their input.

The Montana D.N.R.C. invites comments and suggestions concerning this proposal from all interested parties. Please respond by September 20, 2010 to:

Department of Natural Resources and Conservation
Attn: Craig V. Nelson
48455 Sperry Grade Road
Greenough, MT.
59823-9635

or e-mail to: crnelson@mt.gov
or: (406) 244-2386

DIRECT MAILING OF SCOPING FOR THE CLEARVIEW PROJECTS

Confederated Salish and Kootenai Tribes
Blackfeet Tribe
Alliance for the Wild Rockies
Friends of the Wild Swan
Defenders of Wildlife
WildWest Institute
Montana Wood Products Association
Plum Creek Timber Company
F.H. Stoltze Land and Lumber
Rocky Mountain Elk Foundation
Missoula County Commissioners
Montana Association of Counties
Placid Lake Homeowners
Clearwater Resource Council
Double Arrow Landowners Association
Ron and Joyce Jensen
Stuart Lewin
Les and Sandra Turnbull
United States Forest Service, Seeley Lake Ranger District
Montana Department of Fish, Wildlife, and Parks
Montana Department of Natural Resources and Conservation

Response from the Department of Montana Fish, Wildlife, and Parks

Region 2 Office
3201 Spurgin Road
Missoula, MT 59804-3101
406-542-5500
Fax 406-542-5529
September 24, 2010

Craig Nelson
Clearwater Unit
DNRC
48455 Sperry Grade Rd.
Greenough, MT 59823-9635

Reference: Clearview Timber Sales (Clearwater River drainage, east & west of MT Highway 83 [Missoula Co; T16N, R15W, Sec. 4, 8, 9, 10, 14, 15, 16, 23, 24, 26; T16N, R14W, Sec 30, 32])--Scoping

Dear Mr. Nelson:

We have reviewed the Initial Proposal for this projected timber harvest of approximately 5.5 million board feet of timber on an unknown number of acres. The primary purpose of this harvest is to generate funds for three school/college Trust Funds. The project is also expected to "remove dying, stagnant, diseased, and overstocked trees," as well as incorporate the "Primary Line of Defense" (PLOD) in the "harvest units to defend against wildfires that may risk the town of Seeley Lake and outlying areas in the future."

Fisheries & Riparian

The properties proposed for timber management contain a number of water bodies and wetland complexes with extremely high aquatic value. In particular, recent fisheries and aquatic inventories in the past 5 years have highlighted the importance of several river and stream reaches within the project boundary for native fish and other organisms. These include:

1. The main stem Clearwater River in sections 3, 10, 14, 15, 23, 24. This reach of river is a functionally intact river and riparian corridor, with interspersed wetlands. This makes up a large portion of the connective corridor between Seeley and Salmon Lakes and serves as the primary migration route for fish moving from the lakes to Morrell Creek. Section 14 also contains the area around the Morrell Creek mouth, which is used frequently as a staging area for migratory bull trout, westslope cutthroat trout (a Montana Species of Concern[1]), and other fish species.

    a. Recent radio-telemetry work and fisheries surveys (Benson 2009; FWP, unpublished data) confirmed the importance of these reaches for bull trout migration and rearing in the lower Clearwater system. These sections of river are also extremely important spawning areas for kokanee and other salmonid species.

    b. These reaches also contain a number of wetlands and beaver dam complexes that support a diverse wildlife assemblage.

2. Outlet Arm of Seeley Lake lies within sections 3 and 4 (upstream of Riverview Drive bridge). Although this reach contains a high density of cabin leases, it is very important biologically as a migratory corridor and riparian wetland complex.

3. North half of Tuppers Lake lies in section 8.

We look forward to a more detailed description of the planned activities, but offer these comments and recommendations to the initial limited-detail proposal:

1. Given the high aquatic resource value of these water bodies and riparian areas, FWP recommends no harvest within Streamside Management Zones (SMZs) and expanded buffers to protect a range of resource values. For instance, in sections 14, 23 and 24, the Clearwater River has a wide floodplain, extensive riparian community and numerous off-channel wetlands that lie between the river and Montana Highway 83. Timber harvest in this area would likely limit long-term large woody debris (LWD) recruitment and cause a large amount of disturbance. On the west side of the river through this reach, harvest and disturbance should not extend past the high terrace into the stream bottom. This corridor is vital to the health of the lower Clearwater system.

[1] A native animal breeding in Montana that is considered to be "at risk" due to declining population trends, threats to its habitats, and/or restricted distribution. The purpose of Montana's SOC listing is to highlight species in decline and encourage conservation efforts to reverse population declines and prevent the need for future listing as Threatened or Endangered Species under the Federal Endangered Species Act.

2. FWP understands the importance of establishing a PLOD to mitigate fire risk, given the high number of residences in the area and proximity to the Seeley Lake. However, riparian, wetland and floodplain areas should be a low priority for fire protection given the low risk of ignition or transmission of an active fire.

3. A few of the DNRC sections (or portions of sections) included within the project boundary include numerous state "cabin" leases. With so many (est. ~100+) individual lessees of DNRC land on or very near the Clearwater River shoreline, we have found many situations where lessees are mowing, removing, or otherwise disturbing riparian vegetation along and near the river. Lacking specific cutting-unit information, we do not know DNRC's intentions for timber harvest near or perhaps within the cabin sites. Therefore, we comment that DNRC's actions near or in riparian areas will set an example, and these lessees (and other local residents) may likely follow suit.

Wildlife

Roads

DNRC states that up to 11 miles of road could be constructed and up to 10.5 miles of additional roads could be improved. It also states that up to 4 miles may be closed (but we do not know if these 4 miles would be the new or the improved roads). This would appear to result in a net gain of 7 (or more) miles of roads in the project area. Roads often have a greater impact on wildlife than tree removal itself, and impacts from roads often last long after the timber harvesting is done. Even closed roads can have impacts to wildlife, as they can facilitate human access into steep country that would otherwise provide security for wildlife. Sections 14 and 23 in particular, have very few roads (on the DNRC portions).

For roads in the project area, we recommend DNRC:

1. Minimize the number of new roads that would need to be constructed;

2. Remove and rehab at least as many miles of road as are constructed, so that the total miles of roads (closed or not) does not increase in this landscape;

3. Limit timber harvest in section 23 (west side of Clearwater River) to the western portions of those sections accessible from the old existing road in the western edge of section 23 (to keep most of these sections unroaded); and

4. Similarly, limit timber harvest in sections 14 and 24 to the areas *east* of Highway 83 in those sections.

The goals for recommendations 3 and 4 are to leave a large, unroaded and undisturbed buffer along the west side of the Clearwater River in those sections, in order to provide secure habitat for wildlife, and leave the steepest portions of those sections undisturbed, to protect water quality in wetlands along the Clearwater River.

Harvest Pattern

We recommend leaving hiding cover in areas without home or cabin sites and maintain wildlife corridors where appropriate.

Wetlands and Riparian

This area has a lot of wetland and riparian habitat. National Wetland Inventory maps and GIS layers are available for this area. Adequate buffers should be maintained around all wetlands and riparian areas. The generic SMZ of 50 feet from the edge of the high water mark is not adequate for wildlife protection in general (Ellis 2008), and very inadequate for the Clearwater (although the Ellis report focuses on urban development, similar principles apply for protecting forested habitats near streams for wildlife). For the Clearwater River and the larger ponds and wetlands, we recommend a protective buffer of at least 300 feet (~100 meters) from the normal high-water mark, where tree harvest should not take place except if absolutely needed in areas directly adjacent to lease cabins. This larger buffer would help provide future nest sites for bald eagles, great blue herons, and osprey, as well as better security for movement of black and grizzly bears, moose, and other wildlife species.

Large Trees and Snags

Large diameter trees, both live and dead, are especially important for supporting certain Montana bird Species of Concern such as pileated woodpecker and flammulated owl, as well as providing roost sites for bats. Research on bats (Schwab 2006) indicates the odds of bat use of a tree nearly double with every 10-cm (~4 inch) increase in tree diameter. Large trees located close to water are especially important for providing maternity roost sites for bats. Other bat research, both in burned and unburned forest has found similar results. Therefore, to better provide for large-tree dependent birds and bats, we recommend retaining all large trees (>15 inches dbh) within 100 meters of any water body (pond, lake, or stream) in the project area, and retaining as many large-diameter snags as possible per acre.

Environmental Assessment

If FWP will not have an opportunity and reasonable time frame to review and comment on the Draft EA for this major project--prior to DNRC writing and issuing the Decision Notice--then we ask that you consult with the following FWP personnel as you develop the project plan and write the Draft EA:

Kristi DuBois, nongame species biologist (phone 542-5551; kdubois@mt.gov)

Jamie Jonkel, bear management specialist (phone 542-5508; jajonkel@mt.gov)

Ladd Knotek, area fisheries biologist (phone 542-5506; lknotek@mt.gov)

Jay Kolbe, area wildlife biologist (phone 677-0162; jkolbe@mt.gov)

Thank you for providing the opportunity for FWP to comment on this proposal.

Sincerely,

/s/ Mack Long

Mack Long
Regional Supervisor

ML/sr

References

Benson, A. 2009. Effects of barriers on migratory bull trout and application of a conceptual framework to evaluate tradeoffs associated with dam removal in the Clearwater River drainage, Montana. Master's Thesis, University of Montana, Missoula.

Ellis, J. H. 2008. Scientific recommendations on the size of stream vegetated buffers needed to protect wildlife and wildlife habitat. Part 3, The need for stream vegetated buffers: What does the science say? Montana Department of Environmental Quality, EPA/DEQ Wetland Development Grant. Montana Audubon, Helena, Montana. <http://www.mtaudubon.org/issues/wetlands/documents/Science%20Series/MA_ Science_Setback_Wildlife_2008.pdf> Accessed 17 Sep 2010.

Schwab, N. A. 2006. Roost-site selection and potential prey sources after wildland fire for two insectivorous bat species (*Myotis evotis* and *M. lucifugus*) in mid-elevation forests of western Montana. Master's Thesis, University of Montana, Missoula

CS&KT CONCERNS

I just spoke with Marsha Pablo of the CS&KT. We agreed that once you have established harvest unit boundaries and proposed road routes, I will contact Ms. Pablo to better define where on the ground a potential Indian trail route is located, and where site 24MO0830 is situated, in relation to timber harvest activities.

- Patrick Rennie (DNRC Archeologist)

No further comments were made by the Confederated Salish and Kootenai Tribes

Attachment C – Vegetative Analysis

Clearview Projects– Vegetation Analysis

Analysis Prepared By:
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Introduction

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

Issues

- These stands will be treated in a fashion to help produce usable areas for the Primary Lines of Defense for Seeley Lake and Placid Lake communities.
- Forest management activities may adversely affect Old Growth.
- Shade tolerant species would continue to outcompete seral species removing stands from their historic cover type and species distribution.
- Young stands are currently overstocked.
- There is a concern that forest management activities may result in introduction of new weeds or increased spread of noxious weeds from the proposed forest management activities.
- There is concern the proposed project could negatively impact populations of threatened, endangered, or sensitive plant species.

Regulatory Framework

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

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

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

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

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

Seeley-Swan Fire Plan
This is a component of the Missoula County Wildfire Protection Plan. The latest version was produced in 2013. DNRC is a cooperator of this plan. It identifies the importance of maintaining current relationships and mapping of concentrations of high wildland fuel concentrations within the Wildland Urban Interface (WUI). DNRC plans on treating high-risk areas located on School Trust parcels.

Analysis Areas

Direct and Indirect Effects Analysis Area
The proposed treatment areas – 2,219 acres (harvest and pre-commercial thinning areas)

Cumulative Effects Analysis Area
The proposed project area – 5,230 acres (all acres including riverbeds)

Existing Conditions

Noxious Weeds
Noxious weeds occurring in the project parcels are mainly a combination of knapweed (*Centaurea maculosa*), houndstongue (*Cynoglossum officinale L*) and spot infestations of thistle (*Cirsium arvense*). Knapweed was found along roadsides as well as in some forested portions of the project area. Houndstongue was found mostly along roadsides along the access haul routes within project sections and on adjacent lands. Orange hawkweed (*Hieracium aurantiacum*) occurs in the area, but has not been noted on the project sites. Road use, livestock and wildlife grazing, timber harvest activities, recreational uses, and soil disturbance from fire are most likely the reasons for the existing rate of spread of noxious weeds and the potential future spread and introduction of noxious weeds. Moist sites with well-established surface vegetation provide a competitive advantage over noxious weed establishment. Reseeding of some road cuts followed by roadside, spot herbicide treatments and release of bio-control insects are examples of treatments utilized on noxious weeds on portions of all of the project sections and this has helped reduce the spread of noxious weeds. DNRC has completed considerable herbicide treatments and revegetation on forest management projects for the last 10 years coupled with weed treatments by the Lolo National Forest on system roads. Parts of the Placid Lake access road were recently treated by a combined effort with Missoula County, Plum Creek Timberlands and the Clearwater Resource Council. Yet weeds continue to spread by wind, animals and vehicles. Weed management treatments on adjacent ownerships in the area varies from no-action to combinations of revegetation, herbicide treatments and bio-control measures.

Rare Plants

Within the project area, the large majority of the rare vascular plants are found in riparian areas, rivers, lakes, or sloughs. The one exception to this is Howell's Gumweed (*Grindelia howellii).*

This is a sensitive plant that has limited distribution across portions of western Montana (Powell and Missoula Counties) and Idaho (Benewah County). In some areas, the populations are well established. This gumweed responds like a pioneer species and requires disturbance for an effective germination substrate.

The Montana Natural Heritage Program stated on their website: *"In Montana, Grindelia howellii is known from over 100 mapped occurrences. However, most populations are small and many occur on roadsides or other similarly disturbed habitat. This habitat preference in conjunction with the short-lived nature of the species means occurrences may drift from place to place or from year to year and as a result many occurrences may be ephemeral…*

Invasive weeds are a threat to many occurrences, as the habitat occupied by G. howellii is also favorable for many weedy species. Application of herbicides to control these weeds, especially along roadsides may also have a direct, negative impact."

Standard Vegetative Community

- **Stand History/Past Management**
  This area falls within climatic section 332B and climatic section 333C. Section 332B was historically 79% forested while section 333C was historically 99% forested (Losensky, 1997). Climatic Section 332B includes valley bottoms as well as high elevations in the Bitterrroot and Blackfoot region. Section 333C, found only within sections 4 and 8 of T16N R15W, is described as including the area from Flathead Lake to the Continental Divide from the Canadian border to the border of climatic section 332B. The project area ranges in elevation from 4,000-5,000feet. These areas were historically dominated by large, mature ponderosa pine and western larch / Douglas-fir stands. Fire played a large role in shaping these stands. Throughout the sale area there is evidence of both infrequent stand replacing fires and light ground fires. Evidence (fire scars on 200+ year old western larch, ponderosa pine, and Douglas-fir trees and stumps from previous harvests) found during field reconnaissance indicates that these fires burned in the 1800's through today. It is certainly believable that this fire occurrence proceeded that date. Much of this has been confirmed in the Seeley-Swan Fire Plan (2013).

  Although fire has shaped these stands prior to the arriving of European settlers, much of this area has been treated by timber harvesting. Given the location of these stands adjacent to towns such as Seeley Lake and the many water sources nearby, harvest has occurred in this area since the late 1880's. Signs of this can easily be found driving the Placid Lake Road and viewing the "high-stumps" within the area. Previous treatments were not necessarily done with the same ideals as they are currently. As a result, some stands regenerated to a different tree species than the expected appropriate condition.

  Two of the parcels (sections 15 and 23 T16N R15W) within this project area were owned by Champion International Corporation until 1989 when it was included within a land trade. Obviously, this segment was treated with different objectives than they are currently.

  Several DNRC sales have occurred on these parcels. Our records show treatment dating back to the 1940's, although much of this area had been harvested previously. The Sour Fish Timber Sale treated Section 32 T16N R15W in the early 2000's while there were two sales (Seeley Salvage and Seeley Salvage II) that occurred in the areas immediately southeast of the Clearwater River. The Vaughn-Owl Timber Sale occurred in Section 26 T16N R15W in the late 1980's. In the early 1990's, the Double Arrow Timber Sale was harvested within Section 8 T16N R15W. After the Jocko Lakes wildfire of 2007, the Double Beaver Salvage occurred within portions of the same sections. Many small timber permits have also been employed within this project area over the past with varying volumes.

- **Current stand conditions (species composition, size, density, insects and disease, forest age class and distribution, etc.)**

  The current stand condition in the project area is a result of past timber management and wildfire activity and/or suppression. Current cover types differ from the Desired Future Condition (DFC). See Table V-1 for current project area cover types as well as the DFC for the project area.

Table V-1 – Current and appropriate cover type for the Clearview Projects Area.

Cover Type	Current Acres	Current Percent of Project Area	Desired Future Condition (DFC)	
			Acres	Percent
Subalpine fir	N/A	N/A	N/A	N/A
Douglas-fir	300	6%	0	N/A
Lodgepole pine	260	5%	210	4%
Mixed conifer	430	8%	50	1%
Ponderosa pine	1,570	30%	2,320	44%
Western larch/Douglas-fir	2,280	43%	2,410	46%
Western white pine	N/A	N/A	N/A	N/A
Non-stocked	90	2%	0	N/A
Non-forest	290	6%	230	4%
Other (hardwood)	10	<1%	10	<1%
Total:	***5,230***	***100%***	***5,230***	***100%***

Please note; rounding was used in the above table to achieve the given acreages within the sections in this sale.

Using DNRC's Stand Level Inventory further information was captured as well. Most of the stands within the sale area show the increase of Douglas-fir. This is generally a response of fire prevention. As fires are controlled, trees such as Douglas-fir regenerate, often at a more successful rate than trees such as ponderosa pine. This can easily be seen above with the current acres, and percentage, of the Douglas-fir cover type. This is also found within the dramatic reduction of the ponderosa pine cover type.

Previous logging practices also caused some of these changes as well. Harvest practices of the late 1800's targeted the best quality trees (straight, fewer limbs, and often the largest stems). This was done using crosscut saws. As one can understand, the fewer cuts necessary meant less work. Signs of this harvest can be found around the Seeley Lake and Placid Lake areas with the tall stumps that can be seen from the roads as referenced before. These are usually western larch or ponderosa pine.

By the late 1940's, most harvesting operations used chainsaws to perform the severing of the trees on the site. This also included a change in the silvicultural practices that were used. Often seed tree or shelterwood harvests were used. The overstory that was reserved to produce regeneration was harvested after regeneration occurred. The removal of these trees have reduced the larger component of stems on the site, this obviously affects the amount of "old growth" areas that occur. This regeneration often included Douglas-fir. The general mindset was to include the maximum amount of spaced trees per acre. We now realize that that can often rob the site of needed nutrients and water. On some of the sites (section 15 for example), the previous owners continued to remove trees of different species and sizes as time went on. Currently, these stands also show a change to Douglas-fir and away from western larch, as they have been removed.

Over half of the stands in the general sale area have been found to have Douglas-fir as the most prominent species. This contrasts to the 19 stands that show that ponderosa pine as the leading species within the overstory on 601 acres.

Stands within the area have average diameters of 11.7 inches. Mean heights were shown to be 60.7 feet. The volume per acre over the area has been revealed to be 6.5 thousand board feet (MBF) per acre. The "smallest" results were shown to result in zero in all of the categories, while the "largest" stand totals were tabulated as 22 inches at breast height, 110 feet tall, and the volume of 25 MBF per acre.

Old Growth

Old Growth is identified and analyzed using criteria outlined in Green et al. and this information was placed in the Montana DNRC Stand Level Inventory. A search of the Stand Level Inventory of the project area was accomplished and it was queried to identify potential Old Growth and Old Growth stands.

Stands were categorized as: Possible, Yes, No, and Field Verified. Stands classified as "Possible" showed possible Old Growth characteristics when the "Green" old growth portion or the "Full Old Growth Index" computer models analyzed limited field data provided. Obviously, the "Yes" showed those stands which most likely contain Old Growth characteristics. The other two categories, "No" and "Field Verified" showed those determinations based upon old growth plots or field recognizance during the visit.

Table V-2 –Old Growth in project area

Stand ID	SLI Old Growth Status	Habitat Type	Acres of Old Growth
16N15W0400003	Possible	7	47
16N15W0800008	Possible	4	29
16N15W0900001	Yes	5	12
16N15W0900005	Yes	4	6
16N15W0900006	Yes	7	36
16N15W0900007	Yes	7	6
16N15W0900013	Yes	5	16
16N15W0900016	Possible	5	10
16N15W0900017	Possible	4	14
16N15W1000004	Possible	7	17
16N15W1400004	Possible	8	24
16N15W1400010	Possible	4	7
16N15W1500008	Possible	4	26
16N15W1500014	Possible	4	39
16N15W1600011	Field	5	18
16N15W2300001	Possible	4	107
16N15W2600004	Possible	9	8
16N15W2600006	Possible	4	9
TOTAL	-	-	**431 acres**

Environmental Effects

Noxious Weeds

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

With no action, noxious weeds would continue to spread along roads and may increase on the drier site habitats. Limited weed control efforts on access roads across multiple ownerships in the area, increases the potential for windblown seed. Following disturbance events such as fires, or grazing, the establishment and spread of noxious weeds can be more prevalent than in undisturbed areas. DNRC would continue to treat selected sites on DNRC roads based on priorities and funding availability, but the levels of weed control treatments would be lower than with the action alternative. If new weed invader species are found they would have highest priority for management. On state land parcels the grazing licensees and cabin site lessees would be required to continue weed control efforts consistent with their use.

Direct, indirect, and cumulative effects of noxious weeds within the project areas are moderate. Weeds have spread across ownerships over time and are prone to more dispersal along open roads. Weeds also have spread by multiple uses from wind, fire, traffic, forest management, wildlife and grazing animals. As tree density and ground cover vegetation increase, weeds are reduced through vegetative competition.

Action Alternative: Direct, Indirect, and Cumulative Effects

Implementation of the action alternative would involve ground-disturbing activities that have the potential to introduce or spread noxious weeds in susceptible habitat types. For the action alternative, an Integrated Weed Management (IWM) approach was considered for treatment of existing and prevention of potential noxious weeds. For this project: prevention, revegetation, and weed control measures on existing roads and for spot outbreaks are considered the most effective weed management treatments. Prevention measures would require cleaning off-road equipment. Roadsides would be sprayed prior to operations and weed control and revegetation would slow noxious weed spread and reduce weed density and occurrence compared to no-action. There would be a similar or potential slight increase in weed infestation with harvest units due to soil disturbance (refer to soil section) and reduction of tree canopy. The silvicultural prescriptions are designed to control disturbance and scarification to goals need for sustained forest growth. Noxious weeds control efforts would promote rapid revegetation and emphasize treatment of any new noxious weeds found.

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

Overall direct, indirect, and cumulative effects of increased noxious weeds within the project area are expected to be moderate based on herbicide treatments of existing weeds along roads and implementation of prevention measures to reduce new weeds such as cleaning equipment, planting grass on roads to compete against weeds, and the continuing weed control of grazing users. The combined efforts of weed control across ownerships continues to improve through cooperative efforts with the Missoula County Weed District and local weed control interest groups including the Clearwater Resource Council and Blackfoot Challenge.

Rare Plants

No Action Alternative – Direct, Indirect, and Cumulative Effects

The No Action alternative would not change the existing conditions available for Howell's gumweed populations present within the proposed area. No disturbance would occur as part of the no action alternative. As a result, there would be low risk of direct, indirect, and cumulative effects to Howell's gumweed given the No-Action Alternative.

Action Alternative – Direct, Indirect, Cumulative Effects

If a population is found, disturbance would be limited, and based on the fact that Howell's gumweed is often found in disturbed areas, and the gumweed population is expected to remain the same or would slightly increase if plants establish on reclaimed road sites. Some individual plants would likely be killed if present during timber harvest. Core populations would be protected and potentially enhanced through the ground disturbance nearby. If a population is found, mitigations would be put in place during herbicide application to protect the plants.

Given the limited area that Howell's gumweed inhabits and the protective measures that would be taken, there would not be any adverse cumulative effects. There may be an increase in the gumweed population as disturbance would cause an increase in adequate germination substrates. As a result, there would be low risk of direct, indirect, and cumulative effects.

Standard Vegetative Community

No Action Alternative – Direct, Indirect, and Cumulative Effects

The No Action alternative would not change the current existing conditions within the proposed area. The proposed harvest, road building and closures, and pre-commercial thinning would not occur. These stands would remain at overstocked levels and are currently under the possible insect and disease threats including mountain pine beetle (*Dendroctonus ponderosae*) and spruce budworm (*Choristoneura occidentalis*). Many existing roads are in poor locations and are also open to unregulated use. Concerns regarding overstocked stands and fire danger would continue. DNRC would not be able to address the needs of the Seeley-Swan Fire Plan, and therefore, fire conditions would not be lessened in this area. All pre-commercial stands would continue to grow with decreased vigor and would show more death within the stand. As a result, there would be low to moderate risk of direct, indirect, and cumulative impacts to the vegetative community given the No Action alternative.

Action Alternative – Direct, Indirect, and Cumulative Effects

This proposal includes timber harvest under several sales on approximately 1,900 acres removing an estimated 5.5 MMBF. Pre-commercial thinning would also occur under this EA on a proposed 1,400 acres. The DNRC would try to address the above concerns on these acres by using the following silvicultural treatments.

> **Shelterwood:** Shelterwood harvest is a traditional prescription that is a "regenerative" harvest. This is designed to produce regeneration of a preferred tree species that has been chosen and has be left as a "shelter" above the regeneration. This overstory stand is later removed (within regulations of the landowner). These stands within the project area are generally higher percentage of Douglas-fir and do not have an understory that could be managed after harvest. Spacing after harvest is predicted to be variable and would be based upon the individual tree characteristics. A target residual basal area per acre is proposed to be around 30-50 square feet of and a resulting volume of 3-5 MBF per acre. The reduction of the overstory and treatment of the existing pole size and understory trees generally causes a stand to produce regeneration of the remaining overstory. The reduction of the total Douglas-fir numbers in the overstory, and an increase in other species (ponderosa pine and western larch) would promote a stand closer to pre-settlement times. The proposed stand density would make limited resources (light, water, and nutrients) more plentiful for the residual overstory trees and potential regeneration. These changes would continue the progression toward the DNRC Desired Future Condition. Areas that are within this proposed treatment type may be considered Old Growth. They are often in the wrong cover type (according to Greene et. al.) currently, or are proposed for an Old Growth Maintenance treatment. The definition is found in the Administrative Rules for Forest Management *36.11.403* and is as follows: *"Old growth maintenance" means silviculture treatments in old growth stands designed to retain old growth attributes, including large live trees, snags, and coarse woody debris, but that would remove encroaching shade-tolerant species, create small canopy gaps generally less than one acre in size, and encourage regeneration of shade-intolerant species. This type of treatment is applicable on sites that historically would be characterized by mixed severity fire regimes, either relatively frequent or infrequent.*

Selection: A general description of this treatment is selectively removing portions of the existing overstory. In places, this can result in as much removal as a traditional seedtree, within other areas of the stand, it can be more similar to a commercial thin. Depending on the location, the selected overstory trees would determine the volume and basal area left behind. For example, a selection harvest within Section 32 T16N R14W (favoring ponderosa pine) may leave approximately 30-70 square feet of basal area per acre and 3-6 MBF per acre residual. Within Section 26 T16N R15W, treatment would favor a mix of western larch, ponderosa pine, and some Douglas-fir. This prescription is expected to result in 50-80 square feet of basal area per acre and predicted residual volume of 4-7 MBF per acre. If you look at the area harvested by previous owners (Anaconda Copper Mining and Champion International Corporation) within Section 15 T16N R15W, the residual basal area per acre may be higher than other stands, but the residual volume would be less. The current stands are a residual of the heavier previous harvests. Although the traditional term "selection" applies to creating a multi-cohort stand, it is primarily used to change species percentages to help the DNRC arrive at a Desired Future Condition in the overstory. Some areas that are Old Growth are within larger areas typed as "Selection". These are proposed to be treated with an Old Growth Maintenance treatment.

Selection Overstory Removal: Generally, stands proposed for this treatment are areas that have been treated more recently. This harvest is prescribed to remove a portion of the larger overstory trees. This would be done to remove members of the overstory for one or both of the following reasons. First is that the regeneration harvest worked well and the removal of some of the overstory is acceptable. Secondly, that some of these trees may have not responded to the previous treatments well, or they may be a species that is not wanted on the site. The "selection" portion of this prescription is similar to the above definition, but would be achieved with the removal of small sawlog sized material that is on-site as a result of previous harvest. A great example of this is within Section 23 T16N R15W. This area was treated by Anaconda Copper Mining and Champion International Corporation. The resulting stand is an overstory of ponderosa pine and Douglas-fir. A second stand of Douglas-fir, ponderosa pine, and western larch has reached the small sawlog size. This prescription would allow DNRC to promote the ponderosa pine in both stand levels. Generally, residual volume is proposed to be between 2-7 MBF per acre. Residual basal area is expected to be around 40-90 square feet of basal area per acre. Some of these areas are currently classified as Old Growth. The above mentioned stand, within Section 23 T16N R15W, has not been field verified at this time, but would be treated as an Old Growth ponderosa pine stand.

Pre-Commercial Thinning: The treatment of pre-commercial thinning is defined as removing small trees not for monetary benefit but to reduce stand stocking, release of limited nutrients (water, light, and nutrients), and improve growth of desired trees. It has also proven to decrease the loss of deterioration through death and poor growth over a longer time period, especially on poor sites. Old Growth is not a concern within this size class, but there are concerns for Canada Lynx in this area.

Road Construction, Maintenance, and Closure: This project plans to use roads within the area for all silvicultural uses. Some of the transportation is proposed to be abandoned (i.e. poor location, poor grade, SMZ concerns) while others are proposed to be constructed (i.e. better access, lower grades, less concerns over roadside erosion and deposition). All roads that would be part of these proposed actions would be addressed by the forester, the soils scientist, the hydrologist, and potentially the wildlife biologist. The majority of the roads proposed for use under this EA are behind locked travel gates.

Fuel loading concerns would vary according to the pre-harvest stand. In accordance with *ARM 36.11.410* and *ARM 36.11.414* the majority of fine slash foliage and approximately 5 to 10 tons per acre of coarse woody debris would be left scattered on the forest floor in all harvest units. This would increase the intensity of and reduce the ability to control ground fires in all harvest units for approximately three years. In stands that have numerous leave trees following harvest this could result in ground fires killing trees and an increased risk of crown fires. In areas with few leave trees the risk of a catastrophic crown fires would decrease.

Given the following factors:

- Post treatment, the overall stand health and vigor would be improved in the residual overstory.
- Shade tolerant species would be removed, favoring seral species.
- Much of this sale area would promote the Seeley Lake Primary Line of Defense.
- Pre-commercial thinned areas would promote seral trees, increase growth, and increase vigor in the young age classes.

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

Old Growth

No Action Alternative – Direct, Indirect, and Cumulative Effects

The No Action alternative would not change the existing conditions available within the proposed area. No disturbance would occur as part of the no action alternative. There is the likelihood that given a longer time period, old growth acres would increase. In the same instance, the stands that occur currently would be at larger risk for wildfire. As a result, there would be low risk of direct, indirect, and cumulative effects to old growth given the No-Action Alternative.

Action Alternative – Direct, Indirect, and Cumulative Effects

After a search of the Stand Level Inventory system, 420.8 acres of Old Growth exist within the project area (as defined by Green et. al.). Of that, 205 acres of Old Growth currently exist within the treatment area. The following table illustrates acres pre- and post- harvest conditions for the treatment area (direct and indirect effects analysis area) and the project area (cumulative effects analysis area).

Stand Id.	Desired Future Condition	Current Cover Type	Acres of Old Growth	Acres Treated	Prescription
16N15W0400003	WL/DF	WL/DF	47.1	0	N/A
16N15W0900005	LPP	LPP	6.2	6.2	Shelterwood
16N15W0900006	LPP	LPP	36.3	0	N/A
16N15W0900005	LPP	LPP	5.9	2	Selection
16N15W1400004	WL/DF	WL/DF	24.3	2	Selection
16N15W1400010	PP	PP	6.5	0	N/A
16N15W1500008	WL/DF	WL/DF	26	23	Selection
16N15W1500012	WL/DF	WL/DF	26	23	Selection
16N15W2300001	PP	PP	107.8	107.8	Selection / OSR
16N15W2600006	WL/DF	WL/DF	9	1	Selection
16N15W0800008	PP	WL/DF	29	26	Selection
16N15W0900001	WL/DF	LPP	12.2	0	N/A
16N15W0900013	WL/DF	LPP	16.5	8	Shelterwood
16N15W0900016	WL/DF	DF	10.1	1	Shelterwood
16N15W0900017	WL/DF	DF	13.7	0	N/A
16N15W1000004	WL/DF	MC	17.3	0	N/A
16N15W1600011	PP	WL/DF	18.4	5	Shelterwood
16N15W2600004	MC	DF	8.5	0	N/A
TOTALS			**420.8**	**205**	

Stands containing Old Growth are intermixed with non-Old Growth stands throughout both the project area and the treatment area. Within the treatment area stands containing Old Growth would receive an Old Growth Maintenance treatment. This treatment would be designed to retain Old Growth attributes, including large live trees and snags. Shade tolerant species are targeted for removal. This prescription is consistent with the selection treatment mentioned earlier in the standard vegetative community effects analysis. Post-harvest stands would retain Old Growth classification.

Given the following factors:

- Post-treatment, all stands would retain Old Growth classification.
- If left untreated, stands that currently are classified as Old Growth areas may be at risk of insects (such as mountain pine beetle or spruce budworm), disease (root rot), or wildfire may no longer meet Old Growth classification because of ongoing mortality.
- Shade tolerant species would be removed, favoring seral species historically present on the site.

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

Vegetation Mitigations

- Favor western larch and ponderosa pine in harvest areas and pre-commercial thinnings to shift species represented toward the accepted Desired Future Condition.
- Plant western larch and ponderosa pine in appropriate harvest units to shift species represented toward the accepted Desired Future Condition.
- Conduct Old Growth maintenance treatments to maintain Old Growth on the landscape.
- Prescribe a selection harvest in order to emulate natural disturbance historically present on the landscape.
- Wash equipment prior to harvest to limit weed seed dispersal.
- Spray weeds along roadsides to limit spread of existing weed, while preventing weed spraying within Howell's gumweed populations.
- Plant grass on 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.
- No harvest would occur near within 100 feet of the Clearwater River or Class 1 fishery streams.

VEGETATION REFERENCES

MT DNRC , Environmental Assessments of the past DNRC timber sales including; Vaughn-Owl Timber Sale 1988, Double Arrow Timber Sale 1995, Sour Fish Timber Sale 2000, Double Beaver Fire Salvage 2007, Seeley Salvage 2010 and minor salvage permits, Clearwater Unit, Southwestern Land Office.

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.

Montana Natural Heritage Program (MTNHP). 2013. Plant species of concern report. Available online at: http://mtnhp.org/SpeciesOfConcern/?AorP=p. Last accessed November, 5, 2014.

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.

Attachment D – Soil Analysis

Clearview Timber Sale – Soils & Noxious Weeds Analysis

Analysis Prepared By: Jeff Collins, Hydrologist/Soil Scientist, DNRC, 2/6/14

Introduction

The following analysis will describe the existing soil conditions and the anticipated effects to soil resources and noxious weeds within the Clearview project area. Direct, indirect, and cumulative effects to soil resources and noxious weeds of both the No-Action and Action alternatives will be analyzed.

Issues and Measurement Criteria

Soil Resources – There is a concern that forest management activities may result in increased erosion and reduced soil productivity where excessive disturbance from compaction, displacement, or loss of nutrients occurs, depending on the extent and degree of harvest related soil effects.

Regulatory Framework

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

All applicable Best Management Practices (BMP's), State Forest Land Management rules and regulations, and measures outlined in the DNRC Habitat Conservation Plan (HCP) would be implemented. This includes, but is not limited to, silviculture considerations for sustained forest growth (*ARM 36.11.420*) and biodiversity. As required by *ARM 36.11.410* and *36.11.414*, adequate vegetative debris shall be left on-site to support nutrient conservation. Whole tree skidding shall be discouraged unless mitigation measures are taken to retain a portion of (fine litter) nutrients on-site. The proportions of vegetative materials retained are based on the range of comparable levels determined by Graham et al (1994).

Analysis Methods & Analysis Areas

The methods for disclosing impacts for this analysis include using general soil descriptions and management limitations and then qualitatively assessing the risk of negative effects to soil productivity from compaction, displacement and erosion from each alternative.

The soils analysis included an evaluation of Missoula County Soil Survey and Lolo National Forest Landtype Inventory (1988) data, air photos, past harvest designs and on-site field reviews by DNRC hydrologist/soil scientist. For the purposes of this analysis, minor soils of 5% or less of the area were grouped based on slope, soil properties and interpretations. Field reviews were conducted to verify the soil properties and current conditions to assess past and predicted effects based on DNRC soil monitoring results from over 80 DNRC postharvest monitoring projects (DNRC 2006, 2011). The soil analysis considered soil management interpretations, the physical effects to soils from the area and degree of harvest disturbance associated with skidding and roads. The analysis for soil nutrients considers the area of disturbed surface as well as the fine litter and coarse woody debris available to supply organic materials to the soil. While the anticipated impacts from each alternative will disclose the direct/indirect effects, the cumulative impacts will be the result of previous and proposed activities.

Direct, Indirect and Cumulative Effects Analysis Areas

The analysis area for geology and soil resources includes the proposed harvest units and locations of existing roads as well as the new and temporary roads proposed for construction within state parcels of the following sections.

Sections 4, 8, 10, 14, 24, and 26 T16N R15W: MSU- Agricultural College Board Trust,
Sections 9, 15, 16, and 23 T16N R15W: Common Schools Trust and
Sections 30 and 32 T16N R14W: Pine Hills Permanent Trust

Existing Conditions

The proposed project is located within the Clearwater River valley and the lower Owl Creek drainage. The area has been strongly glaciated. Geology in the Placid Creek drainage and general project area is dominated by Pre-Cambrian age sedimentary quartzites and argillites. Bedrock outcrops are common on steeper sideslopes and ridges scoured off by glaciation, which left stair-stepped terrain of moderate sloping benches with short abrupt slopes on rock faces. Rock outcrops limit road locations and may require heavy excavation depending on site review. Bedrock is rippable where formations are thin bedded and generally well fractured. No especially unusual or unique geologic features occur in the project area. No harvest areas or road locations are located on areas of slope instability. As such, slope stability is dismissed from further analysis.

Soil map units are derived from the Missoula County Soil Survey. Summary properties and management interpretations are described in attached Table S1 and displayed on Soil Maps 1 & 2. Within the project area, mountain sideslopes are a complex of shallow glacial till deposits and residual soils along ridges with deeper till deposits on concave slopes. Residual soils forming in fractured bedrock materials typically produce high rock content, coarse textured soils that weather to fine sandy and silt textures, that includes Winkler soils and rock outcrop map units that occur on convex mid- to upper- slopes of the Clearwater River valley and Placid Lake drainage.

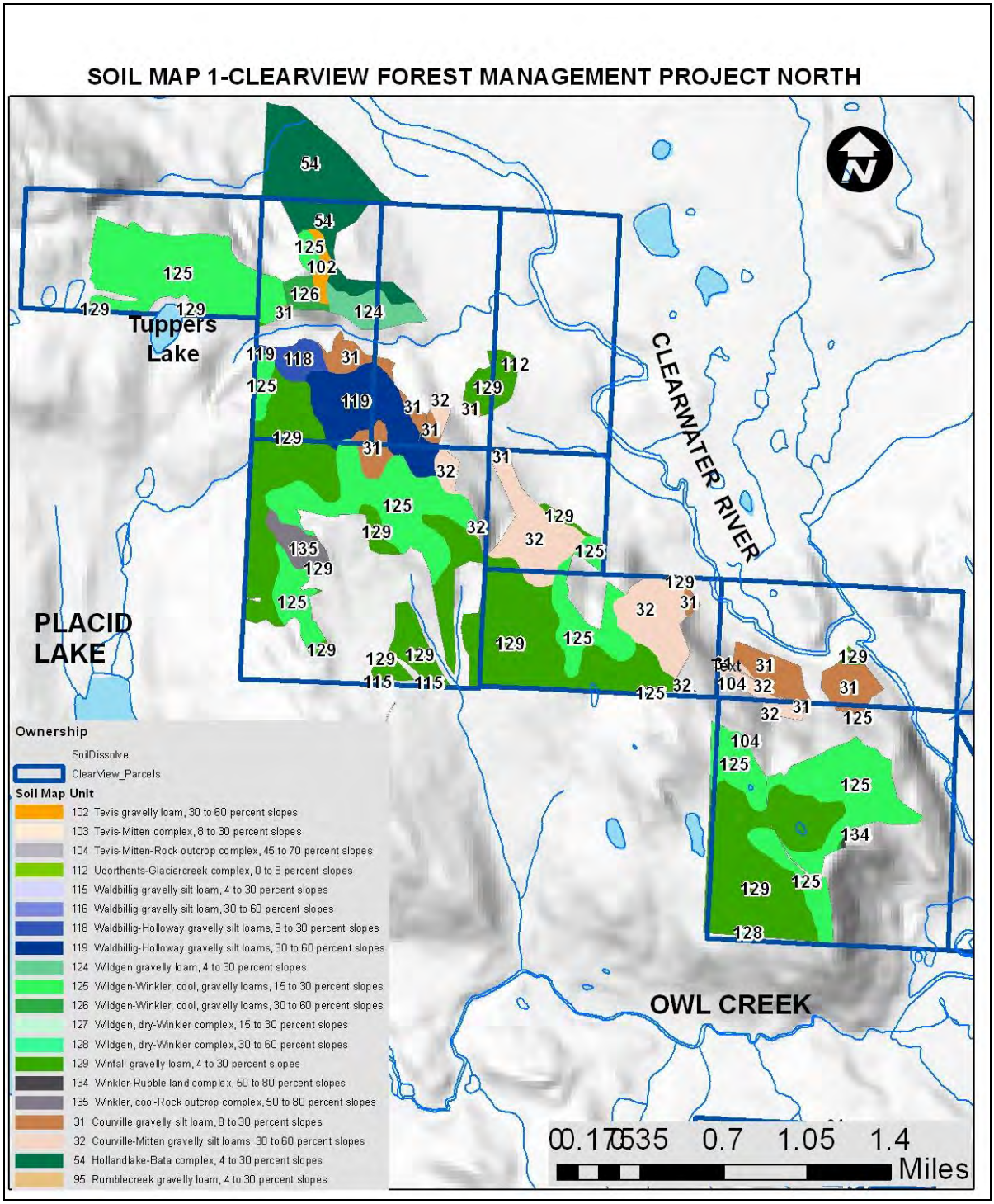
The footslopes and valley bottom include deep glacial till deposits, coarse glacial outwash deposits and alluvial deposits. Primary soils on foot slopes are complexes of Hollandlake gravelly clay loams as well as Bata and Wildgen gravelly loams forming in deep glacial till on moderate slopes of 5-30% which have shallow surface deposits of volcanic ash silt loams. The primary concerns are soil displacement and to a lesser degree, compaction which can be mitigated by limits on season of use. Predominate slopes of 10-45% are well suited to ground-based skidding operations and have a long operational season of use, once soils dry out in the spring .

The mid- and upper- forest slopes are glacial till covered Wildgen/Winkler gravelly loams and Waldbillig/ Holloway gravelly loams. Wildgen gravelly loams occur in glacial till deposits on concave slopes in combination with Winkler soils and have common rock outcrops. Wildgen soils are more productive than Winkler and tend to have higher cobble content in the subsoil. These soils are excessively well drained and droughty which increases vegetative competition for conifer establishment which can lead to plant mortality and difficulty in revegetating cutslopes on south slopes. The primary soils concerns are avoiding displacement and moderate erosion hazards due to the high gravel contents. Waldbillig/Holloway gravelly loams have volcanic ash influenced surface soils on the Holloway soils that increase productivity. Erosion risk can be effectively controlled with standard drainage practices.

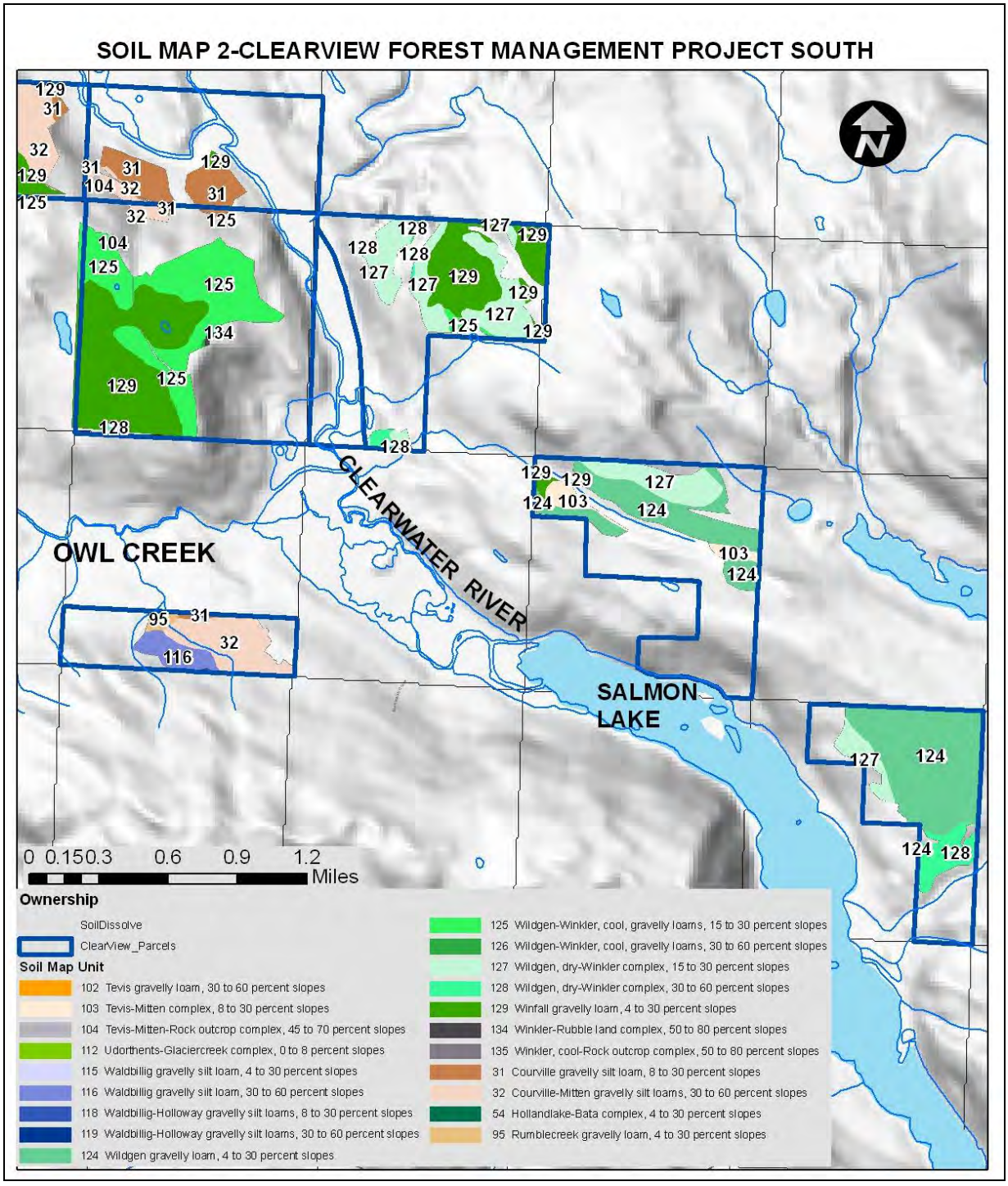
Soil Table S-1 Soil Management Interpretations Risk Ratings of Low, Moderate, High

Map Unit *% of Area*	Mapping Unit Name	Erosion Risk	Displacement Risk	Compaction Risk	Notes
6 **95** < *0.5%*	Aquolls and Aquepts, poorly drained Udorthents Glaciercreek 0-8%	Moderate	Ruts Easily	Severe when wet	Deep organic silts, riparian, wetlands & potholes. Mark & maintain wetland / SMZ zone as field verified.
129 *30 %*	Winfall gravelly loam, 4 to 30 % slopes, Glacial till & colluvium	Low / Moderate Kf=0.37	Moderate	Low	Dry site .Long season of use.
125 *22 %*	Wildgen-Winkler, cool, gravelly loams, 15 to 30 % slopes Deep Glacial till & colluvium	Moderate Kf=0.37	Moderate	Moderate	Moist productive soil. Average season of use, check moisture.
124 *12 %*	Wildgen gravelly loam, 4 to 30 % slopes, Deep Glacial Till	Low / Moderate Kf=0.37	Moderate	Moderate	Average season of use, check moisture.
128 *2 %*	Wildgen, dry-Winkler complex, 30 to 60 % slopes Moderate to Deep Glacial till – Wildgen Colluvium-Winkler	Wildgen Kf=.37 Winkler Kf=0.2 Moderate to high on slopes >45%	Moderate to high on slopes >45%	Low	Dry site, rock limits roads, planting. Long season of use. Limit ground skid to slopes less than 45%.
127 *7%*	Wildgen-Winkler, dry, gravelly loams, 15 to 30 % slopes Moderate to Deep Glacial till & colluvium	Wildgen Kf=.37 Winkler Kf=0.2 Moderate to high on slopes >45%	Moderate to high on slopes >45%	Low	Dry site, Rock limits roads, planting. Long season of use. Limit ground skid to slopes less than 45%.
31 *5 %*	Courville gravelly silt loam, 8 to 30 % slopes, Loamy till/colluvium & Volcanic ash surface	Moderate Kf=.37	Moderate	Moderate	Moist productive soil, Bata has ash surface. Avoid displacement by season of use/ skid trail planning.
32 8 %	Courville –Mitten gravelly silt loam, 30 to 60 % slopes, Loamy till/colluvium & Volcanic ash surface	Kf=.37 Moderate to high on slopes >45% Close drain spacing	Moderate to high on slopes >45%	Moderate	Moderate depth soils, road construction may hit rock. Limit ground skid to slopes less than 45%.
54 < 6 %	Hollandlake-Bata complex, 4 to 30 % slopes, Deep Loamy till / colluvium & Volcanic ash surface	Kf=.37 Moderate, check road materials	Moderate , ruts easily	Severe when wet	Moist productive soil, Bata has ash surface. Avoid displacement by season of use/ skid trail planning.
116 119 5 %	Waldbillig-Holloway gravelly silt loams, 30- 60% slopes, Glacial till & volcanic ash	Kf=.37 Low / Moderate	Moderate to high on slopes >45%	Moderate	Moderate depth soils, road construction may hit rock. Limit ground skid to slopes less than 45%.
3%	Minor soils and other combinations of the above soil series that are each less than 0.5% area				Soil interpretations and mitigations included on site specific basis. Mixed Glacial till, colluvium and alluvium.

Erosion Factor (Kf) indicates the susceptibility of a soil fine fraction to sheet and rill. Erosion Factor K has a range of 0.02 to 0.69. The higher the value, the more susceptible a bare soil is to erosion.



Narrow alluvial deposits occur along stream bottoms and wetlands. These alluvial deposits are somewhat poorly drained and seasonally wet supporting riparian species (willow, dogwood and some spruce). Pothole lakes and small concave kettle landforms include a range from wetlands to seasonally dry sites. The complex terrain and narrow nature of some wet areas all require site specific review for design of WMZ's, SMZ's and mitigation measures.



General interpretations for harvest operations: Slope steepness over 45% limits tractor operations due to potential for excessive disturbance and erosion. A slope map was generated with ArcGIS computer mapping to overlay on proposed harvest areas to locate slopes over 45% and is part of the project file data. Cable operations on steeper slopes reduce ground disturbance and impacts. North and easterly aspects have moderate to high productivity associated with typically deeper surface soils and moist sites. On steeper south and westerly aspects and areas of shallow soils the potential annual productivity is moderately low. Competition for moisture from understory vegetation and high solar insolation can constrain conifer growth and

regeneration. Retention of well distributed forest cover provides protection from high solar insolation and can help reduce drought stress to improve conifer regeneration.

Roads: Balanced road cut/fills are practical up to 50% where slope steepness increases the quantity of material excavated. Hard rock at shallow depth occurs on all sections in the project area and limits excavation on the glacial scoured convex slopes. The thinly bedded bedrock is generally rippable, yet some spot locations may require jackhammer or blasting for road construction where bedrock is exposed. Material exposed by road construction is subject to rock ravel on steep cutbanks and is difficult to revegetate. Sediment delivery is concern on the finer textured soils within and adjacent to riparian areas, yet can be mitigated by implementation of buffer areas and BMP's.

Effects of Past Management

There was previous harvesting in all sections that ranges from firewood and thinning to even age harvest. The most recent harvests were salvage harvest of dead lodgepole pine in 2000 within sections 9, 10, 15 T16N, R15W as well as fire salvage harvest associated with the Jocko Lakes fire in 2007 which burned in the Placid Lake Owl Creek drainage and burned through parts of State lands Section 8 T16N, R15W. Salvage harvest occurred in the section 8 parcel and operations complied with BMP's with less than 10% ground impacts. The burned sites would not be affected by this proposed action.

Historic harvest effects have largely recovered with vegetation and trees established in secondary trails. A few major skid trails and landing sites are still apparent and harvest effects are estimated to be less than 5% of the proposed harvest units. Field assessment found that the previous soil effects have ameliorated in the stands proposed for harvest and the parcels are well regenerated and overstocked with conifers. There are apparent growth reductions still on some of the old landing sites that would likely be used again. Historically there has been moderate road construction on state trust lands compared to the combined ownerships. Several older roads in the area include segments of steep and low standard roads, especially for powerline access.

Nutrient Cycling & Soil Productivity

There are moderate to high levels of existing downed course woody debris across the proposed harvest areas that are within the range of woody debris levels on representative vegetation types established by Graham et al. (1994). The tree mortality of lodgepole pine from insects has resulted in many trees shedding their needles, which helps return organic matter and nutrients to the soil. In portions of the project area tree mortality has left high levels of downed and jack-strawed material, which is a concern for fire risk to adjacent forest homes. Retaining vegetative litter and woody debris helps to control erosion on disturbed sites, provides media for healthy soil fungi and acts as mulch for water retention and conservation of soil nutrients important to tree growth. It is desirable to maintain moderate levels of litter and old and new coarse woody debris (>3 inches in diameter) at ~10-15 tons/acre on the harvest units.

Soils Mitigations

The analysis and levels of effects to Soil resources with the Action Alternative are based on implementation of the following mitigation measures.

* DNRC would implement all applicable BMP's, Montana Administrative Rules for Forest Management, and reasonable mitigation and erosion control practices during timber harvest, road maintenance, and road construction and road use activities. The commitments of the DNRC HCP would be implemented on the applicable parcels.

* Limit harvest equipment and hauling operations to periods when soils are relatively dry (less than 20%), frozen or snow covered to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up.

* On tractor harvest units the logger and sale administrator would agree to a general skidding plan prior to equipment operations to limit trails to 15% or less of the harvest unit. Preference would be placed on existing skid trail use, unless the trail is too steep. Feller-bunchers may work on slopes up to 45% as long as displacement and turning is minimized to prevent excessive disturbance. Slopes over 45% are expected to be cable harvested to reduce soil impacts and improve harvest efficiency.

* On moderate to densely stocked stands, whole tree skidding can reduce slash hazard, but also remove a portion of nutrients from growing sites. Target fine slash and woody debris levels are to retain 5-15 tons/acre well distributed on-site while meeting the requirements of the slash law. On thinning sites with lower basal area, retain large woody debris as feasible since it may not be possible to retain 5 tons/acre and the emphasis would be on providing additional coarse woody debris in the future. Slash would be placed on main skid trails to protect soils and reduce erosion potential and potential unauthorized ATV use as needed.

* Existing road segments would be improved and maintained in association with the harvest activities. Road improvements would include surface blading and installation of drainage features to control surface erosion and prevent sediment delivery to streams as needed to comply with BMP's and to protect water quality.

* Roads that would no longer be used due to relocation would be stabilized from erosion and hydrologically restored to promote conifer growth, by reclaiming the road surface. Reclaimed roads would have the surface ripped to 12 inches in depth, relief culverts removed and effectively drained with waterbars, the surface grass seeded and slash applied.

* Harvest operations and road conditions would be monitored as part of the on-going project operations and repairs would be made as needed, including erosion control, culvert cleaning and re-vegetation. If cut-slope or fill-slope slumps occurred on new roads they would be stabilized to control erosion as part of the harvest project.

* Road use would be limited to dry or frozen ground conditions to reduce rutting and erosion. New road construction, including drainage features, should be completed in the fall prior to freeze-up. Road cut-slopes are to be constructed at relatively stable angles as noted in contract Exhibit B. Check snow/frozen ground conditions prior to operations.

Environmental Effects on Soils

No Action Alternative: Direct, Indirect, and Cumulative Effects

Implementation of the no-action alternative would result in no soil resource impacts in the project area. Soil resource conditions would remain similar to those described in the existing conditions of this analysis.

Action Alternative: Direct and Indirect Effects on Soils

Implementation of the action alternative would be a combination of salvage harvest of dead, dying and high-risk trees and selection harvest of live trees to reduce competition and improve growth of diverse tree species as noted in Table S-2. Selection and shelterwood harvest would potentially occur on up to 1,900 acres within the 5,230 acres of State land on the project parcels outlined on Soil Maps 1 & 2 using ground -based equipment.

Pre-commercial thinning is proposed on up to 1,400 acres. Most of the pre-commercial thinning overlaps the proposed harvest units (58%) and the thinning would be completed in combination with harvest activities on forest sites that are overstocked with young conifers. An additional 320 acres of thinning would occur in stands where no harvest is proposed. Tree planting, grass seeding roads and noxious weed management would also occur.

The proposed project could construct 11 miles of road, including relocation/stabilization/closure of 4 miles of road that do not meet BMP's for a net new road construction of up to 7 miles. DNRC plans also to repair and maintain up to 10.5 miles of road that do not currently meet BMP's or DNRC guidelines.

The thinning would be completed by hand crews or equipment in combination with harvest activities and would retain well stocked forest sites. The proposed thinning is expected to have negligible and likely not measurable impacts to soil resources.

Table S-2
Proposed Forest Management Treatments and Distribution across Approximate Harvest Area

Harvest Treatment	Selection OSR	Selection	Shelterwood	Totals
Approximate Harvest Acres	**255**	**1,175**	**470**	**1,900**
% of Harvest Area	**14%**	**62%**	**25%**	**100%**
% of Harvest Acres Thinned	**12%**	**40%**	**6%**	**58%**
Thinned only Acres				**320**

Primary soil concerns are the potential for excessive surface disturbance, erosion or soil compaction with harvest operations. To maintain soil productivity and promote conifer regeneration, BMP's and the listed mitigation measures would be implemented to minimize the area and degree of soil effects associated with harvest operations. Implementation of BMP's and the recommended mitigation measures has been shown to effectively limit detrimental soil impacts to less than 15% of the harvest units based on DNRC soil monitoring

on comparable sites (DNRC 2006). Recent harvest on nearby sites and the estimated area that may be detrimentally impacted is displayed in Table S-3.

Approximately 11 miles of new road would be constructed which would include relocation and decommissioning of 4 miles of poor roads that do not meet BMP's. The net 7 miles of new road construction would change the land use of the added roads to transportation and disturb up to 28 acres of land as noted in Table S-3. The actual area disturbed varies with road width and extent of temporary roads that would be reclaimed. Road maintenance would take place on up to 10.5 miles of existing access roads as well as on up to 11 miles of newly constructed road. Proposed roads cross segments of shallow soils and fractured bedrock, rock raveling is expected in these locations which would require periodic maintenance. The high rock/coarse fragment soils are excessively well drained and durable to road traffic with implementation of standard road drainage features. On existing roads, road maintenance and site specific road reconstruction requirements would be implemented to improve road drainage and control erosion. All new roads would be grass seeded with site-adapted grass to speed revegetation as well as control erosion and weeds.

Table S3 – Detrimental Soil Disturbance for the Action Alternative

Area of Analysis	Estimated Total Area (Acres)	Disturbance Rate (%)	Estimated Impacted Area (Acres)
Harvest Units (including landings)	1,900 acres Ground-based	On Ground-based Units up to15% including past effects	285
Roads *	28	< 1% of project parcels	28

We expect that by protecting at least ~80% of a harvest area in non-detrimental soil impacts, soil properties important to soil productivity would be maintained, and the projected impacts are below that range. The estimates of existing impacts are approximately 5% and additional impacts from the proposed operations are expected to add up to 10% equaling15% projected impacts. Contract administration would monitor on-going operations to control soil disturbance to avoid excessive impacts and meet silvicultural goals to reduce competition. The improved tree spacing would improve growth of retained trees due to reduced competition for soil moisture and nutrients. For all these reasons, there would be low to moderate risk of direct and indirect effects to geology or soil resources as a result of the proposed action.

Nutrient Cycling & Soil Productivity

Considering nutrient cycling, the level of tree mortality of pine has already caused many needles and fine litter to fall to the forest floor. A substantial proportion of plant available nutrients are retained in the forest floor duff and surface mineral soils. Forest duff and litter provide a mulching cover that retains surface moisture. A substantial portion of fine foliage that have not already fallen would be expected to break off during logging operations. The desired fuels reduction treatments for the Primary Line of Defense in the urban interface of Seeley Lake should not conflict with silviculture and biodiversity *ARMs* if moderate amounts of fine litter and coarse woody debris are retained on-site and effectively treated by trampling or slash treatments and reduced to meet fire hazard requirements. There would be short- to mid-term reductions in fine litter on high priority fuels reduction treatment zones near residences and open roads. The proposed fuels reduction treatments would process fine litter and material more thoroughly that is expected to reduce 15 to 20% of the existing coarse and fine woody debris, based on the planned 50% canopy harvest and retaining a proportion of fine

materials. On all proposed harvest areas a portion of old and new course woody debris (CWD >3 inches in diameter) at ~5-10 tons/acre and fine litter (similar to historic ranges) would be retained.

Cumulative Effects of the Action Alternative on Soils

Cumulative effects to soils can occur from repeated ground skidding entries into the harvest area and additional road construction, depending on the area included. Currently, there are moderate effects of road construction and minimal effects from the previous selective harvest and salvage removal in the proposed harvest units. Old skid trails are still evident as cleared routes, yet are well vegetated and only minor erosion was observed. Past impacts are estimated to occupy less than 5% of the proposed units and are stable. Implementation of the Action Alternative should present a low risk of cumulative effects based on the implementation of BMP's and mitigation measures that would minimize the area of detrimental soil impacts and retain a portion of fine litter and woody debris. Mastication measures for slash treatments would make the best balance of treating slash and thinned trees while retaining a higher proportion of fine foliage on-site and fuels treatments are expected to reduce the risk of extreme fire effects such as increased erosion and loss of surface organics.

The estimates of existing impacts are approximately 5% and additional impacts from the proposed operations are expected to add up to 10% equaling15% projected impacts. The area of new roads would be less than 1% of the state lands project parcels and steep eroded segments of roads would be stabilized. Road drainage would be improved on existing road haul routes, yet some routes that are native material and used all seasons would require continued periodic maintenance for effective road drainage.

There would be short- to mid-term reductions in fine litter on high priority fuels reduction treatment zones near residences and open roads. Cumulatively over the rotation of the forest stands, the combination of fine litter and coarse woody debris would be expected to maintain surface organic matter that provides media for healthy soil fungi, conserves soil nutrients and moisture important to tree growth and supports long term productivity. Improved tree spacing would reduce competition for nutrients and soil moisture, enhance growth of retained trees and promote regeneration of conifers as noted in the vegetation section.

Section 7 Vegetation, Noxious Weeds Issue

Noxious Weeds – There is a concern that forest management activities may result in introduction of new weeds or increased spread of noxious weeds from the proposed forest management activities.

Regulatory Framework

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

All applicable weed management requirements of the County Weed Control Act 7-22-2101 to 7-22-2153 , Best Management Practices (BMP's), State Forest Land Management rules and regulations, and measures outlined in the DNRC Habitat Conservation Plan (HCP)would be implemented. This includes, but is not limited to management rules for classified forest lands *ARM 36.11.445* where the department shall use an integrated pest management approach for noxious weed management that includes prevention, education, cultural, biological, and chemical methods as appropriate.

Analysis Methods & Analysis Areas

The methods for disclosing impacts for this analysis include using descriptions of weeds occurring in the area, weed management efforts that have been completed and then qualitatively assess the risk of weed spread based on the proposed actions and mitigations.

Noxious Weeds- Existing Conditions

Noxious weeds occurring in the project parcels are mainly a combination of knapweed (Centaurea maculosa), houndstongue (Cynoglossum officinale L) and spot infestations of thistle (Cirsium arvense). Knapweed was found along roadsides as well as in some forested portions of the project area. Houndstongue was found mostly along roadsides along the access haul routes within project sections and on adjacent lands. Orange hawkweed occurs in the area, but has not been noted on the project sites. Road use, livestock and wildlife grazing, timber harvest activities, recreational uses, and soil disturbance from fire are most likely the reasons for the existing rate of spread of noxious weeds and the potential future spread and introduction of noxious weeds. Moist sites with well-established surface vegetation provide a competitive advantage over noxious weed establishment. Reseeding of some road cuts followed by roadside, spot herbicide treatments and release of bio-control insects are examples of treatments utilized on noxious weeds on portions of all of the project sections and this has helped reduce the spread of noxious weeds. DNRC has completed considerable herbicide treatments and revegetation on forest management projects for the last 10 years coupled with weed treatments by the Lolo National Forest on system roads. Parts of the Placid Lake access road were recently treated by a combined effort with Missoula County, Plum Creek Timberlands and the Clearwater Resource Council. Yet weeds continue to spread by wind, animals and vehicles. Weed management treatments on adjacent ownerships in the area varies from no-action to combinations of revegetation, herbicide treatments and bio-control measures.

Environmental Effects on Noxious Weeds

No-Action Alternative: Direct, Indirect, and Cumulative Effects on Noxious Weeds

With no action, noxious weeds would continue to spread along roads and may increase on the drier site habitats. Limited weed control efforts on access roads across multiple ownerships in the area increases the potential for windblown seed. Following disturbance events such as fires or grazing, the establishment and spread of noxious weeds can be more prevalent than in undisturbed areas. DNRC would continue to treat selected sites on DNRC roads based on priorities and funding availability, but the levels of weed control treatments would be lower than with the action alternative. If new weed invader species are found they would have highest priority for management. On state land parcels the grazing licensees and cabin site lessees would be required to continue weed control efforts consistent with their use.

Direct, indirect, and cumulative effects of noxious weeds within the project areas are moderate. Weeds have spread across ownerships over time and are prone to more dispersal along open roads. Weeds also have spread by multiple uses from wind, fire, traffic, forest management, wildlife and grazing animals. As tree density and ground cover vegetation increase, weeds are reduced through vegetative competition.

Action Alternative: Direct, Indirect, and Cumulative Effects on Noxious Weeds

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

require off-road equipment cleaning. Roadsides would be sprayed prior to operations and weed control and revegetation would slow noxious weed spread and reduce weed density and occurrence compared to no-action. There would be a similar or potential slight increase in weed infestation with harvest units due to soil disturbance (refer to Soils section) and reduction of tree canopy. The silvicultural prescriptions are designed to control disturbance and scarification would be limited to amounts needed for sustained forest growth. Noxious weeds control efforts would promote rapid revegetation and emphasize treatment of any new noxious weeds found.

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

Overall direct, indirect, and cumulative effects of increased noxious weeds within the project area are expected to be moderate based on herbicide treatments of existing weeds along roads and implementing prevention measures to reduce new weeds such as cleaning equipment and planting grass on roads to compete against weeds, and the continued weed control of grazing users. The combined efforts of weed control across ownerships continues to improve through cooperative efforts with the Missoula County Weed District and local weed control interest groups including the Clearwater Resource Council and Blackfoot Challenge.

References

Graham, Russell T.; Harvey, Alan, Jurgensen, Martin; Jain,T.; 1994. Managing Coarse Woody Debris in Forests of the Rocky Mountains. Res. Paper INT-RP-477. Ogden, Utah: U.S.D.A., F.S., Intermountain Research Station, 12p.

MT DNRC 2006, Collins, Jeffry, Compiled Soil Monitoring Report on Timber Harvest Projects 1988-2004., Montana Department of Natural Resources and Conservation, Trust Land Management Division, Forest Management Bureau, Missoula, MT.

MT DNRC , Environmental Assessments of the past DNRC timber sales including; Double Beaver Fire Salvage 2007, Seeley Salvage 2010 and minor salvage permits, Clearwater Unit, Southwestern Land Office.

MT DNRC. 2003 Montana Administrative Rules for Forest Management on DNRC Forested Lands. Montana DNRC. Trust Lands Management Division. Helena, MT.

Montana DNRC. 2010, 2012 Multiple reports, Montana Forestry Best Management Practice Audit Reports. Forestry Division. Missoula, MT.

MT DNRC. 2010. DNRC Habitat Conservation Plan, Final EIS Forest Management Bureau Division, Missoula, Montana.

MT DNRC 2011, Schmalenberg, Jeff, Compiled Soil Monitoring Report on Timber Harvest Projects 2007-2011., Montana Department of Natural Resources and Conservation, Trust Land Management Division, Forest Management Bureau, Missoula, MT.

MT DNRC, 2011. Best Management Practices for forestry in Montana. Available online at www.dnrc.mt.gov/forestry/assistance/practices/documents/bmp.pdf; Last accessed August 3, 2012.

NRIS, Montana Natural Resources Information System, Internet database for soils, air photos, geology, 2013. http://nris.state.mt.us/interactive.html

Sugden, B.D., R. Ethridge, G. Mathieus, P. Heffernan, G. Frank, and G. Sanders. 2012. Montana's forestry best management practices program: 20 years of continuous improvement. J. For. 12-029.

U.S. Dept. of Agriculture, Forest Service. 1989, Lolo National Forest Land Systems Inventory. Missoula, MT.

Attachment E: Water Resources Analysis

Clearview Timber Sale – Water Resources Analysis

Analysis Prepared By: Jeff Collins, Hydrologist/Soil Scientist, DNRC, 12/16/14

Introduction

The following analysis will describe the existing soil conditions and the anticipated effects to water resources within the Clearview project area. Direct, indirect, and cumulative effects to soil resources and noxious weeds of both the No-Action and Action alternatives will be analyzed.

Issues

The following issue statements were developed from internal scoping and public comments and include compliance with laws and rules regarding the effects of the proposed timber harvest and road systems to water resources.

Water Quality - There is a concern that the proposed action may cause impacts to water quality from sedimentation that may occur associated with timber management activities, road construction and road use.

Cumulative Watershed Effects- There is a concern that the proposed timber harvest may cause or contribute to cumulative watershed impacts as a result of increased water yields.

Issues and Concerns dismissed from further analysis.

1) Riparian Large Woody Debris-DFWP expressed concern for the removal of large woody debris and snags from SMZ's or wetlands and the possible disturbance effects of this harvest along the Clearwater River. DFWP recommended no harvest in SMZ's and to maintain adequate buffers around wetlands and riparian areas. DNRC would designate a RMZ width of 100 feet along Class 1 streams based on stand potential tree height, and no harvest would occur in SMZ's or the wider RMZ width adjacent to Class 1 fisheries streams and rivers. Consequently, there is not expected to be any detrimental effect on large woody debris or stream shading, which may also affect stream temperatures. Therefore, these concerns are dismissed from further analysis.

2) Riparian Clearing by cabin owners- A concern was expressed that vegetation clearing (mowing, pruning, firewood removal) has occurred on several DNRC cabin site leases on or very near the Clearwater River shoreline. DNRC cabin lessees must comply with applicable laws; 4 sites have recently been confirmed with mowing/ shoreline vegetation removal. Compliance is being reviewed by DNRC and permitting is being considered by Missoula County Conservation District. No timber harvest or shoreline alterations are proposed in the RMZ/SMZ of any cabin sites. Therefore, this concern is dismissed from further analysis.

Regulatory Framework

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

Montana Surface Water Quality Regulations

All the watershed areas listed in this report are classified as B-1 in the Montana Surface Water Quality Standards. The water quality standards for protecting beneficial uses in B-1 classified watersheds are described in *ARM 17.30.623*. The B-1 classification is for multiple-use waters suitable for; domestic use after conventional treatment, growth and propagation of cold-water fisheries, associated aquatic life and wildlife, agricultural, and industrial uses. Other criteria for B-1 waters include; no increases are allowed above naturally occurring concentrations of sediment, which will prove detrimental to fish or wildlife and a maximum 1 degree Fahrenheit increase above naturally occurring water temperature is

allowed within the range of 32 to 66 degrees Fahrenheit. Naturally occurring includes conditions or materials present from runoff or percolation on developed land, where all reasonable land, soil, and water conservation practices have been applied. Reasonable conservation practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses. The State has adopted Forestry BMP's through its Non-point Source Management Plan as the principle means of controlling non-point source pollution from silvicultural activities. Stream temperatures are discussed in the fisheries section. DNRC provides further protection of water quality and sensitive fish through implementation of the SMZ Laws and Forest Management Rules.

Water Quality Limited Waterbodies and Beneficial Uses

A Total Maximum Daily Load (TMDL) analysis was completed by MT DEQ for the Middle Blackfoot watershed (DEQ 2006) that includes the watersheds of this Clearview Project area. All beneficial uses are considered supported within the watersheds of the proposed project areas and none of the streams are listed as impaired (DEQ 2012). The lower Clearwater River below Salmon Lake is listed as Water Quality Category 3 where there is Insufficient or no data available to determine whether or not any designated use is attained. A Basin-Wide Restoration Action Plan for the Blackfoot Basin was completed in 2005 by the Blackfoot Challenge and DFWP to list mitigations and establish restoration priorities.

Beneficial Uses-The downslope beneficial uses in the project area include: domestic surface water rights, recreation, cold-water fisheries, agriculture, irrigation, industrial, wildlife and livestock watering.

Water Rights- There are water rights for municipal drinking water in Seeley Lake and private drinking water from Placid Lake, Salmon Lake, the Clearwater River and streams. There are water rights for private drinking water, agriculture, livestock watering, and industrial uses in the analysis areas. Owl Creek has reduced seasonal flows from a dam at the outlet of Placid Lake.

Montana Streamside Management Zone (SMZ) Law

All rules and regulations pertaining to the SMZ Law will be followed. An SMZ width of 100 feet is required on Class I and II streams when the slope is greater than 35%. An SMZ width of 50 feet is required when the slope is less than 35%(*ARM 36.11.427(3) (a) (i)* and *(IV)* and *ARM 36.11.436)*.

DNRC Forest Management Rules and DNRC Habitat Conservation Plan (HCP)

All applicable State Forest Land Management rules and regulations regarding watershed and fisheries management will be followed. This includes, but is not limited to, rules listed for water quality (*ARM 36.11.422*), cumulative effects (*ARM 36.11.423*) RMZ's (*ARM 36.11.425*), Fisheries (*ARM 36.11.427*) and Conservation Strategies outlined in the DNRC Habitat Conservation Plan (HCP 2011). As part of *ARM 36.11.427(3)(a)(i)* and *(iv)* and *ARM 36.11.436*, DNRC is committed to designing forest management activities to protect and maintain bull trout, westslope cutthroat trout and all other sensitive fish and aquatic species as noted in the fisheries assessment. DNRC would protect Class 1 fisheries streams by designating RMZ's based on stand potential tree height at 100 years in age and no-harvest buffers as noted in the mitigations.

Analysis Methods & Analysis Areas

A watershed analysis and field survey was completed by a DNRC hydrologist for the proposed sale area to determine direct, indirect and cumulative effects to water quality. The water quality evaluation included a review of existing inventories for water resources (NRIS 2013), the 2005 Upper Blackfoot Restoration Plan (BFC 2005) and reference to previous DNRC projects. Aerial photos of the project area were compared and combined with GIS analysis to estimate the area of past timber harvest and vegetative recovery. The water resources analysis included a course filter cumulative watershed effects analysis for the project area. Field reviews were completed for the proposed harvest units, access roads and associated streams. Then the observations, information and data were integrated into the watershed analysis and design of project mitigations. Descriptions of anticipated adverse impacts or positive impacts to water resources will be described, if applicable, using information on impact extent and duration.

Sediment delivery

The analysis areas for sediment delivery are limited to the harvest units and roads used for hauling and will focus on the streams described as affected watersheds. Refer to the Hydrology Map WS-1 for analysis areas that encompass the proposed harvest units, road haul routes, and the soils analysis. A road inventory was completed for sediment sources and to design mitigation measures. The analysis includes in-channel and upland sources of sediment that could result from this project. In-channel areas include the stream channels adjacent to and directly downstream of harvest areas. Upland sources include harvest units and roads that may contribute sediment delivery as a result of this project. The measurement criteria for this sediment analysis are 1) miles of new road construction and road improvements compared to road density and 2) the potential for sediment delivery to streams and impacts to water quality.

Water Yield

Cumulative watershed effects can be characterized as impacts on water quality and quantity that result from the interaction of past, current or foreseeable future disturbances, both natural (fire) and human-caused. Past, current, and future planned activities have been taken into account for the cumulative effects analysis.

The analysis for cumulative effects to water yield considers the area of harvest units and access roads within the project drainages described as the affected watersheds. A DNRC hydrologist completed a coarse filter qualitative assessment of watershed conditions and cumulative effects as outlined in the Forest Management Rules (*ARM 36.11.423*) and the commitments described in the HCP concerning watershed management. Based on extensive past logging in the area, a more detailed assessment of sediment sources and stream channel conditions was also completed. The measurement criteria for the water yield analysis are the potential for increases to surface runoff water yield. Effects to stream flow will be described qualitatively considering the distribution and timing of peak flows.

Affected Watersheds

The proposed timber harvest and forest management project is located within 10 air miles of the town of Seeley Lake. Affected watershed are the Lower Placid Creek, Placid Lake, Seeley Lake and Salmon Lake watersheds which were designated to evaluate the existing and predicted impacts to water resources associated with the proposed actions. The proposed harvest and thinning treatments occur within the following State trust parcels: sections 4, 8, 10, 14, 24, and 26, T16N R15W of MSU Agricultural College Board Trust, sections 9, 15, 16, and 23 T16N R15W of Common Schools Trust and sections 30 and 32 T16N R14W of Pine Hills Permanent Trust. Refer to the Watershed Map WS-1 for analysis areas that include the proposed harvest units and road haul routes.

The Seeley Lake drainage (HUC 170102031007) is 24,805 acres in size and the average precipitation is a moderate 25 inches/ year mainly as snow. Precipitation ranges from 14 inches/year near the Blackfoot River to about 50 inches /year near Morrell Mountain. This drainage includes the Clearwater River, Morrell Creek, Drew Creek, Auggie Creek, Rice Creek drainages and unnamed tributaries. No harvest or road use is planned north of the Seeley Lake outlet to the Clearwater River or in the headwaters of Seeley Lake and there would be no effects to water resources, sediment or water yield in Morrell Creek, Drew Creek, Auggie Creek or Rice Creek drainages.

The Salmon Lake drainage (HUC 170102031008) is 9,678 acres in size and the average precipitation is a moderate 26 inches/ year mainly as snow. Precipitation ranges from 21 inches/year near the confluence with Elbow Lake to 35 inches /year in the headwaters of Fish Creek. The Salmon Lake drainage includes Salmon Lake, the Clearwater River, Fish Creek, Fish Lake, Tote Lake and several unnamed intermittent tributaries. No harvest or road use is planned near Fish Lake and there would be no effects to water resources, sediment or water yield in the headwaters of Fish Creek above the lake.

The Placid Lake drainage (HUC 170102031204) is 14,019 acres in size and the average precipitation is a moderate 25 inches/ year mainly as snow. Precipitation ranges from 21 inches/year near the Clearwater River to about 33 inches /year in the headwaters of Vaughn Creek. The Placid Lake drainage incudes Owl creek from the lake's outlet to the Clearwater River, Vaughn Creek, Placid Creek near the lake inlet, and several unnamed tributaries and wetlands. No harvest or road use is planned south or west of Placid Lake and there would be no effects to water resources, sediment or water yield in Vaughn Creek or Placid Creek above the lake.

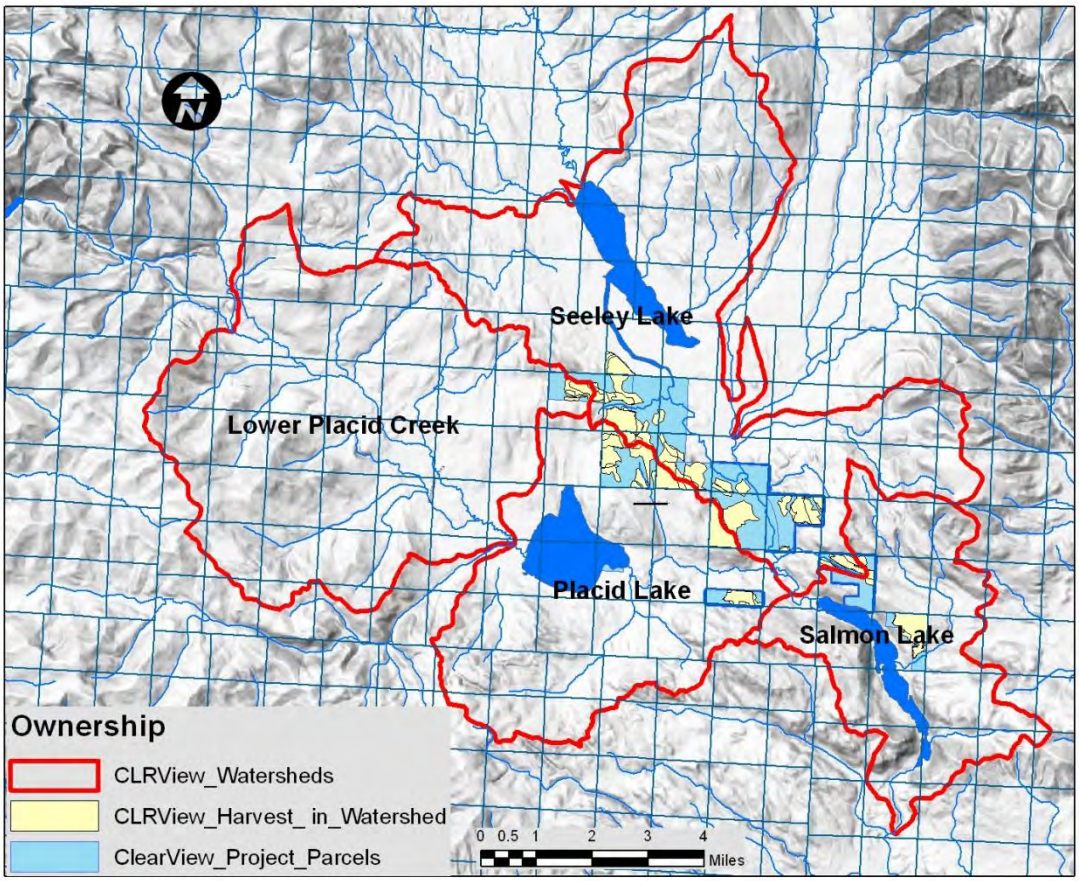
The analysis areas for watershed cumulative effects include the watersheds that wholly surround the DNRC project sections and the access roads to those sections. Past, current, and future planned activities within each analysis area have been taken into account for the cumulative effects analysis.

State Trust Land Areas Dismissed from Further Analysis

The Lower Placid Creek drainage (HUC 170102031202) includes state lands in the north ½ of partial Section 8 T16N R14W that includes the north 1/3 of Tupper Lake. No harvest is proposed with 300 feet of Tupper Lake. There are dispersed sediment effects from roads adjacent to the south ½ of Tupper Lake on private land. A large portion of this headwaters drainage was burned in the 2007 Jocko Fire. The fire, salvage harvest, road repairs and restoration activities across ownerships resulted in moderate cumulative effect to water quality from wildfire and land management activities. There is no direct sediment delivery to Tupper Lake or surface waters on the proposed haul route. There are no culverts or stream crossings on the haul roads that may affected within this drainage and no sources of sediment delivery to surface waters were identified on the existing access route, on the proposed harvest or thinning areas. The proposed main haul route is open to public use and road segments that do not meet BMP's for road surface drainage would have maintenance repairs and segments of relocation to improve road surface drainage and reduce future maintenance. Approximately ½ mile of road would be constructed on stable slopes with very low potential for off-site sedimentation and about 1.2 miles of road would be closed and stabilized for a net reduction in roads.

The proposed harvest and thinning is located on relatively rocky and droughty mountain sideslopes where the average precipitation is a moderate 23 inches/year and the rates of forest soil infiltration exceed all but extreme storm events. The proposed 93 acres of shelterwood, selection harvest and thinning treatments are small in area, equaling less than 1% of the 21,618 acre Lower Placid Lake drainage. For all these reasons including resilient site conditions, moderate precipitation, low to moderate harvest, minor road construction, and implementation of BMP's and standard mitigations, the proposed project within the Lower Placid Creek drainage has low potential for direct, indirect or cumulative impacts to water quality or water yield and is dismissed from further water resources analysis. This project's water resources analysis will be carried through for proposed forest management actions within the Placid Lake, Seeley Lake and Salmon Lake watersheds.

MAP WS-1 DNRC CLEARVIEW PROJECT WATERSHED ANALYSIS AREAS



Existing Conditions

Existing Conditions - Water Quality and Sediment Delivery

Past management activities in the proposed project area include timber harvest, grazing, road construction, urban and rural development, fire suppression and recreation. Sedimentation sources identified in the area are road-fill segments adjacent to stream channels, stream crossings with inadequate road surface drainage prior to the crossing sites, historic riparian harvest and dispersed grazing that includes wildlife use. Sediment inventories were completed for existing roads and crossing sites on haul routes within the project area. Streams within the project parcels were reviewed for channel stability and sediment sources.

The project area forests are dominated by mixed conifer forests that were largely initiated by wildfires. Historic timber harvests were extensive from 1960 to 2005. Some impacts likely occurred on adjacent ownerships associated with logging and road use prior to the adoption of BMP's in 1988. There was previous harvesting in all sections that ranges from firewood and thinning to even-age harvest. Unauthorized firewood salvage in riparian areas has also occurred. The most recent harvest was salvage harvest of dead lodgepole pine in 2000 within sections 9, 10, & 15, T16N, R15Was well as salvage harvest associated with the Jocko Lakes fire in 2007 which burned in the Placid Lake Owl Creek drainage through parts of State lands Section 8 T16N R15W. Salvage operations complied with BMP's with less than 10% ground impacts. The burned sites would not be affected by this proposed action.

Sediments

There are dispersed sediments from open roads; Highway 83 adjacent to Seeley Lake and the Clearwater River, Owl Creek road and Fish Creek road on segments where the roads are adjacent to streams. Most of the main roads meet BMP's and there are few stream crossings. Secondary forest roads include segments that are steep and do not meet BMP's for adequate surface drainage, yet there are few direct sediment sources on the proposed haul routes, principally at culvert locations noted in the following drainage descriptions. In a general framework, the potential for sediment risk increases with the amount of area disturbed and area in roads. Table WS-1 is a comparison of existing road densities throughout the analysis areas and displays a lower road density of roads/ square mile on State trust lands than on the combined land ownerships. Portions of sections 14 and 23, T16N, R15W do not have existing road access.

Table WS-1 Comparison of Existing Road Density within Analysis Areas

Analysis Area Drainages	Analysis Areas in Square Miles	Total Road Miles in Analysis Areas- All Ownerships	Road Miles per Square Mile within Analysis Area	State Lands Parcels Area Square Miles	Existing Road Miles/Square Miles on State Trust Lands
Placid Lake	21.9	128.0	5.8	7.5	3.1
Salmon Lake	15.1	67.1	4.4	3.3	2.7
Seeley Lake	37.6	216.5	5.8	11.1	2.3

Seeley Lake Drainage

This analysis will focus on the proposed timber harvest project that is located southwest of Seeley Lake along a low glacial-scoured rocky ridge forming the watershed boundary between the Seeley Lake drainage and the Placid Lake drainage. The proposed treatment units are located mainly along a northeast aspect of the ridge that drains toward the Clearwater River. Vegetation is well established within areas proposed for treatments and exposed soils and areas of erosion are rare except for roads and some historic landing areas. No surface flow is evident to the Clearwater River on these face drainages except for an unnamed tributary A. Soils are mostly well drained and infiltration rates generally exceed precipitation rates for all but major precipitation storms.

The Clearwater River is a wide meandering river that flows through glacial outwash and alluvial deposits and has mainly stable banks with adjacent wetlands. There are also glacial potholes and isolated wetlands throughout the area. There are considerable home sites developed along the river that include docks, roads and boat ramps. Clearing of shoreline vegetation and dispersed sediment is a continuing effect of the home sites and developments in the watershed.

The primary haul routes for harvest units in sections 8,9,10,14,15,16 and 23, T16N, R15W are the West Riverside Drive, and the Tupper Lake/Power-line road that extends from West Riverside Drive at Seeley Lake to Section 9, T16N, R15W. West Riverside Drive is in good condition along the southwest side of Seeley Lake and crosses the Clearwater River with an old steel bridge that is planned for replacement by Missoula County. The Tupper Lake/Power-line forest road is located parallel to an unnamed tributary A of the Clearwater River that originates on the west bank of northwest ¼ 4 Section 10, T16N, R15W. This road has potholes, needs regular maintenance, segments do not meet BMP's for road drainage and has dispersed sedimentation to tributary A.

This tributary A has perennial flow for about 1 mile upstream into Section 9, T16N, R15W during spring flows, has good channel stability and well established riparian vegetation. The upper stream segment has low flow that quickly subsides to intermittent flows and narrow wetland. There are two existing culvert crossings on this stream. The lower crossing is on a perennial stream reach and was replaced in 2004 to provide potential fish passage and meet BMP's for adequate drainage and sediment control. The upper crossing is on an intermittent reach of the stream, has minor sedimentation due to a short culvert and a need for additional road surface drainage.

The forest access road to partial Section 24, T16N R15W is in good condition with no direct sediment sources. Segments of the secondary forest access roads do not have adequate road surface drainage to meet BMP's. The forest access road to partial Section 24, T16N R15W is in good condition and meets BMP's with no direct sediment sources.

Placid Lake Drainage

The primary haul routes for harvest units in parts of sections 9,15,16,23, and 26, T16N, R15W are the Placid Lake road and secondary forest roads north of Owl Creek that connect to the Tupper's Lake/Power-line road. Along the proposed forest haul routes there are segments of road that are steep, have inadequate road surface drainage and do not meet BMP's which results in localized effects to water quality.

An existing forest access road to Section 16, T16N R15W parallels an unnamed tributary B of Owl Creek. Tributary B originates as ephemeral flow in state ownership southwest ¼ Section 16, T16N, R15W and flows south across private lands to Owl Creek. Segments of this access road do not have adequate road surface drainage and there is one stream crossing that is undersized and a sediment source. The lower mile of Tributary B has perennial flow that is low and stream channel stability is good with fair condition at the crossing. The stream is unlikely to support fish based on field review and an absolute fish barrier occurs where the stream goes subsurface in talus rock in the northwest ¼ Section 27, T16N R15W prior to Owl Creek. The forest access road to partial Section 26, T16N R15W is in good condition and meets BMP's with no direct sediment sources. Vegetation is well established within areas proposed for treatments and exposed soils and areas of erosion are rare except for some historic skid trails on steep slopes, segments of roads and some historic landing areas.

Salmon Lake drainage

The Salmon Lake drainage includes state lands in partial sections 30 & 32 T16N R14W that are located on relatively rocky, droughty mountain sideslopes over ¼ mile from Salmon Lake, as noted on the Watershed Map WS-1. There is an intermittent stream channel in the Section 30 parcel that goes subsurface downslope and is not a sediment source. The Woodworth road to the Section 32 parcel is north and upslope of Fish Creek, a tributary to Salmon Lake. There are small pothole wetlands within the parcels.

State lands in partial Section 24, T16N R15W straddle the rocky divide between the Seeley Lake and Salmon Lake drainages. The forest access road to partial Section 24, T16N R15W is in good condition with no direct sediment sources. Segments of the secondary forest access roads do not have adequate road surface drainage to meet BMP's. Vegetation is well established within areas proposed for treatments and exposed soils and areas of erosion are rare except for some historic skid trails on steep slopes, segments of roads and some historic landing areas.

Water Yield

Tree canopy reduction by timber harvest activities, tree mortality or wildfire can affect the timing of runoff, increase peak flows and increase the total annual water yield of a particular drainage, principally in areas with an average of 30 inches or more of annual precipitation. Moderate to high increases in water yield can increase stream channel scour and in-stream sediments that impact water quality and fish habitat, so we assess stream channel conditions as part of the project analysis. Water yield can also decline based on forest canopy regrowth that increases precipitation interception and transpiration, which reduces runoff. Paired watershed studies in snow dominated areas of Wyoming and Colorado indicate that in a drainage with a mean annual precipitation of 30 inches, a removal of 100% of forest canopy would result in an approximate 8-inch (about 90%) increase in water yield. By comparison an area with 21 inches mean annual precipitation with 100% canopy removal would only have a1 inch, or an 18%, increase in water yield. Yet, in low annual precipitation zones of 16-20 inches/ year there is unlikely to be a statistically measurable change in water yield even from extensive canopy removal (Romme et. al.2006).

Snowmelt in the project areas typically occurs early spring in April and prior to peak runoff in May from snowmelt in the upper Seeley Lake basin. The bulk of the DNRC project is located in the lower Seeley drainage area that has considerably lower runoff. The Placid Lake and Salmon lake drainages are lower in elevation and total runoff occurs slightly earlier in the spring than the Seeley Lake drainage. As noted in the soil analysis, soil infiltration rates generally exceed 6 inches/ hour and even in rapid snowmelt, surface runoff carries only a short distance before infiltrating into the soil. This low to moderate potential for runoff is reinforced by estimates of Relative Effective Annual Precipitation (REAP) developed by the Montana Natural Resources Conservation Service (NRCS web reference 2014). REAP is an indicator

of the amount of moisture available at a location taking into account precipitation, slope, aspect and soil properties and is displayed as a map layer (in project file). The REAP data and climate summary for the project area indicates that effective precipitation is at a deficit in the summer when transpiration exceeds precipitation. Areas of overstocked trees increase competition for limited soil moisture.

Currently, older lodgepole pine and a portion of ponderosa pine that are dead, dying and at risk of mountain pine beetle mortality comprise less than 20% of overall stand volume in proposed DNRC harvest areas. Pine mortality is greater in the northeast corner of the project on the flat alluvial valley floor, and insect mortality may have resulted in a minor increase in available water. But is very unlikely to be measurable, increase the surface runoff or water yield and would be within the range of natural conditions expected. Historically, tree cover comprised about 75-80% of forest stands in combination with natural openings and areas in various successional stages after fires, as noted in the vegetation section description.

Channel stability has been affected by historic riparian harvest and sediment from roads at crossing sites. Channel stability is good through the DNRC parcels in part due to vegetative recovery on channel banks and the fact that past harvests occurred over 25 years ago.

Environmental Effects on Water Quality

Direct and Indirect Effects of the No- Action Alternative on Water Quality and Quantity

No direct or indirect effects to water quality or quantity would be expected to result other than those described under existing conditions. Approximately 14.5 miles of existing road do not meet BMP's for drainage and there are low to moderate direct and indirect effects to sediment from roads. Sedimentation on segments of existing roads with inadequate surface drainage would continue to impact water quality unless remedial actions are taken, and would be completed over time based on priorities with limited funds.

There is a concern that without thinning to establish a Preliminary Line of Defense for fire protection near Seeley Lake that more extreme wildfire effects may occur in the area. Continued insect mortality or extreme wildfire may increase runoff and water yield relative to increasing canopy loss. There are low to moderate direct and indirect effects to water yield due to extensive past harvest, principally on adjacent lands, yet recent harvest stands have regenerated and begun hydrologic recovery, and many stands are overstocked.

Table WS-2 Summary Effects of the No- Action Alternative on Water Quality and Quantity

Water Quality & Quantity	Impact											
	Direct				Indirect				Cumulative			
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High
No-Action												
Water Quality			X				X			X	X	
Water Quantity		X	X			X	X			X	X	

Direct and Indirect Effects of the Action Alternative on Water Quality and Quantity

Land management activities such as timber harvest and road construction could impact water quality primarily by accelerating sediment delivery to local stream channels. The primary risk to water quality is sediment delivery at stream crossings. Potential change in water yield is addressed under cumulative effects. The summary effects of the action alternative on water quality and quantity are noted in Table WS-3.

Implementation of the action alternative would be a combination of salvage harvest of dead, dying and high-risk trees and selection harvest of live trees to reduce competition and improve growth of diverse tree species. Selection and

shelterwood harvest would occur on up to 1,900 acres of State land on the project parcels outlined on Watershed Map WS-1 using ground-based equipment.

Pre-commercial thinning is proposed to overlap the proposed harvest units (~58%) and the thinning would be completed in combination with harvest activities on forest sites that are overstocked with young conifers. An additional 320 acres of thinning would occur in stands where no harvest is proposed. Tree planting to ensure stocking of preferred species, grass seeding roads for erosion control and noxious weed management would also occur.

Implementation of the Action Alternative would principally use existing haul roads and road drainage would be improved to comply with BMP's. The proposed project could construct 11 miles of road, including relocation/stabilization/closure of 4 miles of road that do not meet BMP's for a net new road construction of up to 7 miles. DNRC plans also to repair and maintain up to 10.5 miles of road that do not currently meet BMP's or DNRC guidelines.

The thinning would be completed by hand crews or equipment in combination with harvest activities and would retain well stocked forest sites. The proposed thinning is expected to have negligible and likely not measurable impacts to water resources and water quality.

All applicable BMP's, State Forest Land Management rules and regulations, and measures outlined in the DNRC HCP would be implemented.

Table WS-3 Summary Effects of the Action Alternative on Water Quality and Quantity

Water Quality & Quantity	Impact											
	Direct				Indirect				Cumulative			
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High
No-Action												
Water Quality			**X**				**X**			**X**	**X**	
Water Quantity		**X**	**X**			**X**	**X**			**X**	**X**	

Sediments

The proposed action is mainly low to moderate intensity harvest of trees that are overstocked, dead or in poor condition and to improve fire protection. There are relatively few intermittent streams in or adjacent to the proposed harvest and thinning areas The proposed harvests would minimize soil disturbance to while achieving silvicultural needs and provide adequate drainage/stabilization for skid trails that would control erosion. Based on implementing BMP's, no-harvest SMZ' buffers and mitigations as outlined in the soil analysis, there is low potential for off-site sediment delivery to streams or surface waters from harvest activities as noted in summary Table WS-3.

SMZ's vary from 50 to 100 feet in buffer width in the project area. SMZ's and WMZ's would be marked to maintain harvest buffers to surface waters. The only Class one perennial stream segments adjacent to proposed harvests are on the Clearwater River. The north boundary lines of harvest Units 5 & 6 in Section 14, T16N, R15W, and a small unit in Section 24, T16N R15W are located upslope of a terrace edge that parallels the Clearwater River. A RMZ of 100 feet buffer distance (based on the forest stand potential tree height) was designated along the Clearwater River above the river terrace edge that defines a CMZ. No harvest is proposed in this 100-foot RMZ or other Class 1 stream segments. Riparian vegetation is well established and there is low potential for off-site erosion or sediment delivery based on comparable findings for no harvest within these buffer widths (Lakel et.al. 2010).

Several intermittent stream crossings on the existing road would have substantial reductions in sediments from road surfaces as a result of maintenance and relocations that would reduce non-point sediments.

One partially plugged and old culvert would be replaced or the crossing removed on unnamed tributary A in the west ½ of Section 9, T16N R15W which would reduce sediments and improve water quality. One undersized culvert would be replaced on a perennial unnamed tributary B of Owl Creek to improve flows and stabilize a sediment source through implementation of BMP's to improve water quality.

Replacement of several culverts on streams would result in direct, very short term increases in sediment when flows return to the stream channels but sediment is expected to be low, short term and less than the current conditions with no-action. In summary, the proposed logging operations and road construction are expected to have low risk of direct and in-direct impacts to water quality and would reduce sedimentation based on implementing BMP's and Forest Management Rules.

Cumulative Watershed Effects of No-Action Alternative:

Under the no-action alternative, cumulative effects would remain the same as described in existing conditions. Past, current, and future planned activities within each analysis area have been taken into account for the cumulative effects analysis. DNRC timber harvest projects in the general area during the last 15 years include: Jocko Lakes Fire Salvage, Hidden Bugs Timber Sale, Seeley Bug Salvage, Elbow Lake Salvage near Clearwater Junction and minor permits. A programmatic, BMP audit was completed on Elbow Lake Salvage to monitor administration and mitigations, and operations were found to be in compliance with all BMP's and SMZ rules.

Cumulative Watershed Effects of the Action Alternative:

There would be low risk of adverse cumulative impacts from the proposed action to water quality and beneficial uses based on implementation of BMP's and mitigation measures during timber harvest and road construction operations. Within the cumulative effects analysis area, DNRC has proposed to selectively harvest dead, dying and overstocked trees in the project area, and complete thinning broadly dispersed across the project parcels sections.

Table WS-4 Project Comparison of Road Densities by Watershed	Placid Lake 21.9 square miles	Salmon Lake 15.1 square miles	Seeley Lake 37.6 square miles
Road Miles by Watershed	128.00	67.20	216.50
Existing Road Miles on State Project Parcels	25.80	10.50	35.90
New Road Miles On State	2.20	0.30	8.30
State Road Miles to Close by Watershed	1.80	0.80	2.80
Net Project Roads on State Parcels	26.20	10.00	41.40
Net Change in Road Miles	0.40	-0.50	5.50
Existing Road Density Miles of Road/Square Mile Watershed	5.84	4.44	5.75
Project Road Density Miles of Road/Square Mile Watershed	5.86	4.41	5.90

Table WS-4 displays there would be an increase in total roads constructed, principally in the Seeley lake analysis area, yet the total road density would change less than 0.2 % and would be a low cumulative effect. The new road locations would be located well away from surface waters and represent a low risk of impacts to water quality. The low increase in road density combined with improved road relocation with wide buffers to surface waters represents a low risk of impacts to water quality. Water quality would be improved on existing roads to meet BMP's where sediment concerns have been identified. Closure and stabilization of steep and poor road locations that do not meet BMP's would further reduce dispersed sediments to benefit water quality.

Water Yield

The proposed harvest and thinning would occur on up to 1,900 acres, which is well distributed over the drainage areas and would result in less than 5% of the Seeley and Placid Lake drainages and less than 3% of the Salmon Lake drainage.

The proposed treatments are located in the low- to mid- elevations of the drier valley floor and footslopes of the drainage which receive moderate precipitation. Refer to Table WS-3 for a comparison of harvest treatment acres by precipitation zone and distribution by drainages.

Table WS-3 Distribution of Proposed Forest Treatments by Average Precipitation						
	Average Inches Annual Precipitation					
Forest Treatment by Watershed	**21**	**23**	**25**	**27**	**29**	**Total Acres**
Seeley Lake	**824**	**177**	**188**	**17**		**1,205**
Selection OSR	78	15				93
Selection	400	71	158	15		644
Shelterwood	214	81	13			307
Thinning	132	10	17	2		161
Placid Lake	**453**	**234**	**3**			**690**
Selection OSR	19	151				170
Selection	177	75	3			255
Shelterwood	153					153
Thinning	103	9				111
Salmon Lake			**2**	**222**	**11**	**236**
Selection				205	10	216
Shelterwood			0			0
Thinning			2	16	1	20
Grand Total Acres	**1,290**	**496**	**194**	**239**	**11**	**2,230**

There is low potential for surface runoff or measurable water yield increases from the proposed partial harvest, compared to no-action based on the following reasons;

1) Removal of dead and dying trees would not measurably contribute to interception or transpiration that is proposed on approximately 20% of the harvest area.

2) The project areas include multi-story forest stands that are generally well regenerated and overstocked with young trees.

3) The proposed moderate intensity, selective and shelterwood harvests would remove stagnant trees and promote codominant and understory trees that use water more efficiently.

4) These are moderate precipitation sites of 11- to 25-inch annual precipitation, where evapotranspiration and soil infiltration rates exceed precipitation levels and surface runoff is unlikely, except on bare soils or roads

5) Harvest in Seeley drainage would be estimated to increase water yield less than 1%

Harvest in Placid Lake drainage would be estimated to increase water yield less than 2%

Harvest in Salmon drainage would be estimated to increase water yield less than 1%

Research has shown that water yield is not likely detectable for low precipitation levels of less than 20– inches annually, even with aggressive harvests (MacDonald & Stednick. 2003, Romme et.al.2006).This proposal would involve low to moderate selective harvesting and thinning mainly in the 21- to 25-inch precipitation zones over a broad area.

The proposed precommercial thinning would thin overstocked trees of up to 1,000 stems/acre to a spacing of 200-300 stems/acre. Thinning would also reduce competition and promote faster growth and improved water efficiency in the

retained trees. For all these reasons, there is low risk of cumulative effects due to increased road density, increased water yield or a potential change in stream channel forms or flow regimes.

Based on the resilient site conditions, low to moderate harvest, minor road construction, moderate precipitation, implementation of BMP's and standard mitigations, the proposed project has low to moderate potential for cumulative impacts to water quality or water yield.

Water Resources Mitigations

The analysis and levels of effects to Water resources with the Action Alternative are based on implementation of the following mitigation measures.

* DNRC would implement all applicable BMP's, Montana Administrative Rules for Forest Management, and reasonable mitigation and erosion control practices during timber harvest, road maintenance, road construction and road use activities. The commitments of the DNRC HCP would be implemented on the applicable parcels.

* DNRC would locate, clearly mark and maintain suitable water resource protection boundaries including Streamside Management Zones (SMZ's), Riparian Management Zones (RMZ's), Channel Migration Zones (CMZ's) and Wetland Management Zones (WMZ's) adjacent to streams and wetlands consistent with State Forest Land Management rules, and the DNRC Habitat Conservation Plan (HCP) where applicable.

* Streamside Management Zones vary from 50 to 100 feet in buffer width. The north boundary lines of harvest Units 5 & 6 in Section 14, T16N R15W, are located upslope of a terrace edge that parallels the Clearwater River. A RMZ of 100 feet buffer distance (based on the forest stand potential tree height) would be designated along the Clearwater River above the river terrace edge that defines CMZ. No harvest is proposed in this 100-foot RMZ or other Class 1 stream segments.

* Limit harvest equipment and hauling operations to periods when soils are relatively dry (less than 20%), frozen or snow covered to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up.

* Construct and maintain erosion control features on trails and roads where needed. For skid trails on slopes, install waterbars or well distributed slash on trails as needed to control erosion potential and reduce potential unauthorized ATV use as needed.

* Existing road segments would be improved and maintained in association with the harvest activities. Road improvements would include surface blading and installation of drainage features to control surface erosion and prevent sediment delivery to streams as needed to comply with BMP's, crossing design 124 permits and to protect water quality.

* All newly disturbed soils on road cuts and fills would be promptly reseeded to site adapted grasses to reduce weed encroachment and stabilize roads from erosion.

* Roads that would no longer be used due to relocation would be stabilized from erosion and hydrologically restored to promote conifer growth, by reclaiming the road surface. Reclaimed roads would have the surface ripped to 12 inches in depth, relief culverts removed and effectively drained with waterbars and the surface grass seeded.

* Harvest operations and road conditions would be monitored as part of the on-going project operations and repairs would be made as needed, including erosion control, culvert cleaning and re-vegetation.

* Road use would be limited to dry or frozen ground conditions to reduce rutting and erosion. New road construction, including drainage features, should be completed in the fall prior to freeze-up. Road cutslopes are to be constructed at relatively stable angles as noted in contract Exhibit B. Check snow/frozen ground conditions prior to operations.

References

Blackfoot Challenge (BFC), DFWP, Trout Unlimited, Hydrometrics. 2005. A Basin-Wide Restoration Action Plan for the Blackfoot Watershed, MTDNRC Renewable Resource Grant Publication.

Lakel, W.A., W.M. Aust, C. Bolding, C.A. Dollloff, P. Keyser, R. Feldt 2010. Sediment Trapping by Streamside Management Zones of Various Widths after Forest Harvest and Site Preparation. Forest Science 56(6) 541-551.

MacDonald, L.H., and J.D. Stednick. 2003. Forests and water: A state-of-the-art review for Colorado. Completion report No.196. Colorado Water Resources Research Institute, Fort Collins, CO, 65 pp

MTDEQ (Montana Department of Environmental Quality). 2010. Montana 2010 305(b) Report. Helena, MT. "Clean Water Act Information Center", Reference 2013 websearch http://cwaic.mt.gov.

MTDEQ (Montana Department of Environmental Quality). 2008. Middle Blackfoot-Nevada Creek Total Maximum Daily Loads and Water Quality Improvement Plan. Helena,MT.

MT DNRC , Environmental Assessments of the past DNRC timber sales including; Double Beaver Fire Salvage 2007, Seeley Salvage 2010 and minor salvage permits, Clearwater Unit, Southwestern Land Office.

MT DNRC. 2003 Montana Administrative Rules for Forest Management on DNRC Forested Lands. Montana DNRC. Trust Lands Management Division. Helena, MT.

Montana DNRC. 2010, 2012 Multiple reports, Montana Forestry Best Management Practice Audit Reports. Forestry Division. Missoula, MT.

MT DNRC. 2010. DNRC Habitat Conservation Plan, Final EIS Forest Management Bureau Division, Missoula, Montana.

MT DNRC, 2011. Best Management Practices for forestry in Montana. Available online at www.dnrc.mt.gov/forestry/assistance/practices/documents/bmp.pdf; Last accessed August 3, 2012.

MT DNRC, Turbidity Monitoring of Culvert Removals, internal report in progress

NRIS, Montana Natural Resources Information System, Internet database for water resources, water rights, soils, air photos, geology, 2014. http://nris.state.mt.us/interactive.html

Sugden, B.D., R. Ethridge, G. Mathieus, P. Heffernan, G. Frank, and G. Sanders. 2012. Montana's forestry best management practices program: 20 years of continuous improvement. J. For. 12-029.

U.S. Dept. of Agriculture, Forest Service. 1989, Lolo National Forest Land Systems Inventory. Missoula, MT.

U.S. Dept. of Agriculture, Forest Service. Vanosdall, Tiffany 2008, Jocko Lake Fire Salvage Project –Fisheries Report for Lolo National Forest.

Attachment F: Fisheries Resources

Fisheries Resources Analysis

Analysis Prepared By: Jeff Collins **February 5, 2014**

Title: Hydrologist, Montana DNRC, Southwestern Land Office

Introduction

The following analysis will disclose anticipated effects to fisheries resources within the Clearview project area. Direct, indirect, and cumulative effects to fisheries resources of both the No-Action and Action alternatives will be analyzed.

Issues

There is a concern that sediment from proposed harvest areas and existing and proposed roads would increase sedimentation to streams and affect fishery habitat.

Issues and Concerns dismissed from further analysis.

1) **Riparian Large Woody Debris-** DFWP expressed concern for removal of large woody debris and snags from SMZ's or wetlands and the possible disturbance effects of harvest especially along the Clearwater River and recommended no harvest in the SMZ. DNRC would designate a RMZ width along Class 1 streams based on stand potential tree height and no harvest would occur in SMZ's or the wider RMZ width adjacent to Class 1 fisheries streams and rivers and there would be no effect on large woody debris or stream shading which may affect stream temperatures. Therefore, these concerns are dismissed from further analysis.

2) **Riparian Clearing by cabin owners-** A concern was expressed that vegetation clearing (mowing, pruning, firewood removal) has occurred on DNRC cabin site leases on or very near the Clearwater River shoreline and if DNRC would complete timber harvest within cabin sites. DNRC cabin lessees must comply with applicable laws, 4 sites have recently been confirmed with mowing/ shoreline vegetation removal. Compliance is being reviewed by DNRC and permitting is being considered by Missoula County Conservation District. No timber harvest or shoreline alterations are proposed in the RMZ/SMZ and there would be no effects of fisheries from the proposed forest management activities. Therefore, this concern is dismissed from further analysis.

3) **Fish Habitat Connectivity-** Bull trout and westslope cutthroat trout as well as other fish species have been identified as migratory in the Clearwater River between Seeley Lake and Salmon Lake and in Owl Creek between Placid Lake and the Clearwater River. There are several existing bridge locations on the proposed haul roads across the Clearwater River and Owl Creek which doesn't restrict fish connectivity. No restrictions to fish connectivity were identified on the Clearwater River between Seeley Lake and Salmon Lake. However, there is a dam on the outlet of Placid Lake that limits surface flow in the summer and Owl Creek is often dewatered in segments between Placid Lake Dam and the Clearwater River. No new road crossings of fishery streams are proposed and there would be no

effects to existing crossings or fish habitat connectivity. Therefore, this concern is dismissed from further analysis.

Regulatory Framework

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

All applicable BMP's, State Forest Land Management rules and regulations, and measures outlined in the DNRC HCP would be implemented. This includes, but is not limited to fisheries considerations (*ARM 36.11.427, 36.11.404* and *36.11.428*) for endangered and sensitive species to minimize impacts to fish populations and habitat. DNRC is a cooperator and signator of the Conservation Strategies and Restoration Plans for Bull Trout and Westslope Cutthroat Trout. The surface waters in the analysis areas are not listed as water quality impaired and fully support beneficial uses and are classified as B-1 in the Montana Surface Water Quality Standards (*ARM 17.30.610*). For additional details on these regulations, water quality standards, and beneficial uses please refer to the water resources analysis for this project.

Analysis Areas

For the Clearview Project four analysis areas were initially identified to evaluate the existing and potential impacts to fisheries resources associated with the proposed actions. The selected analysis areas include: Upper Placid Lake, Placid Lake, Seeley Lake, and Salmon Lake as shown in analysis Map Fish-1 including tributary fish bearing streams that may be affected.

Three analysis areas were chosen because they include (1) the watersheds of current or historic fish-bearing streams and (2) the proposed timber harvest units and/or forest road haul routes that could have potential measurable or detectable impacts to those fish-bearing streams (Refer to Map F-1). The analysis areas for direct, indirect and cumulative effects will be used to evaluate the existing and potential impacts to fisheries and fisheries resources associated with the proposed project.

Analysis Areas dismissed from further analysis

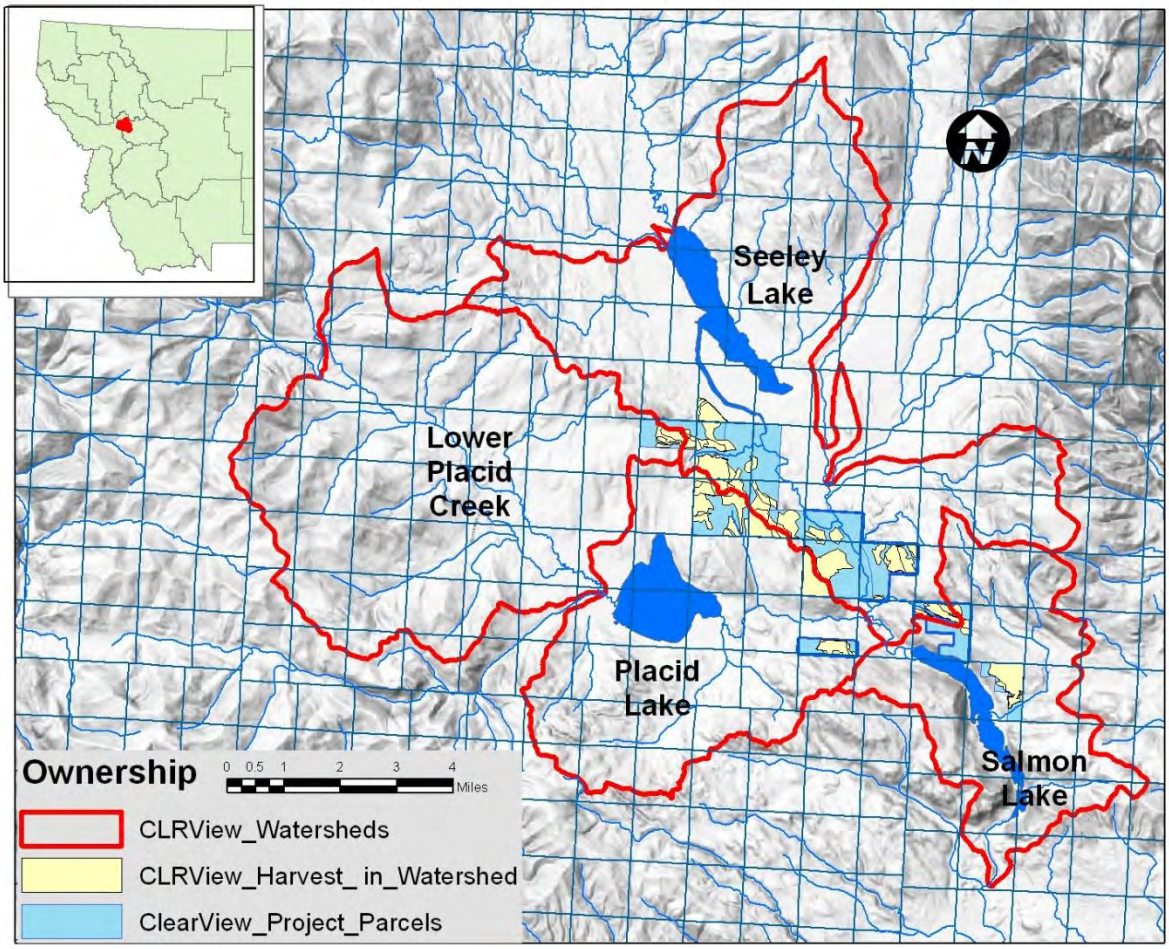
No harvest or road use is planned north of the Seeley Lake outlet to the Clearwater River or in the headwaters of Seeley Lake and there would be no effects to tributary fisheries in Morrell Creek, Drew Creek, Auggie Creek or Rice Creek drainages.

The Lower Placid Lake drainage includes state lands in the north ½ of partial Section 8 T16N R14W that includes Tupper Lake. No harvest is proposed with 300 feet of Tupper Lake. There are dispersed sediment effects from roads adjacent to the south ½ of Tupper Lake on private land and a large portion of this drainage was burned in the 2007 Jocko Fire. There is no direct sediment delivery to Tupper Lake or surface waters on the proposed haul route. There are no culverts or stream crossings on the access road that may be affected, and no sources of sediment delivery were identified on the existing access route or on the proposed harvest and thinning areas. The proposed haul route is open to public use and does not meet BMP's for road surface drainage. It would have maintenance repairs and segments of relocation to improve road surface drainage and reduce maintenance. The proposed harvest and thinning is located on relatively rocky, droughty mountain sideslopes where the average precipitation is a moderate 25 inches/year and water infiltration rates into the soils exceed all but extreme storm events. The proposed 93 acres of harvest is small in area with low to moderate harvest intensity combined with thinning which involves less than 1% of the lower Placid Lake drainage. Approximately ½ mile of road would be constructed on stable slopes with very low potential for off-

site sedimentation and segments of the existing access road would be relocated to reduce maintenance. For all these reasons including resilient site conditions, low to moderate harvest, minor road construction, implementation of BMP's and standard mitigations, the proposed project has very low potential for direct, indirect or cumulative impacts to water quality or water yield.

Water resources analysis will be carried through for proposed forest management actions within the Placid Lake, Seeley Lake and Salmon Lake watersheds for fisheries that may be affected in streams that are within or downslope of proposed harvest areas or adjacent to roads or with stream crossings.

MAP F-1 DNRC CLEARVIEW PROJECT FISHERIES ANALYSIS AREAS



Analysis Methods

A review of fishery resource information was completed in consultation with the DNRC fisheries biologist. The descriptions of foreseeable adverse impacts to fisheries resources are described in the Table Fish-1 below – Descriptions of foreseeable adverse impacts. Positive impacts to fisheries resources will also be described, if applicable, using information on impact extent and duration.

Table Fish-1 Descriptions of foreseeable adverse impacts.

Impact Description	Probability of Impact	Severity of Impact	Duration of Impact
Negligible	The resource impact is not expected to be detectable or measureable	The impact is not expected to be detrimental to the resource	Not applicable
Low	The resource impact is expected to be detectable or measureable	The impact is not expected to be detrimental to the resource	Short- or long-term
Moderate	The resource impact is expected to be detectable or measureable	The impact is expected to be moderately detrimental to the resource	Short- or long-term
High	The resource impact is expected to be detectable or measureable	The impact is expected to be highly detrimental to the resource	Short- or long-term

Fish Species

The presence or absence of fish species will be described for each of the analysis areas. Presence or absence will be based on DFWP MFISH data as of 2013, and field reviews of the potentially affected streams and road crossing sites on the proposed haul routes.

Sediment Delivery

Sediment delivery will follow the same analysis as in the water resources report. Sediment delivery sources are concerns at stream crossings, access roads within the riparian area and on locations that are downslope of harvest areas or areas of soil disturbance.

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

Existing Conditions

Fish Species

Current and historic fisheries distribution within the analysis areas are identified in Table Fish-2 below from MFISH data 2013. There is a broad diversity of both native and non-native fish species in Seeley Lake, Placid Lake, Salmon Lake and the interconnecting waterways of the Clearwater River, Owl Creek, and Fish Creek and these populations have considerable conservation and recreation values. The MFISH database and correspondence from DFWP identify the main stem Clearwater River from Seeley Lake to Salmon Lake as a functionally intact river and riparian corridor, with interspersed wetlands. USFWS has listed bull trout as 'threatened' under the Endangered Species Act. Both bull trout and westslope cutthroat trout are listed as S2 Montana Animal Species of Concern and as sensitive species by DNRC. Species classified as S2 are considered to be at risk due to very limited and/or potentially declining population numbers, range, and/or habitat, making the species vulnerable to global extinction or extirpation in Montana.

Seeley Lake, Placid Lake, Salmon Lake and the interconnecting waterways of the Clearwater River and Owl Creek are listed as migratory routes for bull trout. The Placid Lake dam limits water flow in the summer and fall, resulting in dewatering of segments of Owl Creek and limiting bull trout use.

There is an unnamed tributary A of the Clearwater River that originates on the west bank of Section 10, T16N, R15W and has perennial flow for about 1 mile upstream into Section 9, T16N R15W and may have fish use (refer to Map Fish 1). Fish from the Clearwater River may use the stream segment up to a culvert in the west ½, Section 9, T16N, R15W during spring flows that quickly subside to very low flows that are unlikely support fish in the summer-winter.

There is an unnamed tributary B of Owl Creek that originates as ephemeral flow in state ownership(Section 16, T16N, R15W) and flows south across private lands to Owl Creek. The lower mile of Tributary B has perennial flow that is very low, the stream is unlikely to support fish and there is an absolute fish barrier at the crossing of the Placid Lake road where the stream goes subsurface in talus rock in northwest ¼, Section 27, T16N, R15W.

Table Fish-2 Current & Historic Fish Species Distribution within the Watershed Analysis Areas		**Placid Lake/Owl Creek**	**Seeley Lake/ Clearwater River to Salmon Lake**	**Salmon Lake**
Species Name	Species	**Abundance**	**Abundance**	**Abundance**
Bull Trout	Native	Rare/Node	Common/Node	Common/Node
Largescale Sucker	Native	Common	Common	Common
Longnose Dace	Native	Rare	Unknown	Unknown
Longnose Sucker	Native	Common	Common	Common
Mountain Whitefish	Native	Rare	Common	Common
Northern Pike Minnow	Native	Common	Common	Common
Table Fish-2 Continued Fish Species in Analysis Areas		**Placid Lake/Owl Creek**	**Seeley Lake/ Clearwater River to Salmon Lake**	**Salmon Lake**
Peamouth	Native	Rare	Rare	Common
Redside Shiner	Native	Abundant	Unknown	Unknown

Westslope Cutthroat Trout	Native	Rare	Unknown	Rare
Brook Trout	Non-Native	Rare	Common	Unknown
Brown Trout	Non-Native	Common	Common	Common
Kokanee	Non-Native	Common	Abundant	Abundant
Northern Pike	Non-Native	Rare	Abundant	Abundant
Rainbow Trout	Non-Native	Rare	Unknown	Incidental
Yellow Perch	Non-Native	Rare	Common	Common
Sucker	Non-Native	Unknown	Unknown	Unknown
Whitefish	Non-Native	Unknown	Unknown	Unknown
Pumpkinseed	Non-Native	Unknown	Incidental	Incidental
Largemouth Bass	Non-Native	Common	Common	Unknown

Sediment Delivery

Sediment delivery will follow the same analysis as in the water resources report. Sediment delivery sources are concerns at stream crossings, proposed access roads within the riparian area and on locations that are downslope of harvest areas or areas of soil disturbance. A sediment source survey was completed by DNRC for proposed haul roads and streams and water resources that may be impacted that are downslope of harvest units. In a general framework the potential for sedimentation risk increase with the area in roads. Table Fish-3 is a comparison of road densities throughout the analysis areas and displays a lower road density of roads/ square mile on State trust lands than on the combined ownerships.

Table Fish 4 Comparison of Existing Road Density within Analysis Areas

Analysis Area	Analysis Areas Square Miles	Road Miles in Analysis Areas	Road Miles/Square Miles Analysis Area	State Trust Lands Parcels Square Miles	Existing Road Miles/Square Miles on State Trust Lands
Lower Placid Creek	33.8	175.3	5.2	3.5	3.2
Placid Lake	21.9	128.0	5.8	7.5	3.1
Salmon Lake	15.1	67.1	4.4	3.3	2.7
Seeley Lake	37.6	216.5	5.8	11.1	2.3

The MFISH database and correspondence from DFWP identify the main stem Clearwater River from Seeley Lake to Salmon Lake as a functionally intact river and riparian corridor with interspersed wetlands. There are likely dispersed sediments from open roads; Highway 83 adjacent to Seeley Lake and the Clearwater River, Owl Creek road and Fish Creek road on segments where the roads are adjacent to streams. An existing forest access road to Tupper's Lake is located parallel to unnamed tributary A of the Clearwater River that originates

on the west bank of northwest ¼ Section 10, T16N R15W. There are two existing culvert crossings on this stream. The lower crossing is on a perennial stream reach and the crossing was replaced in 2004 to provide potential fish passage and to meet BMP's for adequate drainage and sediment control. The upper crossing is on an intermittent reach of the stream and has minor sedimentation due to a short culvert and need for additional road surface drainage.

An existing forest access road to Section 16, T16N, R15W parallels an unnamed tributary B of Owl Creek. Tributary B originates as ephemeral flow in state ownership southwest ¼, Section 16, T16N R15W, and flows south across private lands to Owl Creek. Segments of this access road do not have adequate road surface drainage and there are sediment sources from inadequate road drainage and localized effects to water quality. Along the proposed forest haul routes there are segments of road that are steep, have inadequate road surface drainage and do not meet BMP's but are also not point sources of direct sediment delivery to surface waters.

Environmental Effects

No Action Alternative: Direct and Indirect Effects

As a result of implementing the No-Action Alternative, no direct or indirect effects to fisheries resources would occur in the analysis area beyond those described in the Existing Conditions.

Future related actions considered part of cumulative impacts include continued, developments and unauthorized uses (firewood removal), in riparian zones, reduced stream flow below the Placid Lake dam, and road conditions and maintenance effects on public and private roads. Foreseeable cumulative impacts to bull trout and westslope cutthroat trout populations and habitat features are expected to be very similar compared to existing impacts.

Action Alternative: Direct and Indirect Effects

Implementation of the action alternative would be a combination of salvage harvest of dead, dying and high-risk trees and selection harvest of live trees to reduce competition and improve growth of diverse tree species as noted in Table S-2. Under the proposed actions a combination of silvicultural treatments would include selection harvest and shelterwood harvest of about 1,900 acres within the 5,230 acres of State land on the project parcels outlined on Watershed Map WS-1 using ground-based equipment.

Pre-commercial thinning is proposed on up to 1,400 acres. Most of the pre-commercial thinning overlaps the proposed harvest units (58%) and the thinning would be completed in combination with harvest activities on forest sites that are overstocked with young conifers. An additional 320 acres of thinning would occur in stands where no harvest is proposed. Tree planting, grass seeding roads and noxious weed management would also occur.

The proposed project could construct 11 miles of road, including relocation/stabilization/closure of 4 miles of road that do not meet BMP's for a net new road construction of up to 7 miles. There would be no increase in open road density. DNRC plans also to repair and maintain up to 10.5 miles of road that do not currently meet BMP's or DNRC guidelines. Two non-fish bearing stream crossings would be replaced. No new fish bearing stream crossings would be constructed. Following road use, temporary roads would be closed, stabilized with long-term drainage features installed, and reseeding with site adapted grass to control erosion and compete with noxious weeds.

Fish Species

Under the action alternative, the primary haul routes would use the existing roads. No activities would occur within the RMZ of any lake or stream within the project area and no new stream crossings would be constructed that would affect Class 1 fisheries streams. Based on implementation of all rules, regulations, cooperative fishery agreements and mitigation measures, there is very low risk of negligible direct and indirect effects to fish species and impacts are not expected to be detrimental as a result of the proposed harvest. Fish species composition and diversity would be expected to remain similar to the No-action alternative.

Sediment Delivery

The primary risk to water quality is expected to be sediment delivery at crossings, since plans are to maintain adequate stream buffers from harvest. Two non-fish bearing stream may be replaced that would have a short term increase in sedimentation during the construction work. There would be a temporary increase in sediment during construction/replacement of the culverts. The levels of sediment are expected to be low and short duration based on implementation of; 1) BMP's, 2) site specific erosion control mitigations, and 3) all requirements of the 124 permits as well as a comparison to DNRC turbidity monitoring of culvert removals that showed low, short term effects. It is expected that the action alternative would result in less sediment delivery than the current conditions with no-action.

All harvest operations are designed to minimize surface disturbance and potential for erosion and sediment delivery by implementing adequate stream and wetland buffers. No direct sources of sediment were noted from the proposed harvest sites and the potential for off-site sediment delivery from the harvest areas is low, based on; 1) field reviews, 2) the extensive but moderate levels of selection harvest and thinning, and 3) the buffer distances to surface waters that exceed minimum requirements and evaluations noted in the water resources and soil resource reports. A RMZ would be designated that incorporates a CMZ to provide protection for fish and water quality consistent with HCP commitments. No harvest would occur within the RMZ along the Clearwater River or adjacent to any Class 1 fishery stream or lake. Sediment trapping research (Lakel et. al.) on the effectiveness of stream buffers found that > 97% of watershed erosion was trapped by vegetation prior to entering streams for SMZ's of 25 feet or more. In this instance, the proposed RMZ buffers would be 100 feet.

Based on implementation of BMP's, DNRC HCP, site specific mitigations, and all rules and agreements, the proposed timber harvest and road construction is expected to result in moderate risk of short term impacts and low risk of long term impacts to in-stream sediments effects to fish habitat.

No-Action Alternative: Cumulative Effects

No timber harvest or road construction would occur with the no-action alternative. Existing sediment sources from existing roads, and land uses would continue to contribute sediment to streams within the analysis areas depending on levels of road maintenance and where remedial actions are implemented or natural stabilization occurs.

Action Alternative: Cumulative Effects

There would be an overall low risk of additional cumulative impacts to fisheries with the proposed timber harvest and road construction due to the following reasons;

Combined mitigation measures for moderate levels of selection harvest and thinning as well as harvest planning and location of units are directed at minimizing soil disturbance to prevent erosion and potential sedimentation to streams. No harvest would occur near within 100 feet of the Clearwater River or Class 1 fishery streams.

The moderate levels of selection harvest and thinning that maintain well forested stands and well distributed harvest locations on well drained sites with moderate precipitation, present low risk of cumulative watershed

effects from increased surface runoff or water yields that may affect flow regimes or channel conditions as a result of this project.

As detailed in the water resources section, existing road drainage within the project parcels and haul routes would be improved to comply with BMP's, with an emphasis on sediment control at existing stream crossings. The proposed new roads are located well away from streams and there is low risk of off-site sediment delivery to streams. No new stream crossings are proposed on stream locations of fish habitat.

The proposed haul route would require construction of up to 11 miles of new roads that includes relocation and stabilization of 4 miles road for a net increase of 7 miles of road on well drained and stable locations. Within the project watersheds, increases in road density on state trust lands from new construction would be less than the combined road density on all ownerships (refer to Table Fish-4) and has low risk of increased sedimentation based on road repairs, relocations and implementation of BMP's.

Table Fish 4 Comparison of Existing Road Density with Proposed New Road Construction

Analysis Area	All Ownership Road Miles/Square Miles in Analysis Area	Existing Road Miles/Square Miles on State Trust Lands	New Roads on DNRC	Total Road Miles/Square Miles on State Trust Lands	Change in Road Miles/Square Mile on State Trust lands
Lower Placid Creek	5.2	3.2	0.5	3.4	0.1
Placid Lake	5.8	3.1	2.2	3.4	0.3
Salmon Lake	4.4	2.7	0.3	2.8	0.1
Seeley Lake	5.8	2.3	8.3	3.1	0.7

Additional road closures would be installed so there would be no net increase in open roads or travel that may affect sedimentation. Road drainage would be improved by maintenance and repairs on 10.5 miles of roads. For all these reasons there is low risk of cumulative effect to fisheries from the proposed actions.

Fisheries Mitigations

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

* DNRC would implement all applicable BMP's, Montana Administrative Rules for Forest Management, DNRC HCP measures and reasonable mitigation and erosion control practices during timber harvest, road maintenance, road construction and road use activities to reduce sedimentation and minimize effects to fisheries.

* DNRC would locate, clearly mark where needed and maintain suitable water resource protection boundaries, including SMZ's, RMZ's, and WMZ's adjacent to streams and wetlands consistent with State Forest Land Management rules.

* A 100-foot RMZ would be located for the proposed harvest unit adjacent to the Clearwater River in Section 14, T 16N, R15W and no harvest would occur in this RMZ.

* Existing road segments would be improved and maintained in association with the harvest activities. Road improvements would include surface blading, installation of drainage features to prevent surface erosion and sediment delivery to the stream, ditching to improve road surface stability, and gravel surfacing of selected segments to as needed to comply with BMP's and protect water quality.

*Road use would be limited to dry or frozen ground conditions to reduce rutting and potential erosion and sedimentation. New road construction, including drainage features, would be completed in the fall prior to freeze-up. Check snow/frozen ground conditions prior to operations. Minimal effects are expected with snow road construction.

* New roads would be closed to motor vehicles upon completion of harvest activities. Slash would be placed on main skid trails to protect soils, reduce erosion potential and unauthorized ATV use where appropriate.

* Culvert replacements would implement erosion control and stream protection and meet the requirements of the DFWP 124 permit issued for this project.

Fisheries References

Blackfoot Challenge (BFC), DFWP, Trout Unlimited, Hydrometrics. 2005. A Basin-Wide Restoration Action Plan for the Blackfoot Watershed, MTDNRC Renewable Resource Grant Publication.

Graham, Russell T.; Harvey, Alan;, Jurgensen, Martin; Jain,T.; 1994. Managing Coarse Woody Debris in Forests of the Rocky Mountains. Res. Paper INT-RP-477. Ogden, Utah: U.S.D.A., F.S., Intermountain Research Station, 12p.

Lakel, W.A., W.M. Aust, C. Bolding, C.A. Dollloff, P. Keyser, R. Feldt 2010. Sediment Trapping by Streamside Management Zones of Various Widths after Forest Harvest and Site Preparation. Forest Science 56(6) 541-551.

MacDonald, L.H., and J.D. Stednick. 2003. Forests and water: A state-of-the-art review for Colorado. Completion report No.196. Colorado Water Resources Research Institute, Fort Collins, CO, 65 pp

Montana DNRC , Environmental Assessments of the past DNRC timber sales including, Jocko Lake Fire Salvage TS, Hidden Lakes TS, Seeley Salvage TS, and minor salvage permits, Clearwater Unit, Southwestern Land Office.

Montana DNRC. 2003 Montana Administrative Rules for Forest Management on DNRC Forested Lands. Montana DNRC. Trust Lands Management Division. Helena, MT.

MTDEQ (Montana Department of Environmental Quality). 2010. Montana 2010 305(b) Report. Helena, MT. “Clean Water Act Information Center”, Reference 2013 websearch http://cwaic.mt.gov.

Montana DNRC 2012, Turbidity Monitoring of Culvert Removals, internal report in progress

NRIS, Montana Natural Resources Information System. 2012/2013., Internet database search for water, water rights, soils, http://nris.state.mt.us/interactive.html

NRIS, 2013, Internet database search MFISH (Montana Fisheries Information System). Montana Fish, Wildlife and Parks, http://nris.state.mt.us/interactive.html

Attachment G: Wildlife Resources

Clearview – Wildlife Analysis

Analysis Prepared By:

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Introduction

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

Issues

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

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

Proposed activities could negatively affect Canada lynx by altering lynx summer foraging habitat, winter foraging habitat, and other suitable habitat, rendering it unsuitable for supporting lynx.

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

Proposed activities could reduce the amount and/or quality of fisher habitats, which could alter fisher use of the area.

Proposed activities may alter flammulated owl habitat by reducing canopy closure and increasing tree spacing, and could remove snags needed by flammulated owls for nesting.

Proposed activities could displace gray wolves from important habitats, particularly denning and rendezvous sites, and/or alter prey availability.

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

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

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

Regulatory Framework

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

Analysis Areas

The discussions of existing conditions and environmental effects within each subsection pertain to land areas of 2 different scales. The first scale of analysis is the Project Area (5,230 acres), which includes DNRC-managed lands in sections 4, 8, 9, 10 (west half), 14, 15, 16, 23, 24, and 26 of T16N R15W and sections 30 and 32 in T16N, R14W of DNRC-managed lands where activities being proposed. The second scale is the cumulative-effects analysis area, which refers to a broader surrounding landscape useful for assessing cumulative effects to wildlife and habitat. For this proposed project, 2 distinct cumulative-effects analysis areas were identified. The first cumulative effects analysis area includes the project area lands and lands within 1 mile of the project area (23,975 acres). This area is largely privately owned (9,333 acres; 39%), with smaller amounts managed by DNRC (6,212 acres; 26%); USFS (5,090 acres; 21%); DFWP (993 acres; 4%) and a sizeable water component (2,346 acres; 10%). The second cumulative effects analysis area is approximately 30,541 acres and includes the area bounded by Highway 83, Seeley Lake, Beaver Creek, Placid Creek, Vaughn Creek, Salmon Lake, Fish Creek, Cozy Corner, Spring Creek, and Drew Creek. DNRC manages approximately 25% (7,718 acres) of this cumulative effects analysis area; approximately 31% (9,456 acres) is managed by the US Forest Service and the rest of this cumulative effects analysis area is privately owned (43.4%; 13,258 acres).

Analysis Methods

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

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

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Coarse Filter Wildlife Analysis

Issue

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

Introduction

A variety of wildlife species rely on mature to old stands for some or all life requirements. A partial list of these species includes pileated woodpeckers (*Dryocopus pileatus)*, American marten (*Martes americana*), brown creepers (*Certhia americana)*, and winter wrens (*Troglodytes troglodytes*). Wildlife species that require connectivity of forest habitat types between patches, or those species that are dependent upon interior forest conditions, can be sensitive to the amount and spatial configuration of appropriate habitats. Some species are adapted to thrive near patch edges, while others are adversely affected by the presence of edge, or the other animals that prosper in edge habitats. Connectivity of forested habitats facilitates movements of those species that avoid non-forested areas and other openings. Effective corridors tend to be those that are relatively wide, unfragmented, diverse, and associated with riparian areas (Fischer and Fischenich 2000). Width of the travel corridor tends to determine the efficacy of the corridor for individual species. In general, a wider corridor would be more effective and provide for more species than a narrower one. Riparian areas and ridges often play an important role in providing connective corridors. As such, corridors can become compromised through human management and environmental changes (e.g., fires or floods).

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the 5,230-acre project area. Cumulative effects were analyzed on a 30,541-acre area described above in the Analysis Areas portion of this analysis. This scale of analysis would be large enough to support a diversity of species that use mature forested habitats and/or require connected forested habitats.

Affected Environment

The project area currently contains approximately 3,650 acres (70% of the project area) of mature stands (100-plus years in age) of Douglas-fir, Douglas-fir/western larch, and ponderosa pine stands that have a reasonably closed (≥40%) canopy. Currently, forested and semi-forested areas cover most of the project area, facilitating some use by those species requiring connected-forested conditions. On DNRC-managed lands within the cumulative effects analysis area, roughly 5,028 acres (65% of DNRC-managed lands in the cumulative effects analysis area; 16% of the cumulative effects analysis area) of mature stands with a reasonably closed canopy exist. On other ownerships, there are roughly 7,029 acres (31% of non-DNRC-managed lands; 23% of the cumulative effects analysis area) of forested stands with ≥40% canopy closure across the cumulative effects analysis area; a portion of those stands are likely mature stands with a reasonably closed canopy. Additionally roughly 15,746 acres (69% of non-DNRC managed lands; 52% of the cumulative effects analysis area) of sparsely stocked, young forest, shrubs, herbaceous, and non-forested types exist on other ownerships in the cumulative effects analysis area, which are not presently providing habitats for species requiring connected stands of mature forests. Connectivity of forested habitats in the project area is only reasonably intact due to past harvesting, several roads (including Highway 83), the Clearwater River and several lakes, and the presence of open, non-forested habitats intermixed within the project area. Ongoing harvesting within the cumulative effects analysis area continues to alter forested habitats and landscape connectivity.

Environmental Effects- Mature Forested Habitats and Landscape Connectivity

No Action Alternative: Direct and Indirect Effects

No appreciable changes to existing stands would be anticipated. Stands providing forested cover that may be functioning as corridors, including riparian areas, saddles, and ridgelines, would not be altered. No changes in human developments, motorized access, or visual screening would occur. No changes in wildlife use would be expected. Thus, no direct or indirect effects to forested habitat connectivity and wildlife movements would be expected since: 1) no changes to existing stands would occur; 2) no changes to human developments, motorized access, or visual screening would occur, and 3) no alterations to existing corridors would be anticipated.

No Action Alternative: Cumulative Effects

No appreciable changes to existing stands would be anticipated. Stands providing forested cover that may be functioning as corridors, including riparian areas, saddles, and ridgelines, would not be altered. Past harvesting has reduced the amount of mature, forested habitats in portions of the cumulative effects analysis area; however, continued successional advances across the cumulative effects analysis area are moving stands toward mature forests. This alternative would continue to contribute to the amount of mature forested stands in the cumulative-effects analysis area. No further changes in human developments, motorized access, or visual screening would occur. No changes in wildlife use would be expected. Thus, no cumulative effects to forested habitat connectivity and wildlife movements would be expected since: 1) no changes to existing stands would occur; 2) no changes to human developments, motorized access, or visual screening would occur, and 3) no alterations to existing corridors would be anticipated.

Action Alternative: Direct and Indirect Effects

Proposed road construction and timber harvesting could displace individual large mammals and other wildlife, should they be in the area when activities would be occurring. Approximately 1,887 acres (52%) of existing mature Douglas-fir and ponderosa pine stands with a closed canopy in the project area would be harvested. The majority of those acres would receive treatments that would reduce overall stand density, and therefore habitat quality for those species relying on mature, closed-canopied forested habitats. Although these treatments would create more open stands that would not likely be used by wildlife species that use mature stands to move through the landscape, functional corridors, particularly along ridges, draws, and other topographic features, would be retained. Proposed pre-commercial thinning could facilitate enhanced tree growth in portions of the project area, which could enhance habitats for species requiring mature forested conditions through time as these stands continue to mature. Approximately 2.1 miles of open roads would be abandoned in a manner to discourage motorized use following proposed activities, which could slightly decrease open road densities in the vicinity. The only permanent human development that would be constructed with this alternative would be roughly 11 miles of new restricted road, but this increase in human development would be partially offset by the proposed abandonment of roughly 4.4 miles of existing restricted roads and 2.1 miles of open roads. These changes would increase non-motorized access within the project area, but this would not be expected to concentrate human activity beyond the proposed activities. Overall a slight increase in non-motorized access would occur within the project area which could negligibly increase overall human disturbance potential in the project area. Furthermore contract stipulations would minimize the presence of human-related attractants for the duration of the proposed activities. Some changes in visual screening would occur within individual units, but the combination of irregular-shaped units, topography, and unharvested patches throughout the project area would minimize the effect of the reductions in visual screening. Thus, a minor risk of adverse direct and indirect effects to forested habitat connectivity and wildlife movements would be expected since: 1) proposed activities could reduce forested cover in a portion of the

project area, but functional corridors would be retained; 2) minor changes in human developments would occur, but no changes in human developments that would concentrate human activity or human-related attractants would occur beyond proposed activities; 3) minor reductions in motorized human access would occur; and 4) visual screening in portions of the project area would be reduced, but considerable visual screening would be retained across the project area.

Action Alternative: Cumulative Effects

Modifications to mature, forested habitats associated with this alternative (1,887 acres) would be additive to losses associated with past harvesting activities; following proposed treatments, roughly 3,141 (41%) acres of mature forested habitats with a reasonably closed canopy would exist in the cumulative effects analysis area on DNRC-managed lands. Across ownerships in the cumulative effects analysis area, mature stands with a reasonably closed canopy would exist on roughly 10,176 acres (33%) following proposed activities that could provide for wildlife movements. No appreciable changes in the presence of human developments would occur, particularly no changes in the presence of human-related attractants or concentrations of human activities beyond the short duration of proposed activities. Negligible reductions in motorized access to the cumulative effects analysis area would occur that could decrease human disturbance and displacement in the vicinity. Negligible reductions in visual screening in a small portion of the cumulative effects analysis area would be anticipated. Thus, a minor risk of adverse cumulative effects to forested habitat connectivity and wildlife movements would be expected since: 1) proposed activities could reduce forested cover in a small portion of the cumulative effects analysis area, but functional corridors would exist; 2) negligible changes in human developments would occur, but no changes in human developments that would concentrate human activity or human-related attractants would occur; 3) negligible reductions in motorized human access would occur; and 4) visual screening in a small portion of the cumulative effects analysis area would be reduced, but considerable visual screening would persist across the cumulative effects analysis area.

Fine Filter Wildlife Analysis

In the fine-filter analysis, individual species of concern are evaluated. These species include those listed as threatened or endangered under the Endangered Species Act of 1973, species listed as sensitive by DNRC, and animals managed as big game by Montana DFWP. Table WI-2 – Fine Filter provides an analysis of the anticipated effects for each species

Table WI-2 –Anticipated Effects of the Clearview Project on wildlife species

Species/Habitat	Potential for Impacts and Rationale [Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below) L = Low Potential for Effects
Threatened and Endangered Species	
Grizzly bear *(Ursus arctos)* Habitat: Recovery areas, security from human activity	[Y] Detailed analysis provided below.

Canada lynx (*Felix lynx)* Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zone	[Y] Detailed analysis provided below.
Sensitive Species	
Bald eagle *(Haliaeetus leucocephalus)* Habitat: Late-successional forest less than 1 mile from open water	[Y] Detailed analysis provided below.
Black-backed woodpecker *(Picoides arcticus)* Habitat: Mature to old burned or beetle-infested forest	[N] No preferred, recently (less than 5 years) burned areas are in the project area. Thus, no direct, indirect, or cumulative effects to black-backed woodpeckers would be expected to occur as a result of either alternative.
Coeur d'Alene salamander *(Plethodon idahoensis)* Habitat: Waterfall spray zones, talus near cascading streams	[N] No moist talus or streamside talus habitat occurs in the project area. Thus, no direct, indirect, or cumulative effects to Coeur d'Alene salamanders would be expected to occur as a result of either alternative.
Columbian sharp-tailed grouse *(Tympanuchus Phasianellus columbianus)* Habitat: Grassland, shrubland, riparian, agriculture	[N] No suitable grassland communities occur in the project area. Thus, no direct, indirect, or cumulative effects to Columbian sharp-tailed grouse would be expected to occur as a result of either alternative.
Common loon *(Gavia immer)* Habitat: Cold mountain lakes, nest in emergent vegetation	[N] No suitable lakes occur in the project area. Thus no direct, indirect, or cumulative effects to common loons would be expected under either alternative.
Fisher *(Martes pennanti)* Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian	[Y] Detailed analysis provided below.
Flammulated owl *(Otus flammeolus)* Habitat: Late-successional ponderosa pine and Douglas-fir forest	[Y] Detailed analysis provided below.

Gray Wolf *(Canis lupus)* Habitat: Ample big game populations, security from human activities	[Y] Detailed analysis provided below.
Harlequin duck *(Histrionicus histrionicus)* Habitat: White-water streams, boulder and cobble substrates	[N] No suitable high-gradient stream or river habitats occur in the project area. No direct, indirect or cumulative effects to harlequin ducks would be expected to occur as a result of either alternative.
Mountain plover (*Charadrius montanus*) Habitat: short-grass prairie, alkaline flats, prairie dog towns	[N] No prairie dog colonies or other shortgrass prairie habitats occur in the project area. Thus, no direct, indirect, or cumulative effects to mountain plovers would be anticipated to occur as a result of either alternative.
Northern bog lemming *(Synaptomys borealis)* Habitat: Sphagnum meadows, bogs, fens with thick moss mats	[N] No suitable sphagnum bogs or fens occur in the project area. Thus, no direct, indirect, or cumulative effects to northern bog lemmings would be expected to occur as a result of either alternative.
Peregrine falcon *(Falco peregrinus)* Habitat: Cliff features near open foraging areas and/or wetlands	[N] No preferred cliffs or suitable rock outcrops suitable for use by peregrine falcons occur on, or within 1 mile of the proposed project area. Thus, no direct, indirect, or cumulative effects to peregrine falcons would be anticipated as a result of either alternative.
Pileated woodpecker *(Dryocopus pileatus)* Habitat: Late-successional ponderosa pine and larch-fir forest	[Y] Detailed analysis provided below.
Townsend's big-eared bat *(Plecotus townsendii)* Habitat: Caves, caverns, old mines	[N] No suitable caves or mine tunnels are known to occur in the project area or vicinity. Thus, no direct, indirect or cumulative effects to Townsend's big-eared bats would be anticipated as a result of either alternative.
Wolverine *(Gulo gulo)* Habitat: Alpine tundra and high-elevation boreal and coniferous forests that maintain deep persistent snow into late spring	[N] 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 a primary factor in the large home range sizes of wolverines (Banci 1994). The project area is generally below the elevations where wolverines tend to be located. No areas of deep persistent spring snow occur in the project area. Individual animals could occasionally use lands in the project area while dispersing or possibly foraging, and they could be displaced by project-related disturbance if they are in the area during proposed activities. However, given their large home range sizes (~150 sq. mi. -- Hornocker and

	Hash 1981), and manner in which they use a broad range of forested and non-forested habitats, the proposed activities and alterations of forest vegetation on the project area would have negligible influence on wolverines. Thus, minimal direct, indirect or cumulative effects to wolverines would be anticipated.
Big Game Species	
Elk	[Y] Big game winter range exists in the project area. Potential big game security habitat exists in the project area - Detailed analysis provided below.
Moose	
Mule Deer	
White-tailed Deer	

Threatened and Endangered Species

GRIZZLY BEAR

Issue

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

Introduction

Grizzly bears are native generalist omnivores that use a diversity of habitats found in western Montana. Preferred grizzly bear habitats are meadows, riparian zones, avalanche chutes, subalpine forests, and big game winter ranges, all of which provide seasonal food sources. The search for food drives grizzly bear movements, with bears moving from low elevations in spring to higher elevations through the summer and early fall, as fruits ripen throughout the year. Primary habitat components in the project area include meadows, riparian areas, and big game winter ranges. Primary threats to grizzly bears are related to human-bear conflicts, habituation to unnatural foods near high-risk areas, and long-term habitat loss associated with human development (Mace and Waller 1997). Forest-management activities may affect grizzly bears by altering cover and/or by increasing human access into secure areas by creating roads (Mace et al. 1997). These actions could lead to the displacement of grizzly bears from preferred areas and/or result in an increased risk of human-caused mortality by bringing humans and bears closer together and/or making bears more detectable, which can increase the risk of bears being illegally shot. Displacing bears from preferred areas may increase their energetic costs, which may, in turn, lower their ability to survive and/or reproduce successfully.

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the 5,230-acre project area. Cumulative effects were analyzed on a 30,541-acre area described above in the Analysis Areas portion of this analysis. This area approximates the home range size of a female grizzly bear.

Existing Environment

The project area is approximately 4 miles southwest of the Mor-Dun grizzly bear subunit of the Lander Fork Grizzly Bear Management Unit of the Northern Continental Divide Ecosystem grizzly bear recovery area, which has a sizeable grizzly bear population. The project area is in the ‘occupied habitat’ area as mapped by grizzly bear researchers and managers to address increased sightings and encounters of grizzly bears in habitats outside of recovery zones (Wittinger 2002). Grizzly bears generally use different habitats relative to season.

The project area primarily provides low elevation forested areas, riparian areas, and big game winter range. Grizzly bears may be present in the project area throughout the non-denning period.

Managing human access is a major factor in management for grizzly bear habitat. There are roughly 18 miles of open roads in the project area. Open road densities are fairly high in the cumulative effects analysis area (112.5 miles; 2.4 mile /sq. mile, simple linear calculation). Hiding cover exists on roughly 2,047 acres (39%) in the project area. Across the cumulative effects analysis areas, hiding cover exists on 2,649 acres of DNRC-managed lands (34%; 9% of the cumulative effects analysis area); grizzly bear hiding cover is likely present on a portion of the 7,029 acres (31% of the cumulative effects analysis area) of forested stands with ≥40% canopy closure across the cumulative effects analysis area on other ownerships. Within the cumulative effects analysis area, hiding cover is largely absent from the 5,369 acres (24%) of shrubs, herbaceous, and non-forested habitats and is likely somewhat limited on the other 10,377 acres (45%) of sparsely stocked and young forest habitats in the cumulative effects analysis area. The habitats in the project area contribute to grizzly bear security habitat (blocks ≥ 0.3 miles from roads receiving motorized use and ≥2,500 acres in size); within the cumulative effects analysis area there are 11,844 acres (39% of the cumulative effects analysis area) of grizzly bear security habitat in 3 blocks, and 2 of those blocks extend outside of the cumulative effects analysis area. Timber harvesting and human development that is occurring or has occurred in the cumulative effects analysis area likely altered grizzly bear habitats and/or human disturbance levels.

Environmental Effects- Grizzly Bears

No Action Alternative: Direct and Indirect Effects

No direct or indirect effects to grizzly bears would be anticipated since: 1) no disturbance or displacement would be expected, 2) no changes in hiding cover would occur, 3) security habitat would not be altered, 4) no changes in long-term open-road densities would be anticipated, and 5) no changes in availability of unnatural bear foods or attractants would occur.

No Action Alternative: Cumulative Effects

No appreciable changes to existing habitats would be anticipated; advances in succession within those recently harvested stands could improve hiding cover and potentially foraging habitats for grizzly bears. Use of the cumulative effects analysis area by grizzly bears would not be expected to change from present levels. Thus, no further adverse cumulative effects to grizzly bears would be anticipated since: 1) no changes in human disturbance levels would be expected; 2) no changes to open road density would occur; 3) no further modifications to hiding cover would occur; 4) no changes to security habitat would be expected; and 5) no changes in availability of unnatural bear foods or attractants would occur.

Action Alternative: Direct and Indirect Effects

Proposed activities might affect grizzly bears directly through increased road traffic, noise, and human activity, and indirectly by altering the amount of hiding cover and forage resources. Activities in grizzly bear habitats reduce grizzly bear security, possibly resulting in increased stress and/or energy expenditure to endure the disturbance or to move from the area. These disturbances would only be present during harvesting operations; therefore, the season of disturbance is important in addressing effects to grizzly bears. Proposed activities would not be permitted between April 1 and June 15 since this area is in spring grizzly bear habitat. Otherwise harvesting could occur when soil conditions are dry, frozen, or snow covered. Thus activities could either occur during the denning or non-denning period for grizzly bears. If activities were to occur during the denning period, no direct effects to grizzly bears would be anticipated. Some disturbance of grizzly bears could be possible with any activities that may occur during the non-denning period, but activities would avoid the spring period

when grizzly bears are most likely to be using the area. Overall, since the proposed activities would avoid the important spring period, a minor potential for disturbance and displacement of grizzly bears exists.

Roughly 2.1 miles of existing open road would be restricted following proposed activities, slightly reducing motorized public access in the project area. No new open roads and roughly 11 miles of restricted roads would be constructed with this alternative, but these increases would be partially offset by proposed abandonment of 4.4 miles of existing, restricted roads. Minor changes in non-motorized human access would occur in the project area with the proposed road construction and abandonment. Hiding cover, defined as vegetation that will hide 90 percent of a grizzly bear at a distance of 200 feet, would be reduced on roughly 1,125 acres (55%) in the short-term with the proposed activities. Some hiding cover in the form of brush, shrubs, and sub-merchantable trees would persist in some of the units, albeit at a reduced level from the existing condition; hiding cover would increase through time as young trees and shrubs regenerate over the next 5 to 10 years. Proposed activities would alter cover on roughly 1,328 acres of grizzly bear security habitat. Although hiding cover would be reduced, no appreciable changes to security habitat would occur since no new roads would be opened, and those roads proposed to be closed are relatively close to other existing, open roads.

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. Thus, a minor risk of adverse direct or indirect effects to grizzly bears would be anticipated since: 1) minor disturbance and displacement would be anticipated; 2) the majority of existing hiding cover would be reduced in the project area, but would be expected to recover in the short-term; 3) no changes to security habitat would be expected; 4) minor decreases in long-term open road density would be anticipated; and 5) negligible increases in the availability of unnatural bear foods or attractants would be anticipated.

Action Alternative: Cumulative Effects

Project activities conducted during the non-denning period could temporarily increase human disturbance to grizzly bears within a portion of the cumulative effects analysis area; activities conducted during the denning period would not be expected to disturb grizzly bears. Any potential human disturbance would be of short duration (2-4 years) and would largely occur outside of the more sensitive time periods for grizzly bears in the area. Continued use of the cumulative effects analysis area by grizzly bears would be anticipated at levels similar to present levels. On DNRC-managed lands in the cumulative effects analysis area, hiding cover would continue to be present on 1,524 acres (20%) and no changes to the hiding cover on other ownerships would be anticipated. Reductions in hiding cover would be additive to the reductions from past timber harvesting, ongoing harvesting, recent wildfires, as well as more permanent land-cover changes in the cumulative effects analysis area. Early successional stages of vegetation occurring in harvest units could provide additional foraging opportunities for grizzly bears. Quality of grizzly bear security habitat would be slightly reduced in the short-term, but would persist through time. No changes in the amount of security habitat would occur in the cumulative effects analysis area; security habitat would continue to exist on 39% of the cumulative effects analysis area. Negligible changes in long-term open-road density would be anticipated; a slight increase in non-motorized access to a small portion of the cumulative effects analysis area could occur. Thus, a minor risk of adverse cumulative effects to grizzly bears would be anticipated since: 1) minor increases in human disturbance levels in the short-term would be expected within a small portion of the cumulative effects analysis area; 2) hiding cover would be modified in the short-term, but would be expected to recovery fairly rapidly; 3) negligible reductions in long-term open road density would occur, 4) no changes to security habitat would be expected; and 5) negligible increases in the availability of unnatural bear foods or attractants would be anticipated.

CANADA LYNX

Issue

Proposed activities could negatively affect Canada lynx by altering lynx summer foraging habitat, winter foraging habitat, and other suitable habitat, rendering it unsuitable for supporting lynx.

Introduction

Canada lynx are associated with subalpine forests, generally between 4,000 to 7,000 feet in elevation in western Montana (Ruediger et al. 2000). Lynx habitat in western Montana consists primarily of stands that provide habitat for snowshoe hares, either dense, young coniferous stands or dense, mature forested stands. Lynx in western Montana preferred mature, multi-storied stands with dense horizontal cover year-round; during the summer lynx also selected earlier successional stands with a high horizontal cover (Squires et al. 2010). For denning sites, the primary component appears to be abundant large woody debris, particularly in the form of downed logs, root wads, slash piles, and live trees (Squires et al. 2008). These conditions are found in a variety of climax vegetation habitat types, particularly within the subalpine fir series (Pfister et al. 1977). Historically, high intensity, stand-replacing fires of long fire intervals (150 to 300 years) occurred in continuous dense forests of lodgepole pine, subalpine fir, and Engelmann spruce. These fires created extensive even-aged patches of regenerating forest intermixed with old stands that maintained a mosaic of snowshoe hare and lynx habitat.

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the 5,230-acre project area. Cumulative effects were analyzed on a 30,541-acre area described above in the Analysis Areas portion of this analysis. The scale of this analysis area approximates the home range size of an individual lynx (Ruediger et al. 2000).

Existing Environment

The proposed project area ranges from approximately 3,920 to 4,880 feet in elevation and is dominated by Douglas-fir, western larch, and ponderosa pine stands. Approximately 1,520 acres (29% of the project area) of lynx habitat occur in the 5,230-acre project area, which is comprised of foraging (286 acres; 5% of project area), other suitable lynx habitats (largely forested lands that provide cover to facilitate movement; 719 acres; 14% of project area), and temporary non-suitable lynx habitats (514 acres; 10% of project area). Connectivity of forested habitats in the project area is only reasonably intact due to past harvesting, several roads (including Highway 83), the Clearwater River, and the presence of unsuitable types intermixed within the project area.

On DNRC-managed lands within the cumulative effects analysis area, roughly 2,710 acres (35% of DNRC-managed lands in the cumulative effects analysis area) of potential lynx habitats exist, which is split between `other suitable' lynx habitats (822 acres; 30% of lynx habitats on DNRC-managed lands; 11% of all DNRC-managed lands), foraging (874 acres; 32% of lynx habitats on DNRC-managed lands; 11% of all DNRC-managed lands) and temporary non-suitable lynx (1,014 acres; 37% of lynx habitats on DNRC-managed lands; 13% of all DNRC-managed lands) habitats. On other ownerships, there are roughly 7,029 acres (31% of non-DNRC ownership) of forested stands with ≥40% canopy closure across the cumulative effects analysis area; a portion of those stands would likely be suitable lynx habitats and probably include some winter foraging habitats. Additionally, younger summer foraging habitats likely exists on a portion of the 10,377 acres (45% of non-DNRC ownership) of sparsely stocked and young forest on other ownerships; no lynx habitats likely exist on the 5,369 acres (24% of non-DNRC ownership) of shrubs, herbaceous, and non-forested types on other ownerships in the cumulative effects analysis area. The project area is in DNRC's Seeley Lake Lynx

Management Area (LMA). Roughly 3,170 acres of the project area (60%) are within the Seeley Lake LMA; approximately 5,393 acres of DNRC-managed lands in the cumulative effects analysis area (70%) are in the LMA. Within this LMA, roughly 62% of the total potential lynx habitats on DNRC-managed lands is in the various suitable habitat classes and 38% is in the temporary non-suitable habitat category, largely due to the Jocko Lakes fire of 2007. The LMA is dominated by winter foraging habitats (40% of the LMA), followed by temporary non-suitable (38%), with lesser amounts of other suitable (16%) and summer foraging (6%).

Environmental Effects- Canada Lynx

No Action Alternative: Direct and Indirect Effects

In the short-term, no changes in lynx habitat elements would be expected in the project area. Landscape connectivity would not be altered. Thus, no adverse direct and indirect effects to Canada lynx would be expected since: 1) existing winter foraging habitats would persist; 2) summer foraging habitats would continue to be a minor component without other disturbance; 3) the amount of temporary non-suitable habitats would not increase; and 4) landscape connectivity would not be altered.

No Action Alternative: Cumulative Effects

No appreciable change in lynx habitats in the cumulative effects analysis area would occur. No appreciable changes to landscape connectivity would be anticipated. Any ongoing harvesting would continue within the cumulative effects analysis area. Within the Seeley Lake LMA, roughly 62% of the total potential lynx habitats would be in the various suitable habitat classes and 38% would be in the temporary non-suitable habitat category. Winter foraging habitats would continue to represent roughly 40% of the total lynx habitats in the LMA. Thus, a negligible risk of adverse cumulative effects to lynx would be expected since: 1) winter foraging habitats would persist in the cumulative effects analysis area; 2) summer foraging habitats would continue maturing and longer-term availability of summer foraging habitats would likely decline without disturbance; 3) no changes in the amount of temporary non-suitable habitat would occur; and 4) landscape connectivity would not be altered.

Action Alternative: Direct and Indirect Effects

The majority of the proposed activities would not occur in mapped lynx habitats (1,950 acres; 88%) and would not be expected to appreciably affect lynx; approximately 260 acres of lynx habitats (17% of lynx habitats in the project area) would be altered with proposed activities. Roughly 73 acres of temporary non-lynx habitats (5% of lynx habitats in the project area) that are not likely currently being used by lynx would be treated and would be considered temporary non-lynx habitats following proposed treatments. Activities in those temporary non-lynx habitats would reduce stand densities, but would not appreciably lengthen the time it would take for these areas to begin providing suitable habitat for lynx. An additional 91 acres of `other' suitable habitats and denning habitats outside of the HCP area could be converted to temporary non-lynx habitats following proposed treatments, increasing the amount of lynx habitats in the project area in this category from 34% to 40%. These stands in temporary non-lynx habitats would be expected to mature into a suitable habitat condition in 10 to 15 years. Approximately 72 acres of `other' suitable habitats (5% of lynx habitats in the project area) would be altered with proposed activities, but would not change from the other habitat class because prescriptions would retain trees of sufficient density (≥40% canopy closure) and size to continue to be

considered `other' suitable habitats following proposed treatments; similarly, an additional 24 acres (2% of lynx habitats in the project area) of foraging habitats would be removed, but would also receive treatments that would retain trees of sufficient density (≥40% canopy closure) and size to continue to be `other' suitable habitats following proposed treatments to minimize potential for additional adverse effects to lynx. Collectively, no reductions in the amount of suitable lynx habitats in the HCP area would occur. On lands outside of the HCP area, sufficient habitats would persist to exceed retention requirements under *ARM 36.11.435(8)*. Pre-commercial thinning would occur on up to 1,400 acres (27% of the project area), but the majority (roughly 1,311 acres; 94%) would not occur in lynx habitats; pre-commercial thinning could occur on up to 89 acres (2% of the project area) of mostly `other' suitable habitats (86 acres) and trace amounts of foraging habitats and temporary non-lynx habitats (3 acres) outside of the HCP area, but no pre-commercial thinning would occur in lynx habitats in the HCP area. Through time as tree seedlings and shrubs recover, these stands would begin providing additional habitats for snowshoe hares. The retention of patches of advanced regeneration of shade-tolerant trees, such as sub-alpine fir, would break-up sight distances, provide horizontal cover, and provide forest structural attributes preferred by snowshoe hares and lynx. In all proposed units, coarse woody debris would be retained (emphasizing retention of some logs 15 inches dbh and larger) to provide some horizontal cover and security structure for lynx. In the short-term, lynx use of the project area could decline due to the resulting openness on a portion of the project area. Forested connectivity could be slightly altered with the proposed activities, but overall connectivity would be maintained with a couple of corridors being retained along riparian areas, draws, ridges, and other topographic features. Collectively, a minor risk of adverse direct and indirect effects to Canada lynx would be expected since: 1) mature or winter foraging habitats would be slightly reduced; 2) summer or young foraging habitats would continue to be largely absent from the project area, but could develop through time; 3) the amount of the project area in the temporary non-suitable lynx habitat category would increase slightly; and 4) connectivity could be slightly decreased, but connectivity would be maintained.

Action Alternative: Cumulative Effects

Within the cumulative-effects analysis area, limited changes to existing lynx habitats would occur and at least 1,604 acres (59% of all potential lynx habitats) of DNRC-managed lands would continue to support suitable lynx habitats and up to 1,106 acres (41% of all potential lynx habitats) would be in the temporary non-suitable habitat category. The minor reductions in foraging (30 acres) and other suitable habitats (62 acres) coupled with an increase in temporary non-suitable habitats (91 acres) on a small portion of the cumulative effects analysis area could slightly decrease the quality of the lynx habitats in the larger cumulative effects analysis area. Near-term increases in summer foraging habitats could occur with the proposed harvesting within a portion of the cumulative effects analysis area, however, the majority of the proposed harvesting would not occur in potential lynx habitats and summer foraging habitats are fairly limited in the cumulative effects analysis area. Reductions in lynx habitats would be additive to past losses from timber harvesting and any ongoing modifications in the cumulative-effects analysis area; likewise, increases in temporary non-suitable lynx habitats would be additive to habitats that have been recently converted due to timber harvesting. No changes to the other suitable lynx habitats on other ownerships would be anticipated. Forest connectivity would be modified in the project area, but negligible changes to connectivity across the cumulative effects analysis area would be anticipated. In the Seeley Lake LMA, roughly 62% of the total potential lynx habitats on DNRC-managed lands would be in the various suitable habitat classes and 38% would be in the temporary non-suitable habitat category following proposed treatments; no changes in the availability of suitable lynx habitats at the LMA scale would occur. Thus, a minor risk of adverse cumulative effects to Canada lynx would be expected since: 1) winter foraging habitats would persist; 2) summer foraging habitats would continue developing for the next 10 to 30 years; 3) moderate amounts of lynx habitats would be in the temporary non-

suitable habitat category, meaning most of the lynx habitats would be in a usable state for lynx; and 4) negligible alterations in landscape connectivity would not prevent lynx movements.

Sensitive Species

BALD EAGLE

Issue

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

Introduction

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

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the 5,230-acre project area. Cumulative effects were analyzed on home ranges associated with the Upper Salmon, Seeley Lake North, and Placid Lake bald eagle territories. This scale includes enough area for several nesting pairs of bald eagles.

Existing Environment

Portions of the project area are within the home ranges associated with the Upper Salmon Lake, Seeley Lake North, and Placid Lake bald eagle territories; none of the project area is in the nest or primary use areas associated with these territories. The Upper Salmon Lake territory has been fairly productive for the last 20 years or so, the Seeley Lake North territory has been equally productive since 1997, and the Placid Lake territory is relatively new, but may have existed for a few years before being detected. The aquatic habitats associated with these bald eagle territories include the Clearwater River, Seeley Lake, Placid Lake, Tuppers Lake, Hidden Lake, Salmon Lake, Fish Lake, and numerous smaller streams and wetlands. Aquatic and terrestrial prey species are fairly common in the home range. The terrestrial habitat incorporated by the territories is a coniferous/deciduous mixture along the riparian areas, with coniferous forests and grasslands in the upland areas. Within the home ranges, black cottonwood is the deciduous tree of primary importance to bald eagles, while large emergent conifers also provide important nesting, roosting, and perching habitats.

Human disturbance, including timber harvesting, agricultural activities, the Highway 83 corridor, and various forms of recreation are potential sources of disturbance to the nesting territories. Numerous large emergent trees are available across portions of the home ranges, but logging and other human developments in the last 100 years has likely reduced some of these attributes while others have experienced mortality and are declining in quality.

Environmental Effects-Bald Eagle

No Action Alternative: Direct and Indirect Effects

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

No Action Alternative: Cumulative Effects

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

Action Alternative: Direct and Indirect Effects

No activities would occur in the nest area or primary use areas associated with the bald eagle territories. Proposed harvesting on 1,942 acres (88% of proposed units) would occur in the home ranges associated with the bald eagle territories in the vicinity. Proposed activities would not be permitted between April 1 and June 15, otherwise harvesting and thinning could occur when soils are dry, frozen, or snow covered. Thus, the proposed activities could occur during the early nesting season (February 1 – March 31), late nesting season (June 16-August 15), or the non-nesting period (August 16-February 1). Minor disturbance to bald eagles could occur should any activities be conducted during the nesting period. Conversely, should those activities be conducted during the non-nesting period, no disturbance to bald eagles would be anticipated. Negligible reductions in the availability of large snags or emergent trees that could be used as nest or perch trees could occur in the home range. No changes to human access to the home range would occur, thereby limiting potential for introducing additional human disturbance to these territories. Thus, a negligible risk of direct and indirect effects to bald eagles would be anticipated since: 1) disturbance could be slightly elevated within the home ranges during operations, should they occur during the nesting period; 2) no appreciable change in human access within the project area would occur; and 3) minor reductions in the availability of large, emergent trees could occur in the fringe areas of these territories, but none in the high use areas along the Clearwater River.

Action Alternative: Cumulative Effects

Nesting bald eagles would continue to experience varying levels of disturbance. Any potential disturbance and/or noise from the proposed harvesting would be additive to any of these other forms of disturbance, however no changes in bald eagle behavior would be anticipated. No appreciable changes in emergent trees or snags would occur. Thus, a negligible risk of cumulative effects to bald eagles would be anticipated since: 1) disturbance would be slightly elevated within the territories during harvesting operations; 2) no changes in human access within the territories would occur; and 3) no appreciable changes in the availability of large, emergent trees would be expected.

FISHER

Issue

Proposed activities could reduce the amount and/or quality of fisher habitats, which could alter fisher use of the area.

Introduction

Fishers are a mid-sized forest carnivore whose prey includes small mammals such as voles, squirrels, snowshoe hares, and porcupines, as well as birds (Powell and Zielinski 1994). They also take advantage of carrion and seasonally available fruits and berries (Foresman 2012). Fishers use a variety of successional stages, but are disproportionately found in stands with dense canopies (Powell 1982, Johnson 1984, Jones 1991, Heinemeyer and Jones 1994) and avoid openings or young forested stands (Buskirk and Powell 1994). However, some use of openings may occur for short hunting forays or if sufficient overhead cover (shrubs or saplings) is present. Fishers appear to be highly selective of stands that contain resting and denning sites and tend to use areas within 150 feet of water (Jones 1991). Resting and denning sites are found in cavities of live

trees and snags, downed logs, brush piles, mistletoe brooms, squirrel and raptor nests, and holes in the ground. Forest-management considerations for fisher involve providing for resting and denning habitats near riparian areas while maintaining travel corridors.

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the 5,230-acre project area. Cumulative effects were analyzed on a 30,541-acre area described above in the Analysis Areas portion of this analysis. This scale includes enough area to approximate overlapping home ranges of male and female fishers (Heinemeyer and Jones 1994).

Existing Environment

There are approximately 970 acres of potential upland fisher habitats and 71 acres of potential riparian habitats in the project area. Within the cumulative effects analysis area, there are roughly 26,887 acres that would be classified as upland (more than 100 feet from Class 1 streams and lakes and more than 50 feet from Class 2 streams) and 1,628 acres that would be classified as riparian that are associated with the 57 miles of streams and numerous lakes in the cumulative effects analysis area. On DNRC-managed lands in the cumulative effects analysis area, there are roughly 92 acres (1% of DNRC-lands) of potential riparian habitats and 1,520 acres (20% of DNRC lands) of potential upland habitats. Additionally, there are 9 acres (<1% of DNRC lands) of riparian and 552 acres (7% of DNRC lands) of upland preferred covertypes that currently lack sufficient structure to meet habitat needs for fishers. On DNRC-managed lands, roughly 91% of the potential riparian fisher habitats in the cumulative effects analysis area are providing structural habitat attributes that would facilitate use by fisher. In the future, potentially suitable fisher habitats could develop on a portion of the 561 acres of riparian and upland preferred covertypes on DNRC-managed lands that are currently lacking structural attributes to meet the needs of fishers. Potential fisher habitats likely exist on a portion of the 7,029 acres (31% of non-DNRC lands) of forested stands with ≥40% canopy closure across the cumulative effects analysis area, including approximately 429 acres within 100 feet of Class 1 streams and lakes and within 50 feet of Class 2 streams. Within the cumulative effects analysis area, fisher habitats are largely absent from the 5,369 acres (24% of non-DNRC lands) of shrubs, herbaceous, and non-forested habitats and is likely fairly limited on the other 10,377 acres (45% of non-DNRC lands) of sparsely stocked and young forest habitats in the cumulative effects analysis area.

Environmental Effects-Fisher

No Action Alternative: Direct and Indirect Effects

No direct and indirect effects would affect fishers in the project area since: 1) no changes to existing habitats would be anticipated; 2) landscape connectivity would not be altered further; 3) no appreciable changes to snags, snag recruits, and coarse woody debris levels would be anticipated; and 4) no changes to human access or the potential for trapping mortality would be anticipated.

No Action Alternative: Cumulative Effects

No further cumulative effects to fishers would be anticipated since: 1) no changes to existing habitats on DNRC-managed lands would occur; 2) any landscape connectivity afforded by the stands on DNRC-managed lands would not change appreciably; 3) no changes to snags, snag recruits, or coarse woody debris levels would be expected; and 4) no changes to human access or the potential for trapping mortality would be anticipated.

Action Alternative: Direct and Indirect Effects

No riparian habitats would be altered with this alternative. Approximately 360 of the 970 acres (37%) of upland fisher habitats in the project area would be treated, with the majority (266 acres; 74%) receiving a selection treatment, which may retain sufficient canopy density to be marginally suitable for fisher post treatment. Proposed activities in the remaining upland fisher habitats (94 acres) would likely yield stands that would be too open to be used by fisher. Minor reductions in open roads would be anticipated, which would not likely alter trapping pressure and the potential for fisher mortality. Negligible reductions in landscape connectivity could occur with the proposed activities, but activities would avoid riparian areas commonly used by fisher. Thus, a minor risk of adverse direct and indirect effects to fisher would be anticipated since: 1) harvesting would modify or remove upland fisher habitats depending the density of trees retained within the proposed units, but would avoid riparian habitats; 2) negligible reductions in landscape connectivity would occur, but those areas associated with riparian areas would remain unaffected; 3) harvesting would reduce snags and snag-recruitment trees while increasing coarse woody debris levels; however, some of these resources would be retained; and 4) no appreciable changes in motorized human-access levels would be anticipated.

Action Alternative: Cumulative Effects

Since no riparian habitats would be modified, no changes in the amount of the preferred riparian fisher cover types meeting structural requirements for fishers at the cumulative-effects analysis area would occur. Roughly 360 acres of upland fisher habitats on DNRC-managed lands (24% of upland habitats on DNRC-managed lands) would be modified, altering the amount of suitable upland fisher habitats in the cumulative effects analysis area. Any reductions in upland fisher habitats would be additive to the losses associated with past timber harvesting in the cumulative-effects analysis area as well as any ongoing harvesting. No appreciable changes to landscape connectivity would be anticipated, and activities would avoid riparian areas commonly used by fisher. No appreciable changes in human disturbance and potential trapping mortality would be anticipated. Thus, a minor risk of adverse cumulative effects to fisher would be anticipated since: 1) harvesting would modify a small amount of upland fisher habitats, but upland habitats would persist and no changes to existing riparian habitats would occur; 2) no appreciable changes in landscape connectivity would be anticipated and connectivity in riparian areas would not be altered; 3) harvesting in a relatively small portion of the cumulative-effects analysis area would partially reduce snags and snag recruits, while increasing the coarse woody debris levels, largely in the smaller-sized pieces; and 4) no appreciable changes to motorized human access would occur.

FLAMMULATED OWLS

Issue

Proposed activities may alter flammulated owl habitat by reducing canopy closure and increasing tree spacing, and could remove snags needed by flammulated owls for nesting.

Introduction

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

and saplings, stimulating shrub growth, and by protecting large dominant trees from ladder fuels and competition with other mature trees.

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the 5,230-acre project area. Cumulative effects were analyzed on the 23,975-acre cumulative effects analysis area described above in the Analysis Areas portion. This area includes enough area to support several pairs of flammulated owls (McCallum 1994).

Existing Environment

There are approximately 3,391 acres (65%) of potential flammulated owl habitats in ponderosa pine and dry Douglas-fir stands across the project area. Within the cumulative-effects analysis area, there are roughly 3,857 acres (62% of DNRC-managed lands) of potential flammulated owl habitats on DNRC-managed lands. Some suitable habitats likely exist on a portion of the 13,347 acres (75% of non-DNRC-managed lands) of open and closed forested habitats on other ownerships in the cumulative effects analysis area. A portion of the cumulative effects analysis area has 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. Modern fire suppression has allowed Douglas-fir in-growth to create denser stands of ponderosa pine and Douglas-fir in portions of the cumulative effects analysis area, which has reduced habitat quality for flammulated owls.

Environmental Effects-Flammulated Owl

No Action Alternative: Direct and Indirect Effects

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

No Action Alternative: Cumulative Effects

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

Action Alternative: Direct and Indirect Effects

Flammulated owls can be tolerant of human disturbance (McCallum 1994), however the elevated disturbance levels associated with proposed activities could negatively affect flammulated owls should activities occur when flammulated owls are present. Proposed activities could overlap the nestling and fledgling period. Since most snags would be retained, loss of nest trees would be expected to be minimal. Proposed timber harvesting and pre-commercial thinning on 1,933 acres of potential flammulated owl habitats (57% of the habitats in the project area) would open the canopy while favoring western larch, ponderosa pine, and Douglas-fir. Elements of the forest structure important for nesting flammulated owls, including snags, coarse woody debris, numerous leave trees, and snag recruits would be retained in the proposed units. The subsequent regeneration in the existing habitats would likely be beneficial for flammulated owls as potential foraging habitats. The more open stand conditions, the retention of fire adapted tree species, and the maintenance of snags would move the project area toward historical conditions, which is preferred flammulated owl habitat. Thus, a minor risk of adverse direct and indirect effects would be expected to flammulated owls since: 1) the potential exists to disturb flammulated owls; and 2) harvesting would open denser stands up while retaining elements of forest structure used for foraging and nesting by flammulated owl, improving flammulated owl habitat conditions.

Action Alternative: Cumulative Effects

Disturbance to flammulated owls would be possible on a small portion of the cumulative effects analysis area (9%). Proposed harvesting would increase the amount of the cumulative effects analysis area that has been recently harvested, which would add to the amount of foraging habitats available, but possibly at the expense of losing snags and large trees important for nesting. Overall no change in the amount of potential flammulated owl habitats would exist on DNRC-managed lands or any other ownerships; a slight improvement in habitat quality at the cumulative-effects analysis level could be realized with this alternative and the more historic conditions likely after proposed activities. Thus, a negligible risk of adverse cumulative effects to flammulated owls would be expected since: 1) harvesting could disturb flammulated owls in a small portion of the cumulative effects analysis area should activities occur during the period when flammulated owls are in the vicinity; and 2) harvesting would improve the quality and sustainability of flammulated owl habitat on a portion of the cumulative effects analysis area by making this area more representative of historic conditions.

GRAY WOLF

Issue

Proposed activities could displace gray wolves from important habitats, particularly denning and rendezvous sites, and/or alter prey availability.

Introduction

Wolves are a wide-ranging, mobile species that occupy a wide variety of habitats that possess adequate prey and minimal human disturbance, especially at den and/or rendezvous sites. Wolves are opportunistic carnivores that frequently take vulnerable prey (including young individuals, older individuals, and individuals in poor condition). In general, wolf densities are positively correlated to prey densities (Fuller et al. 1992, Oakleaf et al. 2006). In Montana, wolves prey primarily on white-tailed deer and elk (Kunkel et al. 1999, Arjo et al. 2002). Thus, reductions in big game populations and/or winter range productivity could indirectly be detrimental to wolf populations.

Wolves typically den during late April in areas with gentle terrain near a water source (valley bottoms), close to meadows or other openings, and near big game wintering areas. When the pups are 8 to 10 weeks old, wolves leave the den site and start leaving their pups at rendezvous sites while hunting. These sites are used throughout the summer and into the fall. Disturbance at den or rendezvous sites could result in avoidance of these areas by the adults or force the adults to move the pups to a less adequate site. In both situations, the risk of pup mortality increases.

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the 5,230-acre project area. Cumulative effects were analyzed on the 44,442-acre area described above in the Analysis Areas portion of this analysis. This scale includes enough area to support at least 1 pack of wolves.

Existing Environment

The project area is not within any known wolf pack areas; however, the Inez and Morrell Mountain wolf packs as well as the suspected Belmont wolf pack are in the general vicinity. Several landscape features commonly associated with denning and rendezvous sites occur in the project area, such as areas with gentle terrain near a water source (valley bottoms) and areas that are close to big game wintering areas. No known den or rendezvous sites occur in the project area, but some use of the project area by wolves could occur for breeding, hunting, or other life requirements. Big game species are present in the project area much of the

year. Montana Department of Fish, Wildlife, and Parks identified white-tailed deer (1,424 acres), mule deer (813 acres), and elk (1,290 acres) winter range in the project area. Mature Douglas-fir, with lesser amounts of ponderosa pine and lodgepole pine stands in the project area are providing attributes facilitating use by wintering big game. Approximately 3,690 acres of the project area appear to be providing snow intercept and thermal cover attributes for big game.

Within this cumulative-effects analysis area, big game species are fairly common and winter range for deer and elk exists in the lower portions of the cumulative effects analysis area. Roughly 13,205 acres of winter range (43% of the cumulative effects analysis area) exist in the cumulative effects analysis area; at least 4,124 acres (31%) of these areas appear to have sufficient canopy closure to provide thermal cover and snow intercept for big game. Numerous landscape features commonly associated with denning and rendezvous sites, including meadows and other openings near water and in gentle terrain, occur in the cumulative-effects analysis area. Past timber management and human developments have altered big game and wolf habitats in the cumulative effects analysis area.

Environmental Effects-Gray Wolf

No Action Alternative: Direct and Indirect Effects

Negligible direct and indirect effects would be expected to gray wolves since: 1) no changes in human disturbance levels would occur; and 2) no appreciable changes to prey availability would occur.

No Action Alternative: Cumulative Effects

White-tailed deer, mule deer, and elk winter ranges would not be affected and substantive changes in big game populations, distribution, or habitat use would be not anticipated. Levels of human disturbance would be expected to remain similar to present levels. Past harvesting and any ongoing harvesting may cause shifts in big game use and, subsequently, gray wolf use, of the cumulative-effects analysis area; however, no changes would be anticipated that would alter levels of gray wolf use of the cumulative-effects analysis area. Thus, no further cumulative effects to gray wolves would be expected since: 1) no changes in human disturbance levels would occur, particularly near known wolf den and/or rendezvous sites; and 2) no changes to prey availability would occur.

Action Alternative: Direct and Indirect Effects

Wolves using the area could be disturbed by harvesting activities and are most sensitive at den and rendezvous sites, which are not known to occur in the project area or within 1 mile of the project area. If a den or rendezvous site were identified within 1 mile of the project area, a DNRC biologist would be consulted to determine if additional mitigations would be necessary. Seasonal operations constraints would restrict activities between April 1 and June 15, limiting potential disturbance at den sites and reducing the potential for disturbing rendezvous sites. After proposed harvesting activities, human disturbance levels would likely revert to pre-harvest levels. Likewise, wolf use of the project area for denning and rendezvous sites would likely revert to pre-harvest levels. In the short-term, the proposed harvesting could lead to slight shifts in big game use, which could lead to a shift in wolf use of the project area. Proposed activities on approximately 2,210 acres (42% of the project area) would alter canopy closure and potential winter use by big game, including roughly 1,829 acres (50% of available stands in the project area providing these attributes) that likely have attributes facilitating considerable winter use by big game. Collectively, the modifications to summer and winter range could alter big game use of the project area, and subsequently alter the use of the project area by wolves. Thus, a low risk of direct and indirect effects would be expected to gray wolves since: 1) minor short-term increases and negligible long-term changes in human disturbance levels would occur, with no increases near known wolf den and/or rendezvous sites anticipated; and 2) changes to summer and winter big game habitats could alter big game use of the project area, but would not appreciably alter prey availability.

Action Alternative: Cumulative Effects

Disturbance to gray wolves in a portion of the cumulative effects analysis area would be possible, but would only occur for the short-period of time that activities are occurring. No changes in motorized human access would be anticipated; negligible increases in non-motorized access would be possible. Reductions in thermal cover and snow intercept capacity on a portion of the winter range in the cumulative effects analysis area could redistribute the big game relying on those habitats, and subsequently shift wolf use of a small portion of the cumulative effects analysis area. Reductions in cover may cause slight decreases in use by deer and elk; however, no appreciable changes would be expected within the cumulative-effects analysis area. These reductions in cover would be additive to losses from past timber-harvesting activities as well as any ongoing harvesting in the cumulative-effects analysis area. No substantive change in wolf use of the cumulative-effects analysis area would be expected; wolves could continue to use the area in the long-term. Thus, a low risk of cumulative effects to gray wolves would be expected since: 1) elevated human disturbance levels would be short-lived and negligible changes to long-term disturbance levels would be anticipated with no increases near known wolf den and/or rendezvous sites; and 2) modifications to big game winter range could alter big game distributions, but would not appreciably alter prey availability.

PILEATED WOODPECKER

Issue

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

Introduction

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

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the 5,230-acre project area. Cumulative effects were analyzed on the 23,975-acre cumulative effects analysis area described above in the Analysis Areas portion. This scale includes enough area to support a couple of pairs of pileated woodpeckers (Bull and Jackson 1995).

Existing Environment

In the project area, potential pileated woodpecker nesting habitat exists on approximately 2,616 (50% of the project area) acres. These nesting habitats are dominated by Douglas-fir, western larch and ponderosa pine. Additionally, roughly 1,822 acres (35% of the project area) of sawtimber stands dominated by Douglas-fir, western larch, and ponderosa pine exist in the project area, which are potential foraging habitats. Roughly 2,843 acres (46% of DNRC-managed lands) of potential pileated woodpecker habitats exist on DNRC-managed lands in the cumulative effects analysis area; an additional 2,134 acres (34% of DNRC-managed lands) of potential foraging habitats exist on DNRC-managed lands in the cumulative effects analysis area.

Additionally, some suitable habitats likely exist on a portion of the 3,593 acres (20% of non-DNRC-managed lands) of reasonably closed forested habitats on other ownerships in the cumulative effects analysis area, and some of the 5,705 acres (32% of non-DNRC-managed lands) of moderately stocked forested stands on those other ownerships could also be suitable foraging habitats. Much of the 8,434 acres (48% of non-DNRC-managed lands) 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.

Environmental Effects-Pileated Woodpecker

No Action Alternative: Direct and Indirect Effects

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

No Action Alternative: Cumulative Effects

No disturbance of pileated woodpeckers would occur. Continued use of the cumulative-effects analysis area by pileated woodpeckers would be expected at similar levels as presently occurring. Thus, no cumulative effects to pileated woodpeckers would be expected since: 1) no harvesting would occur that would alter the amount of continuously forested habitats; 2) no further changes in to existing pileated nesting and foraging habitats would be anticipated; 3) no additional changes to snags or snag recruits would be anticipated; and 4) long-term, succession-related changes in the abundance of shade-intolerant tree species, which are valuable to pileated woodpeckers, would occur.

Action Alternative: Direct and Indirect Effects

Pileated woodpeckers can be somewhat tolerant of human activities (Bull and Jackson 1995), but could be temporarily displaced by the proposed activities on roughly 2,210 acres (42% of the project area), should those activities occur during the nesting season. No appreciable disturbance to nesting pileated woodpeckers would be anticipated should the proposed activities occur during the non-nesting period. Activities would be restricted between April 1 and June 15, which would limit the potential for disturbance during the early portion of the nesting season; but could provide some potential disturbance during the later nesting period; some disturbance to pileated woodpeckers would be possible during any proposed activities. Harvesting would alter some of the continuously-forested habitats suitable for pileated woodpeckers in the project area. Roughly 1,401 acres (54%) of the potential nesting habitat and an additional 711 acres (39%) of potential foraging habitats would be altered. Most of these acres would likely be too open to be used by pileated woodpeckers following proposed treatments. Following potential reductions in quality associated with the proposed activities, habitats would gradually improve in quality for pileated woodpeckers over the next 30-80 years, depending on the density of trees retained. Proposed pre-commercial thinning could improve pileated woodpecker habitat quality in the future. 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. 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 roughly 2,210 acres. The silvicultural prescriptions would retain healthy ponderosa pine, western larch, and Douglas-fir while promoting the growth and/or regeneration of many of these same species, which would benefit pileated woodpeckers in the future by providing nesting, roosting, and foraging habitats. Thus, a minor risk of adverse direct and indirect effects to pileated woodpeckers would be anticipated since: 1) harvesting would alter the amount of continuous-forested habitats available; 2) potential nesting habitats and foraging

habitats would be removed, but the majority of these habitats would be retained; 3) snags and snag recruits would be removed; however, mitigation measures to retain snags and snag recruits would be included, and 4) proposed treatments would promote seral species in the project area.

Action Alternative: Cumulative Effects

Reductions in pileated woodpecker habitats and further modifications in the amount of continuously forested habitats available in the cumulative effects analysis area would occur. On DNRC-managed lands in the cumulative effects analysis area, roughly 1,442 acres (23%) of nesting and 1,423 acres (23%) of foraging habitats would persist; no further changes to the existing habitats on other ownerships would be anticipated. Snags, coarse woody debris, and potential nesting trees would be retained in the project area; however, future recruitment of these attributes may be reduced in a portion of the area by the proposed activities. Any modifications to pileated woodpecker habitats under this alternative would be additive to modifications associated with past harvesting; continued use of the cumulative-effects analysis area would be expected. Across the cumulative-effects analysis area, continued maturation of stands is increasing suitable pileated woodpecker habitats. Thus, a minor risk of adverse cumulative effects to pileated woodpeckers would be anticipated since: 1) harvesting would reduce the amount of continuous forested habitats available in the cumulative-effects analysis area, but forested habitats would persist; 2) potential nesting and foraging habitats would be reduced, but habitats would persist in the cumulative-effects analysis area; 3) snags and snag recruits could be removed; however, mitigation measures would retain some of these attributes; and 4) proposed treatments would promote seral species in a small portion of the cumulative effects analysis area.

BIG GAME

BIG GAME SECURITY HABITAT

Issue

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

Introduction

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

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the 5,230-acre project area. Cumulative effects were analyzed on a 30,541-acre area described above in the Analysis Areas portion of this analysis. This scale includes enough area to support hundreds of elk.

Existing Environment

Big game security habitat are nonlinear blocks of hiding cover that are more than 0.5 mile from open roads and are a minimum of 250 acres in size. Portions of the project area have motorized public access and elsewhere, restricted roads facilitate non-motorized access to other portions of the project area. Hiding cover, which is the other component of big game security habitat, is fairly abundant in much of the project area; currently there are approximately 4,158 acres of coniferous cover with ≥40% canopy cover in the 5,230-acre project area (79% of project area). Roughly 1,207 acres in the project area (23%) contributes to larger patches of potential big game security habitat in the cumulative effects analysis area, which in turn contributes to a larger block of security habitat that extends beyond the cumulative effects analysis area.

In the cumulative effects analysis area, motorized access for recreational hunting is fairly widespread with at least 113 miles of open roads (2.4 miles/sq. mile) coupled with a couple of open roads immediately outside of the cumulative effects analysis area facilitate access. Additionally, numerous restricted roads (at least an additional 147 miles; 3.1 mile/sq. mile) that could be used for non-motorized use. Hiding cover in the cumulative effects analysis area is fairly common; currently there are approximately 12,411 acres of coniferous cover with ≥40% canopy cover within the 30,541-acre cumulative effects analysis area (41%). Hiding cover varies within the cumulative effects analysis area with the recent modifications from timber management and wildfires, but the combination of topography, distance from open roads, and the presence of regenerating vegetation likely provides adequate cover for elk during the hunting season. Roughly 8,423 acres (28% of the cumulative effects analysis area) in 3 blocks of habitat meet the distance, size, and cover criteria to meet the definition of elk security habitat in the cumulative effects analysis area.

Environmental Effects-Big Game Security Habitat

No Action Alternative: Direct and Indirect Effects

None of the proposed forest management activities would occur in the project area. No risk of adverse indirect effects to security habitat for moose, elk, mule deer, and white-tailed deer would be expected since: 1) no changes in existing security habitat would be anticipated and continued maturation of forest cover would improve big game security habitat; 2) the level of human access to the project area would not change; and 3) no appreciable changes to big game survival would be anticipated.

No Action Alternative: Cumulative Effects

No changes in big game security habitat would be anticipated. Past harvesting has reduced big game security habitat and allowed increased human access; continued maturation in previously harvested stands in the cumulative-effects analysis area would improve hiding cover in those areas. No other changes in disturbance and potential mortality due to hunting would be anticipated. Thus, no risk of adverse cumulative effects to big game security habitat would be anticipated since: 1) no reductions in big game security habitat would occur and modest levels of security habitat and hiding cover would persist within the cumulative-effects analysis area; 2) no changes in open roads, motorized access, or human access would occur; and 3) no appreciable changes to big game survival would be anticipated.

Action Alternative: Direct and Indirect Effects

Tree density within proposed units would be reduced on 2,210 acres, including 1,975 acres (47% of existing) with ≥40% canopy closure that are likely providing hiding cover. Proposed harvesting on 812 acres in 2 of the

blocks of big game security habitat (67% of existing) could reduce some of the hiding cover in the short-term, while slightly increasing sight distances; however hiding cover 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 would reduce the potential effects of the hiding cover reductions. Slight increases in sight distance would be anticipated. Overall, changes to sight distance and hiding cover would negligibly affect big game vulnerability risk in the project area. Slight decreases in open roads and associated motorized access for the general public would occur with the proposed abandonment of 2.1 miles of existing, open road. 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. Slight increases in non-motorized access would occur with the proposed construction of 11 miles of restricted roads, but this would be partially offset by the proposed abandonment of 4.4 miles of existing, restricted road. 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. Collectively, a negligible risk of adverse effects to big game security habitat would be anticipated since: 1) modifications to existing hiding cover would reduce the quality of the big game security habitat in the project area; 2) minor reductions in open roads and motorized access for the general public would be anticipated and negligible increases in non-motorized access would occur that would alter hunter access; and 3) no appreciable changes in big game survival would be anticipated.

Action Alternative: Cumulative Effects

Alterations of cover could reduce the quality of big game security habitat in a small portion of the cumulative effects analysis area. Following proposed treatment, roughly 7,611 acres (25%) in the cumulative effects analysis area would likely be providing big game security habitat. Continued maturation across the cumulative-effects analysis area would improve hiding cover and big game security habitat. Under this alternative open road density and associated public, motorized access would decrease from 2.4 mile / sq. mile to 2.3 mile / sq. mile in the cumulative effects analysis area. Negligible net increases (6.6 mi total, 0.1 mile / sq. mile increase) in non-motorized access would be expected, which would not appreciably affect big game vulnerability in the cumulative effects analysis area. Negligible impacts to big game survival would be anticipated. Thus, a minor risk of adverse cumulative effects to big game security would be anticipated since: 1) quality of hiding cover in a small portion of the cumulative effects analysis area would be reduced, which would reduce the quality of the big game security habitat, but security habitat and hiding cover would persist in the cumulative-effects analysis area; 2) negligible changes in open roads and motorized access for the general public would be expected along with slight increases in non-motorized access would occur that would alter hunter access; and 3) no appreciable changes in big game survival would be anticipated.

BIG GAME WINTER RANGE

Issue

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

Introduction

Winter ranges enable big game survival by minimizing the effects of severe winter weather conditions. Winter ranges tend to be relatively small areas that support large numbers of big game, which are widely distributed during the remainder of the year. These winter ranges have adequate midstory and overstory to reduce wind

velocity and intercept snow. The effect is that temperatures are moderated and snow depths are lowered, which enables big game movement and access to forage with less energy expenditure than in areas with deeper snow and colder temperatures. Snow depths differentially affect big game; white-tailed deer are most affected, followed by mule deer, elk, and then moose. Thus, removing cover that is important for wintering big game through forest management activities can increase their energy expenditures and stress in winter, but may increase forage production for use on summer range. Reductions in cover could ultimately result in a reduction in winter range carrying capacity and subsequent increases in winter mortality within local big game herds.

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the 5,230-acre project area. Cumulative effects were analyzed on the combined winter ranges in the 30,541-acre cumulative effects analysis area described above in the Analysis Areas portion of this analysis. This scale includes enough area to support hundreds of elk.

Existing Environment

Montana Department of Fish, Wildlife, and Parks identified white-tailed deer (1,424 acres), mule deer (813 acres), and elk (1,290 acres) winter range in the project area. These winter ranges are part of larger winter ranges in the area. Mature Douglas-fir, with lesser amounts of ponderosa pine and lodgepole pine stands in the project area are providing attributes facilitating use by wintering big game. Approximately 3,690 acres of the project area (70%) appear 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.

Roughly 13,205 acres of winter range (43% of the cumulative effects analysis area) exist in the cumulative effects analysis area; at least 4,124 acres (31%) of these areas appear to have sufficient canopy closure to provide thermal cover and snow intercept for big game. In the recent past, harvesting and wildfires within this area has reduced thermal cover and snow intercept; ongoing harvesting across the winter range could continue altering these attributes while potentially disturbing wintering big game. Portions of the cumulative effects analysis area are in non-forested, herbaceous, or shrub types, which would not be expected to provide thermal cover or snow intercept in the future. Human disturbance within the winter range is associated with residential development, agricultural clearing, recreational snowmobile use, commercial timber management, and the several roadways.

Environmental Effects-Big Game Winter Range

No Action Alternative: Direct and Indirect Effects

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

No Action Alternative: Cumulative Effects

Continued winter use of the larger winter range would be expected. No further changes in thermal cover and snow intercept would be anticipated. Human disturbance levels would be anticipated to continue at current levels. No appreciable changes to big game distribution or habitat use would be anticipated. Thus, no cumulative effects to big game winter range would be expected since: 1) no further changes in the amount of

mature-forested habitats in the winter range would be anticipated; 2) no further changes in thermal cover and snow intercept would occur; and 3) human disturbance levels would not change

Action Alternative: Direct and Indirect Effects

Some logging activities could occur in the winter, and disturbance created by mechanized logging equipment and trucks would likely temporarily displace big game animals during periods of operation for 2 to 4 years. However, winter logging provides felled tree tops, limbs, and slash piles that could concentrate feeding deer during nighttime and quiet periods when logging operations are shut down. Increasing short-term forage availability in this manner may partially offset some of the effects associated with temporary displacement caused by logging disturbance. There would be short-term added risk of disturbance and displacement of wintering animals that could result in moderate adverse effects associated with logging operations, short term road construction, and road use in the project area. However, no long-term effect to winter range carrying capacity or factors that would create long-term displacement or reduced numbers of big game would be anticipated.

Proposed activities would occur on roughly 553 acres (39%) of white-tailed deer winter range, 449 acres (55%) of mule deer winter range, and 724 acres (56%) of elk winter range; proposed activities would reduce canopy closure and potential winter use by big game on roughly 1,829 acres (50% of existing stands) that likely have attributes facilitating considerable winter use by big game. Following proposed activities, canopy densities in these stands providing snow intercept and thermal cover would be reduced, reducing habitat quality for wintering big game. In general, it could take 30 to 50 years for these stands to regenerate and attain a size capable of providing thermal cover for big game. Proposed activities would not prevent big game movement through the project area appreciably in winter and could stimulate browse production in the units. Thus, a moderate risk of adverse direct or indirect effects to big game winter range would be anticipated since: 1) the relatively short-term that logging activities could create disturbance in this area; 2) harvesting would alter a moderate amount of the stands that are providing thermal cover and snow intercept habitats for big game species; and 3) portions of winter ranges for several species of big game would be altered.

Action Alternative: Cumulative Effects

Disturbance and displacement associated with this alternative could be additive to any displacement associated with ongoing activities in the cumulative effects analysis area and any other disturbances that may be affecting wintering big game. Similarly, any harvesting that may be occurring in the cumulative effects analysis area could continue altering big game winter range and/or disturbing big game. Proposed activities would reduce canopy closure on 974 acres of winter range (7%) and roughly 1,829 acres (44% of existing) that appear to have attributes facilitating considerable use by wintering big game. Modifications to thermal cover and snow intercept in the project area could further alter the amount of the larger winter range providing these attributes for big game. Continued use of the larger winter range would be expected. Thus, a minor risk of adverse cumulative effects to big game would be anticipated since: 1) the relatively short-term that logging activities would create disturbance in a small portion of the cumulative effects analysis area; 2) a small percentage of the larger winter range would be altered; 3) availability of lower-quality cover in the vicinity that provides some opportunity for big game should they be displaced.

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.
- If a wolf den is found within 1 mile of active harvest units or within 0.5 miles of a rendezvous site, cease operations and consult a DNRC wildlife biologist for appropriate site specific mitigations before resuming activities.
- 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, attractants, and other unnatural bear foods would be stored in a bear-resistant manner.
- Harvesting and thinning would be prohibited between April 1 and June 15 to minimize the potential for disturbance to grizzly bears, bald eagles, and a host of other avian species.
- Retention of patches of advanced regeneration of shade-tolerant trees, such as sub-alpine-fir, in units in lynx habitats would break-up sight distances, provide horizontal cover, and provide forest structural attributes preferred by snowshoe hares and lynx.
- Provide connectivity for fisher, Canada lynx, and a host of other species by maintaining corridors of unharvested and/or lighter harvested areas along riparian areas, ridge tops, and saddles.

Wildlife References

Aney, W. and R. McClelland. 1985. Pileated Woodpecker Habitat Relationships (revised). Pages 10-17 in Warren, N. eds. 1990. Old Growth Habitats and Associated Wildlife Species in the Northern Rocky Mountains. USFS, Northern Region, Wildlife Habitat Relationships Program R1-90-42. 47pp.

Arjo, W. M., D. H. Pletscher, and R. R. Ream. 2002. Dietary Overlap between Wolves and Coyotes in Northwestern Montana. Journal of Mammalogy. 83:754-766.

Banci, V. 1994. Wolverine. Pp 99-127 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinksi, editors. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western united States. USDA Forest Service Rocky Mountain Forest and Range Experiment Station, General Tech. Report RM-254, Fort Collins, Colorado, USA.

Bull, E. L., and J. A. Jackson. 1995. Pileated woodpecker: Dryocopus pileatus. American Ornithologists' Union. Washington DC. 24pp.

Buskirk, S.W., and R.A. Powell. 1994. Habitat ecology of fishers and American martens. Pages 283-296 *in* Buskirk, S.W., A. Harestad, M. Raphael, eds. Biology and conservation of martens, sables and fishers. Cornell University Press, Ithaca, NY.

Copeland, J. P., K.S. McKelvey, K.B. Aubry, A. Landa, J. Persson, R.M. Inman, J. Krebs, E. Lofroth, H. Golden, J.R. Squires, A. Magoun, M.K. Schwartz, J. Wilmot, C.L. Copeland, R.E. Yates, I. Kojola, and R. May. 2010. The bioclimatic envelope of the wolverine (*Gulo gulo*): do climatic constraints limit its geographic distribution? Can. J. Zool. 88: 233-246.

Fischer, R.A. and J.C. Fischenich. 2000. Design recommendations for riparian corridors and vegetated buffer strips. US Army Engineer Research and Development Center. Vicksburg, MS. ERDC TN-EMRRP-SR-24. April 2000. 17 pp.

Foresman, K.R.. 2012. Mammals of Montana. Mountain Press Publishing Company, Missoula Montana. 430pp.

Fuller, T. K., W. E. Berg, G. L. Radde, M. S. Lenarz, and G. B. Joselyn. 1992. A History and Current Estimate of Wolf Distribution and Numbers in Minnesota. Wildlife Society Bulletin 20:42-55.

Heinemeyer, K. S., and J. L. Jones. 1994. Fisher biology and management in the western United States: A literature review and adaptive management strategy. USDA Forest Service, Northern Region, Missoula, Montana. 108pp.

Hillis, J.M., and M.J. Thompson, J.E. Canfield, L.J. Lyon, C.L. Marcum, P.M. Dolan, and D.W. McCleerey. 1991. Defining elk security: the Hillis paradigm. Pages 38-43 in A.G. Christensen, L.J. Lyon, and T.N. Lonner, comps., Proc. Elk Vulnerability Symp., Mont. State Univ., Bozeman, Montana. 330pp.

Hornocker, M. and H. Hash. 1981. Ecology of the wolverine in northwestern Montana. Journal of Wildlife Management 44(3):1286-1301.

Johnson, S. 1984. Home range, movements, and habitat use of fishers in Wisconsin. M.S. Thesis, University Wisconsin, Stevens Point. 78pp.

Jones, J.L. 1991. Habitat use of fisher in north-central Idaho. M.S. Thesis, University of Idaho, Moscow, Idaho. 147 pp.

Kunkel, K., T.K. Ruth, D.H. Pletscher, and M.G. Hornocker. 1999. Winter Prey Selection by Wolves and Cougars in and near Glacier National Park, Montana. Journal of Wildlife Management 63:901-910.

Mace, R.D., and J.S. Waller. 1997. Final Report: Grizzly bear ecology in the Swan Mountains, Montana. Montana Fish, Wildlife and Parks, Helena, Montana. 191pp.

Mace, R.D., J.S. Waller, T.L. Manley, L.J. Lyon, and H. Zuuring. 1997. Relationships among grizzly bears, roads, and habitat in the Swan Mountains, Montana. Pages 64-80 *in* Mace, R.D., and J.S. Waller. 1997. Final Report: Grizzly bear ecology in the Swan Mountains, Montana. Montana Fish, Wildlife and Parks, Helena, Montana. 191pp

McCallum, D. A. 1994. Review of technical knowledge: flammulated owls. Pages 14-46 *in* G. D. Hayward and J. Verner, tech eds. Flammulated, boreal, and great gray owls in the United States: a technical conservation assessment. USDA Forest Service Gen. Tech. Rep. RM-253. Fort Collins, Colorado.

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

Oakleaf, J.K., D. L. Murray, J. R. Oakleaf, E. E. Bangs, C. M. Mack, D. W. Smith, J. A. Fontaine, M. D. Jimenez, T. J. Meier, and C. C. Niemeyer. 2006. Habitat Selection by Recolonizing Wolves in the Northern Rocky Mountains of the United States. Journal of Wildlife Management 70:554-563.

Pfister, R., B. Kovalchik, S. Arno, and R. Presby. 1977. Forest Habitat Types of Montana. USDA Forest Service General Technical Report INT-34. Intermountain Forest and Range Experiment Station Ogden, UT. 174pp.

Powell, R. 1982. The fisher: National history, ecology, and behavior. University of Minnesota Press, Minneapolis, Minnesota. 217pp.

Powell, R. A. and W. J. Zielinski. 1994. Fisher. Pages 38-73 in Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski, tech eds. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States. USDA Forest Service Gen. Tech. Rep. RM-254. Fort Collins CO.

Ruediger, B., J. Claar, S. Mighton, B. Nanaey, T. Tinaldi, F. Wahl, N. Warren, D. Wenger, A. Williamson, L. Lewis, B. Holt, G. Patton, J. Trick, A. Vandehey, and S. Gniadek. 2000. Canada Lynx Conservation Assessment (2nd Edition). USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Missoula, MT. 122 pp.

Squires, J.R., N.J. DeCesare, J.A. Kolbe, and L. F. Ruggiero. 2010. Seasonal resource selection of Canada lynx in managed forests of the Northern Rocky Mountains. Journal of Wildlife Management 74:1648-1660.

Squires, J. R., N. J. DeCesare, J. A. Kolbe, and L. F. Ruggiero. 2008. Hierarchical den selection of Canada lynx in western Montana. Journal of Wildlife Management 72:1497–1506.

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

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