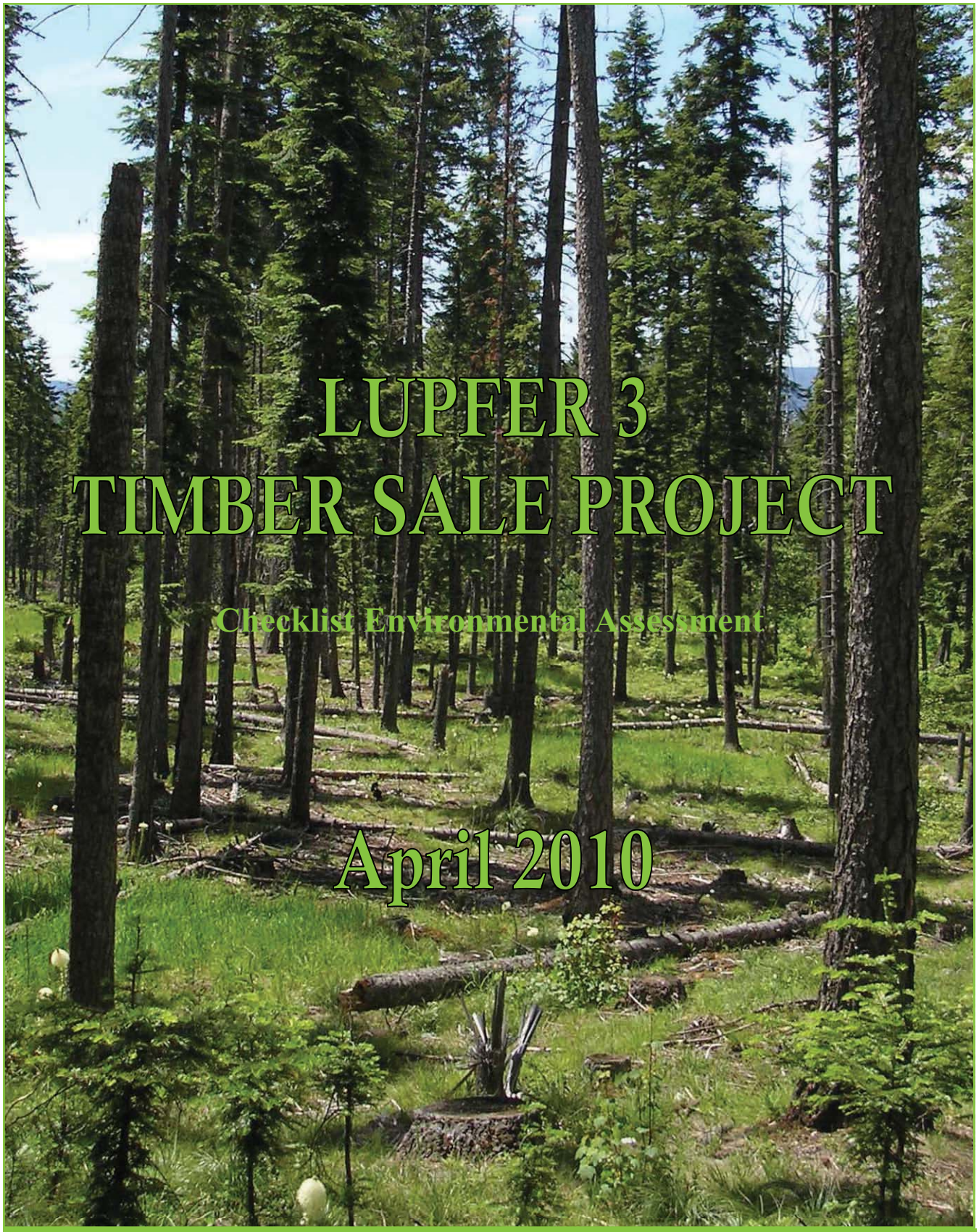
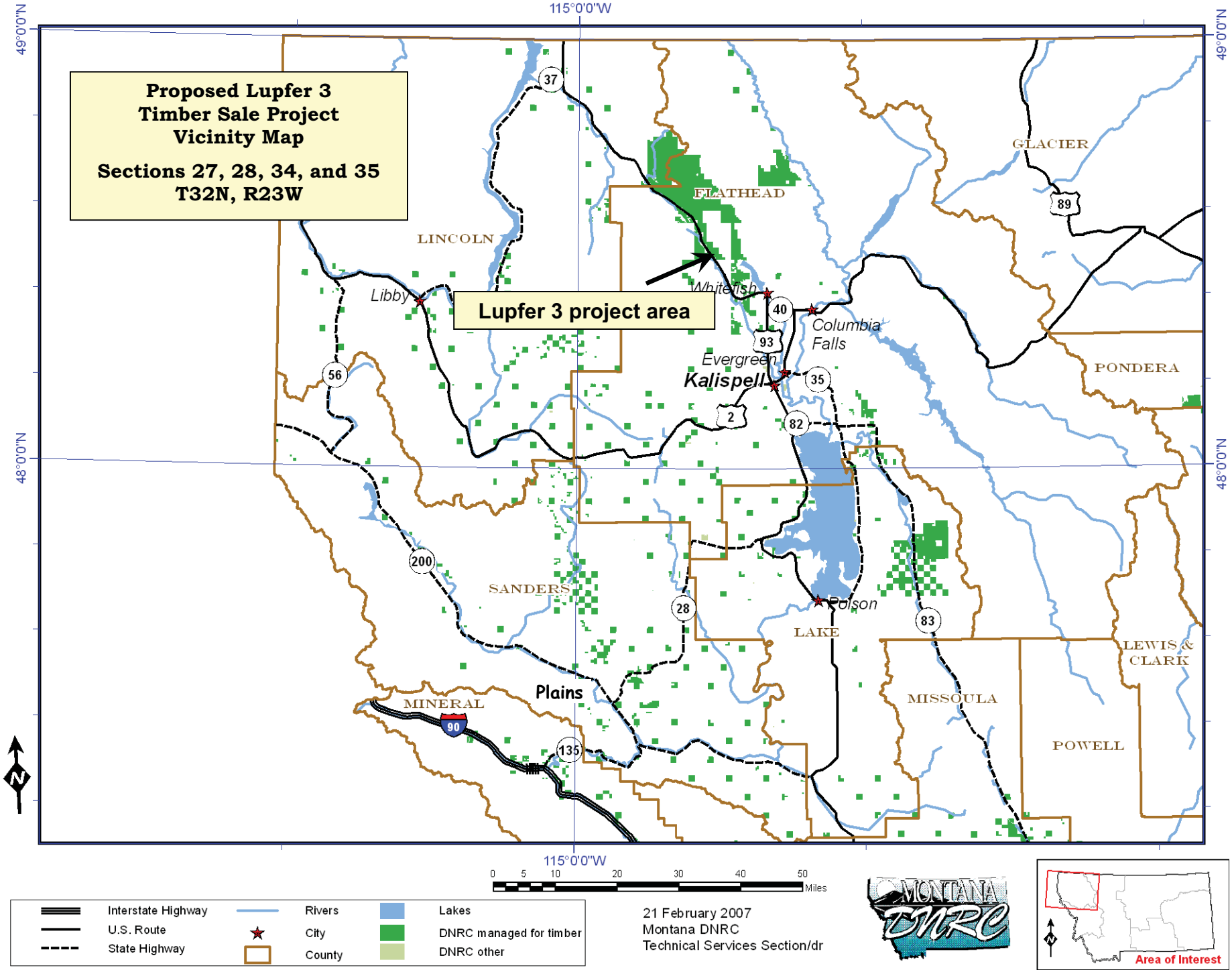


LUPFER 3 TIMBER SALE PROJECT

Checklist Environmental Assessment

April 2010

Montana Department of Natural Resources and Conservation
Northwestern Land Office
Stillwater Unit


Proposed Lupfer 3
Timber Sale Project
Vicinity Map
Sections 27, 28, 34, and 35
T32N, R23W
Lupfer 3 project area
115°0'0"W
49°0'0"N
48°0'0"N
LINCOLN
FLATHEAD
GLACIER
PONDERA
SANDERS
LAKE
MINERAL
MISSOULA
POWELL
LEWIS & CLARK
Libby
Whitefish
Columbia Falls
Evergreen
Kalispell
Polson
Plains
37
89
40
93
35
2
82
56
200
28
83
135
90
0 5 10 20 30 40 50 Miles
Interstate Highway
U.S. Route
State Highway
Rivers
City
County
Lakes
DNRC managed for timber
DNRC other
21 February 2007
Montana DNRC
Technical Services Section/dr
MONTANA DNRC
Area of Interest

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Acronyms (Inside of front cover)

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CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	Lupfer 3 Timber Sale Project
Proposed Implementation Date:	June 2010
Proponent:	Department of Natural Resources and Conservation (DNRC), Northwest Land Office, Stillwater Unit.
Location:	Sections 27, 28, 34, and 35, Township 32 north, Range 23 west
County:	Flathead

I. TYPE AND PURPOSE OF ACTION

The Department of Natural Resources and Conservation (DNRC), proposes to harvest 2 million board feet of timber from portions of Sections 27, 28, 34, and 35 in Township 32 north, Range 23 west, located southeast of Olney (see *Vicinity Map*). This project would produce an estimated $175,000 in revenue for the state trusts. The School of Mines, Public Buildings, and Morrill Grant are the trusts that could receive money from this project. Activities proposed would reduce the hazard of fuel loading through forest-management activities that will regenerate new stands of healthy trees while improving the vigor and growth of trees remaining in the forest to benefit future trust actions.

The Action Alternative would commercially harvest a total of 331 acres in 11 units:

- Two units of young sapling-sized trees totaling approximately 40 acres would be precommercially thinned.
- Approximately 251 acres would be harvested using conventional ground-based equipment, while the remaining 80 acres would be treated using cable methods.
- Approximately 35 acres would be commercially thinned, 233 acres would be harvested using a seedtree-with-reserves prescription, 52 acres would be harvested using group selection and hazard reduction, and approximately 11 acres would be harvested with an overstory-removal prescription.
- Six of the harvest units (250 acres) would be completed during winter and would require frozen and/or snow-covered conditions. The remainder of the units (81 acres) may be completed under summer or winter conditions.

Approximately 1.65 miles of temporary road would be constructed, a new road closure would be installed, and 6 to 9 miles of road would be maintained or have minor drainage improvements installed as necessary to protect water quality.

The lands involved in the proposed project are held in trust by the State of Montana for the support of specific beneficiary institutions, such as public schools, state colleges and universities, and other specific state institutions, such as the School for the Deaf and Blind (*Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11*). The Board of Land Commissioners (Land Board) and DNRC are legally required to administer these trust lands to produce the largest measure of reasonable and legitimate long-term return for these beneficiary institutions (*Section 77—1-202, Montana Codes Annotated [MCA]*). On May 30, 1996, DNRC released the *Record of Decision* on the *State Forest Land Management Plan (SFLMP)*. The Land Board approved the implementation of the *SFLMP*

on June 17, 1996. On March 13, 2003, the Department adopted *Administrative Rules (Rules) (Administrative Rules of Montana [ARM] 36.11.401 through 450)*. The *SFLMP* outlines the management philosophy, and this proposal will be implemented according to the Rules.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS, OR INDIVIDUALS CONTACTED: *Provide a brief chronology of the scoping and ongoing involvement for this project.*

In August 2009, DNRC solicited public participation on the Lupfer 3 Timber Sale Project by advertising in the *Whitefish Pilot* and sending the Initial Proposal with maps to individuals, agencies, industry representatives, and other organizations that have expressed interest in Stillwater State Forest's management activities. The mailing list developed for this project is located in the project file.

The public-comment period for the *Initial Proposal* was open for 30 days. The comments received were 2 phone calls, 3 personal visits, 1 letter, and 3 e-mails.

In February 2010 a newsletter with project updates was sent to the public that had responded to the *Initial Proposal*. The mailing list developed for this project is located in the project file. The comment received was on personal visit.

In October 2009, the ID Team began to compile issues and gather information related to current conditions, activities that are required by the *Forest Management Rules*. Comments received from the public were also utilized in developing the timber sale project and access issues. Hydrology, soils, wildlife, vegetation, and visual concerns were identified by DNRC resource specialists and field foresters for both the No-Action and Action alternatives. Issues and concerns have been resolved or mitigated through project design or would be included as specific contractual requirements of the project. Recommendations to minimize direct, indirect, and cumulative impacts have been incorporated in the project design. (See *APPENDIX A – PRESCRIPTION AND MAP; APPENDIX B - SOILS ANALYSIS; APPENDIX C – VEGETATION ANALYSIS; APPENDIX D – WATERSHED AND HYDROLOGY ANALYSIS; APPENDIX E – WILDLIFE ANALYSIS; APPENDIX G – STIPULATIONS AND SPECIFICATIONS, APPENDIX H – CONSULTANTS,* and *APPENDIX I - REFERENCES*).

2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

Montana/Idaho Airshed Group - DNRC is a member of the Montana/Idaho Airshed Group, which coordinates burning activities related to forest management among the group's members in order to minimize impacts from smoke generated by those activities. 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 in Missoula, Montana.

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

major open-burning permit holder, DNRC agrees to comply with all limitations and conditions of the permit.

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3. ALTERNATIVES CONSIDERED:

- ***No-Action Alternative***

  No timber harvesting or timber-management revenue generation for the trust beneficiaries would occur in the Lupfer 3 Timber Sale Project area at this time. Salvage logging, firewood gathering, recreational use, fire suppression, noxious-weed control, additional requests for permits and easements, and ongoing management requests may occur. Natural events, such as plant succession, tree mortality due to insect infestations and disease infections, windthrow, down fuel accumulation, in-growth of ladder fuels, and wildfires, would continue to occur. Future proposed management activities, including timber harvesting, would go through the appropriate level of environmental analyses before implementation. The No-Action Alternative may be used as a baseline for comparing the effects the Action Alternative would have on the environment and is considered a possible alternative for selection.

- ***Action Alternative***

  The Action Alternative is described in *SECTION 1 - TYPE AND PURPOSE OF ACTION*. No other action alternatives were identified during project scoping or analysis; therefore, only precommercial thinning and the removal and sale of forest products are analyzed in this Checklist Environmental Assessment (*EA)*. Recommended actions to minimize environmental effects would be incorporated into the proposed action.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT
• *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.* • *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.* • *Enter "NONE" if no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY, AND MOISTURE: *Consider the presence of fragile, compactable, or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify any cumulative impacts to soils.*

- ***Direct and Indirect Effects of the No-Action Alternative***

The No-Action Alternative would have no direct or indirect effects on soil physical properties or slope stability. No ground-based activity would take place under this alternative, which would leave the soil in the project area unchanged from the description in the *Existing Conditions* portion of *APPENDIX B – SOILS ANALYSIS*.

- ***Direct and Indirect Effects of the Action Alternative***

A DNRC soils specialist has reviewed the project area, harvest plan, and transportation system. Based on DNRC soil monitoring on soils and sites similar to those found in the project area, direct impacts would be expected on up to 33 of the total 331 acres proposed for harvesting. Soil monitoring conducted on DNRC lands shows that sites harvested on similar soils with ground-based machinery on DNRC-managed lands statewide had a range of impacts from 4.4 to 8.1 percent of the acres treated, with an average disturbance rate of 6.0 percent (*DNRC, 2004*). The low range of impacts includes operations on frozen or snow-covered soils, and the high range includes operations on dry soils during periods of nonwinter conditions. As a result, the extent of impacts expected would likely be similar to those reported by *Collins (DNRC, 2004)*, or approximately 4.4 to 8.1 percent of ground-based harvested acres.

Ground-based site preparation would also generate direct impacts to the soil resource. Site-preparation disturbance would be intentionally done; these impacts are considered light and promote reforestation of the site. Approximately 1.65 miles of temporary road would be constructed with the Action Alternative, which would leave up to 9 percent of the proposed harvest units in an impacted condition. This level is below the range analyzed for in the *EXPECTED FUTURE CONDITIONS* section of the *SFLMP*, and well within the 20-percent impacted area established as a level of concern in the *SFLMP (DNRC 1996)*. In addition, *Best Management Practices (BMPs)* and a combination of mitigation measures would be implemented to limit the area and degree of soil impacts, as noted in *ARM 36.11.422* and the *SFLMP (DNRC, 1996)*.

By designing the proposed harvesting operations with soil-moisture restrictions, season of use, and method of harvesting, the risk of unacceptable long-term impacts to soil productivity from compaction and displacement would be low. As detailed in *APPENDIX B -SOILS ANALYSIS*, no substantial direct, indirect, or cumulative impacts to soils resources are expected to result from the implementation of the Action Alternative.

- ***Cumulative Effects of the No-Action Alternative***

This alternative would have no cumulative impacts to the physical properties of soils in the

project area. The impacts of this alternative would be similar to those described under *Existing Conditions* in *APPENDIX B-SOILS ANALYSIS*. No soil would be disturbed and no past harvest units would be entered. All impacts from past management activities would continue to improve or degrade as dictated by natural and preexisting conditions.

- ***Cumulative Effects of the Action Alternative***

  Approximately 81 acres with previous timber sale operations would be entered. Cumulative effects to soils may occur from repeated entries into a forest stand where additional ground is impacted by equipment operations. Existing skid trails, where compaction has begun to ameliorate through freeze-thaw cycles and revegetation, would return to a higher level of impact due to the Action Alternative. Additional trails may also be required if existing trails are in undesirable locations. In the remaining stands where timber has not been harvested in the past, the cumulative impacts to the soil physical properties in this parcel would be the same as those listed in the direct and indirect impacts section above. Cumulative impacts to soil physical properties under this alternative would fall below the range analyzed for in the *Expected Future Conditions* section of the *SFLMP* and are well within the 20-percent impacted area established as a level of concern in the *SFLMP (DNRC, 1996)*.

  DNRC would minimize long-term soil impacts and adverse cumulative effects by implementing any or all of the following: 1) existing skid trails from past harvesting activities would be used if they are properly located and spaced; 2) additional skid trails would be used only where existing trails are unacceptable; 3) the potential direct and indirect effects would be mitigated with soil moisture restrictions, season of operation, and method of harvest; and 4) a portion of coarse woody debris and fine litter would be retained for nutrient cycling. In previously unharvested stands, cumulative effects to soil productivity from multiple entries would be the same as those listed in the direct and indirect effects sections.

Refer to *APPENDIX B - SOILS ANALYSIS* for more detailed information.

5. WATER QUALITY, QUANTITY, AND DISTRIBUTION: *Identify important surface or groundwater resources. Consider the potential for violation of ambient water-quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify cumulative effects to water resources.*

- ***Direct and Indirect Effects of the No- Action Alternative***

  Direct and indirect effects of the No-Action alternative would be similar to the conditions described under the existing conditions for water quality and water yield in *APPENDIX D – WATERSHED AND HYDROLOGY ANALYSIS*. The water quality and water yield would be unaffected, and the streams in the proposed project area would continue to be affected by natural and preexisting conditions.

- ***Direct and Indirect Effects of the Action Alternative***

  Sediment Delivery

  Log trucks would haul timber over a maximum of 10 miles of existing roads. Most of these roads have been used in the past 20 years and meet applicable BMPs. Erosion control and BMPs would be improved where necessary. In some cases, the addition of erosion-control measures may increase the risk of sediment delivery in the short-term by creating bare soil;

however, as these sites revegetate, the long-term risk of sedimentation to a stream would be reduced to levels lower than the existing condition.

Water Yield

Under this proposed Action Alternative, approximately 98 acres would receive either a commercial thin, group selection/hazard reduction, or an overstory removal prescription. Approximately 233 acres would be treated with a seedtree prescription. Approximately 40 acres of young sapling-sized trees would not be commercially harvested, but would receive a precommercial-thin treatment. This level of harvesting would not be sufficient to generate measurable increases in water yield or cause channel instability in streams located within or near this portion of the project area. The stability of channels and the buffering capacity of the wetlands throughout and below the project area would be sufficient to handle these increases without measurable change. As a result, no direct or indirect impacts to water yield are expected in the project area as a result of the proposed Action Alternative.

- ***Cumulative Effects of the No-Action Alternative to Water Resources***

Cumulative effects of this alternative on water quality and water yield would be similar to the situations described under *Existing Conditions* in *APPENDIX D – WATERSHED AND HYDROLOGY ANALYSIS*. The water quality and water yield would be unaffected. Streams and draws in the proposed project area would continue to be affected by natural and preexisting conditions.

- ***Cumulative Effects of the Action Alternative to Water Resources***

Sediment Delivery

Adverse cumulative effects to water quality are not expected in the project area. Risk of sediment delivery would be slightly higher than current levels. Log hauling on existing roads would create some bare soil on the road surface. This would increase the risk of erosion on these sites where vegetation was lost. Ground-based harvesting activities may also increase the risk of erosion by exposing bare soil on skid trails and landings. This risk would be elevated for 2 to 3 years after project completion until sites begin to revegetate. The risk of increasing sediment loads is very small since all proposed activities are located well away from a stream or draw.

Water Yield

Adverse cumulative impacts to stream channels and downstream waters in and near the proposed project area are not expected as a result of the proposed project for the following reasons: 1) the limited area and selective nature of the proposal would not have a measurable effect on the small, groundwater-fed watersheds in this parcel, 2) the high stability of stream channels where they occur show that the small watersheds are not prone to impacts of water-yield increases, and 3) the presence of ponds and wetlands within and below the proposed activity act as storage of increases in water yield.

6. AIR QUALITY: *What pollutants or particulate would be produced? Identify air quality regulations or zones (e.g. Class I air shed) the project would influence. Identify cumulative effects to air quality.*

- ***Direct, Indirect, and Cumulative Effects of the No-Action Alternative***

  Under this alternative, no timber harvesting or related activities, such as log hauling and the burning of slash, would occur. Consequently, no direct, indirect, or cumulative effects on air quality would be expected under the No-Action Alternative.

- ***Direct, Indirect, and Cumulative Effects of the Action Alternative***

  During dry periods of the year, gravel and dirt or native-surfaced roads cause dust relative to the amount of use. The log-hauling traffic from this proposed sale may increase to 6 to 12 truckloads of logs hauled per day. Depending on the season of harvest and weather conditions, road dust may increase. In cases where the Forest Officer determines the dust level is unacceptable, the application of dust abatement, such as magnesium chloride, may be required.

  The project is located in Airshed 2. Some particulate matter may be introduced into the Airshed from the burning of logging slash. Impacts are expected to be minor and temporary with slash burning to be conducted when conditions favor good to excellent smoke dispersion. All burning would be conducted during times of adequate ventilation in accordance with existing rules and regulations. Thus direct, indirect, and cumulative effects to air quality are expected to be acceptable.

7. VEGETATION COVER, QUANTITY, AND QUALITY: *What changes would the action cause to vegetative communities? Consider rare plants or covertypes that would be affected. Identify cumulative effects to vegetation.*

Direct and Indirect Effects

- ***Direct and Indirect Effects of the No-Action Alternative***

  Neither covertypes nor age-class distributions in the analysis area would be directly or indirectly affected. Over time, lacking substantial disturbances such as timber harvests or wildfires, the proportion of seedling-/sapling-sized stands would gradually decrease.

  Noxious weeds occurring on the project area would likely spread with road traffic and recreational use of the area.

- ***Direct and Indirect Effects of the Action Alternative***

  In the area where treatment is proposed for the mixed-conifer covertype, approximately 119 acres would be converted to the western larch/Douglas-fir covertype. In the 203 acres of western larch/Douglas-fir covertype, the covertype would not change. In areas where treatment is proposed for the current Douglas-fir covertype (approximately 22 acres) and the lodgepole pine covertype (approximately 22 acres), no change in covertypes would occur.

  Most of these treatments would result in 2-storied stands following regeneration. After regeneration, the overstory would be comprised primarily of western larch, Douglas-fir, western white pine, and western red cedar. The understory would be made up of western larch, western white pine, Engelmann spruce, and Douglas-fir. Overall, the Action Alternative would move stands in the proposed project area toward desired future conditions.

In this proposal, the only change in age class would take place in Unit 5. The overstory removal prescription would move the 11-acre unit from a 150-year-plus age class to a 0-to-39-year age class. On the remaining 360 acres proposed to be harvested or precommercially thinned, no change in age class would take place due to the amount of older-aged trees being left on site and DNRC's *Stand Level Inventory (SLI)* methodologies used in determining age class.

On roads in the proposed Lupfer 3 Timber Sale Project area, the existing noxious weeds would be significantly reduced by spraying before any road building or timber harvesting would be allowed. A second spraying would be required after the completion of all harvesting activities to help eliminate future weed problems

Cumulative Effects

- ***Cumulative Effects of the No-Action Alternative***

  Since neither covertypes nor age-class distributions in the analysis area are expected to substantially change, cumulative effects to these forest-stand attributes are not expected as a result of this alternative.

- ***Cumulative Effects of the Action Alternatives***

  The cumulative effects of timber-stand management on Stillwater State Forest trend toward increasing seral covertypes in areas where recent forest-management activities have taken place.

  In addition to the changes in age-class distributions from the proposed alternative, other timber sale projects have been initiated. These projects are estimated to increase the amount of area in the 0-to-39-year age class by slightly decreasing the area in older stand classes.

  Structure changes show that approximately 92 percent of the stands over 150 years old is still multistoried, which displays a slight change to more 2-storied and single-storied stands. This change mimics the mixed-severity and stand-replacement fire regimes on Stillwater State Forest.

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8. TERRESTRIAL, AVIAN, AND AQUATIC LIFE AND HABITATS: *Consider substantial habitat values and use of the area by wildlife, birds, or fish. Identify cumulative effects to fish and wildlife.*

Existing Condition

The project area provides habitat for a variety of wildlife species, including a host of species that require mature forests and/or use snags and coarse woody debris. Deer, elk, and moose likely use the project area much of the year, but no winter range or security habitats exist in the project area. Where stream channels exist, they generally have flow for more than 6 months each year, but flow becomes subsurface and does not contribute surface water to another body of water. No fish populations have been identified in the streams in the project area.

- ***Direct, Indirect, and Cumulative Effects of the No-Action Alternative***

  Under this alternative, no timber harvesting or related activities would occur. Thus no appreciable changes to existing habitats would be anticipated.

- ***Direct, Indirect, and Cumulative Effects of the Action Alternative***

  Under the action alternative, approximately 331 acres of western larch/Douglas-fir and mixed conifers would be harvested; leading to younger, more-open stands on much of that acreage, and an additional 40 acres would be precommercially thinned. This would alter habitats for wildlife species requiring mature forests, while creating habitats for species needing more-open stands of younger forest. Present and future deadwood material would be reduced during the proposed timber harvesting; however, several snags and snag recruits would be retained in most of the units.

Refer to *APPENDIX E - WILDLIFE ANALYSIS* for more detailed information.

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9. UNIQUE, ENDANGERED, FRAGILE, OR LIMITED ENVIRONMENTAL RESOURCES:
Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of Special Concern. Identify cumulative effects to these species and their habitat.

Existing Condition

The project area contains potential habitat for grizzly bears and Canada lynx. Potential habitat exists in the project area for bald eagles, fisher, gray wolves, and pileated woodpeckers.

- ***Effects of the No-Action Alternative***

  No direct effects to grizzly bears would be expected. No changes to the level of disturbance to grizzly bears would be anticipated. No changes in security core, open-road densities, or hiding cover would be anticipated. Thus, since no changes in available habitats or level of human disturbance would be anticipated, no direct or indirect effects to grizzly bears would be anticipated.

  In the short-term, no changes in lynx habitat elements would be expected in the project area. In the longer term, barring major natural disturbances, natural succession would advance several classes forward, generally improving several classes of lynx habitats; however, the net reduction in young foraging habitats would be expected in the absence of new regenerating stands to replace the stands succeeding out of young foraging habitat. When this occurs, habitat quality for snowshoe hares could decline, thereby reducing the availability of prey for lynx.

  Under this alternative, no timber harvesting or related activities would occur. Thus, no appreciable changes to existing habitats for gray wolves, fisher, pileated woodpeckers, or bald eagles would be anticipated and no indirect, direct, or cumulative impacts are anticipated for these species with this alternative.

- ***Effects of the Action Alternative***

  This alternative could disturb grizzly bears, but mitigations would largely reduce the effect of disturbance on grizzly bears; no changes in open-road densities would be anticipated. Grizzly bear hiding cover would be reduced on much of the 331 acres proposed for harvesting, but no changes to security habitat would be anticipated. Approximately 371 acres of lynx denning, mature foraging, and forested travel/other habitats would be altered with the action alternative and landscape connectivity would be slightly reduced; however, adequate habitats

would persist. Proposed activities could cause slight shifts in use by wolves and their prey; however, no key habitat components are known to exist in the project area and long-term use is not expected to appreciably change. The Farm-to-Market and Swift Creek bald eagle territory home ranges include portions of the project area; approximately 331 acres would be within those home ranges and would be altered with the Action Alternative. Proposed harvesting would not disturb the nesting pairs and would be expected to retain some important habitat attributes. Roughly 2.4 acres of riparian fisher habitats and an additional 363 acres of potential upland fisher habitats included in the proposed units would be altered. Most of the 331 harvested acres within the project area would be largely too open to be considered pileated woodpecker habitat after the proposed harvesting; however, the silvicultural prescriptions and the proposed precommercial thinning would retain healthy western larch, western white pine, and Douglas-fir while retaining snags to benefit long-term pileated woodpecker use.

Refer to *APPENDIX E - WILDLIFE ANALYSIS* for more detailed information.

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10. HISTORICAL AND ARCHAEOLOGICAL SITES: *Identify and determine effects to historical, archaeological, or paleontological resources.*

- ***Effects of the No-Action and Action Alternatives***

  No resources were identified during inspection for cultural resources in the project area by a DNRC archaeologist. In the Action Alternative, a contract clause provides for suspending operations if cultural resources are discovered; operations may only resume as directed by the Forest Officer.

---

11. AESTHETICS: *Determine if the project is located on a prominent topographic feature or may be visible from populated or scenic areas. What level of noise, light, or visual change would be produced? Identify cumulative effects to aesthetics.*

- ***No-Action Alternative***

  Under this alternative, no timber harvesting or related activities would occur. No changes in views would occur.

- ***Action Alternative***

  Portions of the project area would be visible from Lupfer Loop Road and Lupfer County Road. Specifically, portions of Unit 9 would be visible from Lupfer County Road. Portions of Units 1, 2, and 6 would be visible from Lupfer Loop Road. Timber sale design would minimize visual impacts by variably spacing retention trees in the units and retaining various amounts of leave trees along the unit boundaries

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12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR, OR ENERGY: *Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify cumulative effects to environmental resources.*

No direct, indirect, or cumulative impacts would likely occur under either alternative.

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

- Lupfer 2 EA, March 1996
- Good/Long/Boyle EA, July 2000
- Olney Urban Interface EA, March 2009
- Beaver/Swift/Skyles EA, April 2009
- Whitefish School Trust Lands Neighborhood Plan, 2004

IV. IMPACTS ON THE HUMAN POPULATION

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" if no impacts are identified or the resource is not present.*

14. HUMAN HEALTH AND SAFETY: *Identify any health and safety risks posed by the project.*

Traffic and safety problems may occur with log hauling when the school bus picks up or drops off students at the junction of Highway 93 and Lupfer County Road. If DNRC has an easement on Lupfer Loop Road to Lupfer County Road, DNRC would restrict log truck traffic to times when school buses were not receiving or delivering students in the area.

15. INDUSTRIAL, COMMERCIAL, AND AGRICULTURE ACTIVITIES AND PRODUCTION: *Identify how the project would add to or alter these activities.*

The proposed timber harvest would provide continuing industrial production in the Olney/Flathead area.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: *Estimate the number of jobs the project would create, move, or eliminate. Identify cumulative effects to the employment market.*

People in the region are currently employed in the wood-products industry. Due to the relatively small size of the proposed timber sale, no measurable direct, indirect, or cumulative impacts would be expected from either alternative.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES: *Estimate tax revenue the project would create or eliminate. Identify cumulative effects to taxes and revenue.*

The wood products industry is currently producing taxes in the region. Due to the relatively small size of the proposed timber sale, no measurable direct, indirect, or cumulative impacts would be anticipated from either alternative.

18. DEMAND FOR GOVERNMENT SERVICES: *Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify cumulative effects of this and other projects on government services.*

Log trucks hauling to the purchasing mill would result in temporary increases in traffic on U.S. Highway 93 and Lupfer Loop Road.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: *List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.*

On May 30, 1996, DNRC released the *Record of Decision* for the *SFLMP*. The Land Board approved the implementation of the *SFLMP* on June 17, 1996. On March 13, 2003, the Department adopted *Administrative Rules (Administrative Rules of Montana [ARM] 36.11.401* through *450*). The *SFLMP* outlines the management philosophy, and the proposal will be implemented according to the Rules. The philosophy is:

> *"Our premise is that the best way to produce long-term income for the trust is to manage intensively for healthy and biologically diverse forests. Our understanding is that a diverse forest is a stable forest that will produce the most reliable and highest long-term revenue stream… In the foreseeable future, timber management will continue to be our primary source of revenue and our primary tool for achieving biodiversity objectives."*

The project area is within the Stillwater subarea addressed in the Whitefish School Trust Lands Neighborhood Plan. DNRC has kept members of organizations involved with the Whitefish Neighborhood Plan apprised of the proposed action. The project development phase has addressed both the community and trust objectives in regard to natural-resource protection, wildfire mitigations, recreation, and future development options.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES: *Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify cumulative effects to recreational and wilderness activities.*

Hunters frequently use this area. Under the Action Alternative, the road closure that would be installed in the project area would only affect the immediate area and would not affect the ability of people to recreate on the project area. Illegal off-road vehicle use would be expected to decrease, while legal use would be expected to remain the same.

Winter logging and the plowing of roads could negatively impact winter recreation for a DNRC licensee. The current travel routes the licensee uses would be impacted where the routes intersect the required winter logging units and log-hauling routes. DNRC plans to allow only 1 winter season of operation; the remainder of the harvesting would be required during nonwinter months. For the winter operation season, DNRC would work with licensee on alternative areas for their operations.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING: *Estimate population changes and additional housing the project would require. Identify cumulative effects to population and housing.*

No measurable direct, indirect, and cumulative impacts related to population and housing would be expected due to the relatively small size of the timber sale and the fact that people are already employed in this occupation in the region.

22. SOCIAL STRUCTURES AND MORES: *Identify potential disruption of native or traditional lifestyles or communities.*

No direct, indirect, and cumulative impacts related to social structures and mores would be expected under either alternative.

23. CULTURAL UNIQUENESS AND DIVERSITY: *How would the action affect any unique quality of the area?*

No direct, indirect, and cumulative impacts related to cultural uniqueness and diversity would be expected under either alternative.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES: *Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify cumulative economic and social effects likely to occur as a result of the proposed action.*

Costs, revenues, and estimates of return are approximations intended for a relative comparison of alternatives and are not intended to be used as absolute estimates of return. The estimated stumpage is based on comparable sales analysis, which compares recent sales to find the market value for stumpage. These sales have similar species, quality, average diameter, product mix, terrain, date of sale, distance from mills, road building and logging systems, terms of sale, or anything that could affect a buyer's willingness to pay for timber. The effect of the proposed Action Alternative would generate an estimated return of $175,000 to the trust beneficiaries. The No-Action Alternative would generate no return to the beneficiaries at this time.

EA Checklist Prepared By:	**Name:** Pete Evans and R. Jason Parke	**Date:** April 1, 2010
	Title: Management Foresters	

V. FINDING

25. ALTERNATIVE SELECTED:

The Action Alternative is the chosen alternative. This alternative meets the intent of the project as stated in *Section I - Type and Purpose of Action*. Mitigation measures have been designed into the project to help implement good management practices on the ground and reduce effects to the various resources affected by the proposed action.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

I find that the Action Alternative will not have significant impacts on the human environment for the following reasons:

- Individually and cumulatively, the identified impacts are within DNRC's policies, standards, and applicable State laws.
- The proposed activities will not be conducted on unique or fragile sites.
- This alternative will not preclude analysis of future actions on state land, and
- Local planning has been completed on portions of the project area with the Whitefish Neighborhood Plan.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

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

EA Checklist Approved By:	**Name:**	Brian Manning
	Title:	Stillwater Unit Manager
Signature: /S/ Brian Manning		**Date**: April 5, 2010

APPENDIX A
PRESCRIPTIONS AND MAPS

Modified Seedtree with Reserves - Portions of the unit would be regenerated by cutting all merchantable timber except 6 to 10 of the larger-diameter western larch, Douglas-fir, and ponderosa pine per acre. The selected leave trees would show the most vigor, contain the healthiest crowns, and have the potential to produce healthy cone crops; as a result, leave trees would be unevenly spaced in some areas. The reserves would consist of pockets of advanced regeneration and/or groups of superior-quality trees that would be best retained as a seed source. If no viable leave trees are present, openings up to 0.25 acre may be present.

Commercial Thin - A stand of trees would be partially harvested to allow for growth acceleration of the retained trees and management of species. To reduce stocking density and improve growth rates and vigor, 40 to 60 percent of the existing overstory would be harvested. The residual stand would consist of the most vigorous and, generally, largest-diameter trees. Where no viable leave trees are present, openings up to 0.25 acre will exist.

Overstory Removal - Harvesting would remove all merchantable overstory except for those trees needed as live-recruitment trees for wildlife, to release the advanced regeneration established from the previous harvesting. These areas have healthy understories, which would provide a sufficient number of trees for future harvests.

Group Selection - Harvesting would remove groups of trees (primarily lodgepole pine for this project), leaving openings up to 1.5 acres in size. Individual trees of desirable species, form, and vigor may be left within the openings. Areas between openings would be left unharvested.

Hazard Reduction – Primarily, smaller trees and large diseased and dead trees would be removed. The removal of ladder fuels, combined with a high level of slash cleanup on the forest floor (approximately 90 percent), would help reduce fire danger. The remaining timber would be the healthiest and largest trees spaced an approximate distance of 10 feet between tree crowns.

Proposed Unit: 1 **Acres:** 34 **Volume (Mbf):** 150

Proposed Treatment(s): Seedtree with reserves (11 acres)/commercial thin (23 acres)

Harvest Particulars: Unit 1 is predominately a multistoried stand consisting of western larch, Douglas-fir, and Englemann spruce as the dominant species in the overstory and a smaller component of subalpine fir. The area closest to the power line has a larger component of western larch and Douglas-fir than the rest of the unit.

The area closer to the Lupfer Loop Road is classified as a Douglas-fir/western larch stand, but is closer to a mixed conifer type and would be commercially thinned. The leave trees will be primarily co-dominant Douglas-fir and western larch with well-formed tops. The northeastern 30 percent of the unit would be screened from the road by both by the commercial thin and the area southwest of the unit. This northeastern area will be marked to a seedtree cut where the component of larger seedtrees are present.

This unit will be cut-tree marked, with the healthiest and largest Douglas-fir and western larch favored.

Where available, 2 snags and 2 snag recruits (21 inches dbh and greater) would be left per acre, with western larch, western white pine, western red cedar, and Douglas-fir favored. In the absence of 21-inch-plus trees, the largest-diameter trees available would be retained.

Because of soil considerations and grizzly bear security, this unit would be a logged only in the winter.

Follow-Up Treatments:

- Pile and burn slash.
- Mechanically site prep area.
- Natural regeneration.
- Regeneration survey - 5 years following site preparation; plant seedlings if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.

Proposed Unit(s): 2, 3, 7, 10 **Acres:** 154 **Volume (Mbf):** 1,200

Proposed Treatment(s): Seedtree with reserves

Harvest Particulars: To facilitate natural regeneration, 6 to 8 trees per acre would be retained, with western larch, ponderosa pine, Douglas-fir, and western white pine favored. Where available, 2 snags and 2 snag-recruit trees (21 inches dbh and greater) would be left per acre, with western larch, ponderosa pine, western white pine, western red cedar, and Douglas-fir favored. In the absence of 21-inch-plus trees, the largest-diameter trees available would be retained. Small pockets (1 to 2 acres) of superior younger trees scattered throughout the units would be commercially thinned. Adjacent to Lupfer Loop Road, a visual barrier would be retained where possible, leaving a clumped shelterwood spacing/improvement cut. Any advanced regeneration and nonsawtimber species, such as birch, would be protected.

Units 2 and 7 would be combination skyline and tractor units.

Units 2, 3, and 7 would be winter logged.

Follow-Up Treatments:

- In Units 3 and 10, pile and burn slash.
- Pile and burn landings.
- In Units 2 and 7, broadcast burns to eliminate the common juniper component in the understory and as site prep/slash treatment.
- Natural regeneration.
- Regeneration survey - 5 years following site preparation; plant seedlings if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.

Proposed Unit(s): 4, 8 **Acres:** 10 **Volume (Mbf):** 60

Proposed Treatment(s): Seedtree with reserves

Harvest Particulars: These units are located around previous regeneration harvest units ranging from 0.5 to 2 acres in size. Regeneration in these units was largely unsuccessful for a variety of reasons, including lack of site preparation, too many seedtrees that over shade the site, and/or seedtrees have not produced a good cone crop. The objectives for these units are to open up the old harvest units and interplant trees to achieve regeneration. Another goal is to expand these openings, more than doubling their size in some places, to promote a more dynamic pattern of sizes and age classes in the project area.

To facilitate natural regeneration, 6 to 8 trees per acre would be retained, with western larch and Douglas-fir favored. Where available, 2 snags and 2 snag-recruit trees (21 inches dbh and greater) would be left per acre, with western larch and Douglas-fir favored. In the absence of 21-inch-plus trees, the largest-diameter trees available would be retained.

Follow-Up Treatments:

- Pile and burn slash.
- Mechanically site prep area.
- Natural regeneration.
- Regeneration survey - 5 years following site preparation; plant seedlings if necessary.
- Precommercial thinning survey (TSI Evaluation) – 12 to 15 years following site preparation.

Proposed Unit(s): 5 **Acres:** 11 **Volume (Mbf):** 44

Proposed Treatment(s): Overstory removal

Harvest Particulars: This proposed unit is a modified seedtree unit that has successfully regenerated. Many of the trees that were left when the unit was cut in the past are now showing poor form and, in general, appear to be deteriorating. The overstory trees are primarily Douglas-fir and western larch with some lodgepole pine present. The objective is to remove the overstory and leave 2 snags and 2 snag-recruit trees per acre.

Follow-Up Treatments:

- Regeneration survey - 5 years following site preparation; plant seedlings if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.

Proposed Unit(s): 6 **Acres:** 43 **Volume (Mbf):** 500

Proposed Treatment(s): Seedtree with reserves (30 acres)/commercial thin (13 acres)

Harvest Particulars: The harvest treatments in this unit would consist of 30 percent commercial thin and 70 percent seedtree. The species retained would be the largest and best-formed western larch, Douglas-fir, and western white pine. Where available, 2 snags and 2 snag-recruit trees (21 inches dbh and greater) per acre would be left, with western larch, western white pine, western red cedar, and Douglas-fir favored.

This unit would have to be logged under winter conditions because of soil moisture considerations.

Follow-Up Treatments:

- Pile and burn slash.
- Mechanically site prep area.
- Natural regeneration.
- Regeneration survey - 5 years following site preparation; plant seedlings if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.

Proposed Unit: 9 **Acres:** 52 **Volume (Mbf):** 60

Proposed Treatment(s): Hazard reduction / group selection

Harvest Particulars: This treatment would be designed to reduce fire hazards and promote growth in residual trees. The whitewoods (lodgepole pine, grand fir, subalpine fir, and Engelmann spruce) would be harvested. The healthiest and largest Douglas-fir and western larch would be retained at approximately 20-foot spacing (commercial thin) or a spacing of 10 feet or more between live crowns. The group-selection harvesting would remove groups of trees (primarily lodgepole pine), leaving openings up to 1.5 acres in size (up to 10 such openings would be located in this unit). Individual trees of desirable species, form, and vigor may be left within the openings.

Follow-Up Treatments:

- On the areas adjacent to home sites; a high level of hazard reduction would remove 90 percent of the slash.
- In the group selection portion of the unit, regeneration would be natural.
- Regeneration survey - 5 years following site preparation; plant at that time if necessary.

Proposed Unit(s): 11 **Acres:** 27 **Volume (Mbf):** 132

Proposed Treatment(s): Seedtree with reserves

Harvest Particulars: To facilitate natural regeneration, 6 to 8 trees per acre would be retained, with western larch, Douglas-fir, and western red cedar favored. Where available, 2 snags and 2 snag-recruit trees (21 inches dbh and greater) would be left per acre, with western larch, western red cedar, and Douglas-fir favored. In the absence of 21-inch-plus trees, the largest-diameter trees available would be retained. The small pockets of superior younger trees scattered throughout the units would be the reserves that would help maintain visuals for the adjacent landowners.

This unit would be winter logged.

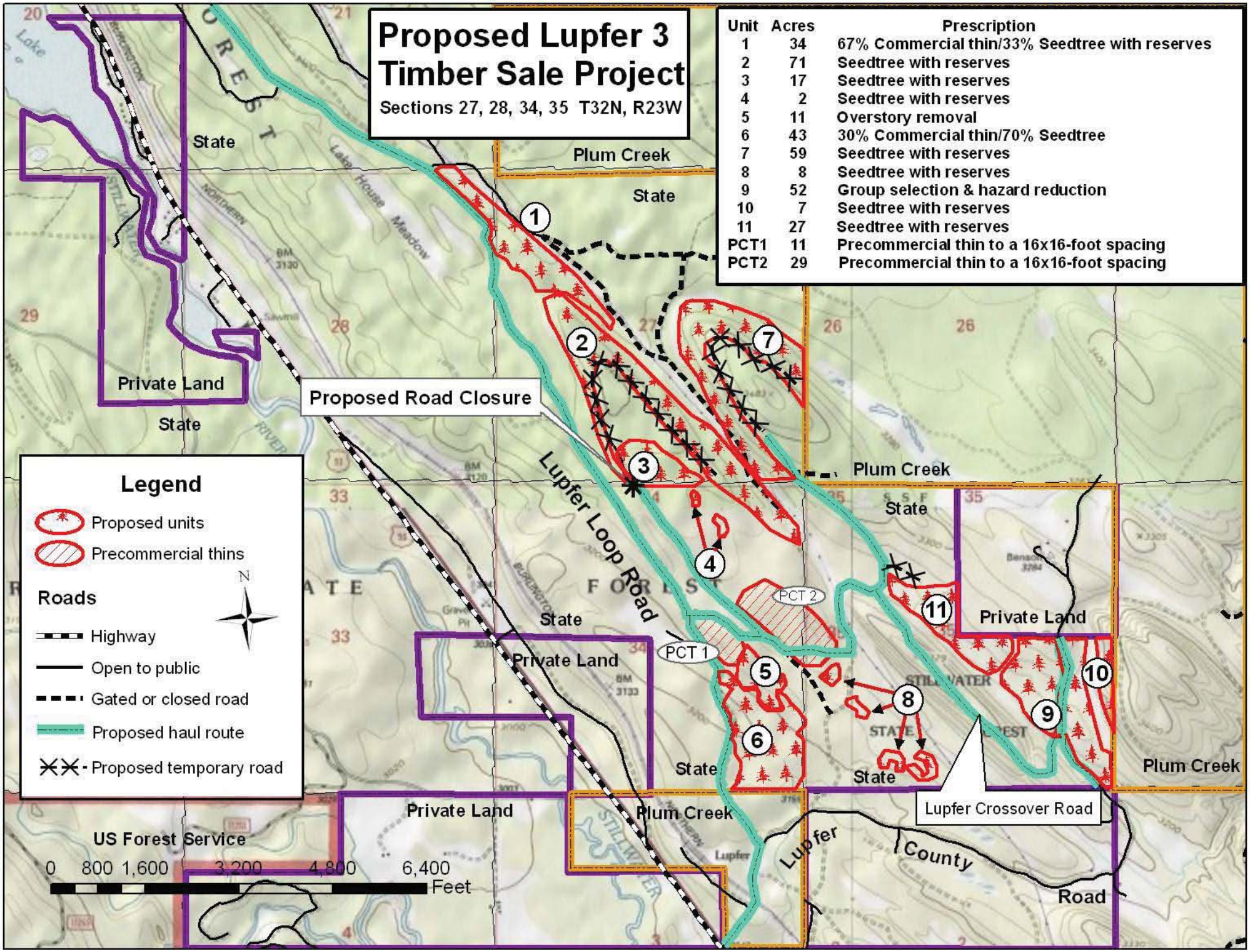
Follow-Up Treatments:

- Pile and burn slash.
- Mechanically site prep area.
- Natural regeneration.
- Regeneration survey - 5 years following site preparation; plant seedlings if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.
- Adjacent to home sites, a high level of hazard reduction would remove 90 percent of the slash.

Proposed Lupfer 3 Timber Sale Project

Sections 27, 28, 34, 35 T32N, R23W

Unit	Acres	Prescription
1	34	67% Commercial thin/33% Seedtree with reserves
2	71	Seedtree with reserves
3	17	Seedtree with reserves
4	2	Seedtree with reserves
5	11	Overstory removal
6	43	30% Commercial thin/70% Seedtree
7	59	Seedtree with reserves
8	8	Seedtree with reserves
9	52	Group selection & hazard reduction
10	7	Seedtree with reserves
11	27	Seedtree with reserves
PCT1	11	Precommercial thin to a 16x16-foot spacing
PCT2	29	Precommercial thin to a 16x16-foot spacing



APPENDIX B
SOILS ANALYSIS

INTRODUCTION

LANDFORM DESCRIPTION

The Stillwater River, including the Lupfer 3 Timber Sale area lies within a valley formed by glaciers and river processes. The dominant landtypes found in the project area include lacustrine terraces, organic depressions, and glaciated mountain slopes. The primary parent material for each of these landtypes is glacial till derived from argillite, siltite, and limestone from the Belt Supergroup. Surface soil for each landtype in the project area is volcanic ash-influenced loess.

SOIL PHYSICAL PROPERTIES

This analysis addresses the issue that timber harvesting and associated activities may affect soil conditions in the proposed project area through ground-based activities and repeated entries to previously harvested areas. Operation of ground-based machinery can displace fertile layers of topsoil, which can lead to a decrease in vegetation growth. Ground-based machinery can also lead to compaction of the upper layers of soil. Compaction decreases pore space in soil, reduces its ability to absorb and retain water, and can increase runoff and overland flow. These conditions can also lead to a decrease in vegetation growth.

SLOPE STABILITY

Slope stability can be affected by timber-management activities by removing stabilizing vegetation, concentrating runoff, or by increasing the soil moisture. The primary risk areas for slope stability problems include, but are not limited to, landtypes that are prone to soil mass movement, and soils on steep slopes (generally over 60 percent).

ANALYSIS METHODS

SOIL PHYSICAL PROPERTIES

Impacts to soil physical properties will be analyzed by evaluating the current levels of soil disturbance in the proposed project area based on field review and aerial-photograph review of existing and proposed harvest units. Percent of area affected is determined through pace transects, measurement, aerial-photograph interpretation, or GIS to determine skid-trail spacing and width. From this, skid-trail density and the percent of area impacted are determined. Estimated effects of proposed activities will be assessed based on findings of DNRC soil monitoring.

SLOPE STABILITY

Slope stability risk factors will be assessed by reviewing the *Flathead National Forest (FNF) Land System Inventory* to identify landtypes listed as high risk for mass movement. Field reconnaissance will also be used to identify any slopes greater than 60 percent as an elevated risk for mass movement.

ANALYSIS AREA

The analysis area for evaluating soil physical properties and slope stability will include DNRC-managed land in the Lupfer 3 project area. The proposed project is located mostly within the Lazy Creek watershed; a small portion that has no identifiable surface water features is located outside of this watershed.

EXISTING CONDITIONS

SOIL PHYSICAL PROPERTIES

The project area was last managed in the 1990s. Timber sale records dating back to the 1980s show that approximately 1,000 acres of timber have been harvested in the project area using ground-based harvest methods. Ground-based yarding can create soil impacts through displacement and compaction of productive surface layers of soil, mainly on heavily used trails. Existing skid trails are spaced at least 50 feet apart; none were identified as erosion or sediment sources. Trails are still apparent, but most are well vegetated, and past impacts are beginning to ameliorate from freeze-thaw cycles and root penetration. Based on pace transects of trail spacing, knife penetration tests for compaction, and ocular estimates of revegetation, less than 15 percent of previously ground-skidded harvest units are in an impacted condition in the proposed project area.

SLOPE STABILITY

Landtypes in the project area vary from nearly level wetlands and organic depressions to glaciated mountain slopes in the central portion of this parcel. The FNF LSI identified no areas of soils at high risk for mass movements in the project area. No slope failures were identified during reconnaissance in the proposed project area, and slopes are less than 60 percent. Because none of the slope-stability risk factors are present in the proposed project area, slope stability will not be evaluated on this project for the remainder of this analysis. A list of landtypes found in the project area and the associated management implications are found in *TABLE B-2 – SOIL MAP UNIT DESCRIPTIONS FOR THE LUPFER 3 TIMBER SALE PROJECT AREA*.

ENVIRONMENTAL EFFECTS

DIRECT AND INDIRECT EFFECTS

- ***Direct and Indirect Effects of No-Action Alternative on Soil Physical Properties***

  This alternative would have no direct or indirect effects on soil physical properties or slope stability. No ground-based activity would take place, which would leave the soil in the project area unchanged from the description under *EXISTING CONDITIONS*.

- ***Direct and Indirect Effects of Action Alternative on Soil Physical Properties***

  Based on DNRC soil monitoring on soils and sites similar to those found in the project area, direct impacts would be expected on up to 24 of the total 371 acres proposed for harvesting. Soil monitoring conducted on DNRC-managed lands shows that sites harvested on DNRC-managed lands statewide on similar soils with ground-based machinery had a range of impacts from 4.4 to 8.1 percent of the acres treated, with an

average disturbance rate of 6.0 percent (*DNRC, 2004*). The low range of impacts includes operations on frozen or snow-covered soils, and the high range includes operations on dry soils during nonwinter conditions. As a result, the extent of impacts expected would likely be similar to those reported by *Collins (DNRC, 2004)*, or approximately 4.4 to 8.1 percent of ground-based harvested acres. The proposal includes 251 acres of ground-based mechanical harvesting, 80 acres of cable yarding, and 40 acres of hand-felled precommercial thinning.

Ground-based site preparation would also generate direct impacts to the soil resource. Site-preparation disturbance would be intentionally done, and these impacts are considered light and promote reforestation of the site. Approximately 1.6 miles of temporary road would be constructed with the Action Alternative. *TABLE B-1 – SUMMARY OF DIRECT EFFECTS OF ALTERNATIVES ON SOILS* summarizes the expected impacts to the soil resource as a result of the Action Alternative. These activities would leave up to 8.0 percent of the proposed harvest units in an impacted condition. This level is below the range analyzed for in the *EXPECTED FUTURE CONDITIONS* section of the *SFLMP*, and well within the 20-percent impacted area established as a level of concern in the *SFLMP (DNRC 1996)*. In addition, BMPs and a combination of mitigation measures would be implemented to limit the area and degree of soil impacts as noted in *ARM 36.11.422* and the *SFLMP (DNRC, 1996)*.

TABLE B-1 – SUMMARY OF DIRECT EFFECTS OF ALTERNATIVES ON SOILS

DESCRIPTION OF PARAMETER	**ALTERNATIVE**	
	NO ACTION	***ACTION***
Acres of harvest	0	371
Acres of tractor yarding	0	251
Average. acres of ground-based impacts	0	20
Acres of cable yarding	0	80
Acres of yarding corridors[1]	0	8
Acres of temporary road construction	0	6
Total acres of moderate impacts[2]	0	30
Percent of harvest area with impacts	0%	8.0%

[1] *5-10% of cable yarding units*

[2] *8.1 percent of ground-based units based on DNRC monitoring and 50 percent of cable corridors*

CUMULATIVE EFFECTS

- ***Cumulative Effects of the No-Action Alternative on Soil Physical Properties***

  This alternative would have no cumulative impacts to physical properties of soils in the project area. The impacts of this alternative would be similar to those described in under *EXISTING CONDITIONS*. No soil would be disturbed and no reentry of past harvest units would occur. All impacts from past management activities would continue to improve or degrade as dictated by natural and preexisting conditions.

- ***Cumulative Effects of Action Alternative on Soil Physical Properties***

  Approximately 81 acres with previous timber-harvesting operations would be entered. Cumulative effects to soils may occur from repeated entries into a forest

stand where additional ground is impacted by equipment operations. Existing skid trails where compaction has begun to ameliorate through freeze-thaw cycles and revegetation would return to a higher level of impact due to the Action Alternative. Additional trails may also be required if existing trails are in undesirable locations. In the remaining stands where timber has not been harvested in the past, the cumulative impacts to the soil physical properties in this parcel would be the same as those listed under *DIRECT AND INDIRECT EFFECTS*. Cumulative impacts to soil physical properties under this alternative would fall below the range analyzed for in the *EXPECTED FUTURE CONDITIONS* section of the *SFLMP* and are well within the 20-percent impacted area established as a level of concern in the *SFLMP (DNRC, 1996)*.

DNRC would minimize long-term soil impacts and adverse cumulative effects by implementing any or all of the following: 1) existing skid trails from past harvesting activities would be used if they are properly located and spaced, 2) additional skid trails would be used only where existing trails are unacceptable, 3) the potential direct and indirect effects with soil-moisture restrictions, season of operation, and method of harvest would be mitigated, 4) a portion of coarse woody debris and fine litter would be retained for nutrient cycling. In previously unharvested stands, cumulative effects to soil productivity from multiple entries would be the same as those listed under *DIRECT AND INDIRECT EFFECTS*.

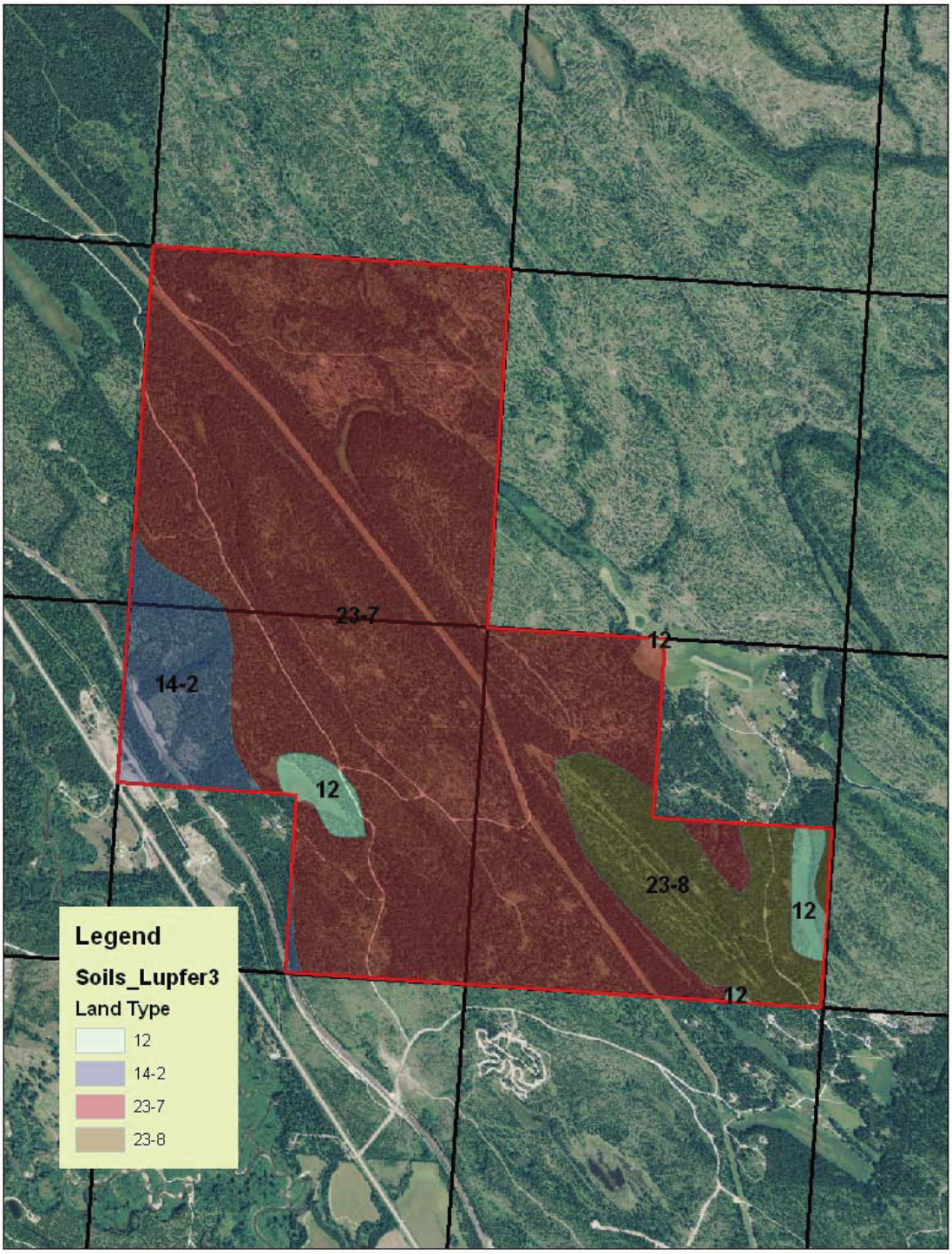

23-7
12
14-2
12
23-8
12
12
Legend
Soils_Lupfer3
Land Type
12
14-2
23-7
23-8

TABLE B-2 – SOIL MAP UNIT DESCRIPTIONS FOR THE LUPFER 3 PROJECT AREA

MAP UNIT[1]	DESCRIPTION	SOIL DRAINAGE	ROAD LIMITATIONS	TOPSOIL DISPLACEMENT AND COMPACTION	SEEDLING ESTABLISHMENT	EROSION (BARE SURFACE)	NOTES
12	Organic depressions	Poor	Severe	Severe	Poor	Slight	Wetland soil types; avoid operation.
14-2	Silty lacustrine terraces, 0 to 5 percent	Poor	Wet, poor bearing strength	Severe	Poor	High	Soil has very limited season of use, consider winter harvesting, designated skid trails. Roads may require turnpiking, special design, gravel. Lop and scatter slash, excavator pile or broadcast burn.
23-7	Glaciated mountain slopes, 0 to 20 percent	Well drained	Low	Moderate/High	Moderate - competition	Moderate	Moderately deep coarse soils reduce water and nutrients. South slopes droughty. On slopes over 35 percent, lop and scatter slash, excavator pile or broadcast burn.
23-8	Glaciated mountain slopes, 20 to 40 percent	Well drained	Low	Moderate/High	Moderate - competition	Moderate	Moderately deep coarse soils reduce water and nutrients. South slopes droughty. On slopes over 35 percent, lop and scatter slash, excavator pile or broadcast burn.

[1]*Flathead National Forest Land Types. Interpretations taken from: USDA Forest Service. 1998. Soil Survey of the Flathead National Forest Area, Montana. USDA Forest Service and Natural Resources Conservation Service.*

APPENDIX C
VEGETATION ANALYSIS

INTRODUCTION

This section describes conditions of the existing vegetation on Stillwater Unit as a whole and in the project area specifically and documents how the No-Action and Action alternatives would affect the various components of this resource. A number of vegetation parameters could be affected by implementation of the alternatives; therefore, each will be analyzed. Forest covertypes and age-class distributions will be discussed at the landscape and stand levels to facilitate the analysis of direct, indirect, and cumulative effects. The conditions of forest fuels, fire regimes, insects, diseases, and noxious weed will be discussed at the project-area level. Past, present, and reasonably foreseeable activities are identified and considered in the analysis of effects.

ANALYSIS METHODS

The *Forest Management Rules* direct DNRC to promote biodiversity by taking a coarse-filter approach that favors an appropriate mix of stand structures and composition on state lands *(ARM 36.11.404)*. Static ecological parameters, including landtype, climatic section, habitat type, disturbance regime, and other unique characteristics, influence the forest communities that occur in a given area and provide a basis for determining and managing for appropriate structures and composition. Dynamic characteristics of forest communities, such as species composition, age-class distribution, covertype, and stand structure, reflect the ecological parameters influencing a site and describe the resulting biodiversity in an area. The effects of an action on these characteristics describe the contributions of the action toward promoting biodiversity.

To assess the existing condition of the project area and surrounding landscape, a variety of techniques were used. Field visits, scientific literature, *SLI* data, and consultations with other professionals provided information for the analysis.

The current covertype distribution was compared to DNRC's desired future conditions. The Stillwater *SLI*, specifically *STW SLI_2009*, was used to describe current covertypes. DNRC's desired future conditions refer to the covertype that DNRC attempts to manage toward in a forest stand. Desired future conditions are determined according to the model described in *ARM 36.11.405*. DNRC's desired future conditions have been delineated in the Forest Management Bureau's *Desired Future Condition DATASET*. This information is available at the Stillwater Unit office in Olney. The *STW SLI_2009* was used to address the cumulative effects on covertype and age-class distributions.

Historic age-class distributions described by *Losensky (1997)* for climatic section M333C, which represents Upper Flathead Valley, were compared to the current age-class distribution on Stillwater Unit.

ANALYSIS AREA

The analysis area for direct and indirect effects is the project area as defined in *SECTION I* of the *CHECKLIST EA*. Stillwater Unit is the analysis area for the cumulative effects.

The coarse-filter analysis will consider historic conditions from Climatic Section 333c for Stillwater Unit (*Losensky 1997*). The current and desired future forest conditions will be analyzed separately on forested lands administered by Stillwater Unit. Stillwater Unit administers Stillwater State Forest, Coal Creek State Forest, and most of the scattered state lands north of Coal Creek State Forest in Flathead County and the northeastern portion of Lincoln County.

Condition assessments of forest fuels and fire regimes, insects and diseases, and noxious weeds were conducted on the project area. The project area consists of the 4 sections in which the proposed treatments will occur and the haul routes leading out to U.S. Highway 93 near Olney, Montana.

COVERTYPES AND AGE CLASSES

EXISITING CONDITION

Covertype refers to the dominant tree species that currently occupy a forested area. *TABLE C-1 – THE CURRENT AND DESIRED FUTURE CONDITIONS OF COVERTYPES ON FORESTED LAND ADMINISTERED BY STILLWATER UNIT (BY PERCENT)* shows the percentage of the current covertypes and the percentages of covertypes for the desired future condition.

TABLE C-1 – THE CURRENT AND DESIRED FUTURE CONDITIONS OF COVERTYPES ON FORESTED LAND ADMINISTERED BY STILLWATER UNIT (BY PERCENT)

COVERTYPE	CURRENT (PERCENT)	DESIRED FUTURE CONDITION COVERTYPE (PERCENT)
Douglas-fir	3.7	1.5
Subalpine fir	27.0	17.7
Lodgepole pine	11.3	10.2
Ponderosa pine	0.9	1.7
Mixed conifer	26.0	6.6
Western larch/Douglas-fir	24.6	47.1
Western white pine	2.5	14.9
Hardwoods	0.3	0.3
Area that does not have a covertype designated in the SLI*	3.8	

**A major portion of those stands not inventoried with a covertype are stands that were involved in the stand-replacement fires of the Moose Fire of 2001; at the time of data collection in 2001 and 2002, these areas were nonstocked. Since the fire and salvage harvest, reconnaissance shows that many areas are regenerating to the early successional covertypes of primarily lodgepole pine or western larch/Douglas-fir.*

Data indicates, as illustrated by *TABLE C-1 - THE CURRENT AND DESIRED FUTURE CONDITIONS OF COVERTYPES ON FORESTED LAND ADMINISTERED BY*

STILLWATER UNIT (BY PERCENT), that mixed-conifer and subalpine fir stands are currently overrepresented compared to DNRC's desired future conditions. Many of the species that make up the mixed-conifer and subalpine covertypes are shade tolerant, and stand structure tends to be multistoried. The multistoried structure has resulted, in part, from the ingrowth of shade-tolerant trees over time. Therefore, the component of shade-tolerant species increases as the interval between disturbances such as wildfires or timber harvesting is lengthened.

The western larch/Douglas-fir and western white pine covertypes are currently underrepresented on the forest compared to the desired future condition covertype distribution. Western larch and western white pine are not shade tolerant and have, historically, been perpetuated through fairly intensive disturbances such as wildfires. These disturbances most often created single- and two-storied stands of primarily western larch and Douglas-fir overstories and western larch, western white pine, and Douglas-fir understories. While western larch is not shade tolerant, past silvicultural treatments have promoted multistoried western larch/Douglas-fir stands with numerous age classes represented in small groups of trees within larger stands. The white pine blister rust infection has drastically affected the western white pine covertype by substantially reducing over several decades the number of healthy western white pine that occupies the canopy as overstory dominants. Additionally, a weather event occurred in 1998 that caused western white pine to become susceptible to bark beetle mortality.

Age-class distributions delineate another characteristic important for determining trends on a landscape level. Comparing the entire Stillwater Unit's administrative area with historical data for the Upper Flathead Valley climatic section (*Losensky [1997]*, *TABLE C-2 – DISTRIBUTION OF AGE CLASSES* shows that Stillwater Unit currently has proportionately less area in the 0-to-39-year (seedling/sapling stands) and 100-to-150-year age classes, and higher proportions of areas in the 40-to-99-year and greater-than-150-year age classes. DNRC's *Forest Management Rules* reflect the ecological principle that age-class distributions are not static and are dependent upon disturbances, whether those are natural or implemented by man through silvicultural practices.

TABLE C-2 – DISTRIBUTION OF AGE CLASSES

AGE CLASS	HISTORIC PERCENT IN CLIMATIC SECTION M333C	HISTORIC ESTIMATES OF PERCENT ON STILLWATER UNIT	CURRENT PERCENT
0-to-39-year	36	22.8	11.4
40-to-99-year	12	17.9	24.0
100-to-150-year	22	24.7	13.4
150+-year	29	32.8	47.4
No age provided in SLI*			3.7

**A major portion of these stands were partially burned in the Moose Fire of 2001; SLI updates in 2001 and 2002 could not discern which age class to assign these stands.*

A fairly clear picture emerges of the forest conditions when distributions are combined with information on covertypes as displayed in *TABLE C-3 – AGE-CLASS DISTRIBUTION OF CURRENT COVERTYPES ON STILLWATER UNIT*.

TABLE C-3 - AGE-CLASS DISTRIBUTION OF CURRENT COVERTYPES ON STILLWATER UNIT

CURRENT COVERTYPE	AGE CLASS					
	0 TO 39 YEARS	40 TO 99 YEARS	100 TO 149 YEARS	150 YEARS AND OLDER	NO AGE DATA	TOTAL ACRES
	NUMBER OF ACRES					
Douglas-fir	25	466	634	2,534	621	4,280
Hardwoods	100	122	68	64	0	354
Lodgepole pine	2,532	8,843	443	407	1,003	13,228
Mixed conifer	2,460	7,010	4,339	16,417	303	30,529
Ponderosa pine	371	0	491	242	0	1,104
Subalpine fir	2,599	7,627	3,646	17,372	357	31,601
Western larch/ Douglas-fir	510	3,888	5,881	16,427	2,076	28,782
Western white pine	325	234	256	2,087	0	2,902
Nonstocked	4,437	0	0	0	0	4,437
Total acres (total percent)	13,359 (11.4)	28,190 (24.0)	15,758 (13.4)	55,550 (47.4)	4,360 (3.7)	117,217

As was noted in *TABLE C-2 - DISTRIBUTION OF AGE CLASSES,* current age-class distributions are predominately in the oldest age class. The stand structure of the older age classes tend to be multistoried; this occurs when a stand has progressed through time and succession to the point that shade-tolerant species, such as grand fir, Engelmann spruce, and subalpine fir, are replacing a shade-intolerant overstory, such as western larch.

ALTERNATIVE EFFECTS TO COVERTYPES AND AGE CLASSES

Direct and Indirect Effects

- ***Direct and Indirect Effects of the No-Action Alternative to Covertypes and Age Classes***

  Neither covertypes nor age-class distributions in the analysis area would be directly or indirectly affected. Over time, lacking substantial disturbances such as timber harvests or wildfires, the proportion of seedling-/sapling-sized stands would gradually decrease.

- ***Direct and Indirect Effects of the Action Alternative to Covertypes and Age Classes***

  Following harvesting and regeneration within those areas where treatment is proposed, approximately 119 acres would be converted from a mixed-conifer covertype to the western larch/Douglas-fir covertype. In the 208 acres of western larch/Douglas-fir covertype, the covertype would not change. Most of these treatments would result in 2-storied stands following regeneration. Overall, this

alternative would move stands in the proposed project area toward desired future conditions.

In areas where treatment is proposed for the current Douglas-fir (approximately 22 acres) and lodgepole pine (approximately 22 acres) covertypes, no change in covertypes would occur.

Of the 371 acres being harvested or precommercially thinned, one 11-acre unit would change in age class from a 150-year + age class to a 0-to-39-year age class. On the remaining 360 acres proposed to be harvested or precommercially thinned, no notable change in age class would occur due to the amount of older-aged trees being retained and DNRC's *SLI* methodologies used in determining age class. Based on *SLI* methodologies, when the sawtimber component of a stand has greater than 10-percent canopy coverage, the stand will be evaluated and classified with the age class of the sawtimber component; therefore, not all areas of seedtree harvests would change to the 0-to-39-year age class. Most stands receiving harvest treatments are 2-storied stands that would retain those characteristics; the overstory of these stands would consist primarily of older-aged western larch, Engelmann spruce, western white pine, and Douglas-fir; the second story would primarily be Engelmann spruce and Douglas-fir; and within 2 to 3 years, another story of western larch, western white pine, and Douglas-fir would become established.

The proposed action would mimic the effects of historic fire behavior; thus, openings for wildlife would be created, the potential of high-intensity wildfires would be reduced, and stands would regenerate toward desired future conditions.

Cumulative Effects

- ***Cumulative Effects of the Action and No-Action Alternatives to Covertypes and Age Classes***

The cumulative effects of timber-stand management on Stillwater Unit trend toward increasing seral covertypes in areas where recent forest-management activities have taken place.

In addition to the changes in covertype distributions from the proposed action, the stands involved in the stand-replacement fires of the 2001 Moose Fire have not been inventoried. Other timber sale projects have been initiated since the compilation of *STW 2008 SLI*; several are reflected in the *STW 2009 SLI*, but not all. The timber sale projects that have been designed or sold since the *STW 2006SLI* increase the amount of the western larch/Douglas-fir covertype over the analysis area and, subsequently, reduce the amount of area in the mixed-conifer and subalpine fir covertypes. Stillwater Unit has a precommercial-thinning program that often favors the retention of western larch and western white pine saplings; in some cases this changes a mixed-conifer covertype to a western larch or western white pine covertype.

INSECTS AND DISEASES

EXISTING CONDITION

Damage and mortality from insects and diseases are relatively minor in the project area. The Douglas-fir beetle (*Dendroctonus pseudotsugae*), western balsam bark beetle (*Dryocoetes confusus*), and mountain pine beetle (*Dendroctonus ponderosae*) exist at endemic levels. *Armillaria* root disease (*Armillaria ostoyae*), pini rot (*Phellinus pini*), Indian paint fungus (*Echinodontium tinctorium E. & E.*), Douglas-fir and larch dwarf mistletoe (*Arceuthobium douglasii and A. laricis*), and western gall rust (*Endocronartium harknessii*) all exist in the project area and are fairly common on Stillwater Unit. Pockets of trees in the project area have died in recent years from *Armillaria* root disease.

ENVIRONMENTAL EFFECTS

Direct and Indirect Effects

- ***Direct and Indirect Effects of the No-Action Alternative to Insects and Diseases***

  In general, insect populations would continue to rise or fall based on natural disturbances or climatic conditions. Diseases would continue to exist and may increase in susceptible species, resulting in mortality over time. As mortality in the project area occurs, loss of sawlog value due to stem decay would also occur.

- ***Direct and Indirect Effects of the Action Alternative to Insects and Diseases***

  Insect populations would continue to rise or fall based on natural disturbances or climatic conditions. The increased vigor of new regeneration and species being retained for seedtrees, primarily western larch and Douglas-fir, would improve long-term resistance to insect and disease problems. The mature trees retained in SMZs and other no-cut areas may blow down and maintain a small beetle population for several years.

CUMULATIVE EFFECTS

- ***Cumulative Effects of the No-Action Alternative to Insects and Diseases***

  The current trend in mortality, infection, and infestation levels in mature stands throughout Stillwater Unit would continue. Increases in insect infestations and disease infections could be expected in mature timber stands that are more densely stocked, low in vigor, and contain increased levels of blown-down timber. Managed stands would be less likely to be adversely impacted by insect infestations and disease outbreaks.

- ***Cumulative Effects of the Action Alternative to Insects and Diseases***

  The condition in the timber stands after harvesting would be less conducive to mortality and loss of value from insect and disease attacks since the proposed action would reduce stocking density and increase vigor. Western larch and Douglas-fir regeneration would be promoted and managed for the long-term, thereby improving resistance to insect and disease problems on those areas being harvested.

FIRE REGIMES AND FOREST FUELS

EXISTING CONDITIONS

Timber management, fire suppression, and the subsequent stand development have influenced the amount and distribution of fuels on these various stands in the project area. Stands in the project area have developed a high number of stems per acre and several levels of canopy. Under these forest conditions, fires could reach the upper canopy levels through the available ladder fuels, causing torching and, under some conditions, resulting in crown fires.

Fisher and Bradley (1987), Fire Ecology of Western Montana Habitat Types, described the fire ecology of habitat-type groups in Montana. The fire groups present in the Lupfer 3 project area are summarized in *TABLE C-4 – CHARACTERISTICS OF FIRE GROUPS OCCURRING IN THE LUPFER 3 PROJECT AREA*.

TABLE C-4 – CHARACTERISTICS OF FIRE GROUPS OCCURRING IN THE LUPFER 3 PROJECT AREA

	FIRE GROUP			
	6	**7**	**9**	**11**
Habitat type group	Moist Douglas-fir	Cool types dominated by lodgepole pine	Moist lower subalpine	Warm, moist types
Percent of project area	5.5	5.5	84	5
Fire return interval/ severity*	Frequent/low to moderate	Frequent/low to infrequent/high	Infrequent/mixed	Infrequent/severe
Average fuel loading (tons/acre)	12	18	25	25
Postharvest fuel loading (tons/acre)	10 to 15	10 to 15	10 to 15	10 to 15

Direct and Indirect Effects

- ***Direct and Indirect Effects of the No-Action Alternative to Fire Regimes and Forest Fuels***

  The stands would retain their current density, fuel load, and ladder fuels until a disturbance, man-caused or natural, occurs. Risk of torching and crown fires would remain high. As the trees in the more recently harvested areas grow, ladder fuels would increase.

- ***Direct and Indirect Effects of the Action Alternative to Fire Regimes and Forest Fuels***

  Although the potential for ignition would continue to exist following treatment, ladder fuels to crowns would be removed in the proposed harvest units and the fuel treatments would limit the fire intensity under most circumstances. The success of aerial and ground attacks on wildfires would likely be improved because potentially occurring fires would most likely burn through and remain in the understory rather than climbing into the overstory and moving through the upper canopy.

  Areas treated with a commercial-thin prescription would reduce the amount of trees and, thereby, reduce fuel loads. However, the connectivity of fuel and ladder fuels

may not be reduced. Additionally, thinning may result in increased air flow through the stand, which could promote the drying of fuels on the forest floor and an increased rate of spread for fires that do occur.

Slash left in the woods would meet the *State Hazard Reduction Law*. Slash would be piled at landings; these piles would be burned or otherwise disposed of within 2 years of their creation.

The thinning and removal of forest fuels, especially in the canopies, would be expected to decrease fire intensities, which would allow fire personnel to control these fires more easily. A high level of hazard reduction would remove 90 percent of the slash in areas adjacent to home sites.

Areas receiving regeneration treatments would retain approximately 8 to 15 tons of large woody debris per acre following site-preparation treatments.

Cumulative Effects

- ***Cumulative Effects of the No-Action Alternative to Fire Regimes and Forest Fuels***

  Forest succession and fire suppression would continue; however, with the levels of shade-tolerant species and down woody debris present and due to difficult terrain and limited access, a wildfire would be difficult to suppress and stand replacement could occur. Under this alternative, no changes would occur in fuel reductions except that which would occur with firewood cutting.

- ***Cumulative Effects of the Action Alternative to Fire Regimes and Forest Fuels***

  Natural stand development, past timber sales, and wildfires have created the current vegetative mosaic in this area. These mosaics break up the continuity of fuels and act as natural fire breaks. Maintaining an age-class mosaic in conjunction with fuel-treatment projects would reduce the potential of high-intensity wildfires.

  Due to the location of proposed harvest units, past harvest areas, reduced fuel loads, and the reduced amount of canopy, the success of aerial and ground attacks on wildfire would likely be improved.

NOXIOUS WEEDS

EXISTING CONDITIONS

A noxious weed is defined as a nonnative plant competing with desirable plants for nutrients, water, and sunlight and is harmful to agriculture, wildlife, forestry, and other beneficial uses, thus reducing the value and productivity of the land. Most noxious weeds are exotic species, originating in Eurasia (*Flathead County Weed Management Plan*). Montana has declared 15 weeds noxious; Flathead County has added 10 to their Noxious Weed Management list.

The following noxious weeds have been located on the project area and along access routes to the project area:

- spotted knapweed (*Centraurea maculosa*)

- oxeye daisy (*Chrysanthemum leucanthemem*)
- orange hawkweed (*Hieracium aurantiacum*)

Spotted knapweed and oxeye daisy are Category 1 weeds, which are established weeds with high disbursement; orange hawkweed is a Category 2 weed, which is established, but has a moderate disbursement level. These invading weed species are not new to Flathead County; new invading weed species would be listed as Category 3 weeds.

Spotted knapweed and orange hawkweed, the most widely distributed noxious weeds in the project area and on Stillwater State Forest, are found in areas where ground disturbances such as landings, skid trails, power lines, and roadsides occur.

ALTERNATIVE EFFECTS TO NOXIOUS WEEDS

Direct and Indirect Effects

- ***Direct and Indirect Effects of the No-Action Alternative to Noxious Weeds***

  Additional mineral soil would not be exposed and heavy tree canopies would continue to compete with weeds; therefore, the risk of additional establishment of weed populations would not increase. Currently, weed seed is introduced primarily from motorized vehicle use. Established infestations of noxious weeds are being addressed with an ongoing program of site-specific herbicide spraying along roads and in small areas of infestation.

- ***Direct and Indirect Effects of the Action Alternative to Noxious Weeds***

  The proposed activities would result in an increase in ground disturbance. Mechanized equipment and ground disturbance could increase or introduce noxious weeds along roads and throughout forested areas. Weed seeds are likely to be scattered throughout the forested areas, and the reduction of canopy and disturbance from the timber-harvesting activities are expected to provide the catalyst for spread. Mitigation measures would include:

  - washing equipment before entering the site,
  - sowing grass seed on roads after harvesting has been completed, and
  - applying herbicide applications along roadsides and on spots of weed outbreaks.

Cumulative Effects

- ***Cumulative Effects of the Action and No-Action Alternatives to Noxious Weeds***

  The open roads in the project area have traffic from dispersed recreation, timber-management activities, and other uses on a regular basis. These disturbances and illegal motorized use increase exposure to weed establishment. The weed-management program at Stillwater Unit, including cooperation with USFS and the weed departments of Flathead and Lincoln counties, has improved over time and more weed control is taking place.

APPENDIX D
WATERSHED AND HYDROLOGY ANALYSIS

INTRODUCTION

SEDIMENT DELIVERY

Timber harvesting and related activities, such as road construction, can lead to water-quality impacts by increasing the production and delivery of fine sediment to streams. Construction of roads, skid trails, and landings can generate and transfer substantial amounts of sediment through the removal of vegetation and exposure of bare soil. In addition, removal of vegetation near stream channels reduces the sediment-filtering capacity and may reduce channel stability and the amounts of large woody material. Large woody debris, a very important component of stream dynamics, creates natural sediment traps and energy dissipaters to reduce the velocity and erosiveness of stream flows.

WATER YIELD

Timber harvesting and associated activities can affect the timing, distribution, and amount of water yield in a harvested watershed. Water yields increase proportionately to the percentage of canopy removal, because removal of live trees reduces the amount of water transpired, leaving more water available for soil saturation and runoff. Canopy removal also decreases interception of rain and snow and alters snowpack distribution and snowmelt, which lead to further water-yield increases. Higher water yields may lead to increases in peak flows and peak-flow duration, which can result in accelerated streambank erosion and sediment deposition.

ANALYSIS METHODS

SEDIMENT DELIVERY

Existing conditions for water quality were analyzed using field site visits and visual inspection of the drainage features and road systems in the proposed project area. These analyses were conducted in 2009 by a DNRC hydrologist.

WATER YIELD

The water-yield increase for the watershed in the project area was determined using field review and aerial photo interpretation. Visual inspection of the runoff patterns and stream-channel stability in the proposed project area were used to assess the impacts of past management to water yield. Aerial-photo interpretation was used to determine the extent of past management in project-area watersheds.

ANALYSIS AREA

SEDIMENT DELIVERY

The analysis area for sediment delivery is the Lupfer 3 project area and proposed haul routes. Most of the proposed project area is located in the Lazy Creek watershed. Portions of the proposed project are also located in first-order headwater drainages to Stillwater River. Analysis will cover stream segments within these watersheds that may

be affected by the proposed project and all roads and upland sites that may contribute sediment to Lazy Creek or Stillwater River.

WATER YIELD

The analysis area for water yield is the Lazy Creek watershed and the first-order tributaries to Stillwater River found in the project area. Portions of the project area lie outside of these watersheds, but these areas have no defined stream channels and are very low risk for showing measurable or predictable changes in water yield. Annual precipitation in the project area is 20 to 30 inches per year.

EXISTING CONDITIONS

REGULATORY FRAMEWORK

- **Montana Surface Water-Quality Standards**

  According to *ARM 17.30.608 (1)(a)(iii)*, portions of the project area located in the Whitefish Lake drainage, including Lazy Creek, are classified as A-1. Among other criteria for A-1 waters, no increases are allowed above naturally occurring levels of sediment or turbidity. According to *ARM 17.30.608 (1)(a)*, portions of the project in the Stillwater River drainage are classified as B-1. Among other criteria for B-1 waters, no increases are allowed above naturally occurring levels of sediment, and minimal increases over natural turbidity. 'Naturally occurring', as defined by *ARM 17.30.602 (19)*, includes conditions or materials present during runoff from developed land where all reasonable land, soil, and water conservation practices (commonly called BMPs) have been applied. Reasonable practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses. These practices include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures. Appropriate practices may be applied before, during, or after completion of potentially impactive activities.

  Designated beneficial water uses in the project area include recreational use in the streams and wetlands. No surface water rights are in the proposed project area, and no fish species are present in the project-area streams.

- **Water Quality Limited Waterbodies**

  Lazy Creek is not currently listed as a water-quality-limited waterbody in the 2008 303(d) list. Portions of Stillwater River located downstream from the proposed project area are currently listed as a water-quality-limited waterbody in the 2008 303(d) list. The 303(d) list is compiled by DEQ as required by *Section 303(d)* of the *Federal Clean Water Act* and the *Environmental Protection Agency (EPA) Water Quality Planning and Management Regulations (40 CFR, Part 130)*. Under these laws, DEQ is required to identify waterbodies that do not fully meet water-quality standards or where beneficial uses are threatened or impaired. These waterbodies are then characterized as 'water quality limited' and, thus, are targeted for Total Maximum Daily Load (TMDL) development. The TMDL process is used to determine the total allowable amount of pollutants in a waterbody of watershed. Each contributing

source is allocated a portion of the allowable limit. These allocations are designed to achieve water-quality standards.

The *Montana Water Quality Act (MCA 75-5-701-705)* also directs the DEQ to assess the quality of state waters, ensure that sufficient and credible data exists to support a *303(d)* listing, and to develop TMDL for those waters identified as threatened or impaired. Under the Montana TMDL Law, new or expanded nonpoint-source activities affecting a listed waterbody may commence and continue provided they are conducted in accordance with all reasonable land, soil, and water conservation practices. TMDLs have not been completed for Stillwater River. DNRC will comply with the Law and interim guidance developed by DEQ through implementation of all reasonable soil and water conservation practices, including BMPs and *Forest Management Rules (ARM 36.11.401* through *36.11.450)*.

The current listed causes of impairment in Stillwater River are: alteration in streamside or littoral vegetative covers, unknown impairment, nitrates, phosphorus (total), and sedimentation/siltation. The probable sources for Stillwater River are: site clearance (land development), unknown sources, and loss of riparian habitat.

- **Montana Streamside Management Zone (SMZ) Law**

  By the definition in *ARM 36.11.312 (4)*, the majority of the streams in the project area are Class 2 streams. Where stream channels exist, they generally have flow for more than 6 months each year, but flow becomes subsurface and they do not contribute surface water to another body of water. No fish populations have been identified in the streams in the project area. The lower reaches of Lazy Creek do not receive surface flow from the streams in the project area, but support a population of eastern brook trout.

SEDIMENT DELIVERY

According to field reconnaissance in 2009, stream channels in the project area were found in stable condition. Project area streams were rated as B4 channels by a classification system developed by *Rosgen (1990)*. Channel types rated as 'B' are typically in the 2- to 4-percent gradient range and have a moderate degree of meander (sinuosity). Channel bed materials in B4 types are mainly gravel-sized material. Stream channels in the project area were found to be very stable with very little movement of bed materials. Where channel bottoms are scoured, channel materials are moss-covered. Where channel bottoms are not scoured, the channels are vegetated with grasses and forbs. No areas of down-cut channels were identified during field reconnaissance. Large woody debris was found in adequate supply to maintain channel function and stability. Some evidence of past harvesting activity was found in the small wetland stream running through Section 27 of the proposed project area. Where past logging had taken place in the riparian area, adequate levels of existing or potential downed woody material was found.

The existing road system in and leading to the proposed project area was reviewed for potential sources of sediment. The road system in the project area is mainly low to

moderate standard, but no evidence of sediment delivery to streams was identified. Road surfaces are stable and not delivering sediment to stream crossings. Much of the existing road system in the proposed project area meets applicable BMPs. Past project work has installed surface drainage on most of the existing road system, but isolated reaches of the existing road system are in need of spot BMP work to reduce the risk of erosion and sediment delivery.

WATER YIELD

Past activities in and around the proposed project area include timber management, agriculture, and homesite development. These activities have led to reductions in forest canopy cover and the construction of roads. Following field reconnaissance of the proposed project area, determination was made that a detailed water-yield analysis would not be necessary in the proposed project area for the reasons stated below. The water-yield impacts of all roads were considered in the following assessments.

The proposed project area was last managed in the 1990s. Past timber-management activities have had no visible effect on the stream channels located in the proposed project area except for the existing stream crossings. Several small stream channels deliver surface water to wetlands during spring runoff. These channels have a bankfull width of approximately 2 to 3 feet and are well vegetated with an array of grasses, forbs, and shrubs. In most cases, these channels have no scoured bottom. They meet the definition of a creek due to the presence of a definable bank to confine and conduct water. Field reconnaissance of the proposed project area showed that stream channels, where they exist, are stable and not actively eroding. Channel bottoms are vegetated and very stable. Because of the intermittent and discontinuous nature of the streams in the project area, the stable nature of the channels, and the ability of wetlands to store peaks in runoff, the proposed project area is a low risk for impacts to water yield, and a detailed analysis of watershed cumulative effects is not necessary for this parcel (*ARM 36.11.423*).

ENVIRONMENTAL EFFECTS

DIRECT AND INDIRECT EFFECTS

- ***Direct and Indirect Effects of the No-Action Alternative***

  Direct and indirect effects of the No-Action Alternative would be similar to the conditions described under the existing conditions for water quality and water yield. The water quality and water yield would be unaffected by this alternative, and the streams in the proposed project area would continue to be affected by natural and preexisting conditions.

- ***Direct and Indirect Effects of the Action Alternative***

  - **Sediment Delivery**

    Log trucks would haul timber over a maximum of 10 miles of existing roads. Most of these roads have been used in the past 20 years and meet applicable BMPs. Erosion control and BMPs would be improved where necessary. In some cases, the

addition of erosion-control measures may increase the risk of sediment delivery in the short term by creating bare soil. However, as these sites revegetate, the long-term risk of sedimentation to a stream would be reduced to levels lower than the existing condition.

No new stream crossings are proposed with this alternative, and no existing stream crossings would be replaced. Risk of sediment delivery may increase for a 2- to 3-year period following hauling activity due to the truck traffic disturbing vegetated road surfaces. This risk of sediment delivery is low due to the presence of surface-drainage features on the road systems. Cut slopes and fill slopes on existing roads would remain vegetated, and risk of sediment delivery would be the same as the existing condition.

The Action Alternative would have a very low risk of sediment delivery to streams as a result of proposed timber-harvesting activities. Harvesting activities are proposed on approximately 20 acres within designated SMZs. These harvesting activities would retain at least 50 percent of the trees within the SMZ, follow all requirements of the *SMZ Law* and *ARM 36.11.425* through *36.11.427*, and have a low risk of affecting the recruitment of large woody material to project-area streams. The *SMZ Law*, *ARM 36.11.425* through *36.11.427*, and all applicable BMPs would be applied to all harvesting activities, which would minimize the risk of sediment delivery to draws and streams.

- **Water Yield**

  The Action Alternative would treat approximately 98 acres of timber with a commercial thin or an overstory removal, and approximately 233 acres would be treated with a seedtree. This level of harvesting would not be sufficient to generate measurable increases in water yield in any streams located in or near this portion of the project area or cause channel instability. The stability of channels and the buffering capacity of the wetlands throughout and below the project area would be sufficient to handle these increases without measurable change. As a result, no direct or indirect impacts to water yield are expected in the project area as a result of the proposed Action Alternative.

CUMULATIVE EFFECTS

- ***Cumulative Effects of the No-Action Alternative***

  Cumulative effects of the No-Action Alternative on water quality and water yield would be similar to the situations described in the existing conditions. The water quality and water yield would be unaffected. Streams and draws in the proposed project area would continue to be affected by natural and preexisting conditions.

- ***Cumulative Effects of the Action Alternative***

  - **Sediment Delivery**

    Adverse cumulative effects to water quality are not expected in the project area. Risk of sediment delivery would be slightly higher than current levels. Log

hauling on existing roads would create some bare soil on the road surface. This would increase the risk of erosion on these sites where vegetation was lost. Ground-based harvesting activities may also increase the risk of erosion by exposing bare soil on skid trails and landings. This risk would be elevated for 2 to 3 years after project completion until sites begin to revegetate. The risk of increasing sediment loads is very small since all proposed activities are located well away from a stream or draw.

Harvesting of trees within an SMZ would have a low risk of adverse cumulative effects to downed woody material in project-area streams. Tree retention requirements of the *SMZ Law* and *Forest Management Rules* would ensure a future supply of woody material to the creeks.

None of the cumulative impacts described above are expected to adversely affect downstream beneficial uses. All activities would comply with applicable laws, *ARM 36.11.423*, and *36.11.425* through *36.11.427*.

- **Water Yield**

Adverse cumulative impacts to stream channels and downstream waters in and near the proposed project area are not expected as a result of the proposed project for the following reasons: 1) the limited area and selective nature of the proposal would not have a measurable effect on the small, groundwater-fed watersheds in this parcel, 2) the high stability of stream channels, where they occur, show that the small watersheds are not prone to impacts of water-yield increases, and 3) the presence of ponds and wetlands within and below the proposed project area act as storage of increases in water yield.

APPENDIX E
WILDLIFE ANALYSIS

INTRODUCTION

This analysis is designed to disclose the existing condition of the wildlife resources and display the anticipated effects that may result from each alternative of this proposal. DNRC *Forest Management Rules* and comments received during initial scoping led to the following list of issues:

- Timber harvesting could reduce forested cover, which could reduce the amount of mature forested habitats available to those species that rely on these habitats and/or decrease the ability of some wildlife species to move through the landscape, which could alter their ability to use the area and or successfully reproduce.
- Timber harvesting could reduce snags and coarse woody debris densities, leading to a decline in the quality of habitat for those wildlife species that are dependent on these resources, which could alter their survival and/or reproductive ability.
- Timber harvesting and associated activities could alter cover, increase access, and reduce secure areas, which could adversely affect grizzly bears by displacing grizzly bears from important habitats and/or increasing risk to bears of human-caused mortality.
- Timber harvesting and associated activities could remove canopy closure or alter stand conditions, which could result in the reduction or modification of habitat components, leading to a decreased ability for the area to support Canada lynx.
- Timber harvesting and associated activities could displace gray wolves from important habitats, particularly denning and rendezvous sites, and/or alter prey availability.
- Timber harvesting and associated activities could reduce bald eagle nesting and perching habitats and/or disturb nesting bald eagles.
- Timber harvesting and associated activities could reduce fisher habitat availability and quality by reducing canopy cover, snag density, and the amount of coarse woody debris.
- Timber harvesting and associated activities could remove canopy cover and snags needed by pileated woodpeckers to forage and nest and/or displace nesting pileated woodpeckers from active nests, resulting in increased mortality to pileated woodpecker chicks.

The following sections disclose the anticipated direct, indirect, and cumulative effects to these wildlife resources in the analysis area from the proposed actions. Past and current activities on all ownerships in each analysis area, as well as planned future agency actions, have been taken into account for the cumulative-effects analysis.

ANALYSIS AREA

The discussions of existing conditions and environmental effects will focus on 2 different scales. The first will be the 'project area', which consists of approximately 2,251 acres of DNRC-managed lands in Sections 27, 28, 34, and 35 in T32N, R23W. The second scale or the 'analysis area' relates to the surrounding landscape for assessing cumulative effects to wildlife species

and their habitats. The scales of these analysis areas vary according to the species being discussed, but generally approximate the size of the home range of the discussed species.

ANALYSIS METHODS

DNRC attempts to promote biodiversity by taking a 'coarse-filter approach', which favors an appropriate mix of stand structures and compositions on state lands (*ARM 36.11.404*). Appropriate stand structures are based on ecological characteristics (e.g., landtype, habitat type, disturbance regime, unique characteristics). A coarse-filter approach assumes that if landscape patterns and processes are maintained similar to those with which the species evolved, the full complement of species would persist and biodiversity would be maintained. This coarse-filter approach supports diverse wildlife populations by managing for a variety of forest structures and compositions that approximate historic conditions across the landscape. DNRC cannot assure that the coarse-filter approach will adequately address the full range of biodiversity; therefore, DNRC also employs a 'fine-filter' approach for threatened, endangered, and sensitive species (*ARM 36.11.406*). The fine-filter approach focuses on a single species' habitat requirements.

To assess the existing condition of the proposed project area and surrounding landscape, a variety of techniques were used. Field visits, scientific literature, SLI data, aerial photographs, Montana Natural Heritage Program (MNHP) data, and consultations with other professionals provided information for the following discussion and effects analysis. Specialized methodologies are discussed under the species in which they occur. Species were dismissed from further analysis if habitat did not exist in the project area or would not be modified by any alternative.

RELEVANT AGREEMENTS, LAWS, PLANS, RULES, AND REGULATIONS

Various legal documents dictate management criteria for the management of wildlife and their habitats on state lands. The documents most pertinent to this project include: *DNRC Forest Management Rule*s, the *Endangered Species Act*, the *Migratory Bird Treaty Act*, and the *Bald and Golden Eagle Protection Act*.

COARSE-FILTER WILDLIFE ANALYSIS

Of the 108 mammal species found in Montana, 74 are suspected or known to occur in Flathead County (*Foresman 2001*). The majority of terrestrial vertebrates that were present at the time of European settlement likely still occur in the vicinity of the proposed project area. Six amphibian and 7 reptile species have also been documented in Flathead County (*Maxell et al. 2003*) and at least 65 species of birds have been documented in the vicinity in the last 10 years (*Lenard et al. 2003*). Terrestrial species that rely on special habitat elements, such as white bark pine (*Pinus albicaulis*), western white pine (*Pinus monticola*), or burned areas, may not be present or may occur in lower abundance due to the decline of these elements across the landscape. Over time, due to fire suppression, tree densities have increased and shade-tolerant species, such as Douglas-fir and grand fir, have become more prevalent than they were historically. These departures probably benefit wildlife species that rely on shade-tolerant tree species and/or closed-canopy habitats, while negatively affecting species that rely on shade-intolerant tree species and/or open habitats. However, in the vicinity of the project area, the forests are a

mosaic of mature stands, which benefit species relying on mature forests, and regenerating forests, which benefit wildlife species that use early seral stages either exclusively or seasonally. Past timber harvesting that led to the early seral stages has likely reduced the quality and quantity of snags and coarse woody debris compared to historical conditions, reducing habitat for those wildlife species that require these components.

MATURE FORESTED HABITATS AND LANDSCAPE CONNECTIVITY

Issue: Timber harvesting could reduce forested cover, which could reduce the amount of mature forested habitats available to those species that rely on these habitats and/or decrease the ability of some wildlife species to move through the landscape, which could alter their ability to use the area and or successfully reproduce.

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 nonforested areas and other openings; connectivity under historical fire regimes likely remained relatively high as fire differentially burned various habitats across the landscape.

Analysis Area

Direct and indirect effects were analyzed on the project area. Cumulative effects were analyzed on the contiguous Stillwater State Forest. This scale of analysis would be large enough to support a diversity of species that use mature forested habitats and/or require connected forested habitats.

Analysis Methods

Mature forested habitats and landscape connectivity were assessed using field evaluations, aerial-photograph interpretation, and Geographical Information System (GIS) analysis. Factors considered in the analysis include the level of timber harvesting, amount of densely forested habitats, and connectivity.

Existing Environment

The project area currently contains approximately 1,715 acres of mature stands (100-plus years in age) of Douglas-fir/western larch and mixed-conifer stands that have a reasonably closed canopy. These stands are interspersed with a variety of Douglas-fir/western larch and mixed-conifer stands of varying ages and stocking densities. Currently, forested areas cover most of the project area, facilitating some use by those species requiring connected forested conditions and/or forested interior habitats. However, connectivity in the project area has been reduced with past timber harvesting and the network of open roads.

The network of open roads in the cumulative-effects analysis area, coupled with timber management on roughly 21,936 acres in the past 40 years, has reduced some of the landscape-level connectivity. Ongoing harvesting associated with the Duck-to-Dog, Beaver/Swift/Skyles, Chicken-Antice, Southeast Stryker Ridge, and Olney Urban Interface timber sale projects would continue reducing forested habitats and/or altering connectivity. Across the cumulative-effects analysis area, landscape connectivity has largely been retained and considerable forested, interior habitats exist. Considerable amounts (approximately 38,729 acres) of mature western larch/Douglas fir, subalpine fir, and mixed-conifer habitats that have a reasonably closed canopy exist across the cumulative-effects analysis area.

Environmental Effects

- ***Direct and Indirect Effects of the No-Action Alternative on Mature Forested Habitats and Connectivity***

  Forest conditions would continue to age, and denser stands of shade-tolerant tree species with high amounts of canopy cover would gradually develop. Largely, no appreciable changes to forest age, the distribution of dense forested cover, or landscape connectivity would be anticipated. No changes in wildlife use would be expected; wildlife favoring dense stands of shade-tolerant tree species would benefit, while those requiring conditions likely found under natural disturbance regimes would continue to be underrepresented. Habitat for forested interior species and old-stand-associated species, such as American marten, northern goshawk, and pileated woodpecker, would likely improve with this alternative; however, western larch and western white pine, the preferred snag species, could decline in abundance over time. Thus, no direct or indirect effects to mature forested habitats and connectivity would be expected that could affect wildlife in the project area since: 1) no changes to existing stands would occur; 2) no appreciable changes to forest age, the distribution of dense forested cover, or landscape connectivity would be anticipated; and 3) no changes to wildlife use would be expected.

- ***Direct and Indirect Effects of the Action Alternative on Mature Forested Habitats and Connectivity***

  Approximately 331 acres of western larch/Douglas-fir and mixed-conifer stands would be harvested, including roughly 323 acres of mature stands with a closed canopy. Roughly 219 of these acres of mature, forested habitats would receive a regeneration-type treatment, which would reduce habitat for those species relying on mature, closed-canopy forested habitats. The remaining 104 acres of mature, forested habitats would receive a commercial-thin type treatment, which again reduces habitat for species needing a mature, closed-canopied stand. However, these stands could provide lower-quality habitats for those species requiring mature, forested conditions more quickly than some stands receiving regeneration-type treatments due to the anticipated retention levels. Overall, the resultant changes in stand age and density would reduce habitats for species associated with older stands, such as American marten and pileated woodpecker, which benefited from the increasing stand ages and densities caused, in part, by modern fire suppression. Minor changes to landscape connectivity could alter animal movements. No changes to mature forested habitats or landscape connectivity would be anticipated with the proposed precommercial thinning. In general, under this alternative, habitat conditions would

improve for species adapted to the more-open forest conditions, while reducing habitat quality for species that prefer dense, mature forest conditions. Thus, minor adverse direct and indirect effects to mature forested habitats and connectivity would be expected that could affect wildlife in the project area since: 1) harvesting would revert succession on roughly 323 acres of mature forested stands, reducing stand age and the amount of forested cover; 2) minor changes to landscape connectivity would occur; and 3) some changes to wildlife use would be expected.

- ***Cumulative Effects of the No-Action Alternative on Mature Forested Habitats and Connectivity***

  Habitats in the cumulative-effects analysis area are a mosaic of habitat types and age classes. Past harvesting has reduced the amount of mature, forested habitats; however, continued successional advances in the cumulative-effects analysis area is advancing stands towards mature forests. This alternative would continue to contribute to the mature forested stands in the cumulative-effects analysis area. Losses of individuals and pockets of trees would not likely alter the overall age or landscape connectivity. Ongoing activities would continue reducing forested habitats and/or altering connectivity; proposed activities could alter forested habitats and connectivity depending on the alternative selected. Under this alternative, continued use of the analysis area by species favoring dense stands of shade-tolerant tree species and those species requiring larger areas of mature forests would be expected. Habitat for forested-interior species and old-stand-associated species, such as the American marten, northern goshawk, and pileated woodpecker, would likely persist. Thus, no cumulative effects to mature forested habitats and connectivity would be expected that could affect wildlife in the cumulative-effects analysis area since: 1) no changes to existing stands would occur; 2) no further changes to forest age, the distribution of dense forested cover, or landscape connectivity would be anticipated; and 3) no changes to wildlife use would be expected.

- ***Cumulative Effects of the Action Alternative on Mature Forested Habitats and Connectivity***

  Despite advancing succession leading to more mature forested habitats, past harvesting has reduced the amount of mature, forested habitats across Stillwater State Forest. Reductions in mature, forested habitats associated with this alternative would be additive to losses associated with past harvesting activities and ongoing activities. Across the cumulative-effects analysis area, forested habitats would still exist and landscape connectivity would largely persist. Habitats for forested interior species and old-stand-associated species, such as the American marten, northern goshawk, and pileated woodpecker, would be expected to be reduced; however, continued use of the analysis area by these species would be expected. Thus, minor adverse cumulative effects to mature forested habitats and connectivity would be expected that could affect wildlife in the cumulative-effects analysis area since:
  1) harvesting would remove mature stands, further reducing the amount of forested cover in the cumulative-effects analysis area; 2) no appreciable changes to landscape connectivity would occur; and 3) some changes to wildlife use would be expected.

SNAGS AND COARSE WOODY DEBRIS

Issue: Timber harvesting could reduce snags and coarse woody debris densities, leading to a decline in the quality of habitat for those wildlife species that are dependent on these resources, which could alter their survival and/or reproductive ability.

Introduction

Snags and coarse woody debris are important components of forested ecosystems. The following are 5 primary functions of deadwood in the forested ecosystems: 1) increase structural diversity, 2) alter the canopy microenvironment, 3) promote biological diversity, 4) provide critical habitat for wildlife, and 5) act as a storehouse for nutrient and organic matter recycling agents (*Parks and Shaw 1996*).

Snags and defective trees (e.g. partially dead, spiked top, broken top) are used by a wide variety of wildlife species for nesting, denning, roosting, feeding, and cover. Snags and defective trees may be the most valuable individual component of Northern Rocky Mountain forests for wildlife species (*Hejl and Woods 1991*). The quantity, quality, and distribution of snags affect the presence and population size of many of these wildlife species relying on these resources. Snags provide foraging sites for insectivorous species and offer opportunities for primary cavity-nesting species to excavate nests. The cavities created by primary excavators (i.e. woodpeckers) also provide habitat for secondary cavity users, including other birds and small and mid-sized mammals. Snags and defective trees can also provide nesting sites for secondary cavity users where cavities are formed by broken tops and fallen limbs. Larger, taller snags tend to provide nesting sites, while shorter snags and stumps tend to provide feeding sites (*Bull et al. 1997*). Many species that use smaller-diameter snags will also use large snags; however, the opposite is not true. Additionally, snags in early stages of decay are often used more for feeding substrates, while mid-level decay provides opportunities for cavity excavation *(Schepps et al. 1999*). Some species of trees decay at slower rates than others, thereby providing habitat for longer periods of time. For example, western larch, western white pine, and ponderosa pine are harder woods that decay less rapidly than Douglas-fir, subalpine fir, or Engelmann spruce trees. Typically, older-aged stands will have greater numbers of large snags. Finally, snag densities are another important aspect of habitat value for cavity-nesting birds, as many of these species tend to nest in areas where snag densities are high, using one snag for nesting, but having others nearby for foraging or roosting opportunities.

Meanwhile, coarse woody debris provides food sources, areas with stable temperatures and moisture, shelter from the environment, lookout areas, and food-storage sites for several wildlife species. Several mammals rely on deadwood for survival and reproduction. The size, length, decay, and distribution of woody debris affect their capacity to meet these life requisites. Logs less than 6 feet in length tend to dry out and provide limited habitat for wildlife species. Single, scattered downed trees could provide lookout and travel sites for squirrels or access under the snow for small mammals and weasels, while log piles provide foraging sites for weasels and denning sites for lynx.

Analysis Area

Direct and indirect effects were analyzed on the project area. Cumulative effects were analyzed on the contiguous Stillwater State Forest. This scale of analysis would be large enough to support a diversity of species that use coarse woody debris resources, from birds to small mammals and meso-carnivores.

Analysis Methods

Snags and coarse woody debris were assessed during site visits and while reviewing past DNRC harvesting information. Factors considered in the analysis include the level of harvesting, number of snags and coarse woody debris, and the risk level of firewood harvesting.

Existing Environment

During field visits to the project area, 1 to 7 large (greater than 21 inches diameter at breast height [dbh]) snags per acre were observed, which were largely dominated by western larch and Douglas-fir. Large snags (greater than 21 inches dbh) were more abundant in the older stands and away from open roads where firewood cutting often occurs. Likewise, coarse woody debris is typically abundant in these older stands, with much of the volume coming from larger pieces of downed wood (greater than 10 inches dbh). Smaller-sized snags (15 to 21 inches dbh) were also variable in the project area, with a similar species mixture. Generally, evidence of snag use for feeding and/or cavity building was observed across the project area. Coarse woody debris levels were also variable across the project area, with a range of 4 to 10 tons per acre. Elsewhere in the project area, areas that have been harvested in the past decade or so typically have a couple of snags per acre and abundant coarse woody debris. The network of open roads in portions of the project area has facilitated some firewood gathering, which has affected snag and coarse woody debris levels in the vicinity of those open roads.

Past harvesting in the cumulative-effects analysis area has reduced the availability of snags and snag recruits while increasing coarse woody debris levels; however, minimum-retention thresholds for each of these resources have been retained in the recent past. Ongoing harvesting associated with the Duck-to-Dog, Olney Urban Interface, Chicken-Antice, Southeast Stryker Ridge, and Beaver/Swift/Skyles timber sale projects could further alter snags, snag recruits, and coarse woody debris. Snags and coarse woody debris are frequently collected for firewood, especially near open roads, and considerable firewood gathering occurs in the cumulative-effects analysis area.

Environmental Effects

- ***Direct and Indirect Effects of the No-Action Alternative on Snags and Coarse Woody Debris***

  No direct changes in the deadwood resources would be expected. Existing snags would continue to provide wildlife habitats, and new snags would be recruited as trees die. However, in the long-term, densities of shade-intolerant trees and resulting snags could decline as these species are replaced by increasing numbers of shade-tolerant species. Shade-intolerant species tend to provide important habitats, such as nesting structures and foraging habitats, for cavity-nesting birds. Coarse woody debris would persist without other disturbances influencing its distribution and quality. Continued decay and decline in

existing snags and trees would continue to contribute to the coarse woody debris in the project area. Thus, negligible direct and indirect effects would be anticipated to snags, and coarse woody debris would be expected to affect wildlife species requiring these habitat attributes since: 1) no harvesting would occur that would alter present or future snag or coarse woody debris concentrations, and 2) no changes to human access for firewood gathering would occur.

- ***Direct and Indirect Effects of the Action Alternative on Snags and Coarse Woody Debris***

  Present and future snags and coarse woody debris would be reduced due to timber harvesting on 331 acres in the project area. Portions of the project area adjacent to open roads or in stands that lack larger snags would not see appreciable changes in the availability of large snags and/or coarse woody debris since these attributes currently are somewhat limited in those areas. Prescriptions call for a minimum of 2 large snags per acre (greater than 21 inches dbh where they exist, otherwise the next largest size class), 2 large snag recruits per acre (greater than 21 inches dbh where they exist, otherwise the next largest size class; additional large-diameter recruitment trees may be left if sufficient large snags are not present), and 10 to 15 tons of coarse woody debris per acre would be retained in the proposed harvest areas. However, some snags and/or recruit trees could be lost due to safety and operational concerns, but replacements would be identified in order to stay in compliance with *ARM 36.11.411*. Future snag quality in the harvested areas would be enhanced with proposed silvicultural prescriptions that should lead to the reestablishment of shade-intolerant species that tend to provide important habitats, such as long-lasting nesting structures and foraging habitats, for cavity nesting birds. Given the amounts, range of variability in sizes, and decay classes of snags and coarse woody debris present in the project area, prescriptions aiming to maintain a variety of these resources would benefit the suite of species that rely on these habitat components. No changes in human access would occur and, therefore, no changes to the potential risk for snag and coarse woody debris loss due to firewood gathering would occur. Thus, minor adverse direct and indirect effects to snags and coarse woody debris would be anticipated that would affect wildlife species requiring these habitat attributes since: 1) harvesting would reduce snags, snag recruitment trees, and coarse woody debris and 2) no changes to human access for firewood gathering would occur.

- ***Cumulative Effects of the No-Action Alternative on Snags and Coarse Woody Debris***

  Snags and coarse woody debris would not be altered in the project area. The species composition of future snags could be altered with changing species composition in the stands due to advances in succession. Snags have been retained during much of the past harvesting across the cumulative-effects analysis area, with greater numbers away from open roads and reduced numbers near these open roads. Snags and snag recruits have been retained with recent harvesting across the cumulative-effects analysis area, are being retained with the ongoing projects, and would be retained with the proposed projects should an action alternative be selected. Firewood and other forest-product gathering have reduced deadwood resources in the vicinity of the open roads. Wildlife species in the cumulative-effects analysis area that rely on snags and coarse woody debris would be expected to persist. Thus, no cumulative effects to snags and coarse woody debris would be anticipated

since: 1) no further harvesting would occur, 2) changes in the numbers of snags would be negligible, and 3) no change in the level of firewood gathering would be expected.

- ***Cumulative Effects of the Action Alternative on Snags and Coarse Woody Debris***

  Some snags and coarse woody debris could be removed from the project area, while others may be recruited. Across the cumulative-effects analysis area, snags and coarse woody debris are common, and past harvesting activities have placed an emphasis on the retention of these landscape attributes. The losses of snags and coarse woody debris associated with this alternative would be additive to the losses associated with past harvesting, ongoing harvesting, as well as ongoing firewood gathering. However, the project requirements to retain a minimum of 2 large snags per acre (greater than 21 inches dbh where they exist, otherwise the next largest size class), 2 large snag recruits per acre (greater than 21 inches dbh where they exist, otherwise the next largest size class), and 10 to 15 tons of coarse woody debris per acre would mitigate additional cumulative effects associated with this project. Due to a lack of snags, the risk of firewood gathering, or higher removal requirements for fire protection purposes, some areas would not meet these requirements. No change in human access would be anticipated; thus, no changes to the potential loss of snags and coarse woody debris to firewood gathering would occur. Wildlife species that rely on snags and coarse woody debris in the cumulative-effects analysis area would be expected to persist at similar levels, albeit slightly lower numbers in proposed units following treatment. Thus, minor adverse effects to wildlife species requiring snags and coarse woody debris would be anticipated in the cumulative-effects analysis area since: 1) a slight, but cumulative amount of the cumulative-effects analysis area would be harvested, reducing snags and snag-recruit trees while increasing coarse woody debris levels, 2) no changes in access for the general public and associated firewood gathering would be anticipated, and 3) the representation of shade-intolerant species that could become snags in the long-term would be slightly increased.

FINE-FILTER ANALYSIS

In the fine-filter analysis, individual species of concern are evaluated. These species include wildlife species listed as threatened or endangered under the *Endangered Species Act of 1973*, species listed as sensitive by DNRC, and species managed as big game by DFWP. *TABLE E-1 – FINE FILTER* summarizes how each species considered was included in the following analysis or removed from further analysis because suitable habitat does not occur in the project area or proposed activities would not affect their required habitat components.

TABLE E-1 – FINE FILTER. *Status of species considered in the fine-filter analysis for this proposed project.*

SPECIES/HABITAT	DETERMINATION – BASIS
Threatened and Endangered Species	
Grizzly bear (*Ursus arctos*) Habitat: Recovery areas, security from human activity	Portions of the project area are within the Lazy Creek Subunit of the North Continental Divide Ecosystem (NCDE) while the remaining portions are within '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*).
Canada lynx (*Felis lynx*) Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zone	Potential Canada lynx habitats occur in the project area.
Sensitive Species	
Bald eagle (*Haliaeetus leucocephalus*) Habitat: Late-successional forest more than 1 mile from open water	Portions of the project area are within the home ranges of 3 bald eagle territories.
Black-backed woodpecker (*Picoides arcticus*) Habitat: Mature to old burned or beetle-infested forest	No 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	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	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	No suitable lake habitats occur in the project area. Thus, no direct, indirect or cumulative effects to common loons would be expected to occur as a result of either alternative.
Fisher (*Martes pennanti*) Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian	Potential fisher habitats occur in the project area.

Flammulated owl (*Otus flammeolus*) Habitat: Late-successional ponderosa pine and Douglas-fir forest	No suitable dry ponderosa pine stands exist in the project area. Thus, no direct, indirect, or cumulative effects to flammulated owls would be expected to occur as a result of either alternative.
Gray Wolf (*Canis lupus*) Habitat: Ample big game populations, security from human activities	Portions of the project area are within the annual home range of the Lazy Creek wolf pack.
Harlequin duck (*Histrionicus histrionicus*) Habitat: White-water streams, boulder and cobble substrates	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.
Northern bog lemming (*Synaptomys borealis*) Habitat: Sphagnum meadows, bogs, fens with thick moss mats	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	No suitable cliffs/rock outcrops occur in the 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	Mature western larch/Douglas-fir and mixed-conifer habitats exist in the project area.
Townsend's big-eared bat (*Plecotus townsendii*) Habitat: Caves, caverns, old mines	No suitable caves or mine tunnels are known to occur in the project area. Thus, no direct, indirect, or cumulative effects to Townsend's big-eared bats would be anticipated as a result of either alternative.
Big Game Species	
Big game winter range	No deer or elk winter range exists in the proposed project area. Thus, no direct, indirect, or cumulative effects would be anticipated as a result of either alternative.
Elk security habitat	Elk security habitats do not exist in the project area. Thus, no direct, indirect, or cumulative effects to elk security cover would be anticipated as a result of either alternative.

THREATENED AND ENDANGERED SPECIES

GRIZZLY BEAR

Issue: Timber harvesting and associated activities could alter cover, increase access, and reduce secure areas, which could adversely affect grizzly bears by displacing grizzly bears 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. 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 access to humans 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 their risk of being shot illegally. 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 project area. Cumulative effects were analyzed on a 52,394-acre area that includes the 34,560-acre Lazy Creek Grizzly Bear Subunit of the NDCE and the 17,834-acre portion of the 'occupied habitat' area south of the Lazy Creek Subunit that is east and north of U.S. Highway 93 and west of Whitefish Lake. This combined area exceeds the size of the home range of a female grizzly bear.

Analysis Methods

Field evaluations, aerial photograph interpretation, and GIS analysis were the basis for this analysis. A moving-windows analysis (*Ake 1994*) was conducted to determine open-road densities and security core within the Lazy Creek Grizzly Bear Subunit. Results of the analysis identified areas that exceeded an open-road density of 1 mile per square mile and areas that are free of motorized human access that could contribute to security habitats. Security habitats are areas that are greater than 0.3 mile (500 meters) from any open, restricted, or high-use roads and trails and meet a minimum size of 2,500 acres. In the 'occupied habitat' portion of the cumulative-effects analysis area, open-road densities were calculated using a simple linear calculation method. Factors considered in the analysis include the amount of the area with open-road densities greater than 1 mile per square mile, the amount of available security habitat, and the availability of timbered stands for hiding cover.

Existing Environment

Roughly half of the project area (1,133 acres) occurs within the Lazy Creek Grizzly Bear Subunit of the NCDE Recovery Area (*U.S. Fish and Wildlife Service [USFWS] 1993*) and the other half

(1,117 acres) of the project area is outside of the NCDE Recovery Area, but within 'occupied habitat' as mapped by grizzly bear researchers and managers to address increased sightings and encounters of grizzly bears in habitats outside of recovery zones (*Wittinger, 2002*). Grizzly bears generally use different habitats relative to season. The project area primarily provides habitat for grizzly bears in the spring, due to the lower elevations and the presence of springs, seeps, meadows, and riparian areas in which vegetation greens up earlier in the spring. Summer or autumn habitat values are fairly low in the area.

Managing human access is a major factor in management for grizzly bear habitat. Open-road densities in the state-managed portion of the subunit (64.4 percent) are slightly below the 1996 thresholds; open-road densities could increase above the 1996 threshold (64.6 percent) with the Southeast Stryker Ridge Timber Sale Project, pending approval of the Alternative Practice by the Forest Management Bureau Chief. Open-road densities in the 'occupied habitat' portion of the cumulative-effects analysis area are also fairly high, with between 2.7 and 3.2 miles per square mile (simple linear calculation), depending on the class of those roads on private ownerships. No security core exists in the project area, and security habitat is fairly limited on DNRC-managed lands in the subunit due to the existing network of open roads. Currently, security core comprises 19 percent of the DNRC-managed lands in the Lazy Creek Grizzly Bear Subunit, which is the same as the baseline value from 1996. Hiding cover exists in both the project area and Lazy Creek Subunit. The Olney-Urban Interface, Beaver/Swift/Skyles, and Southeast Stryker Ridge timber sale projects are ongoing on DNRC-managed lands in the cumulative-effects analysis area that are altering grizzly bear habitats and/or human-disturbance levels in the cumulative-effects analysis area.

ENVIRONMENTAL EFFECTS

- ***Direct and Indirect Effects of the No-Action Alternative on Grizzly Bears***

  No direct effects to grizzly bears would be expected. No changes to the level of disturbance to grizzly bears would be anticipated. Foraging opportunities might decline due to the lack of diversity in habitat such as forest edge and younger age-class stands. No changes in security core, open-road densities, or hiding cover would be anticipated. Thus, 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, and 4) no changes in long-term open-road densities would be anticipated.

- ***Direct and Indirect Effects of the Action Alternative on Grizzly Bears***

  This alternative 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 impacts to grizzly bears. All of the proposed units in the recovery zone along with 2 units in the 'occupied habitat' area would likely be harvested during the denning period, which would result in no direct effects to grizzly bears. Short

duration (less than 30 days annually), intensive use of restricted roads accessing Units 1, 2, 3, and 7 during the nondenning period for road construction, maintenance, or timber harvesting is possible, which could disturb bears, but would not cause long-term avoidance or reduced reproduction and survival. Some of the 5 remaining units (approximately 72 acres) would not be seasonally restricted; harvesting would likely have minor direct effects if conducted during the nondenning period and no direct effects to grizzly bears would be anticipated if harvesting occurred during the denning period. Overall, grizzly bears may use the project area for much of the nondenning period, but spring use would be the most likely. Disturbance and displacement from this alternative could disturb grizzly bears throughout the nondenning period when activities are active; efforts to concentrate activities during the denning period or during the summer or fall periods while avoiding the spring period would have the lowest potential for grizzly bear disturbance or displacement.

Hiding cover, defined as vegetation that will hide 90 percent of a grizzly bear at a distance of 200 feet, would be reduced or modified on much of the 331 acres in the proposed commercial harvest units and the 40 acres in the proposed precommercial thinning units in the short-term; however, cover would improve with time as shrub and tree regeneration proceeds. Hiding cover is especially important along open roads and in areas that receive human disturbance. Some hiding cover in the form of brush, shrubs, and submerchantable trees would be retained along open roads where feasible, and hiding cover throughout the harvested areas would be expected to regenerate in 5 to 10 years. Security core would not be entered or altered with this alternative.

Minor reductions in motorized access for the general public would occur with the proposed relocation of the closure in Section 34. Approximately 1.7 miles of temporary road would be constructed, which could reduce habitat quality for grizzly bears. Both the existing closed roads and the 1.7 miles of newly constructed temporary roads would be used during the denning period and would be closed in a manner to discourage motorized access after the proposed harvesting. No changes in open-road densities would be anticipated, which would not appreciably alter habitat quality for grizzly bears in the area. Thus, minor adverse direct or indirect effects to grizzly bears in the local area would be expected since: 1) negligible to minor levels of disturbance and displacement would be anticipated; 2) hiding cover would be removed in the short-term, but would be expected to recover fairly rapidly; 3) no changes to security habitats would be expected; and 4) negligible changes in open-road densities would be anticipated.

- ***Cumulative Effects of the No-Action Alternative on Grizzly Bears***

Motorized access to the area, security and hiding cover, and spring habitat would all remain unchanged. Existing forested stands throughout the cumulative-effects analysis area would be expected to persist into the future; in the long-term, forest succession would continue and may reduce food sources, but may increase the amount of hiding cover in the subunit. Human disturbance levels would be expected to continue into the future. No changes to existing security habitats would be anticipated. Ongoing harvesting would continue altering grizzly bear habitats and, potentially, disturbing grizzly bears. Thus, no further adverse cumulative effects would be expected to affect grizzly bears in the cumulative-effects

analysis area since: 1) no changes in human disturbance levels would be expected, 2) no further losses of hiding cover would occur, 3) no changes to security habitats would be anticipated, and 4) no changes to open-road densities would occur.

- ***Cumulative Effects of the Action Alternative on Grizzly Bears***

  The increased use of road systems during the proposed project would temporarily increase human disturbance to grizzly bears in a portion of the cumulative-effects analysis area. Proposed activities would occur in one area of the cumulative-effects analysis area that is already experiencing relatively high levels of human disturbance, largely associated with open roads and private ownerships. Collectively, negligible increases in human disturbance would be expected in the recovery zone, with the potential for minor to negligible increases in human disturbance levels anticipated in the 'occupied habitat' area. Continued use of the cumulative-effects analysis area and Lazy Creek Subunit by grizzly bears would be anticipated. Reductions in hiding cover would be additive to the reductions from past timber harvesting, ongoing harvesting, as well as more permanent changes in land cover in the cumulative-effects analysis area; however, appreciable amounts of the cumulative-effects analysis area are currently providing hiding cover. Early successional stages of vegetation occurring in harvest areas could provide foraging opportunities that do not exist in some mature stands. No changes to existing security habitats would be anticipated. No appreciable changes in long-term open-road densities would be expected in the cumulative-effects analysis area; a fairly extensive road system would persist that would facilitate considerable human access in the cumulative-effects analysis area. In the Lazy Creek Subunit portion of the cumulative-effects analysis area, no changes in open-road densities would be anticipated. Thus, minor adverse cumulative effects to grizzly bears would be expected in the short-term since: 1) negligible increases in human disturbance levels would be expected in the recovery zone and minor to negligible increases in human disturbance levels would be anticipated outside of the recovery zone; 2) hiding cover would be lost in the short-term on a small portion of the cumulative-effects analysis area, but would be expected to recover fairly rapidly; 3) no changes to security habitats would be expected; and 4) no changes in long-term open-road densities would be anticipated.

CANADA LYNX

Issue: Timber harvesting and associated activities could remove canopy closure or alter stand conditions, which could result in the reduction or modification of habitat components leading to a decreased ability for the area to support lynx.

Introduction

Canada lynx are associated with subalpine fir forests, generally between 4,000 to 7,000 feet in elevation in western Montana (*Ruediger et al. 2000*). The analysis area of the proposed project ranges from approximately 3,000 to 3,480 feet in elevation, and is dominated by mixed conifer with appreciable acreage in subalpine fir and Douglas-fir/western larch. Lynx habitats in western Montana consists primarily of stands that provide habitat for snowshoe hares, either dense, young coniferous stands or dense, mature forested stands, as well as mature subalpine fir types with abundant coarse woody debris for denning and cover for kittens, and densely

forested cover for travel and security. These conditions are found in a variety of 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) within continuous dense forests of lodgepole pine, subalpine fir, and Engelmann spruce created extensive even-aged patches of regenerating forest intermixed with quite 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 project area. Cumulative effects were analyzed on the 52,394-acre cumulative-effects analysis area used for the grizzly bear cumulative-effects analysis (per *ARM 36.11.435 (7) (a) & (b)*). More information regarding this subunit can be found under *GRIZZLY BEAR*. The scale of this analysis area approximates the home-range size of an individual lynx (*Ruediger et al. 2000*).

Analysis Methods

To assess lynx habitat, DNRC SLI data were used to map specific habitat classes used by lynx. Lynx habitat (*ARM 36.11.403(40)*) was assigned to a stand if the *SLI* data indicated habitat types (*Pfister et al. 1977*) that are consistent with those reportedly used by lynx (*Ruediger et al. 2000*). Other parameters (stand age, canopy cover, and amount of coarse woody debris) were used in modeling the availability of the following 5 specific lynx habitat elements:

1) denning,
2) young foraging,
3) mature foraging,
4) forested travel/other habitat, and
5) temporary non-lynx habitats.

Denning habitat provides important vegetative and woody structure needed to provide denning sites and security for juvenile lynx, while foraging habitat is important for the survival of both adult and juvenile lynx. 'Forested travel/other habitat' is a general habitat category that provides for secondary prey items and contains modest levels of forest structure usable by lynx. Temporary non-lynx habitat consists of nonforest and open forested stands that are not expected to be used by lynx until adequate horizontal cover reestablishes. Factors considered in the analysis include landscape connectivity and the amount of the cumulative-effects analysis area in denning, foraging, and unsuitable habitats.

Existing Environment

Approximately 2,122 acres of the 2,214-acre project area was identified as lynx habitats (*TABLE E-2 –EXISTING LYNX HABITATS*). Much of this habitat was identified as forested travel/other with smaller components of denning and mature-foraging habitats. In the last 30 years, approximately 1,359 acres have been harvested. Past timber management and road construction has compromised landscape connectivity in the project area (see *WILDLIFE ANALYSIS—MATURE FORESTED HABITATS AND LANDSCAPE CONNECTIVITY*).

At the scale of the cumulative-effects analysis area, mature foraging and forested travel/other habitats dominate the Lazy Creek Grizzly Bear Subunit *(TABLE W-2 –EXISTING LYNX*

HABITATS). The distribution of the various lynx habitat elements on DNRC-managed lands is the result, primarily, of past timber harvesting and the lack of recent wildfire. Forest-management practices over the past 40 to 60 years produced the current levels of temporary unsuitable and young foraging habitats; timber harvesting conducted over 15 years ago has likely recovered to the point of at least providing forested travel/other habitat. In addition, the lack of fire, including the effects of fire suppression, led to the development and maintenance of mature foraging, forested travel/other, and denning habitats. *ARM 36.11.435* requires a minimum of 5 percent and 10 percent of the lynx habitats in a bear-management subunit to be in denning and foraging habitats, respectively. Currently, the cumulative-effects analysis area exceeds the minimum thresholds for both foraging and denning habitat requirements *(TABLE W-2 –EXISTING LYNX HABITATS).* Within the Lazy Creek Subunit, the Olney Urban Interface Timber Sale Project is altering foraging (72 acres), denning (292 acres), and forested travel/other habitats (65 acres); the Southeast Stryker Ridge project is altering foraging habitats (2 acres); and the Beaver/Swift/Skyles Timber Sale Project is not altering any Canada lynx habitats. Connectivity in the cumulative-effects analysis area has been compromised with past harvesting and road construction, but some connectivity exists. Canada lynx have been documented the cumulative-effects analysis area in the past.

Environmental Effects

- ***Direct and Indirect Effects of the No-Action Alternative on Canada Lynx***

  In the short-term, no changes in lynx habitat elements would be expected in the project area. In the longer term, barring major natural disturbance, natural succession would advance several classes forward, generally improving several classes of lynx habitats; however, the net reduction in young foraging habitats would be expected in the absence of new regenerating stands to replace the stands succeeding out of young foraging habitat. When this occurs, habitat quality for snowshoe hares could decline, thereby reducing the availability of prey for lynx. Mature foraging and denning habitats would be expected to remain at similar levels or increase in the future as shade-tolerant trees develop in the understory and coarse woody debris accumulates through time due to natural events. Forested travel/other habitats would be expected to increase in the future as temporary non-lynx habitats and young foraging habitats mature into this habitat element. Therefore, in the short-term, no effects to lynx would be expected. In the longer-term, without disturbance, young foraging opportunities in the project area would decrease. Landscape connectivity would not be altered in the near-term and may improve in the long-term. The existing stands of continuous forested habitats could facilitate lynx movement. Existing closed roads and skid trails would remain closed; no changes in human-disturbance levels would be expected. Thus, minor beneficial direct and indirect effects to lynx habitats would be expected to occur in the project area since: 1) adequate denning habitats would persist, 2) sufficient mature foraging habitat would exist, 3) young foraging habitats would continue developing in the next 10 to 20 years in the project area, 4) longer-term availability of young foraging habitats would likely decline without disturbance, 5) limited amounts of lynx habitats would be in the temporary non-lynx habitat category, meaning most of the lynx

habitats would be in a usable state for lynx, and 6) landscape connectivity would not be altered.

- ***Direct and Indirect Effects of the Action Alternative on Canada Lynx***

  Approximately 371 acres of lynx habitats would be modified, including approximately 331 acres that would be commercially harvested and an additional 40 acres that would be precommercially thinned with this alternative (*TABLE E-3 –CHANGES TO LYNX HABITATS*). In units proposed to receive seedtree-type treatments, canopy cover and horizontal cover would be removed to prepare for regenerating trees. These prescriptions would convert available lynx habitat elements into temporary non-lynx habitats until tree seedlings and shrubs recover and begin providing habitats for snowshoe hares. Conversely, units proposed to receive commercial-thin-type treatments would be converted into the forested travel/other category (*TABLE E-3 – CHANGES TO LYNX HABITATS).* Proposed precommercial thinning units would largely occur in temporary non-lynx habitats, and forested travel/other habitats and would lead to an increase in temporary non-lynx habitats for the short-term following proposed treatments (*TABLE E-3 – CHANGES TO LYNX HABITATS).* Continued maturation of younger-aged stands in the project area would gradually move these stands away from the young foraging class and into other classes of lynx habitats. However, the younger-aged stands created by even-aged harvest treatments that are a component of this alternative would provide young foraging habitats further into the future as tree seedlings and shrubs recover and begin providing habitats for snowshoe hares. Up to 10 years could be needed for seedlings to provide snowshoe hare habitats, and then these ephemeral habitats would gradually outgrow usefulness to snowshoe hares in 10 to 20 years. In all proposed units, 10 to 15 tons of coarse woody debris would be retained to provide some horizontal cover and security structure for lynx. In the short-term, lynx would likely avoid proposed harvest units that would be converted to temporary non-lynx habitat, resulting in habitat usage shifts away from the regeneration units. Use of the commercial-thin-type units would be expected to continue at some level. Forest connectivity around the openings created with this alternative would be partially maintained through riparian buffers and other forested habitats in the project area not altered, but overall connectivity would be reduced (see *MATURE FORESTED HABITATS AND LANDSCPE CONNECTIVITY* earlier in this analysis). Collectively, minor adverse direct and indirect effects to lynx habitats that would be expected to affect Canada lynx in the project area since: 1) adequate denning habitats would persist, 2) sufficient mature foraging would exist, 3) young foraging habitats would continue developing in the next 20 to 50 years in the project area, 4) moderate amounts of lynx habitats would be in the temporary non-lynx habitat category, meaning most of the lynx habitats would be in a usable state for lynx, and 5) landscape connectivity would persist despite an overall reduction in landscape connectivity.

- ***Cumulative Effects of the No-Action Alternative on Canada Lynx***

  Within the cumulative-effects analysis area, the mosaic of habitats would be expected to continue providing snowshoe hare habitats intermixed with mature forested stands that facilitate travel and foraging. No appreciable change in lynx habitats would occur under this alternative except the continued maturation of stands. Lynx habitats in the cumulative-

effects analysis area would be altered with the ongoing harvesting. A slight increase in young foraging habitats in the cumulative-effects analysis area would be possible in the near-term as stands that were harvested in the last 10 to 15 years regenerate tall, dense saplings. Gradually, however, as these young foraging stands continue maturing out of the young foraging category and into forested travel/other habitats, habitat quality for snowshoe hares could decline, thereby reducing the availability of prey for lynx in the long-term. Mature foraging and denning habitats would be expected to increase in the future as shade-tolerant trees develop in the understory, coarse woody debris accumulates through time due to natural events, and, in general, stands continue maturing out of young foraging and forested travel/other habitats. Therefore, in the short-term, negligible negative effects to lynx would be expected. In the longer-term, without disturbance, young foraging opportunities could decrease as stands mature towards mature foraging, denning, and forested travel/other habitats. No appreciable changes to landscape connectivity would be anticipated. Thus, negligible adverse cumulative effects to lynx habitats would be expected to affect Canada lynx in the cumulative-effects analysis area since: 1) adequate denning habitats would persist, 2) sufficient mature foraging habitats would exist, 3) young foraging habitats would continue developing in the near-term across the cumulative-effects analysis area, 4) longer-term availability of young foraging habitats would likely decline without disturbance, 5) limited amounts of lynx habitats would exist in the temporary non-lynx habitat category, meaning most of the lynx habitats would be in a usable state for lynx, and 6) landscape connectivity would persist.

- ***Cumulative Effects of the Action Alternative on Canada Lynx***

  Within the cumulative-effects analysis area, considerable lynx habitats would continue to persist. Minor reductions in mature foraging, denning, and forested travel/other habitats in the proposed units would not be expected to appreciably alter lynx use of any of the cumulative-effects analysis area. Following harvesting, sufficient denning and foraging habitats would be retained on DNRC-managed lands (*TABLE E-4 - CUMULATIVE EFFECTS ANALYSIS AREA FOR LYNX HABITATS)* to satisfy DNRC's commitment for these habitat attributes (*ARM 36.11.435*) in the cumulative-effects analysis area and the Lazy Creek Subunit. Anticipated reductions in denning, foraging, and forested travel/other habitats would be additive to past losses from timber harvesting and ongoing modifications within the cumulative-effects analysis area; likewise increases in temporary non-lynx habitats would be additive to past losses of lynx habitats due to timber harvesting as well as any ongoing modifications within the cumulative-effects analysis area. Gradually, young foraging stands would develop on these temporary non-lynx habitats. Within the next 2 decades, some of the forested travel and temporary non-lynx habitats would be expected to develop into some of the other suitable lynx habitat categories. Denning and foraging habitats would be expected to persist in the absence of timber harvesting or a catastrophic event that reduces habitat quality. Ongoing harvesting would continue to alter lynx habitats across the cumulative-effects analysis area. Relatively small portions of the cumulative-effects analysis area and the Lazy Creek Subunit would be in the temporary non-lynx habitats, meaning most of the lynx habitats would be in a usable state for lynx. Landscape connectivity would be further reduced with the proposed activities (see *WILDLIFE - LANDSCAPE CONNECTIVITY*). Thus,

minor adverse cumulative effects to lynx habitats would be expected to affect Canada lynx in each of the cumulative-effects analysis areas since: 1) adequate denning habitats would persist, 2) sufficient mature foraging habitats would exist, 3) young foraging habitats would continue developing for the next 20 to 50 years across the cumulative-effects analysis area, 4) limited amounts of lynx habitats would be in the temporary non-lynx habitat category (less than 25 percent), meaning most of the lynx habitats would be in a usable state for lynx, and 5) reductions in landscape connectivity would not prevent lynx movements.

TABLE E-2 – EXISTING LYNX HABITATS. *Acres of lynx habitats on DNRC-managed lands in the project area, Lazy Creek Subunit, and cumulative-effects analysis area with the proportion that each suitable class represents out of all suitable lynx habitats in each of these areas.*

LYNX HABITAT	PROJECT AREA	LAZY CREEK SUBUNIT	CUMULATIVE EFFECTS ANALYSIS AREA
Denning	184 (9 percent)	1,995 (16 percent)	2,085 (15 percent)
Foraging	368 (17 percent)	3,744 (30 percent)	4,226 (30 percent)
Forested travel	1,416 (67 percent)	3,618 (29 percent)	4,528 (32 percent)
Temporary non-lynx habitats	155 (7 percent)	3,052 (25 percent)	3,151 (23 percent)
Total lynx habitats	2,122	12,409	13,990
Permanently unsuitable	91	1,816	6,645
Total analysis area	2,214	14,225	20,783

TABLE E-3 –CHANGES TO LYNX HABITATS. *Acreage changes in lynx habitat elements following implementation of each alternative.*

CHANGES TO LYNX HABITATS	ALTERNATIVES	
	A	B
Denning habitat converted to temporary non-lynx habitat	0	39
Mature foraging habitat converted to temporary non-lynx habitat	0	78
Forested travel/other habitat converted to temporary non-lynx habitat	0	116
Temporary non-lynx habitat treated but remaining as temporary non-lynx habitat	0	22
Total increase in temporary non-lynx habitat	*0*	*233*
Denning habitat converted to other habitat	0	54
Mature foraging habitat converted to other habitat	0	4
Forested travel/other habitat treated but remaining as forested travel/other habitat	0	58
Total increase in forested travel/other habitats	*0*	58
Total lynx habitat affected	*0*	371

TABLE E-4 - CUMULATIVE EFFECTS ANALYSIS AREA FOR LYNX HABITATS. *Acres of lynx habitats affected, resulting acres of lynx habitats after each alternative, and proportion each suitable habitat represents out of all suitable lynx habitats, by alternative, in the Upper Whitefish Subunit.*

LYNX HABITAT		NO-ACTION ALTERNATIVE A		ACTION ALTERNATIVE B	
		LAZY CREEK SUBUNIT	CUMULATIVE EFFECTS ANALYSIS AREA	LAZY CREEK SUBUNIT	CUMULATIVE EFFECTS ANALYSIS AREA
Denning	Project-level change	0	0	-34	-92
	Acres posttreatment	1,995	2,085	1,961	1,993
	Percent of lynx habitats	16 percent	15 percent	16 percent	14 percent
Foraging	Project-level change	0	0	-77	-80
	Acres posttreatment	3,746	4,226	3,667	4,146
	Percent of lynx habitats	30 percent	30 percent	30 percent	30 percent
Forested travel	Project-level change	0	0	-34	-66
	Acres posttreatment	3,618	4,528	3,584	4,470
	Percent of lynx habitats	29 percent	32 percent	29 percent	32 percent
Temporary non-lynx habitats	Project-level change	0	0	+145	+230
	Acres posttreatment	3,050	3,151	3,197	3,381
	Percent of lynx habitats	25 percent	23 percent	25 percent	24 percent
Total lynx habitats	Project-level change	0	0	0	0
	Acres posttreatment	12,409	13,990	12,409	13,990
Permanently unsuitable		1,816	6,645	1,816	6,645
Total analysis area		14,225	20,783	14,225	20,783

SENSITIVE SPECIES

When conducting forest-management activities, the *SFLMP* directs DNRC to give special consideration to sensitive species. These species may be sensitive to human activities, have special habitat requirements, are associated with habitats that may be altered by timber management, and/or may, if management activities result in continued adverse impacts, become listed under the *Federal Endangered Species Act*. Because sensitive species usually have specific habitat requirements, consideration of their needs serves as a useful 'fine filter' for ensuring that the primary goal of maintaining healthy and diverse forests is met. A search of the *Montana Natural Heritage Database* documented bald eagles, common loons, fisher, harlequin ducks, and gray wolves in the vicinity of the project area. As shown in *TABLE E-1 - STATUS OF SPECIES CONSIDERED IN THE FINE-FILTER ANALYSIS FOR THIS PROPOSED PROJECT,* the sensitive species portion of this analysis will focus on bald eagles, fisher, gray wolves, and pileated woodpeckers.

BALD EAGLE

Issue: Timber harvesting and associated activities could reduce bald eagle nesting and perching habitats and/or disturb 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 northwestern 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 project area. Cumulative effects were analyzed on the combined Swift Creek and Farm-to-Market bald eagle home ranges. This cumulative-effects analysis area includes the areas used by each pair of eagles using the territory.

Analysis Methods

Effects were analyzed using a combination of field evaluations and aerial-photograph interpretation within the bald eagle home range. Factors considered in this analysis include disturbance levels and availability of large, emergent trees with stout horizontal limbs for nests and perches.

EXISTING ENVIRONMENT

The project area is partially included in the home ranges of the Lower Stillwater, Swift Creek, and Farm-to-Market bald eagle territories. The project area contains only a minor portion (approximately 39 acres) of the Lower Stillwater home range, and is approximately 2 miles from the known nest site. Proposed harvesting activities would not occur in any portion of the Lower Stillwater home range under either alternative; therefore, this nest and associated home range will not be addressed in further analysis. In the area of the combined home ranges for these 2 territories, DNRC manages approximately 31 percent of the terrestrial acres, while 42 percent are on private ownership, 16 percent are managed by USFS, and the remaining 11 percent are owned by industrial timber companies. Human disturbance, including timber harvesting, residential development, recreational use of Whitefish Lake, the Highway 93 corridor, and the Burlington Northern Santa Fe (BNSF) Railroad corridor are potential sources of disturbance to the nesting pair. Some large emergent trees are available across portions of the home range, but logging in the last 100 years has likely reduced some of these trees, while others have experienced mortality and are declining in quality.

Environmental Effects

- ***Direct and Indirect Effects of the No-Action Alternative on Bald Eagles***

  No direct or indirect effects to bald eagles would be expected. Human disturbance would continue at approximately the same levels. Thus, negligible direct and indirect effects would be expected to affect bald eagles using the territory since: 1) no changes to human disturbance levels would occur and 2) no changes in the availability of large, emergent trees would be expected.

- ***Direct and Indirect Effects of the Action Alternative on Bald Eagles***

  No harvesting would occur within the nest area or primary-use areas associated with the Swift Creek or Farm-to-Market nests. However, within the home range, proposed commercial timber harvesting would alter forested canopy on approximately 331 acres and an additional 40 acres would be precommercially thinned. While proposed activities are occurring, eagles could be displaced; however, potential for displacement would only be expected to affect eagles during the activities and not beyond. Given the distance between the units and the nest site and the general disturbance associated with this territory, mechanized harvesting should not cause the pair to abandon their nest; however, efforts to conduct the harvesting during the nonnesting period (August 16 through February 1) would further reduce the risk of disturbing this pair. Within the home range, prescriptions call for the retention of some large snags and emergent trees that could be used in the future as nest or perch trees as the stands develop around these resources. No changes to human access to the project area would occur, thus limiting the potential for introducing additional human disturbance to the territories. Thus, minor direct and indirect effects would be expected to affect bald eagles using the territories since: 1) disturbance would be elevated within the territories during operations, 2) no change in human access in the project area would occur, and 3) negligible changes in the availability of large, emergent trees would be expected.

- ***Cumulative Effects of the No-Action Alternative on Bald Eagles***

  Nesting bald eagles would continue to experience varying levels of disturbance from the ongoing recreational use of Whitefish Lake, human developments in the area, ongoing timber management, as well as disturbance associated with Highway 93 and the BNSF Railroad. Emergent trees exist across ownerships in the cumulative-effects analysis area. Concurrently, no other DNRC activities are planned that would increase human disturbance, development, recreation, timber harvesting, or firewood gathering in the cumulative-effects analysis area. Thus, no cumulative effects would be expected to affect bald eagles using these territories since: 1) no changes to human disturbance levels would occur and 2) no changes in the availability of large, emergent trees would be expected.

- ***Cumulative Effects of the Action Alternative on Bald Eagles***

  Nesting bald eagles would continue to experience varying levels of disturbance associated with U.S. Highway 93 and the BNSF Railroad. Additionally, human developments on private lands would continue to provide potential sources of disturbance to the territories. 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. Emergent trees exist across ownerships in the home range. Concurrently, no other DNRC activities are planned that would increase human disturbance, development, recreation, timber harvesting, or firewood gathering within the home range area. Thus, negligible cumulative effects would be expected to affect bald eagles using the territories since: 1) disturbance would be elevated within the territories during operations, 2) no change in human access in the project area would occur, and 3) negligible changes in the availability of large, emergent trees would be expected.

FISHER

Issue: Timber harvesting and associated activities could reduce fisher habitat availability and quality by reducing canopy cover, snag density, and the amount of coarse woody debris.

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 2001*). 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, 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

Cumulative effects were analyzed on the 52,394-acre cumulative-effects analysis area used for the grizzly bear cumulative-effects analysis (per *ARM 36.11.440 (1) (a)*). More information regarding this subunit can be found in the *GRIZZLY BEAR* section. This area is large enough to include overlapping home ranges of male and female fishers (*Heinemeyer and Jones 1994*).

Analysis Methods

To assess potential fisher habitat and travel cover on DNRC-managed lands in the cumulative-effects analysis area, sawtimber stands within preferred fisher covertypes (*ARM 36.11.403[60]*) below 6,000 feet in elevation with 40 percent or greater canopy closure were considered potential fisher habitat. Fisher habitat was further divided into upland and riparian-associated areas, depending on the proximity to streams and based on stream class. Effects were analyzed using field evaluations, GIS analysis of potential habitat, and aerial-photograph interpretation. Factors considered include the amount of suitable fisher habitats, landscape connectivity, and human access.

Existing Environment

The project area ranges from 3,000 to 3,480 feet in elevation, with approximately 1 mile of perennial streams and another 3.3 miles of intermittent streams. DNRC manages preferred fisher covertypes within 100 feet of Class 1 and 50 feet of Class 2 streams, so that 75 percent of the acreage (trust lands only) would be in the sawtimber size class in moderate to well-stocked density (*ARM 36.11.440[1][b][i]*). Approximately 39 acres are in these riparian areas in the project area along the 4.3 miles of Class 1 and 2 streams. Modeling fisher habitats using SLI data generated an estimate of 1,676 acres of fisher foraging, resting, denning, and travel habitats (1,639 upland acres and 37 riparian acres) in the project area (*Heinemeyer and Jones 1994*). Within the riparian areas, the majority of the preferred fisher covertypes (37 of 37 acres, or 100 percent) are moderately or well-stocked and likely support the structural features necessary for use as

fisher resting and denning habitats in addition to serving as travel habitats and maintaining landscape connectivity.

In the cumulative-effects analysis area, roughly 2,198 acres are within 100 feet of the 79 miles of Class 1 streams and 50 feet of the 26 miles of Class 2 streams. Within the riparian habitats on DNRC-managed lands, 94.2 percent is in preferred fisher covertypes that are presently providing structural features necessary for use as fisher resting and denning habitats. Additionally, between 12,421 acres of upland fisher habitats exist on DNRC-managed lands in the cumulative-effects analysis area. Since *ARM 36.11.440(1)(a)* requires an analysis of fisher habitats by grizzly bear management subunit, the analysis will also identify habitat values at the subunit level as well; presently 95.0 percent (643 of 677 acres) of the preferred fisher covertypes in the Lazy Creek Subunit are supporting structural attributes necessary for use by fisher, which exceeds the required threshold of 75 percent. Ongoing timber management in the cumulative-effects analysis area are altering fisher habitats, including those activities associated with the Olney Urban Interface, Beaver/Swift/Skyles, and Southeast Stryker Ridge timber sale projects, and could alter fisher habitats in the Lazy Creek Subunit.

Environmental Effects

- ***Direct and Indirect Effects of the No-Action Alternative on Fishers***

  No effects to fishers would be expected under this alternative. Minimal changes to the stands providing fisher habitats would be expected. Habitats that are conducive to fisher denning and travel may improve in time due to increases in tree growth and canopy closure; however, foraging opportunities may decline in future decades if disturbance is minimized, since habitats such as edges and younger age-class stands that support a variety of prey species would decline in abundance on the landscape. Human disturbance and potential trapping mortality would expect to remain similar to current levels. No changes in landscape connectivity would occur. Thus, 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; 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.

- ***Direct and Indirect Effects of the Action Alternative on Fishers***

  Approximately 2.3 acres of the 37 acres of riparian habitats in the project area would be included in the proposed harvest areas. All of this acreage is presently meeting the structural requirements of fisher and much of this habitat would be unsuitable following the proposed treatments. Additionally, approximately 363 of the 1,639 acres (22.1 percent) of upland fisher habitats in the project area would receive treatments, with much of those acres likely being too open for appreciable fisher use following proposed treatments. The proposed precommercial thinning would not alter existing fisher habitats and could promote future fisher habitats. No changes in open roads would be anticipated, which would not likely alter trapping pressure and the potential for fisher mortality. Minor reductions in connectivity would be expected in a landscape where connectivity has been reduced with past harvesting and road construction (*see MATURE FORESTED HABITATS*

AND LANDSCAPE CONNECTIVITY under *COARSE FILTER WILDLIFE ANALYSIS*), but activities would largely avoid riparian areas where connectivity has been retained in the past. Thus, minor adverse direct and indirect effects would be anticipated that would affect fisher in the project area since: 1) harvesting would largely avoid riparian areas; 2) harvesting would reduce or remove upland fisher habitats; 3) minor reductions in landscape connectivity would occur, but those areas associated with riparian areas would largely remain unaffected; 4) harvesting would reduce snag and coarse woody debris levels; however, some of these resources would be retained; and 5) no appreciable changes in human motorized-access levels would be anticipated.

- ***Cumulative Effects of the No-Action Alternative on Fishers***

  Fisher denning and resting habitats would be retained. Suitable fisher foraging, denning, and resting habitats occur across each of the cumulative-effects analysis areas. Landscape connectivity in the cumulative-effects analysis area is reasonably intact, particularly along the numerous streams. Road access in the cumulative-effects analysis areas would not appreciably change; therefore, fisher vulnerability to trapping would remain unchanged. Fisher habitats could be altered with the ongoing harvesting. Thus, no further cumulative effects to fishers would be anticipated in the cumulative-effects analysis area since: 1) no changes to existing habitats on DNRC-managed land would occur, 2) landscape connectivity afforded by the stands on DNRC-managed land would not appreciably change, 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.

- ***Cumulative Effects of the Action Alternative on Fishers***

  Approximately 2.3 acres of potential riparian fisher habitats in the portion of the cumulative-effects analysis area outside of the Lazy Creek Subunit would be harvested. This would reduce the amount of the preferred fisher covertypes meeting structural requirements for fishers in the cumulative-effects analysis area from 94.2 percent to 93.9 percent. Since no changes in the amount of the preferred fisher covertypes meeting structural requirements for fishers would occur in the Lazy Creek Subunit, the subunit would remain at 95.0 percent of the subunit, which exceeds the 75-percent threshold established in *ARM 36.11.440(1)(b)(i)*. Roughly 363 acres of the 12,421 acres (2.9 percent) of potential upland fisher foraging and travel habitats would be harvested; upland foraging and travel habitats would continue to be present on a sizeable portion of the cumulative-effects analysis area. These reductions would be additive to the losses associated with past timber harvesting in the cumulative-effects analysis area. Landscape connectivity in the cumulative-effects analysis areas would remain largely intact. No appreciable changes in human disturbance and potential trapping mortality would be anticipated. Thus, minor adverse cumulative effects would be anticipated that would affect fisher in the cumulative-effects analysis area since: 1) harvesting would remove upland fisher habitats, but considerable upland habitats would persist; 2) no changes to riparian habitats or preferred covertypes in the Lazy Creek Subunit and negligible reductions in riparian habitats would occur in the cumulative-effects analysis area would be anticipated; 3) minor reductions in landscape connectivity in the cumulative-effects analysis area would be anticipated; 4)

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 5) no appreciable changes to motorized human access would occur.

GRAY WOLF

Issue: Timber harvesting and associated activities could displace gray wolves from important habitats, particularly denning and rendezvous sites and/or alter prey availability.

Introduction

The gray wolf was listed as 'endangered' under the *Endangered Species Act* in the northern portion of Montana, which includes the project area; however, USFWS recently delisted the gray wolf (May 4, 2009). To meet the delisting criteria, the 3 recovery areas need to support a minimum of 30 breeding pairs for 3 consecutive years. The 3 recovery zones have met the recovery objectives for breeding pairs since 2000. In 2008, 95 packs that met the definition of a 'breeding pair' were documented within the tri-state region (*USFWS et al. 2009*). Of those 95 packs, 34 occurred in Montana, with 17 of those found in the northern Montana portion of the recovery area, along with 28 additional packs that didn't meet the requirements to be considered a 'breeding pair' (*Sime et al. 2009*).

Wolves are a wide-ranging, mobile species that occupy a wide range of habitats, which possess adequate prey and minimal human disturbance, especially at den and/or rendezvous sites. The Lazy Creek pack has been in the vicinity for at least the last 8 years and has been a breeding pair counted toward the recovery goals for 3 of the last 5 years. The home range for this pack is variable, but typically includes part of the project area (*USFWS et al. 2009*).

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 (*Oakleaf et al. 2006, Fuller et al. 1992*). Wolves prey primarily on white-tailed deer, and, to a lesser extent, elk and moose, in northwest Montana (*Kunkel et al. 1999*). However, some studies show that wolves may prey on elk more frequently during certain portions of the year (particularly winter) or in areas where elk numbers are higher (*Arjo et al. 2002, Kunkel et al. 2004, Garrott et al. 2006*). 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. No known wolf den or rendezvous sites are known in the project area; however, landscape features frequently associated with these sites occur in the project area. Wolves may be using the vicinity of the project area for hunting, breeding, and other life requirements.

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the project area. Cumulative effects were analyzed on the 52,394-acre cumulative-effects analysis area described under *GRIZZLY BEAR*. This area includes most of the annual home ranges for the Lazy Creek wolf pack and would be large enough to support this wolf pack.

Analysis Methods

Since changes in winter range could have a sizable effect on the availability of prey for wolves, portions of the analysis are tied to the big game winter range section. Meanwhile, disturbance at den and rendezvous sites are important during certain portions of the year, and the timing of proposed activities in relation to these sites is also important. Direct and indirect, as well as cumulative effects, were analyzed using field evaluations, aerial-photograph interpretation, and a GIS analysis of habitat components. Factors considered in the analysis include the amount of winter range modified and the level of human disturbance in relation to any known wolf dens or rendezvous sites.

Existing Environment

Big game species are fairly abundant in the project area. No deer or elk winter range exists in the project area. In the project area, several landscape features commonly associated with den and rendezvous sites occur, including meadows and openings, several water sources, and relatively few areas of gentle terrain. Wolves from the Lazy Creek wolf pack have been documented in the project area in the past and would be expected to continue using the area into the future. No known den or rendezvous sites occur in the project area. Wolves may be using the vicinity of the project area for hunting, breeding, and other life requirements.

In the larger, cumulative-effects analysis area, big game species are abundant, but winter range is limited in the central portions and is generally concentrated along the southern and western portions of the cumulative-effects analysis area, including portions of the project area. Numerous landscape features commonly associated with den and rendezvous sites, including meadows and other openings near water and in gentle terrain, occur in the cumulative-effects analysis area. The known den site, along with the suspected rendezvous sites for this wolf pack, occurs on private ownership in the vicinity and not in the project area (*K. Laudon, DFWP, personal communication, May 4, 2009).* Wolves from the Lazy Creek wolf pack have utilized a fairly large portion of the cumulative-effects analysis area in the past and would be expected to continue using this area into the future. Past harvesting on all ownerships in the subunit altered big game and wolf habitats, reducing the amount of mature forest, which in turn, reduced the amount of thermal cover and snow intercept available for big game. Similarly, harvesting associated with the Olney Urban Interface Timber Sale Project is altering wolf and big game habitats, the Beaver/Swift/Skyles Timber Sale Project is altering big game habitats, and the Southeast Stryker Ridge Timber Sale Project is altering gray wolf habitats. Additionally, past harvesting has resulted in an extensive road network in the cumulative-effects analysis area, increasing the access to these areas and, as a result, the potential for disturbance to wolves in the area.

Environmental Effects

- ***Direct and Indirect Effects of the No-Action Alternative on Gray Wolves***

  Disturbance to wolves would not increase. No changes in big game habitat, including no changes to big game winter range, would be expected during the short-term; therefore, no changes in wolf prey availability would be anticipated. Wolf use of the project area would be expected to continue at current levels. Thus, no direct and indirect effects would be expected to affect gray wolves in the project area since: 1) no changes in human disturbance levels would occur and 2) no changes to big game winter range would occur.

- ***Direct and Indirect Effects of the Action Alternative on Gray Wolves***

  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. After harvesting activities, human disturbance levels would likely revert to preharvest levels and no changes in human access or open-road densities would be anticipated. Likewise, wolf use of the project area for den and rendezvous sites would likely revert to preharvest levels. In the short-term, the proposed harvest and thinning areas could lead to shifts in big game use, which could lead to a shift in wolf use of the project area. No changes in deer or elk winter range would be anticipated. Thus, negligible direct and indirect effects would be expected to affect gray wolves in the project area 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) no changes to big game winter range would occur.

- ***Cumulative Effects of the No-Action Alternative on Gray Wolves***

  White-tailed deer, mule deer, and elk winter ranges would not be affected, and substantive change 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. Ongoing harvesting may cause shifts in white-tailed deer 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. No changes inhuman access would be anticipated. Thus, no further cumulative effects would be expected to affect gray wolves in the cumulative-effects analysis area since: 1) no changes in human disturbance levels would occur, particularly near known wolf den and/or rendezvous sites, and 2) no changes to big game winter range would occur.

- ***Cumulative Effects of the Action Alternative on Gray Wolves***

  No changes to white-tailed deer, mule deer, or elk winter range would be anticipated. Some slight shifts of big game use may occur. Reductions in cover may cause slight decreases in use by deer and elk; however, no appreciable changes would be expected in the cumulative-effects analysis area. These reductions in cover would be additive to losses from past timber-harvesting activities and ongoing harvesting in the cumulative-effects analysis area. Human-disturbance levels would be expected to revert to levels similar to current levels after the proposed harvesting has been completed and roads would again be closed. No changes in motorized human access would be anticipated. No substantive change in wolf

use of the cumulative-effects analysis area would be expected; wolves would continue to use the area in the long-term. Thus, minor adverse cumulative effects would be expected to affect gray wolves in the cumulative-effects analysis area since: 1) negligible short-term and long-term changes in human disturbance levels would occur with no increases near known wolf den and/or rendezvous sites anticipated, and 2) no changes to big game winter range would occur.

PILEATED WOODPECKER

Issue: Timber harvesting and associated activities could remove canopy cover and snags needed by pileated woodpeckers to forage and nest and/or displace nesting pileated woodpeckers from active nests, resulting in increased mortality to pileated woodpecker chicks.

Introduction

Pileated woodpeckers play an important ecological role by excavating cavities that are used in subsequent years by many other species of birds and mammals. Pileated woodpeckers excavate the largest cavities of any woodpecker. Preferred nest trees are western larch, ponderosa pine, cottonwood, and quaking aspen, 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 a stand (*McClelland 1979*).

Analysis Area

Direct and indirect effects were analyzed for activities conducted in the project area. Cumulative effects were analyzed on the contiguous Stillwater State Forest. This scale includes enough area to support many pairs of pileated woodpeckers (*Bull and Jackson 1995*).

Analysis Methods

To assess potential pileated woodpecker nesting habitats on DNRC-managed lands in the cumulative-effects analysis area, SLI data were used to identify sawtimber stands with more than 100 square feet basal area per acre, older than 100 years, had greater than 40-percent canopy closure, and occurring below 5,000 feet in elevation. Foraging habitats are areas that do not meet the definition above, but include the remaining sawtimber stands below 5,000 feet in elevation with greater than 40-percent canopy cover. Direct and indirect effects, as well as cumulative effects, were analyzed using a combination of field evaluation, aerial-photograph interpretation, and these mapped potential habitats. Factors considered included the amount of potential habitat, degree of harvesting, and amount of continuous forested habitat.

Existing Environment

In the project area, potential pileated woodpecker nesting habitat exists on approximately 520 acres that are dominated by western larch/Douglas-fir and mixed conifers. Additionally, 1,516 acres of sawtimber stands dominated by western larch/Douglas-fir, Engelmann spruce, and

mixed conifers exist in the project area that may be lower-quality foraging stands. Although nesting habitat is defined differently than foraging habitat, nesting habitat also provides foraging opportunities for pileated woodpeckers.

Removal of large western larch by past timber-harvesting activity has reduced the quality of habitat for pileated woodpeckers. However, in the recent past, stands have been managed for mature western larch and western white pine, snags, and snag-recruit trees, which benefit pileated woodpeckers in the long-term. Large live and dead trees are less common than would occur naturally due to these past timber-harvesting activities in portions of the project area. Black cottonwood occurs in some riparian areas in the project area. During field visits, numerous feeding sites and 1 to 7 large (greater than 21 inches dbh) snags per acre were observed; these provide foraging and nesting opportunities for pileated woodpeckers. Additionally, several medium-sized snags (15 to 21 inches dbh) per acre were observed, which are likely suitable foraging habitats. Pileated woodpeckers and associated large cavities were detected in the project area.

In the cumulative-effects analysis area, potential pileated woodpecker nesting habitat exists on approximately 19,375 acres, with at least an additional 48,636 acres of sawtimber-sized stands that may be suitable foraging habitats. Similar to the project area, these nesting habitats are dominated by western larch/Douglas-fir and mixed conifers, with a larger percentage of subalpine fir. In the cumulative-effects analysis area, extensive harvesting has occurred in the past, which has fragmented the contiguous forest to a degree. However, in the more recent past, stands have been managed for mature western larch and western white pine, snags, and snag-recruit trees, which benefit pileated woodpeckers in the long-term. Ongoing harvesting associated with the Duck-to-Dog, Chicken-Antice, Olney Urban Interface, Beaver/Swift/Skyles Southeast Stryker Ridge timber sale projects would continue reducing pileated woodpecker habitats.

Environmental Effects

- ***Direct and Indirect Effects of the No-Action Alternative on Pileated Woodpeckers***

  No disturbance of pileated woodpeckers would occur. Forest succession and natural-disturbance agents would continue to bring about changes in existing stands. Trees would continue to grow, mature, and die, thus providing potential nesting and foraging structure for pileated woodpeckers. Continual conversion to shade-tolerant species would reduce the quality of habitat for pileated woodpeckers over time. Therefore, a reduction in suitable nesting trees would be likely over time, which could lead to decreased reproduction in the project area. Thus, negligible adverse indirect effects to pileated woodpeckers in the project area would be expected until some other disturbance reverses stand succession since: 1) no further 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.

- ***Direct and Indirect Effects of the Action Alternative on Pileated Woodpeckers***

  Pileated woodpeckers tend to be tolerant of human activities (*Bull and Jackson 1995*), but might be temporarily displaced by the proposed harvesting. Commercial harvesting on 331 acres would reduce continuously forested habitats for pileated woodpeckers. At least 90 acres of potential nesting habitat would be removed where regeneration harvests are proposed, which would reduce potential pileated nesting and foraging habitats for 30 to 100 years, depending on the density of trees retained. Additionally, another 282 acres of lower-quality foraging habitats would be modified, many to the point of being too open to be considered pileated woodpecker habitats. Elements of the forest structure important for nesting pileated woodpeckers, including snags (a minimum of 2 snags greater than 21 inches dbh per acre where they exist), coarse woody debris (10 to 15 tons per acre), numerous leave trees, and snag recruits (a minimum of 2 trees per acre greater than 21 inch dbh where they exist) would be retained in the proposed harvest areas. Some areas either lack sufficient large snags or are close to open roads where snag loss could continue due to legal and illegal firewood and forest-product gathering. 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 331 acres. The silvicultural prescriptions would retain healthy western larch, western white pine, and Douglas-fir while promoting the regeneration of many of these same species, which would benefit pileated woodpeckers in the future by providing nesting, roosting, and foraging habitats. Additionally, the proposed precommercial thinning treatments would enhance future pileated woodpecker habitats in the project area by selecting for preferred tree species while enhancing future growth in those stands. Thus, minor adverse direct and indirect effects would be anticipated that would affect pileated woodpeckers in the project area since: 1) harvesting would reduce the amount of continuous forested habitats available; 2) potential nesting and foraging habitats would be reduced; 3) several snags and snag recruits per acre would be removed; however, mitigation measures to retain a minimum of 2 snags per acre and 2 snag recruits per acre in most of the harvest areas would be included, and 4) harvest prescriptions would promote seral species in the proposed harvest areas.

- ***Cumulative Effects of the No-Action Alternative on Pileated Woodpeckers***

  No disturbance of pileated woodpeckers would occur. Trees would continue to grow, mature, and die, thus providing potential nesting and foraging structure for pileated woodpeckers. Continued widespread use of the cumulative-effects analysis area by pileated woodpeckers would be expected. Ongoing harvesting would continue to remove potential pileated woodpecker habitats while reducing the amount of the cumulative-effects analysis area that would be in mature, forested covertypes. Similarly, proposed harvesting could further alter pileated woodpecker habitats. Thus, negligible adverse cumulative effects to pileated woodpeckers in the cumulative-effects analysis area would be expected since: 1) no further changes to existing habitats would occur; 2) no further changes to the amount of continuously forested habitats available for pileated woodpeckers would be anticipated;

and 3) long-term, succession-related declines in the abundance of shade-intolerant tree species, which are valuable to pileated woodpeckers, would occur.

- ***Cumulative Effects of the Action Alternative on Pileated Woodpeckers***

  Under this alternative, reductions in pileated woodpecker habitat would be expected. Several 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. In the project area, the canopy on at least 215 acres proposed for regeneration-type treatments would likely be too open for appreciable pileated woodpecker use, including approximately 90 acres of potential pileated woodpecker habitats. Use of the remaining 156 acres by pileated woodpeckers would likely be reduced due to increasing openness of the stands. Stands recently harvested in the cumulative-effects analysis area reduced pileated woodpecker habitats as well. Ongoing harvesting would continue to remove potential pileated woodpecker habitats while reducing the amount of the cumulative-effects analysis area that would be in mature, forested covertypes. The loss of pileated woodpecker habitats under this alternative would be additive to habitat losses associated with past harvesting; continued widespread use of the cumulative-effects analysis area would be expected. Additionally, continued maturation of stands across the cumulative-effects analysis area is increasing suitable pileated woodpecker habitats. Proposed precommercial thinning would favor preferred tree species and promote tree growth in those preferred pileated tree species, which would enhance future pileated woodpecker habitats. Thus, minor adverse cumulative effects would be anticipated that would affect pileated woodpeckers in the cumulative-effects analysis area since: 1) harvesting would reduce the amount of continuous forested habitats available in the cumulative-effects analysis area, but considerable forested habitats would persist; 2) potential nesting and foraging habitats would be reduced, but extensive habitats would persist in the cumulative-effects analysis area; 3) several snags and snag recruits per acre would be removed in the proposed harvest areas; however, mitigation measures would retain some of these attributes in several of the harvest areas; and 4) harvest prescriptions would promote seral species in the proposed harvest areas.

APPENDIX G
STIPULATIONS AND SPECIFICATIONS

Stipulations and specifications for the Action Alternative include project design provisions that follow *Forest Management Rules* and relevant laws and regulations. Also included are mitigations that were designed to avoid or reduce potential effects to resources considered in this analysis. In part, stipulations and specifications are a direct result of issue identification and resource concerns. This section is organized by resource.

The *Timber Sale Contract* contains stipulations and specifications that apply to operations required by and occurring during the contract period. As such, they are binding and enforceable. Project administrators enforce stipulations and specifications relating to activities such as hazard reduction, site preparation, and planting that may occur during or after the contract period.

The following stipulations and specifications will be incorporated into the action alternative to mitigate potential effects of resources.

ACCESS AND ROADS

- If DNRC has an easement on Lupfer Loop Road to Lupfer County Road, DNRC will restrict log truck traffic to times when school buses were not receiving or delivering students in the area.
- DNRC will open Crossover Road for the purpose of avoiding the narrow, curvy areas of Lupfer County Road, which was a concern that arose during the public comment period. Crossover Road will be used only for log and equipment hauling and will not be open for public use.

AESTHETICS

- Damaged residual vegetation will be slashed.
- Pockets of sawtimber-sized hardwoods (aspen, birch, and cottonwood) will be retained. Individual large-diameter hardwoods may be left as snag-replacement trees.
- Landings will be limited in size and number and be located away from main roads when possible.
- Some harvest areas will have designated "uncut" areas and most areas will have trees remaining in clumps or groups. This, along with strips of small trees along roadways helps reduce the sight distance into a harvest area.
- Where possible, temporary roads will be located on breaks to limit steep sideslopes where cuts and fills may be visible.

AIR QUALITY

- Due to the proximity of residences and private property, dust abatement may be applied on some road segments, depending on seasonal conditions and the level of public traffic.

ARCHAEOLOGY

A Timber Sale Contract clause provides for suspending operations if cultural resources were discovered; DNRC's archeologist will be consulted and operations may only resume as directed by the Forest Officer.

SOILS

- Equipment operations will be limited to periods when soils are relatively dry, (less than 18 percent moisture), frozen, or snow-covered to minimize soil compaction and rutting and maintain drainage features. Soil moisture conditions will be checked prior to equipment start-up.
- On ground-based units, the logger and sale administrator will agree to a general skidding plan prior to equipment operations. Skid-trail planning will identify which main trails to use and how many additional trails are needed. Trails that do not comply with BMPs (i.e. draw-bottom trails) will not be used and may be closed with additional drainage installed where needed or grass seeded to stabilize the site and control erosion.
- Tractor skidding should be limited to slopes of less than 40 percent unless the operation can be completed without causing excessive erosion. Based on site-review, short, steep slopes above incised draws may require a combination of mitigation measures, such as adverse skidding to a ridge or winchline skidding from more moderate slopes of less than 40 percent.
- Keep skid trails to 20 percent or less of the harvest unit acreage. Provide for drainage in skid trails and roads concurrently with operations.
- Temporary roads will be reclaimed by placing water bars at intervals to adequately provide drainage for run-off; slash and other debris will be placed on the road surface to make these roads undriveable.
- Slash disposal - The combination of disturbance and scarification will be limited to 30 to 40 percent of the harvest units. Slopes over 35 percent will have no dozer piling; slopes over 40 percent will have no excavator piling unless the operation can be completed without causing excessive erosion. Lopping and scattering or jackpot burning will be considered on the steeper slopes. Disturbance incurred during skidding operations will be accepted to provide adequate scarification for regeneration.
- Ten to 15 tons of large woody debris and a majority of all fine litter feasible will be retained following harvesting. On units where whole-tree harvesting is used, one of the following mitigations will be implemented for nutrient cycling: 1) use in-woods processing equipment that leaves slash on site; 2) for whole-tree harvesting, return-skid slash and evenly distribute within the harvest area; or 3) cut tops from every third bundle of logs so that tops are dispersed as skidding progresses.

VEGETATION

NOXIOUS WEED MANAGEMENT

- All tracked and wheeled equipment will be cleaned of noxious weeds prior to beginning project operations. The contract administrator will inspect equipment periodically during project implementation.
- Prompt vegetation seeding (with a native grass seed mix) of disturbed roadside sites will be required. Roads used and closed as part of this proposal will be reshaped and reseeded.
- Herbicide weed spraying may be implemented on roads being abandoned following the timber sale project
- Herbicide weed spraying will be implemented on closed roads used in the timber sale project before roadwork takes place and again the next spraying season after the work is done.

FUELS MANAGEMENT

- Within 1000 feet of residences, the *High Standard* specifications of the *State Hazard Reduction Law* will be met. In part, 90 percent of the logging slash along the perimeter of harvest units will be piled and burned or removed.
- Ten to 15 tons of large woody debris will be retained on the forest floor following site preparation.
- Where proposed units border private property, fire hazards will be reduced by limited thinning or seedtree-with-reserve treatments. These treatments will reduce the stocking density, remove ladder fuels, and clean up dead and downed tree concentrations

WILDLIFE

- If a threatened or endangered species is encountered, A DNRC biologist will be consulted 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.
- Harvesting activities will be conducted to limit disturbance to grizzly bear habitats by:
  - harvesting Units 1, 2, 3, and 7 during the denning period (November 16 through March 15);
  - harvesting certain units during short-duration, high-intensity periods of less than 30 days on closed roads; or
  - harvesting from open roads.
- On opened restricted roads, public access will be restricted at all times by using signs during active periods and a physical closure (gate, barriers, equipment, etc.) during inactive periods (nights, weekends, etc.).
- Contractors and purchasers conducting contract operations will be prohibited from carrying firearms while operating on restricted roads.
- Roads and skid trails that are opened and/or constructed with the proposed activities will be reclosed to reduce the potential for unauthorized motor vehicle use.

- A combination of topography, group retention, and roadside vegetation will be used to reduce views into harvest units along open roads.
- Forested corridors will be retained to maintain landscape connectivity and patches of dense vegetation, when possible, to provide security cover. Where feasible, heavier cover would be retained along ridgelines.
- Snags, snag recruits, and coarse woody debris will be managed according to *ARM 36.11.411* through *36.11.414*, particularly favoring western larch, Douglas-fir, and western white pine. Clumps of existing snags will be maintained where they exist to offset areas without sufficient snags.

APPENDIX H
PREPARERS AND CONTRIBUTORS

DECISIONMAKER

Brian Manning, Unit Manager, DNRC, Stillwater Unit, Olney, Montana

ID TEAM MEMBERS

Peter Evans, Co-Project Leader, Management Forester, DNRC, Stillwater Unit, Olney Montana

Jason Parke, Co-Project Leader, Management Forester, DNRC, Stillwater Unit, Olney Montana

Garrett Schairer, Wildlife Biologist, DNRC, Northwestern Land Office, Kalispell Montana

Tony Nelson, Hydrologist, DNRC, Northwestern Land Office, Kalispell Montana

TECHNICAL SUPPORT AND ASSISTANCE

Margaret Beck, Graphics and Publication Technician, DNRC (retired) and contracted services, Olney Montana

Jim Bower, Fisheries Program Specialist, DNRC, Forest Management Bureau, Missoula, Montana

Mike McMahon, Forest Management Specialist, DNRC, Stillwater Unit, Olney Montana

Sonya Germann, MEPA Coordinator, Forest Management Bureau, Missoula, Montana

Jason Glenn, Management Forester, DNRC, Stillwater Unit, Olney Montana

Tim Spoelma, Silviculturist, DNRC, Forest Management Bureau, Missoula, Montana

Dave Ring, Forest Management Specialist, DNRC, Stillwater Unit, Olney Montana

APPENDIX I
REFERENCES

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