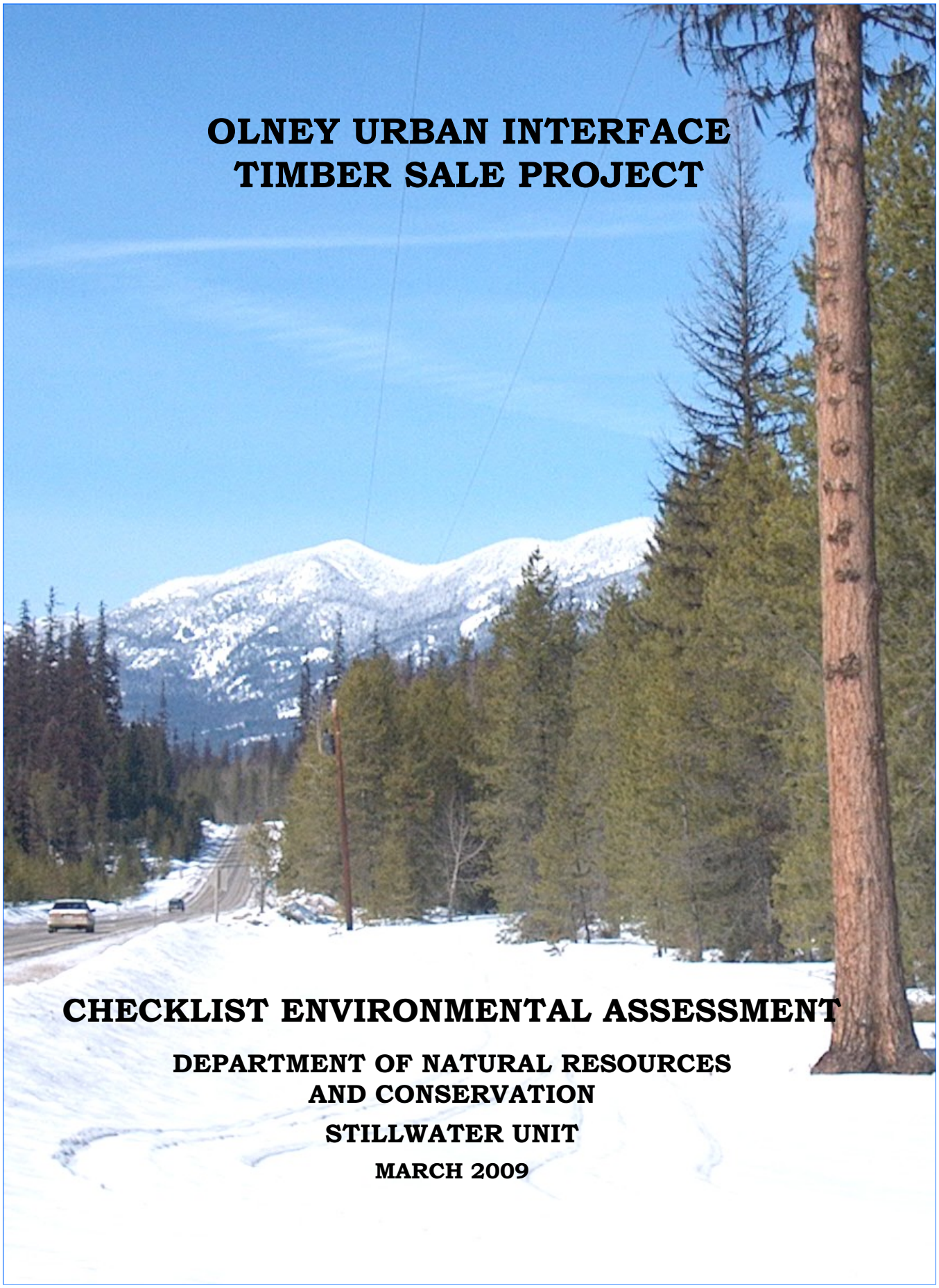

OLNEY URBAN INTERFACE TIMBER SALE PROJECT

CHECKLIST ENVIRONMENTAL ASSESSMENT

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

STILLWATER UNIT

MARCH 2009

CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name: Olney Urban Interface Timber Sale Project
Proposed Implementation Date: June 2009
Proponent: Department of Natural Resources and Conservation (DNRC), Northwest Land Office, Stillwater Unit.
Location: Sections 5, 6, 7, 8, 17, and 18, 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 4 to 6 million board feet (MMbf) of timber from portions of Sections 5, 6, 7, 8, 17, and 18 in Township 32 north, Range 23 west, located near Olney (see *ATTACHMENT I – AREA MAPS*). This project would produce from $426,000 to $640,000 in revenue for the State trusts. The School of Mines, Public Buildings, School for the Deaf and Blind, State Normal School, and State Reform School are the trusts that would receive money from this project. Activities proposed would reduce the fire hazard of fuel loading through forest-management activities, regenerate new stands of healthy trees, and improve the vigor and growth of the retained trees to the future benefit of trust land management actions.

Under the Action Alternative, 19 harvest units totaling approximately 896 acres would be commercially harvested. Approximately 843 acres would be harvested using conventional ground-based equipment and 53 acres would be treated using cable equipment. Approximately 296 acres would be harvested using a commercial thin or shelterwood prescription and 600 acres would be harvested using a seedtree-with-reserves prescription. Harvesting in 3 of the harvest units (423 acres) would be completed under winter conditions, which require frozen and/or snow-covered conditions. The remainder of the units (473 acres) may be completed under summer or winter conditions. Approximately 0.4 miles of new system road and 1.8 miles of temporary road would be constructed, 0.37 miles of road would be abandoned, and 12 to 18 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]*). DNRC would manage the lands involved in this project in accordance with the State Forest Land Management Plan (*DNRC 1996*) and the Administrative Rules for Forest Management (*Forest Management Rules*: *ARM 36.11.401* through *456*), as well as other applicable state and federal laws.

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 March 2008, DNRC solicited public participation on the Olney Urban Interface Timber Sale Project by advertising in the Whitefish Pilot, a weekly newspaper; posting the Initial Proposal at the Olney Post Office; and sending the Initial Proposal with maps to individuals, agencies, industry representatives, other organizations that have expressed interest in the management activities of Stillwater State Forest, and adjacent landowners. The mailing list developed for this project is located in the project file at the Stillwater Unit office.

The public comment period for the Initial Proposal was open for 30 days; 1 letter and 2 e-mails were received.

In June 2008, the Interdisciplinary (ID) Team began to compile issues and gather information related to the current conditions. Comments received from the public were utilized in developing the timber sale project. Hydrology, soils, wildlife, vegetative, and visual concerns were identified by DNRC resource specialists and field foresters for the No-Action and Action alternatives. The issues and concerns have been resolved or mitigated through the project design. The Timber Sale Contract would include the mitigations measures that would be the purchaser's responsibility. Recommendations to minimize direct, indirect, and cumulative impacts have been incorporated in the project design. (See: *ATTACHMENT I - AREA MAPS; ATTACHMENT II - RESOURCE ANALYSES; ATTACHMENT III - PRESCRIPTIONS; ATTACHMENT IV – STIPULATIONS AND SPECIFICATIONS.)*

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

- ***United States Forest Service (USFS)***

  A road cost-share agreement has been reached as outlined in the *Duck-to-Dog Cost Share Environmental Assessment (EA), July 2008*, which covers the access through USFS land needed for this timber sale project.

- ***Montana Department of Environmental Quality (DEQ)***

  A Short-Term Exemption from Montana's Surface Water Quality Standards (318 Authorization), which would be issued by DEQ, may be required if temporary activities would introduce sediment above natural levels into streams and if the Department of Fish Wildlife and Parks (DFWP) recommends it.

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

  DNRC is a member of the Montana/ Idaho Airshed Group, which regulates all slash burning done by DNRC. DNRC receives an air-quality permit through participation in the Montana/ Idaho Airshed Group.

- ***Department of Fish, Wildlife and Parks***

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

3. ALTERNATIVES CONSIDERED:

- ***No-Action Alternative***

  No timber harvesting or timber-management revenue generation for the public school trusts would occur in the Olney Urban Interface 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 still occur. Natural events, such as plant succession, tree mortality due to insects and diseases, windthrow, down fuel accumulation, an in-growth of ladder fuels, and wildfires, would continue to occur. The No-Action Alternative is 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 under *I. TYPE AND PURPOSE OF ACTION*. Within the context of public comments, continuing field reconnaissance, and specific resource concerns, the ID Team considered the need or benefit of developing additional alternatives. The ID Team determined that the issues directly related to the proposed actions could be addressed through minor changes in the project design and/or mitigation measures. These mitigation measures, as specified in ATTACHMENT IV – STIPULATIONS AND SPECIFICATIONS, would be incorporated into the proposed action to minimize the environmental effects.

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

  No timber harvesting or associated activities would occur under this alternative. Skid trails from past harvesting would continue to recover from compaction as freeze-thaw cycles continue and vegetation root mass increases. No substantial direct, indirect, or cumulative impacts to soils resources are expected to result from the implementation of the No-Action Alternative.

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

  A DNRC soils specialist has reviewed the project area, harvest plan, and transportation system. Appropriate Best Management Practices (BMPs) shall be determined during project design and incorporated into implementation in accordance with *Administrative Rules of Montana* (*ARM) 36.11.422 (2)* and *(2)(a)*. 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 the *SOILS ANALYSIS*, no substantial direct, indirect, or cumulative impacts to soils resources are expected to result from the implementation of the Action Alternative.

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***

  No timber harvesting or related activities would occur. The existing direct sediment delivery sources would continue until repaired by another project or funding source. In-channel sources of sediment would continue to exist and erode as natural events dictate. No increase in water yield would be associated with this alternative.

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

  Proposed harvest levels would not substantially increase water yield or stream flow, only a low risk of increased in-channel sediment would

result from this alternative. In-channel sources of sediment would continue to contribute sediment at the current rate.

Since DNRC would incorporate BMPs into the project design as required by *ARM 36.11.422 (2)* and all laws pertaining to Streamside Management Zones (SMZ) would be followed, a low risk of sediment from timber-harvesting activities would result from the implementation of this alternative. Therefore, the risk of long-term adverse direct or indirect effects to water quality or beneficial uses would be low.

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

  The potential for sediment contribution from the proposed haul route would still exist, as would the in-channel sediment sources described under *EXISTING CONDITION*. The existing direct sediment-delivery sources would continue until repaired by another project or funding source. In-channel sources of sediment would continue to exist and erode as natural events dictate. No increase in water yield would be associated with this alternative.

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

  The proposed timber-harvesting and road-construction activities would occur. A reduction in direct sediment delivery would likely occur due to culvert replacements and minor drainage improvements. A cumulative increase in sediment delivery as a result of timber harvesting would have a low risk of occurring because of the BMP application and adequate stream buffers to filter potential displaced soil. In-channel sources of sediment would continue to exist and erode as natural events dictate with a low risk of affecting beneficial uses.

  Because the annual water-yield increases would remain below the thresholds of concern and BMPs would be implemented during timber-harvesting and road-construction operations, the risk of adverse cumulative impacts to water quality and beneficial uses would be low.

Refer to *HYDROLOGY ANALYSIS* in *ATTACHMENT II – RESOURCE ANALYSES* for more detailed information.

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***

  No timber harvesting or related activities, such as log hauling and the burning of slash piles, would occur under this alternative.

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

  During dry periods of the year, gravel, dirt, or native-surfaced roads cause dust relative to the amount of use. The log-hauling traffic from this proposed sale may increase by 6 to 12 truckloads of logs per day. Depending on the season of harvest and weather conditions, particulate production from road use may be elevated. During these periods of elevated particulate production, the application of dust abatement, such as magnesium chloride, may be required.

  The project area is located in a Class 2 Airshed. Some particulate matter may be introduced into the Airshed from the burning of logging slash. Slash burning would be conducted when conditions favor good to excellent smoke dispersion; therefore, impacts are expected to be minor and temporary. Burning would be conducted during times of adequate ventilation and according to existing rules and regulations. Thus direct, indirect, and cumulative effects to air quality are expected to be minimal.

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 of the No-Action Alternative***

  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.

  Old-Growth

  The 25-acre stand of old-growth in Section 6 has Douglas-fir bark beetle present; at the current rate of loss of large-diameter trees, the stand would likely not meet the criteria for old growth within the next 10 years.

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

  Covertypes and Age Classes

  In the area where treatment is proposed for the mixed-conifer or subalpine fir covertype, approximately 445 acres would be converted to the western larch/Douglas-fir covertype. In the 451 acres of western larch/ Douglas-fir and lodgepole pine covertypes, the covertype would not change. Most of these treatments would result in two-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, lodgepole pine, western red cedar, and Douglas-fir. Overall, the Action Alternative would move stands in the proposed project area toward desired future conditions.

Of the 896 acres being harvested, 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.

Old-Growth

Approximately 25 acres of old-growth would be harvested with regeneration treatments on areas that typically experience stand-replacement or mixed-severity fires. The posttreatment timber stand would no longer meet DNRC's criteria for old growth.

Implementation of this alternative would decrease Stillwater Unit's old-growth levels by 25 acres from the current level of 11,703 acres.

Cumulative Effects

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

Covertypes and Age Classes

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

In addition to the changes in age-class distributions from the proposed alternative, other timber sale projects have been initiated. The *STW 2008 SLI* shows a 0.4-percent increase in the amount of 0-to-39-year age class and a 0.5-percent reduction in the 150-year age class, approximate changes of 450 acres and 550 acres, respectively, with 3 timber sales. 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.

Old Growth

The Beaver/Swift/Skyles and Chicken-Antice timber sale project proposals harvest in old-growth stands on Stillwater Unit. The Chicken-Antice Timber Sale Project EA has been released and the Beaver/Swift/Skyles Timber Sale Project EA is in the process of being drafted. If both projects are implemented, approximately 297 acres of old growth would be harvested. Of this, approximately 60 acres would receive 'maintenance' and 'restoration' treatments as described in *ARM 36.11.418*. Those 60 acres would still be classified as old-growth following harvesting because the treatments used would leave a sufficient number of large live trees to meet the minimum criteria described by *Green et al. (1992)*, which DNRC uses to define old growth. Old growth would be reduced to an estimated 11,466 acres, or approximately 9.7 percent of the analysis area. The percentage of old-growth acres by covertype would change very little.

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

  Covertypes and Age Classes

  Under this alternative, cumulative effects to age classes would be similar to the No-Action Alternative while cumulative effects to covertypes would result in a greater increase in seral covertypes within the cumulative effects analysis area.

  Old Growth

  As noted above, the Beaver/Swift/ Skyles and Chicken-Antice timber sale projects would have an effect on old-growth amounts on Stillwater Unit. In combination with the implementation of this proposed action alternative, old -growth would be reduced to an estimated 11,441 acres, or approximately 9.7 percent of the analysis area.

  Refer to the *VEGETATION ANALYSIS* in *ATTACHMENT II – RESOURCE ANALYSES* for more detailed information.

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.

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

  No appreciable changes to existing habitats for the suite of wildlife using the project area would be expected. No changes to availability of snags, coarse woody debris, landscape connectivity, big game habitats, or big game winter ranges would be anticipated. Under this alternative, fisheries habitat quality would be maintained at its current level with a low degree of risk of change due to anthropogenic sources.

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

  Approximately 896 acres of western larch/Douglas-fir and mixed conifers would be removed, leading to younger, more-open stands on much of that acreage. This would alter habitats for wildlife species requiring mature forests while creating habitats for species needing more-open stands of younger forest. The amount of coarse woody debris would be reduced during the proposed timber harvesting; however, snags and snag recruits would be retained in most of the units. The only aspect of the proposed action that could affect fisheries is a 2-acre harvest unit along Stillwater River. The actions in this unit will meet or exceed all SMZ laws, so the risk of adverse impacts to fisheries resources from this action would be very low.

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

  No cumulative effects to mature forested habitats and connectivity would be expected that could affect wildlife in the cumulative-effects analysis area because no changes to existing stands would occur; no further changes to forest age, the distribution of dense forested cover, or landscape connectivity would be

anticipated; no changes to wildlife use would be expected. No cumulative effects to snags and coarse woody debris would be anticipated because no further harvesting would occur, changes in the numbers of snags would be negligible, and the level of firewood gathering would not change. Under this alternative, fisheries habitat quality would be maintained at its current level with a low degree of risk of change due to anthropogenic sources.

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

  Because all timber-harvesting activities would follow BMPs as required by *ARM 36.11.422* and the direct and indirect effects would have a low risk of impacts, additional adverse cumulative effects would not be expected to occur under this alternative. Fisheries habitat quality would be maintained at its current level with a low degree of risk of change due to anthropogenic sources. Minor cumulative effects to wildlife that use mature, forested conditions and/or connected landscape would be expected because mature stands would be harvested, further reducing the amount of forested cover in the cumulative-effects analysis area; however; no appreciable changes to landscape connectivity would occur. Similarly, minor cumulative effects to wildlife species relying on snags and coarse woody debris would be expected because harvesting would reduce snags and snag recruits while increasing the level of coarse woody debris and increasing the amount of shade-intolerant species in the stands that could become snags in the long term.

Refer to the *WILDLIFE ANALYSIS* in *ATTACHMENT II – RESOURCE ANALYSES* for more detailed information.

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.*

- ***Direct and Indirect 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 disturbance, natural succession would advance 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.

No indirect or direct impacts would be anticipated for wolves, pileated woodpeckers, fishers, or bald eagles for this alternative.

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

  The action alternative could disturb grizzly bears, but mitigations would largely reduce the effect of disturbance on grizzly bears; closing a short segment of road would lead to slight reductions in open-road densities. Grizzly bear hiding cover would be reduced on much of the 896 acres proposed for harvesting, but no changes to security habitat would be anticipated. Approximately 850 acres of largely lynx denning and mature foraging habitats would be altered with this 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 home range for the Lower Stillwater Lake bald eagle territory includes part of the project area, and approximately 23 acres would be removed with the action alternative. Proposed harvesting would not disturb the nesting pair and would be expected to retain some important habitat attributes. Roughly 1 acre of riparian fisher habitats and an additional 565 acres of potential upland fisher habitats would be included in the proposed units that would be altered. Most of the 896 harvested acres in the project area would be largely too open to be considered pileated woodpecker habitat after the proposed harvesting; however, the silvicultural prescriptions would retain healthy western larch, western white pine, and Douglas-fir while retaining snags to benefit long-term pileated woodpecker use.

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

  No changes to existing grizzly bears security habitats would be anticipated. Any potential disturbance and/or habitat modification associated with the proposed Beaver/Swift/Skyles Timber Sale Project could continue. No further adverse cumulative effects would be expected to affect grizzly bears in the cumulative-effects analysis area because no changes in the level of human disturbance would be expected, no further losses of hiding cover would occur, no changes to security habitats would be anticipated, and no changes to open-road densities would occur. No appreciable change in lynx habitats would occur under this alternative except the continued maturation of stands. DNRC's proposed Beaver/ Swift/Skyles Timber Sale Project and the proposed U.S. Post Office building in the cumulative-effects analysis area could affect lynx habitats; however, lynx habitats are somewhat limited in

the vicinity of those proposed projects. Minor beneficial cumulative effects to lynx habitats would be expected to affect Canada lynx in the cumulative-effects analysis area as no changes to landscape connectivity or available denning, mature foraging, or temporary non-lynx habitats would be expected, along with the gradual maturation of young foraging habitats.

No cumulative impacts would be anticipated for wolves, pileated woodpeckers, fishers, or bald eagles for this alternative.

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

  Minor adverse cumulative effects to grizzly bears would be expected due to increases in human disturbance levels, reductions in hiding cover, reductions in open-road density, while avoiding security habitats. Likewise, minor adverse cumulative effects to lynx habitats would be expected because adequate denning, mature foraging, and young foraging habitats would persist, with slight increases in the amount of temporary non-lynx habitats and minor reductions in landscape connectivity that would be anticipated. Negligible further cumulative effects to gray wolves would also be anticipated with the negligible short-term changes in human disturbance levels and the lack of changes to big game winter ranges.

  Disturbance would be elevated in the bald eagle territory, but no changes to human access and negligible changes in the availability of large, emergent trees would be expected; thus, negligible cumulative effects would be anticipated. Harvesting would remove upland fisher habitats, while largely avoiding riparian habitats, but would alter landscape connectivity, leading to minor cumulative effects to fisher. Similarly, harvesting would have minor cumulative effects to pileated woodpeckers because harvesting would reduce the amount of continuous forested habitats available in the cumulative-effects analysis area along with available foraging and nesting habitats, but considerable forested habitats would persist.

Refer to *WILDLIFE ANALYSIS* in *ATTACHMENT II – RESOURCE ANALYSES* for more detailed information.

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

- ***Direct, Indirect, and Cumulative Effects for Both Alternatives***

  The project area has been inspected for cultural resources by DNRC archaeologists; further investigation is not deemed necessary. In the Action Alternative, a contract clause would provide for suspended operations if cultural resources were 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.

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

  No timber harvesting or related activities would occur. No changes in views would occur.

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

  Portions of the project area would be visible from U.S. Highway 93 and Good Creek Road. Specifically, portions of Unit 9 would be visible from the public boat launch at the southern end of Lower Stillwater Lake and along Good Creek Road. Portions of Units 1, 8, and 7A would be visible from U.S. Highway 93. Buffer strips along the main roads, narrow yarder corridors on line units, skid trail layout designed to minimize visual impacts, variations in spacing of the trees retained in the units, and unit boundaries with variable numbers of leave trees would help minimize the visual impacts. Until regeneration has reached the point of canopy closure again, the visual impacts would be greater in winter months when snow on the ground would make the openings more visible. The harvest prescriptions and buffer strips along the main roads would minimize the visual impacts.

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.

- Duck-to-Dog Cost Share EA (July 2008)
- Logan Creek Ecosystem Restoration Project (USFS, February 2004)
- Good/Long/Boyle Timber Sale Project EA (October 2000)
- Beaver/Swift/Skyles EA (in progress)
- Chicken/Antice Timber Sale Project (January 2009)

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.

No unusual safety considerations are associated with the proposed timber sale.

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 continued 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 are employed in the wood-products industry in the region. Due to the relatively small size of the timber sale program, no measurable direct, indirect, or cumulative effects to the employment market would be likely.

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.

People are paying taxes from the wood-products industry in the region. Due to the relatively small size of the proposed timber sale, no measurable direct, indirect, or cumulative impacts would be likely 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 Good Creek Road. This increase is a normal contributor to the activities of the local community and would not be considered a new or increased source of traffic.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:
List State, County, City, U.S. Forest Service (USFS), Bureau of Land Management (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* 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, DNRC adopted *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."

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.

The hunting of game animals is common in the area. The road in the project area that would be abandoned only accesses the immediate area; the abandonment would not affect the ability of people to recreate in the project area. Illegal off-road vehicle use is expected to decrease, while legal use is expected to remain about the same with the Action Alternative.

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 are 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 estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return. The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find 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 the willingness of a buyer to pay for timber. The effect of the proposed Action Alternative would generate a return of $426,000 to $640,000 to the various trusts. The No-Action Alternative would generate no return to the trusts at this time.

EA Checklist Prepared By:	**Name:**	Peter Evans	**Date:**	March 13, 2009
	Title:	Management Forester		

V. FINDING

25. ALTERNATIVE SELECTED:

The Action Alternative meets the purpose of the proposed action and is totally compliant with existing laws and policy under which DNRC operates; therefore, this is the selected alternative. The lands involved in this project are held by the State of Montana in trust for the support of specific beneficiary institutions. DNRC is required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run *(Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11;* and *77-1-202, MCA)*. The SFLMP and associated rules provide the management philosophy and framework to evaluate the alternative that would maximize real income while sustaining the production of long-term income. DNRC is required to salvage timber damaged by insects, diseases, fires, or wind before it loses value to decay, provided such harvesting is economically warranted (*MCA 77-5-207*).

26. SIGNIFICANCE OF POTENTIAL IMPAC TS:

I find that no impacts are regarded as severe, enduring, geographically widespread, or frequent. Further, I find that the quantity and quality of various resources, including any that may be considered unique or fragile, will not be adversely affected to a significant degree. I find no precedent for future actions that would cause significant impacts, and I find no conflict with local, State, or Federal laws, requirements, or formal plans. In summary, I find that the identified adverse impacts will be avoided, controlled, or mitigated by the design of the project to the extent that the impacts are not significant.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS :

		EIS		More Detailed EA	**X**	No Further Analysis

EA Checklist Approved By:	**Name:**	Brian Manning		
	Title:	Unit Manager		
Signature:			**Date**:	

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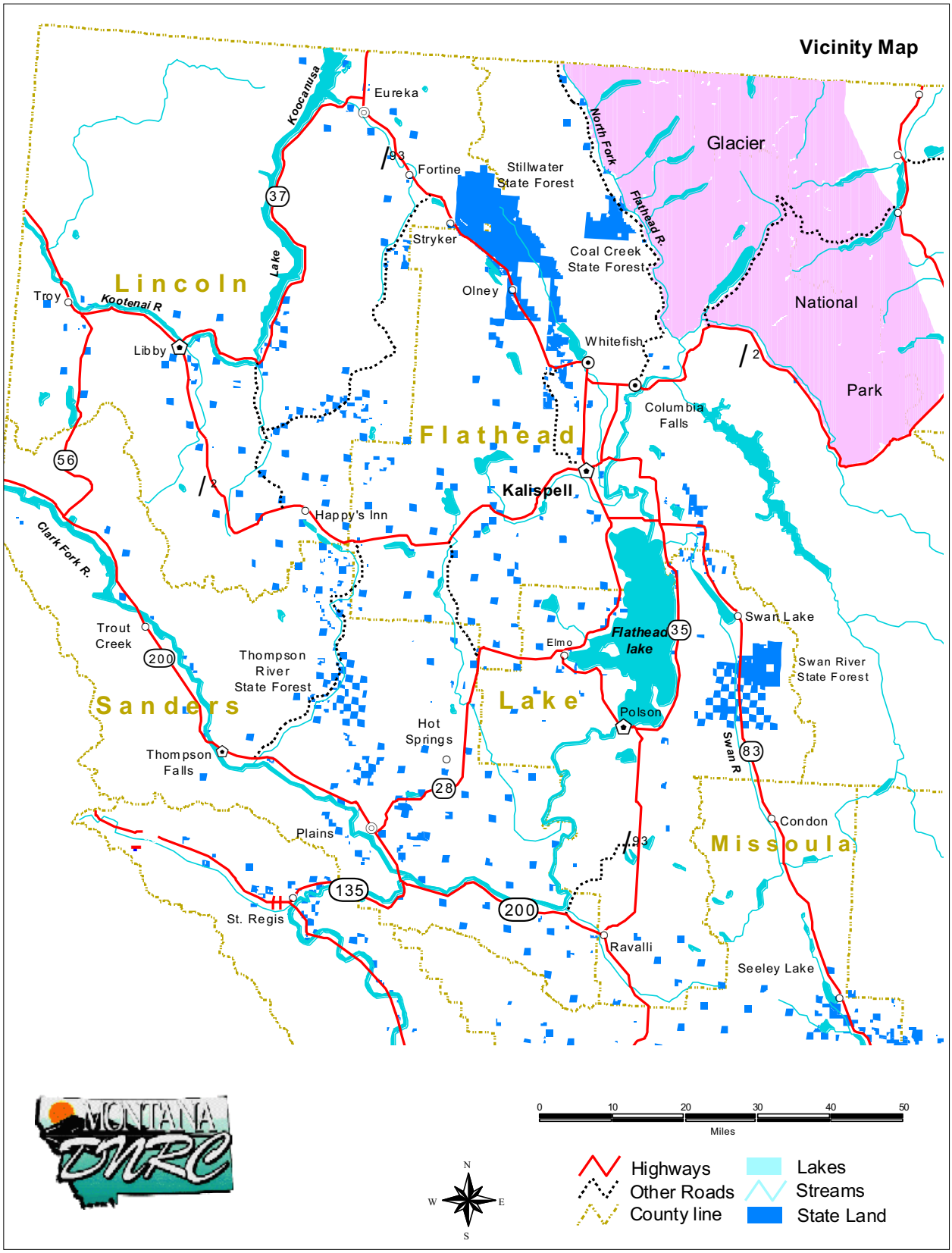
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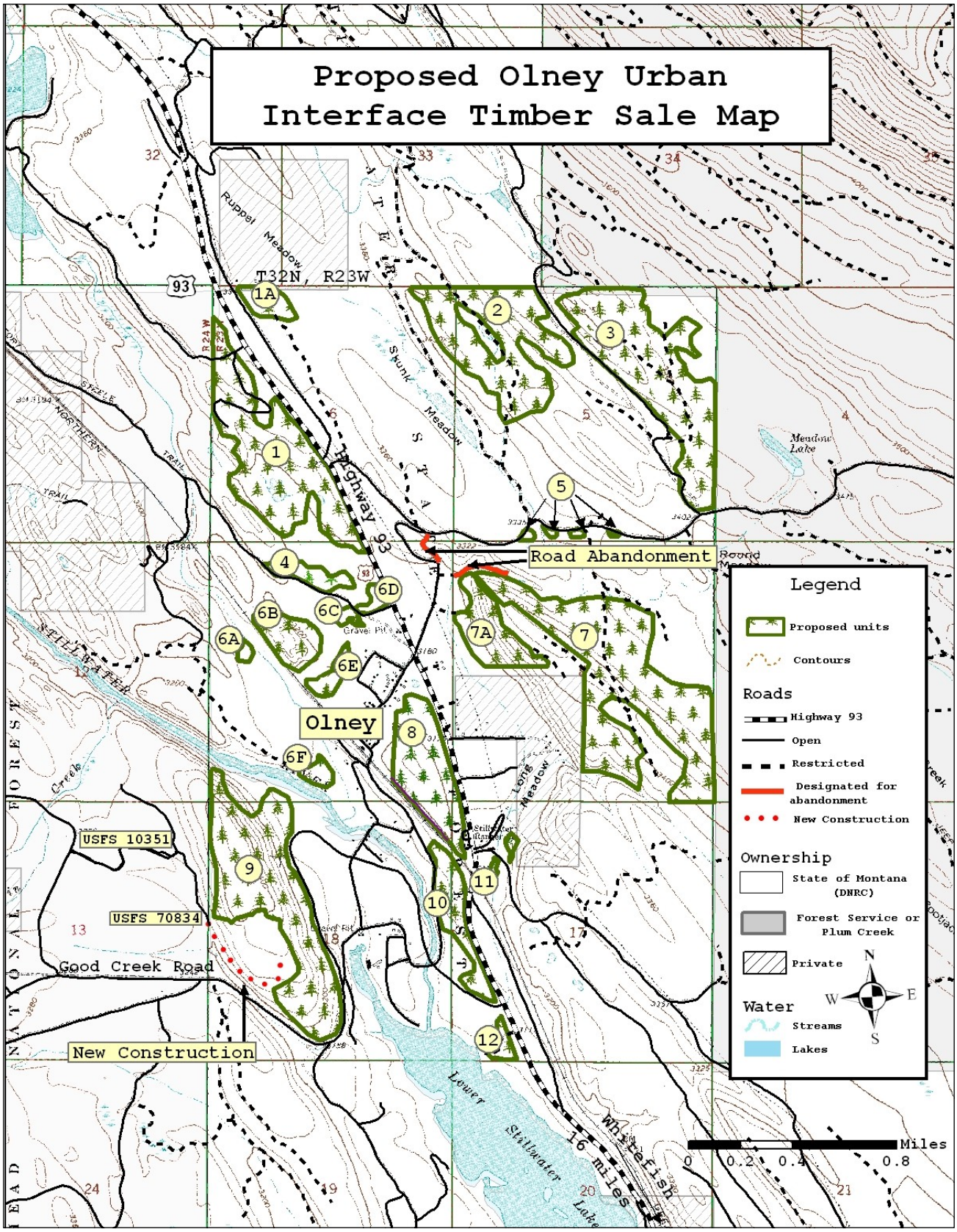
Proposed Olney Urban Interface Timber Sale Map
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Ruppel Meadow
Skunk Meadow
Highway 93
Road Abandonment
Olney
Long Meadow
Meadow Lake
Gravel Pit
USFS 10351
USFS 70834
Good Creek Road
New Construction
Lower Stillwater Lake
Whitefish
16 miles
Legend
Proposed units
Contours
Roads
Highway 93
Open
Restricted
Designated for abandonment
New Construction
Ownership
State of Montana (DNRC)
Forest Service or Plum Creek
Private
Water
Streams
Lakes
N
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Miles
0
0.2
0.4
0.8

VEGETATION ANALYSIS

INTRODUCTION

This section describes conditions of the existing vegetation on Stillwater State Forest as a whole and in the project area specifically, and describes 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, age-class distributions, and the amounts, distribution, and attributes of old growth will be discussed at the landscape and stand levels to facilitate the analysis of direct, indirect, and cumulative effects. Forest fuels, insects, diseases, and noxious weed conditions 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 take a coarse-filter approach to biodiversity by favoring an appropriate mix of stand structures and tree-species composition; this appropriate mix is described as the desired future conditions on State land (*DNRC 2003*). To implement a coarse-filter approach and meet the directive, landscape-analysis techniques were used to determine the desired future conditions, including forest covertype representation, age-class distribution, and structural characteristics.

The coarse-filter analysis will consider historic conditions from climatic section 333c, which represents the Upper Flathead Valley (*Losensky 1997*).

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

The current stand conditions will be compared to DNRC's desired future conditions. The Stillwater SLI, specifically *STW SLI_2006*, 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 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_2008* will help address the cumulative effects of covertype and age-class distributions.

Old-growth amounts and distribution will utilize the old-growth acres found through SLI and during field verification in the Duck-to-Dog, Beaver/Swift/Skyles, Shorts Meadow, and Chicken/Antice timber sales and this project.

ANALYSIS AREA

The analysis area used to assess direct, indirect, and cumulative effects to forest vegetation includes the 6 sections in the project area. Environmental effects to noxious weeds, forest fuels, insects, and diseases were conducted on the 6 sections in the project area and on the haul routes to Highway 93.

Stillwater Unit administers Stillwater State Forest, Coal Creek State Forest, most of the scattered lands north of Coal Creek State

Forest in Flathead County, and the northeastern portion of Lincoln County.

COVERTYPES AND AGE CLASSES

EXISITING CONDITION

Covertype refers to the dominant tree species that currently occupy a forested area. *TABLE II-1 – THE CURRENT AND DESIRED FUTURE CONDITIONS OF COVERTYPES ON FORESTED LAND ADMINISTERED BY STILLWATER UNIT (BY PERCENT)* illustrates the current proportions of forest covertypes compared to desired future conditions.

Data indicates, as illustrated by *TABLE II-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 fir covertypes are shade tolerant, and stand structure tends to be multistoried. The multistoried structure has resulted, in part, from the ingrowth of the shade-tolerant trees over time. Therefore, the component of shade-tolerant species increases as the interval between disturbances, such as wildfires or timber harvests, 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

TABLE II-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	3.5	1.4
Subalpine fir	25.6	16.3
Lodgepole pine	10.7	9.9
Ponderosa pine	0.8	1.7
Mixed conifer	26.1	6.5
Western larch/Douglas-fir	24.5	47.4
Western white pine	2.6	14.8
Hardwoods	3.2	3.1
Area that does not have a covertype designated in the SLI*	4.3	

**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, 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.*

numerous age classes represented in small groups of trees within larger stands. Additionally, the white pine blister rust infection has drastically affected the western white pine covertype. In reality, the number of healthy western white pine that occupy the canopy as overstory dominants have been on the decline for several decades.

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 based on the Upper Flathead Valley and *Losensky (1997)*, *TABLE II-2 – DISTRIBUTION OF AGE CLASSES* shows that Stillwater Unit is low in the 0-to-39-year (seedling/sapling stands) and 100-to-150-year age classes, and high in the 40-to-99-year and greater-than-150-year age classes. As recognized in forest management and by the Forest Management Rules, age-class distributions are not static and are quite dependant upon disturbances, whether those are natural or implemented by man through silvicultural practices.

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

TABLE II-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	13.6
40-to-99-year	12	17.9	22.8
100-to-150-year	22	24.7	13.8
150+-year	29	32.8	45.8
No age provided in SLI*			3.9

**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.*

TABLE II-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	97	421	576	2,372	666	4,132
Hardwoods	118	123	69	64		373
Lodgepole pine	2,571	8,594	320	407		12,865
Mixed conifer	3,335	6,724	4,507	15,884	353	30,804
Ponderosa pine	170	0	525	192		886
Subalpine fir	3,946	6,525	4,116	16,823	304	30,154
Western larch/ Douglas-fir	404	4,269	5,816	16,121	2,242	28,853
Western white pine	360	198	325	2,140		3,024
Nonstocked	5,069					5,069
Total Acres (total percent)	16,071 (13.6)	26,854 (22.8)	16,254 (13.8)	54,007 (45.8)	4,538 (3.9)	117,721

As was noted in *TABLE II-2 - DISTRIBUTION OF AGE CLASSES,* current age-class distributions are predominately in the oldest age class. The stand structure of these 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. Currently 94 percent of the area in the 150-year-plus age class is multistoried and the amount depicted in the mixed-conifer and subalpine fir covertypes is nearly 5 times higher than the desired future condition on Stillwater Unit.

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***

  In the area where treatment is proposed for the mixed-conifer and subalpine fir covertypes, approximately 445 acres would be converted to the western larch/ Douglas-fir covertype. Most of these treatments would result in two-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, lodgepole pine, western red cedar, Douglas-fir, and subalpine fir after regeneration. Overall, the Action Alternative would move stands in the proposed project area toward desired future conditions.

  In areas where treatment is proposed for the current western larch/Douglas-fir and Douglas fir covertypes (approximately 443 acres) and the lodgepole pine covertype (approximately 8 acres), no change in covertypes would occur.

  Of the 896 acres being harvested, no 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 that 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 multistoried stands that would be converted to single- or two-storied stands; the overstory of these two-storied stands would consist primarily of older-aged western larch, Douglas-fir, and western white pine; in 2 to 3 years, a second story of western larch, western white pine, and Douglas-fir would become established. The created openings would be typical of mixed-severity fires.

  The proposed action would mimic the effects of historic fire behavior, thus creating openings for wildlife, reducing the potential of high-intensity wildfires, and regenerating stands toward desired future conditions.

Cumulative Effects

- ***Cumulative Effects of the No-Action Alternative 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 2006 SLI*; several are reflected in the *STW 2008 SLI*, but not all. The timber sale projects that have been designed or sold since the *STW 2006 SLI* 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. The *STW 2008 SLI* shows that with 3 timber sales there has been a 0.4-percent increase in the amount of the 0-to-30-year age class and a 0.5-percent reduction in the 150-year age class, approximate changes of 450 acres and 550 acres, respectively. 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 age classes. 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 or lodgepole pine covertype to a western larch or western white pine covertype.

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

  Under this alternative, cumulative effects to age classes would be similar to the No-Action Alternative, while cumulative effects to covertypes would result in a greater increase in seral covertypes in the cumulative-effects analysis area.

OLD GROWTH

EXISTING CONDITION

DNRC uses the minimum criteria described by *Green et al*. (*Old-Growth Forest Types of the Northern Region, 1992*) to determine old-growth stands on State lands. *Green et al.* described characteristics of old-growth forests in Montana and provided minimum amounts of trees per acre of a given diameter at breast height (dbh) and age for each old-growth type. DNRC classifies stands that meet or exceed those minimums as old growth. For this analysis, existing conditions and effect on old growth are presented according to this definition.

Based on SLI data and field surveys in the project area and on several other sections on Stillwater State Forest, approximately 10.09 percent (11,703 acres) of the Stillwater State Forest Analysis Area can be classified as old growth.

TABLE II-4 - OLD-GROWTH STANDS ON STILLWATER STATE FOREST (2008) OLD-GROWTH ACRES BY COVERTYPE displays old growth by forest covertype. Covertype is related to habitat type, habitat-type groups, and successional stages. Subalpine fir and mixed conifer are the dominant old-growth covertypes on Stillwater State Forest.

TABLE II-4 - OLD-GROWTH STANDS ON STILLWATER FOREST (2008) OLD-GROWTH ACRES BY COVERTYPE

DOUGLAS-FIR	LODGEPOLE PINE	MIXED CONIFER	SUBALPINE FIR	WESTERN LARCH/ DOUGLAS-FIR	WESTERN WHITE PINE	TOTALS
531	407	3,309	3,980	2608	868	11,703

OLD-GROWTH ATTRIBUTES

DNRC developed a tool called the Full Old-growth Index (FOGI) to describe the level of attributes commonly associated with old growth for stands on State lands. The attributes considered are:

- number of large live trees,
- number of snags,
- amount of coarse woody debris,
- amount of decadence,
- multistoried structures,
- gross volume, and
- crown cover.

These attributes are assigned a value or index rating that, when summed with the values or index ratings of the other attributes, indicate a total score or index rating for the stand. These scores can be grouped into low, medium, and high attribute categories. This provides an indication of the condition of the stand in reference to attributes that are often associated with old-growth timber stands. These attribute levels are not necessarily an indication of quality, but are tools to compare and classify a collection of older stands over the landscape. Approximately 25 acres of old growth in the project area is classified 'medium' in the old-growth index. A 10-acre stand of old growth in the originally proposed Unit 9 has a 'high' index; this stand was withdrawn from the harvest proposal.

Some old-growth characteristics in the project area:

- Western larch and Douglas-fir are the main tree species.
- Very few larger-diameter western white pine remain on site; most died around 1990 from a combination of weather-related stresses, white pine blister rust, and the subsequent mountain pine beetle attacks.
- The stand structures are multistoried, comprised of seedling to large sawtimber-sized trees.
- Vigor is below average to poor.
- Evidence of Armillaria root-rot and Douglas-fir bark beetle activity is present in the Douglas-fir and is causing mortality in the larger-diameter trees.

ALTERNATIVE EFFECTS TO OLD GROWTH

Direct and Indirect Effects

- ***Direct and Indirect Effects of the No-Action Alternative to Old-Growth Distribution and Attributes***

  Stands that currently meet DNRC's old-growth definition throughout Stillwater Unit would become more decadent. Stocking levels and the loading of down woody debris would increase in some stands and covertypes, increasing wildfire hazards. Shade-tolerant species would remain dominant in stands. Various factors, such as insects, diseases, and decreasing vigor, would eventually cause more snags to occupy portions of the stands.

  The 25 acres of old-growth that is proposed for harvesting is heavily

infested with Douglas-fir bark beetles. At the current rate of mortality in large-diameter trees in that stand, the 25 acres of old growth would likely not meet the criteria for old growth within the next 10 years.

- ***Direct and Indirect Effects of the Action Alternative to Old-Growth Distribution and Attributes***

  Timber would be harvested in Unit 9, which is located next to a 10-acre old-growth stand. Structurally, this would create more abrupt stand edges and likely increase the amount of sunlight along the edges of harvested and unharvested areas. This additional sunlight would increase the growth of some trees established in that zone. Potentially, the risk of blow-down along the proposed unit boundaries would increase and likely add to the down fuel loading. Harvested areas next to the old-growth stand near Unit 9 could possibly act as a fuel break, which could slow or stop wildfires before they could burn the old-growth.

  Approximately 25 acres of old-growth would be harvested with regeneration treatments on areas that lie within stand-replacement or mixed-severity fire regimes. The posttreatment timber stand would no longer meet DNRC's criteria for old growth.

Cumulative Effects

- ***Cumulative Effects of the No-Action Alternative to Old-Growth Distribution and Attributes***

  The Beaver/Swift/Skyles and Chicken-Antice timber sale projects are proposing to harvest in old-growth stands on Stillwater State Forest. The Chicken-Antice EA has been released; the Beaver/Swift/Skyles EA is currently being drafted. If these projects are implemented, approximately 297 acres of old growth would be harvested. Of this, approximately 60 acres would receive 'maintenance' and 'restoration' treatments as described in *ARM 36.11.418*. Following harvesting, those 60 acres would still be classified as old-growth because the treatments used would leave a sufficient number of large live trees to meet the minimum criteria described by *Green et al. (1992)*, which DNRC uses to define old growth. Old growth would be reduced to an estimated 11,466 acres; approximately 9.7 percent of the analysis area. The percentage of old-growth acres by covertype would change very little.

- ***Cumulative Effects of the Action Alternative to Old-Growth Distribution and Attributes***

  As noted above, the Beaver/Swift/Skyles and Chicken-Antice timber sale projects would have an effect on the old-growth amounts on Stillwater State Forest. In combination with the implementation of this proposed action alternative, old-growth would be reduced to an estimated 11,441 acres; approximately 9.7 percent of the analysis area.

INSECTS AND DISEASES

EXISTING CONDITIONS

The Olney Urban Interface project area is showing an increase in the incidence of western balsam bark beetles(*Dryocoetes confuses*),fir engraver beetles (*Scolytus ventralis*), Douglas-fir beetles (*Dendroctonus pseudotsugae*), *Armillaria* root disease, and Indian paint fungus (*Echinodontium tinctorium* E.& E.). In addition, dwarf mistletoe, comandra blister rust *(Cronartium comandrae Pk.),* mountain pine beetle *(Dendroctonus Ponderosae)*, and spruce bark beetle *(Dendroctonus rufipennis)* are also

present. The present tree mortality and fuel loading conditions in proposed Units 1, 2, 3, 7, and 9 are the result of root disease, Indian paint fungus, and bark beetle infestations.

ALTERNATIVE EFFECTS TO INSECTS AND DISEASES

Direct and Indirect Effects

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

  Insect populations would continue to rise or fall based on natural disturbance events or climatic conditions. The potential for an increase in spruce bark beetle attacks exists if Engelmann spruce were damaged by wind events, stem breakage, or fire in the vicinity of these forested lands. The Douglas-fir bark beetle population would also, potentially, increase damage to Douglas-fir. Mortality over much of the project area may occur and loss of value due to stem decay would likely increase.

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

  Insect populations would continue to rise or fall based on the natural disturbance events or climatic conditions. The increase in vigor of the new regeneration and species being retained for seedtrees, primarily western larch and Douglas-fir, would improve long-term resistance to insect and disease problems.

  Seedtree harvests would reduce the amount of trees susceptible to Douglas-fir bark beetle infestations on approximately 124 acres. Regeneration harvests in Units 1, 2, 3, 5, 7, and 9 would reduce the potential for outbreaks of spruce bark beetles, fir engraver beetles, and western balsam bark beetles in Engelmann spruce, subalpine fir, and grand fir on approximately 637 acres. The mature trees that would be retained along Meadow Creek in Unit 7 and in the wetlands in Units 1, 2, and 3 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 infestation and disease occurrence can be expected as timber stands become more densely stocked, lower in vigor, and contain increased levels of blown down timber.

- ***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 given that the proposed action would reduce stocking density and increase vigor. Western larch, Douglas-fir, western red cedar, and ponderosa pine regeneration would be promoted and managed for the long-term, thereby improving resistance to insect and disease problems on those areas being harvested.

FOREST FUELS AND FIRE REGIMES

The habitat types for stands in the Olney Urban Interface project area are primarily moist grand fir and subalpine fir types (91 percent), with a small percentage of Douglas/ fir and warm grand fir habitat types (9 percent) (*Fisher*).

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 these sections have

developed a high number of stems per acre and several levels of canopy. Under these forest conditions, fires can reach the upper canopy levels through the available ladder fuels, causing torching and, under some conditions, resulting in crown fires.

Units recently harvested in the Olney Urban Interface project area have met the *Montana Hazard Reduction Law* standards, reduced ladder fuels, and have retained approximately 15 tons of large woody debris on site to facilitate nutrient cycling for the soils.

Following the habitat-type grouping that was done by *Fisher and Bradley, Fire Ecology of Western Montana Habitat Types*, the proposed units for this project are represented by 4 fire regimes that are classified as fire groups: Fire Group 9 (moist, lower subalpine habitat type - 61 percent), Fire Group 11 (moist grand fir habitat type - 32 percent), Fire Group 6 (moist Douglas-fir habitat type - 5 percent), and Fire Group 7(cool habitat type dominated by lodgepole pine - 2 percent). Fire Groups 9 and 11 represent moist, lower subalpine and grand fir habitat types where fires are infrequent, but severe, and the effects are long lasting. Under normal moisture conditions, the lush undergrowth usually serves as an effective barrier to rapid fire spread for this group. When drought conditions exist, a severe surface fire will have a good chance of killing most of the trees. Heavy fuel loads combined with drought conditions set the stage for severe widespread fires in these groups. Fire Group 7 consists of cool habitat types, usually with Douglas-fir, Engelmann spruce, and subalpine fir supporting lodgepole pine-dominated stands. Stands in this group generally have about 18 tons per acre of downed woody fuel, but the fuel loading can be up to 150 tons per acre. Wildfires evidently recycle the stands before the lodgepole pine dies out. In Fire Group 6, fire intensities range from nonlethal to mixed lethal, with small areas of stand-replacing fires. Of the Fire Groups that occupy the area, this regime has the lowest amount of downed dead fuel loads, averaging 12 tons per acre.

ALTERNATIVE EFFECTS TO FOREST FUELS

Direct and Indirect Effects

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

  Stands would continue to retain ladder fuels and dense stands until 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 Forest Fuels***

  Areas treated with the seedtree treatment would retain approximately 10 to 15 tons per acre of large woody debris following site-preparation treatments. Fire is always a potential, but the 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 any fire occurring would most likely be a ground fire burning in the understory rather than a stand-replacing crown fire.

  Areas treated with commercial-thin treatments would reduce the amount of trees and, thereby, fuel loads would be reduced. The connectivity of fuel and ladder fuels may not be reduced. In some

circumstances, the risk of wildfires may be increased due to an increased amount of wind, dry fuels on the forest floor, and ladder fuels that have not been significantly reduced.

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

The proposed harvesting would also decrease the risk of uncontrollable fires to adjacent land and homesites. 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 take place in areas adjacent to homesites, removing up to 90 percent of the slash along the perimeter of the harvest unit.

Cumulative Effects

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

  In the past 10 years, approximately 138 acres of the harvest area in the Olney Urban Interface Project have had fuels treated to levels meeting Montana's *Hazard Reduction Law*. Under this alternative, no changes would occur except the fuel reductions that would occur with firewood cutting.

- ***Cumulative Effects of the Action Alternative to Forest Fuels***

  In addition to the actions displayed under the *Cumulative Effects of the No-Action Alternative to Forest Fuels*, 896 acres would be harvested and the slash and fuel loading would be reduced to meet the *Hazard Reduction Law*; in many areas of the Wildland Urban Interface project area, slash reduction would meet the 'High Standards' set forth in the Hazard Reduction Law.

  Due to the location of proposed harvest units, reduced fuel loads, and 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 weeds have been located on DNRC ownership and along access routes to the project area:

- spotted knapweed (*Centraurea maculosa*)
- St. John's-wort (*Hypericum perforatum*)
- oxeye daisy (*Chrysanthemum leucanthemem*)
- orange hawkweed (*Hieracium aurantiacum*)

The first 3 species listed 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 oxeye daisy, the most widely distributed noxious weeds in the project area and on Stillwater State Forest, is found in areas where ground disturbances

such as landings, skid trails, powerlines, 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, the project area is used extensively for dispersed recreation, and weed seed is introduced primarily from motor 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 resulting 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 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. Over time, the weed-management program at Stillwater Unit, including cooperation with the USFS and weed departments of Flathead and Lincoln counties, has improved and more weed control is taking place.

- ***Cumulative Effects of the Action n Alternatives to Noxious Weeds***

  This alternative will be similar to the No-Action Alternative, but with a slightly higher risk of weeds becoming established.

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WATER RESOURCES ANALYSIS

INTRODUCTION

This analysis is designed to disclose the existing condition of the hydrologic and fisheries resources and display the anticipated effects that may result from each alternative of this proposal. During the initial scoping, issues were identified regarding water quality, water quantity, and fisheries resources. After reviewing the public and internal comments, DNRC developed the following issue statements regarding the potential effects of the proposed timber harvesting:

- Timber harvesting and road construction has the potential to increase water yield, which, in turn, may affect stream channel stability.
- Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.
- Timber harvesting and road construction activities may affect fish habitat by impacting water quality and decreasing habitat quality.
- Timber-harvesting activities may affect the fish-habitat parameters of large woody debris, channel complexity, stream shading, and stream temperature.

These issues can best be evaluated by analyzing the anticipated effects of sediment delivery and water yield on the water quality of streams in the project area.

The *ENVIRONMENTAL EFFECTS* sections disclose the anticipated direct, indirect, and cumulative effects to water resources in the analysis area from the proposed actions. Past, current, and future planned activities on all ownerships in each analysis area have been taken into account for the cumulative-effects analysis.

The primary concerns relating to aquatic resources in the analysis area are potential impacts to water quality from sources outside the channel as well as inside the channel. In order to address these issues, the following parameters are analyzed by alternative:

- miles of new road construction and road improvements
- potential for sediment delivery to streams
- increases in the Equivalent Clearcut Acre (ECA) and annual water yield
- increases or decreases in fish-habitat parameters

ANALYSIS METHOD

Sediment Delivery

The methods applied to the project area to evaluate potential direct, indirect, and cumulative effects include a field review of potential sediment sources from haul routes. Stream crossings and roads were evaluated to determine existing sources of introduced sediment. Potential sediment delivery from harvest units will be evaluated from a risk assessment. This risk assessment will use the soil information provided in the *SOILS ANALYSIS* and the results from soil monitoring on past DNRC timber sales. In-channel sources on Meadow Creek have been reviewed as an integral part of the *R1/ R4 Fish Habitat Inventory*.

Water Yield

Annual water yield will be disclosed as a cumulative effect in the *EXISTING CONDITIONS* portion of this report because the existing condition is a result of all past

harvesting and associated activities. Annual water yield refers to the gross volume of water in a watershed that is contributed to a stream or other surface water feature. In the *ENVIRONMENTAL EFFECTS* portion of this report, water-yield increases as a result of this project will be disclosed as a direct effect. The cumulative water-yield increase as predicted to include each alternative will be disclosed as a cumulative effect.

The annual water-yield increase for watersheds in the project area was estimated using the ECA method as outlined in *Forest Hydrology, Part II (Haupt et al, 1976)*.

ECA is a function of total area roaded, harvested, or burned; percent of crown removed during harvesting or wildfire; and amount of vegetative recovery that has occurred in the harvested or burned areas. As live trees are removed, the water that would have evaporated and transpired either saturates the soil or is translated to runoff. This method also estimates the recovery of these increases as new trees revegetate the site and move toward preharvest water use.

In order to evaluate the potential effects of water-yield increases, a threshold of concern for each watershed was established per *ARM 36.11.423*. Thresholds were established based on evaluating the acceptable risk level, resources value, and watershed sensitivity. Increased annual water yields above the threshold of concern result in an increased risk of in-channel erosion and degradation of fisheries habitat.

Fish Habitat Parameters

Expected effects to fisheries habitat will be addressed qualitatively using the current condition as a baseline, disclosing the expected changes due to the alternatives proposed. The analysis method for woody debris recruitment will evaluate the potential reduction in available woody debris and shading due to timber-harvesting activities. Stream temperature will be addressed by evaluating the risk of stream temperature increases due to reduced shading from existing vegetation.

ANALYSIS AREA

Sediment Delivery

The analysis area for sediment delivery is limited to the harvest units and roads used for hauling. This includes upland sources of sediment that could result from this project. In addition, in-channel sources of sediment such as mass-wasting locations or excessive scour/deposition will be discussed for portions of Dog Creek, Meadow Creek, and the portion of Stillwater River downstream of the proposed harvest units.

Water Yield and Cumulative Effects

Dog and Meadow creeks are tributary to Stillwater River and Lower Stillwater Lake, respectively. The Lower Stillwater watershed is the 6th code HUC (Hydrologic Unit Code) watershed for the project area and includes Meadow and Dog creeks; however, the level of proposed harvesting would not likely result in measurable impacts from water yield. Therefore, the analysis areas for water yield and cumulative effects are the Meadow Creek and Dog Creek watersheds. This is selected as the appropriate scale of analysis due to the size of the project versus the watershed size and the potential for impacts.

Due to the low level of harvesting outside of the Dog Creek and Meadow Creek watersheds, these watersheds will be discussed qualitatively.

Fisheries Habitat Parameters

The analysis area for fisheries habitat parameters is the proposed harvest units immediately adjacent to fish-bearing streams. This includes proposed harvest units near Meadow Creek, Dog Creek, and Stillwater River. Because no fisheries resources were identified in the unnamed tributary, no impacts would be expected from this proposal and, therefore, no effects discussion will occur for this stream.

WATER USES AND REGULATORY FRAMEWORK

WATER QUALITY STANDARDS

This portion of the Flathead River Basin, including Stillwater River above Logan Creek and its tributaries, is classified as B-1 by the State of Montana DEQ, as stated in the *Administrative Rules of Montana (ARM 17.30.608)*. The water-quality standards for protecting beneficial uses in B-1 classified watersheds are located in *ARM 17.30.623*. Water in B-1 classified waterways is suitable for drinking, culinary and food processing purposes after conventional treatment, bathing, swimming and recreation, growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers, and agricultural and industrial water supply. State water-quality regulations limit any increase in sediment above naturally occurring concentration in water classified B-1. Naturally occurring means condition or materials present from runoff or percolation over which man has no control or from developed land where all reasonable land, soil, and water conservation practices have been applied (*ARM 17.30.602 [17]*). Reasonable land, soil, and water conservation practices include "methods, measures or practices that protect present and reasonably anticipated beneficial uses…" (*ARM 17.30.602 [21]*). The State of Montana has adopted BMPs through its non-point source management plan as the principle means of meeting the *Water Quality Standards*.

WATER QUALITY LIMITED WATERBODIES

Neither Stillwater River near the project area nor its tributaries are listed as a water-quality-limited waterbody in the *2006 303(d)* list. Stillwater River below Logan Creek is listed on the *2006 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 *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.

STREAMSIDE MANAGEMENT ZONE LAW

All rules and regulations pertaining to the SMZ Law will be followed. An SMZ width of 100 feet is required on Class I and II streams when the slope is greater than 35 percent. An SMZ width of 50 feet is required when the slope is less than 35 percent.

WATER RIGHTS AND BENEFICIAL USERS

Surface water rights exist within 3 miles downstream of the project area for lawn and garden use, industrial use, stock watering, and multiple uses.

FISHERIES - THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Westslope cutthroat trout are listed as a Class-A Montana Animal Species of Concern. A Class-A designation is defined as a species or subspecies that has limited numbers and/or habitats both in Montana and elsewhere in North America, and elimination from Montana would be a significant loss to the gene pool of the species

or subspecies (DFWP, *Montana Natural Heritage Program [MNHP]*, and *Montana Chapter American Fisheries Society Rankings*). DNRC has also identified westslope cutthroat trout as a sensitive species (*ARM 36.11.436*).

EXISTING CONDITION

GENERAL DESCRIPTION

The Lower Stillwater watershed is an approximate 17,500-acre watershed that includes Stillwater River, Meadow Creek, part of Dog Creek and other unnamed tributaries. Precipitation ranges from 30 to 50 inches per year, mostly in the form of snow. Elevations in this 6th code HUC watershed range from 3,000 feet above sea level at the most downstream point on Stillwater River to approximately 5,200 feet above sea level on the divide between Meadow Creek and Swift Creek.

SEDIMENT DELIVERY

- **Meadow Creek**

  The Meadow Creek watershed is an approximate 6,603-acre tributary to Lower Stillwater Lake. The third-order stream flows in a general north-to-south direction from its headwaters at Meadow Lake to its mouth at Lower Stillwater Lake. The lower portion of this stream is intermittent, with surface water flowing less than 3 months of the year. All but the lowest reach of this stream are perennial and provide habitat for westslope cutthroat trout and pumkinseed. Meadow Creek was sampled using electrofishing techniques to determine fish presence/ absence in the stream.

  In-channel sediment sources are very limited in this stream; however, some small areas of bank instability exist. During a *R1/R4 Fisheries Habitat Standard Inventory (Overton et al 1997)* conducted in 2006, approximately 99 percent of the streambank length exhibited stable characteristics. Areas not considered stable were generally at outcurves and constrictions.

  Several road crossings exist on Meadow Creek on trust lands within or downstream of the project area. Three stream-crossing structures are undersized and likely have resulted in spring runoff flows overtopping the road. This has resulted in sediment delivery from the road prism directly into Meadow Creek.

  Additional information regarding Meadow Creek fisheries habitat can be found in the project file.

- **Dog Creek**

  Dog Creek (downstream of Dog Lake) is a *Rosgen* B3 stream with gradients of less than 2 percent. This stream is a perennial, Class I stream that provides habitat for westslope cutthroat trout and eastern brook trout. Several other fish species may also inhabit the stream. No mass-wasting sites or instream sediment sources were noted during field reconnaissance.

  Sediment sources from roads and railroads were identified downstream of Dog Lake at 2 locations. One site is the road crossing in Section 1, T32N, R24W. Sediment delivery is apparent from approximately 300 feet of road surface on the north side of this crossing. While the volume of sediment is relatively low, this site does not meet current BMPs. The second site is the railroad bridge crossing a few hundred feet downstream of the road crossing. This site is a popular recreation site for wading and fishing.

Due to the amount of use, the creosote from the railroad ties, and disturbance from the railroad and road, no vegetation is present and some sediment delivery is likely.

- **Unnamed Stream near Olney (Section 18, T32N, R23W)**

  This unnamed stream is an approximate 450-acre watershed and flows from springs on DNRC- and USFS-managed lands southerly across Good Creek Road and east toward Lower Stillwater Lake. The scoured channel does not continue to Lower Stillwater Lake and, during field reconnaissance, no evidence of surface water connectivity was found.

  This is a low-gradient channel with a silt/ sand bottom mixed with a few gravels and cobble. Due to the consistent source, seasonal fluctuations are limited, although spring snowmelt likely would increase runoff for a short period of time.

  Although 2 road crossings exist, no evidence of direct sediment delivery was noted during field review.

  Electrofishing was performed in multiple locations to determine fish presence/ absence. No native or nonnative fish were found in the system.

- **Stillwater River**

  Within the project area, Stillwater River is a relatively low-gradient stream (approximately 2 percent or less) with a mixed-substrate channel bottom consisting of boulders, cobbles, gravels, and finer material. No unstable mass-wasting sites have been identified within or adjacent to the project area during field review.

  Two stream crossings of Stillwater River exist near the mouth of the river at Lower Stillwater Lake. One of the crossings has been abandoned and presents no signs of direct sediment delivery. The upstream crossing on Good Creek Road is a paved surface, and no evidence of direct delivery was noted.

FISH HABITAT PARAMETERS

- **Large Woody Debris**

  Current levels of large woody debris (*Overton et al 1997*) in Meadow Creek averages 131 pieces per 1,000 feet of stream channel. Data is not available for large woody debris in Dog Creek downstream of Dog Lake; however, analysis during the Duck-to-Dog Timber Sale Project estimated that 15.3 percent of the Lower Dog Creek watershed was affected by riparian harvesting that could affect recruitable large woody debris.

  Large woody debris recruitment to streams is important to maintain channel form and function and as a component of fish habitat. According to *ARM 36.11.425*, DNRC will establish a Riparian Management Zone (RMZ) '*…when forest management activities are proposed …on sites that are adjacent to fish bearing streams and lakes.*' One reason for the RMZs is to retain adequate levels of large woody debris recruitment to the stream channel. RMZs have been identified according to *ARM 36.11.425 (5),* which uses site potential tree heights at the 100-year age. For Meadow Creek, the site potential tree height was modeled at 90 feet. For Dog Creek, the site potential tree height established during the Duck-to-Dog Timber Sale was 103 feet.

  Except for Dog Creek, no harvesting is planned within 100 feet of any fish-bearing stream in the project area; therefore, a risk of adversely affecting

large woody debris recruitment would not be expected and no further discussion is warranted. Dog Creek, however, will be discussed further.

- **Stream Temperature**

  No long-term temperature monitoring has occurred in any of the streams in the project area. Spot temperatures ranging from 17 to 18 degrees Celsius were recorded in Meadow Creek during the summer of 2008. These existing peak seasonal stream temperatures are likely indicative of a limiting or stressing habitat variable for westslope cutthroat trout, which may not be conducive to long-term survival of this apparently isolated population. Westslope cutthroat trout in Meadow Creek were only found in a very short reach that appears to intercept a small amount of groundwater and provide a thermal refugium during base flows. (*Bower 2008*)

- **Water Yield and Cumulative Effects**

  A harvest history was developed for the Stillwater State Forest watersheds from aerial photos, timber sale contracts, and section record cards to estimate the annual water-yield increases for each watershed. Harvesting in Stillwater State Forest has occurred since the early 1900s. Within the Meadow Creek and Dog Creek watersheds, consistent harvesting took place in the 1960s through the 1990s. Small salvage harvesting, Christmas tree harvesting, and firewood gathering has taken place for several decades. Using the ECA method described earlier, the existing annual water-yield increase for the Meadow Creek watershed is estimated at 11.7 percent and Dog Creek is estimated at 6.3 percent over a fully forested condition.

  After reviewing the beneficial uses, existing channel conditions, and existing watershed condition per *ARM 36.11.423*, the threshold of concern for the Meadow Creek watershed was set at 15 percent over a fully forested condition; Dog Creek was set at 12 percent over a fully forested condition. The difference in thresholds reflects the fisheries resources present in each watershed. These threshold values expect a low to moderate degree of risk of adverse impacts to beneficial uses due to water-yield increases as described in *ARM 36.11.423(f)(iv)*.

ENVIRONMENTAL EFFECTS

DESCRIPTION OF ALTERNATIVES

- ***No-Action Alternative***

  No timber harvesting or associated activities would occur under this alternative. Existing activities such as recreational use, individual Christmas tree harvesting, and firewood gathering would continue.

- ***Action Alternative***

  Nineteen units totaling approximately 896 acres would be commercially harvested under this alternative. Approximately 843 acres would be harvested using conventional ground-based equipment, while the remaining 53 acres would be treated using cable methods. In addition, approximately 0.4 miles of new system road and 1.8 miles of temporary road would be constructed, 0.37 miles of road would be obliterated, and 12 to 18 miles of road would be maintained or have minor drainage improvements installed as necessary to protect water quality. Three of the harvest units (423 acres) would be completed under winter conditions, which require frozen and/or snow-covered conditions. The remainder of the units

(473 acres) may be completed under summer or winter conditions.

Existing activities such as recreational use, individual Christmas tree harvesting, and firewood gathering would continue.

DIRECT AND INDIRECT EFFECTS

- ***Direct and Indirect Effects of the No-Action Alternative to Water Resources***

Sediment Delivery

Under this alternative, no timber harvesting or related activities would occur. The existing direct sediment-delivery sources would continue until repaired by another project or funding source. In-channel sources of sediment would continue to exist and erode as natural events dictate.

Fish Habitat Parameters

- ***Large Woody Debris Recruitment***

  No reduction in recruitable large woody debris would result from the implementation of this alternative.

- ***Stream Temperature***

  No increases in stream temperature from a reduction in stream shading would be expected under this alternative.

Water Yield

No increase in water yield would be associated with this alternative.

- ***Direct and Indirect Effects of the Action Alternative to Water Resources***

Sediment Delivery

Past monitoring of DNRC timber harvests has shown erosion on approximately 6 percent of the sites monitored, although no water-quality impacts from the erosion were found (*DNRC 2004*). These sites were harvested during the summer period and the erosion was attributed to inadequate skid trail drainage. Monitoring of soil impacts from past DNRC timber sales has found that "winter logging resulted in minimal soil displacement. Displacement was limited to main skid trails that occupy less than 2% of the harvest units." (*DNRC 2004*). By minimizing displacement, less erosion would likely occur compared to other harvest methods with more extensive disturbance (*Clayton 1987 in DNRC 2004*).

No harvesting would occur within the SMZ or RMZ of streams except for Unit 6A, which is a 2-acre unit designed to remove dead and dying trees near Dog Creek. This area of proposed SMZ harvesting has slopes less than 20 percent. No equipment would be operated within the 50-foot SMZ.

During a review of BMP effectiveness including stream buffer effectiveness, *Raskin et al* found that 95 percent of erosion features (disturbed soil) greater than 10 meters (approximately 33 feet) from the stream did not deliver sediment. His findings indicated that the main reasons stream buffers are effective include 1) keeping active erosion sites away from the stream, and 2) stream buffers may intercept and filter runoff from upland sites as long as the runoff is not concentrated in gullies or similar features (*Raskin et al 2006*).

The proposed road construction does not include new stream crossings. All construction would occur well away from streams on soils that are suitable for road construction (*Martinson and Basko 1998*). Because revegetation may be difficult on the road fill, erosion may occur, but due to the distance from streams, sediment delivery and subsequent water-quality

impacts would not likely occur.

Existing roads would have drainage improvements and BMP upgrades implemented under this alternative, as well as repair of the direct sediment-delivery locations noted on Meadow Creek. Minor drainage improvements include reshaping drain dips, cleaning ditch-relief culvert catchbasins, as well as ditch reshaping and ditch-relief culvert extensions. Other drainage improvements include stream-crossing upgrades to meet BMPs and the removal of undersized culverts. Current maintenance activities would continue to provide drainage to area roads.

Because proposed harvest levels under this alternative would not substantially increase water yield or stream flow, only a low risk of increased in-channel sediment would result from this alternative. In-channel sources of sediment would be expected to continue to contribute sediment at the current rate.

Because DNRC would incorporate BMPs into the project design as required by *ARM 36.11.422 (2)* and all laws pertaining to SMZs would be followed, a low risk of sediment from timber-harvesting activities would result from the implementation of this alternative. Therefore, the risk of long-term adverse direct or indirect effects to water quality or beneficial uses would be low.

Fish Habitat Parameters

- ***Large Woody Debris Recruitment***

  As described earlier, no harvesting would occur within 100 feet of fish-bearing streams except for a 2-acre unit near Dog Creek. The proposed action alternative would remove a portion of the recruitable woody debris from the RMZ of Dog Creek for approximately 225 feet. Due to the small scale of this harvest in the lower Dog Creek watershed, a very low risk of adverse affects would be expected (*Bower 2008*).

- ***Stream Temperature***

  Harvesting along fish-bearing streams would occur outside of 100-foot buffers except for Unit 6A along Dog Creek. Because stream shading would not be reduced along Meadow Creek, Stillwater River, or unnamed tributaries, the risk of increasing stream temperatures due to timber harvesting would be very low.

  Along Dog Creek, where the prescription for Unit 6A proposes partial removal of vegetation within the RMZ and SMZ, stream shading would be reduced. Due to the very small scale of this unit in the lower Dog Creek watershed, the risk of adverse impacts to this fisheries habitat resource from this action would be very low.

Water Yield

If this alternative were selected, approximately 896 acres would be harvested using conventional ground-based and cable yarding methods. Approximately 723 ECA would be generated from these activities. Meadow Creek would see the largest increase. The annual water yield in Meadow Creek would increase by 1.4 percent; Dog Creek would experience an annual water-yield increase of approximately 0.3 percent.

Due to the consistent flow in the unnamed tributary, a measurable water-yield increase is not expected from the 28 ECA generated in that watershed.

The direct annual water-yield increase in Stillwater River would be considerably less than 0.1 percent from the 115 ECA. This level of increase would not be measurable and would not be expected to result in impacts different than the current conditions.

CUMULATIVE EFFECTS

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

Sediment Delivery

The potential for sediment contribution from the proposed haul route would still exist, as would the in-channel sediment sources described in *EXISTING CONDITION*. The existing direct sediment-delivery sources would continue until repaired by another project or funding source. In-channel sources of sediment would continue to exist and erode as natural events dictate.

Fish Habitat Parameters

- ***Large Woody Debris Recruitment***

  No reduction in recruitable large woody debris would result from the implementation of this alternative. Recruitable large woody debris would be retained at an adequate level to maintain stream form and function.

- ***Stream Temperature***

  No increases in stream temperature from a reduction in stream shading would be expected under this alternative because no harvesting would occur. Natural stream temperatures would be maintained with a low degree of risk.

Water Yield

No increase in water yield would be associated with this alternative. As vegetation continues toward preharvest conditions, annual water-yield increases would gradually reduce to preharvest levels.

Cumulative Effects Summary

Because no timber harvesting or associated activities would occur under this alternative, cumulative effects would be limited to the natural progression of the existing condition. Sediment sources would continue unless repaired under a separate project. Conditions would continue to support fish habitat parameters and provide adequate levels of large woody debris and shade to maintain channel form and function and also support a natural range of water temperatures. Under this alternative, fisheries habitat quality would be maintained at its current level with a low degree of risk of change due to anthropogenic sources.

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

Sediment Delivery

The proposed road-construction timber-harvesting and road-construction activities would occur. A reduction in direct sediment delivery would likely occur due to culvert replacements and minor drainage improvements. A cumulative increase in sediment delivery as a result of timber harvesting would have a low risk of occurring because of the BMP application and adequate stream buffers to filter potential displaced soil. In-channel sources of sediment would continue to exist and erode as natural events dictate with a low risk of affecting beneficial uses.

Fish Habitat Parameters

- ***Large woody debris recruitment***

  Approximately 225 linear feet of Dog Creek (approximately 0.5 acres) would have reduced levels of recruitable woody debris. Because a majority of the recruitable woody debris in the proposed harvest units would be retained, adverse affects would not likely result from the reduction.

- ***Stream temperature***

  Because of the limited amount of the shade-producing vegetation that would be removed, a low risk of cumulative temperature increases above naturally occurring ranges would result from the implementation of this alternative.

- ***Water Yield***

  The estimated cumulative water-yield increase in the Meadow Creek watershed would be 13.1 percent if this alternative were selected; Dog Creek would experience an estimated cumulative annual water-yield increase of 6.6 percent. Because this level would remain below the threshold set in accordance with *ARM 36.11.425(g)*, a low degree of risk to water quality would result from the implementation of this alternative. Other watersheds would have very small, likely immeasurable, increases.

Cumulative Effects Summary

Because all timber-harvesting activities would follow BMPs as required by *ARM 36.11.422* and the direct and indirect effects would have a low risk of impacts, a low risk of additional adverse cumulative effects would be expected to occur under this alternative. This expectation includes the results of (1) a reduction in direct sediment delivery to Meadow Creek and to Dog Creek on Fort Steele Road; (2) a slight reduction in potential recruitable large woody debris in the RMZ along 225 feet of Dog Creek; and (3) a slight increase in modeled annual water-yield estimates. Furthermore, conditions would continue to support fish-habitat parameters and provide adequate levels of large woody debris and shade to maintain channel form and function and also support a natural range of water temperatures. Under this alternative, fisheries habitat quality would also be maintained at its current level, with a low degree of risk of change due to anthropogenic sources.

Because the annual water-yield increases would remain below the thresholds of concern and BMPs would be implemented during timber-harvesting and road-construction operations, the risk of adverse cumulative impacts to water quality and beneficial uses, including fisheries habitat, would be low.

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SOILS ANALYSIS

INTRODUCTION

This analysis is designed to disclose the existing condition of the soil resources and display the anticipated effects that may result from each alternative of this proposal. During the initial scoping, issues were identified by the public regarding soil impacts. The following issue statement was expressed from comments regarding the effects of the proposed timber harvesting:

> Timber harvesting activities may result in reduced soil productivity and increased erosion due to compaction and displacement, depending on the area and degree of harvesting effects.

Other comments regarding unstable soils were expressed. However, after reviewing the soil survey of the area (*Martinson and Basko, 1998*), no unstable soils were identified where activities are proposed in the project area; therefore, unstable soils will not be further discussed.

ANALYSIS AREA

The project area for this proposal includes approximately 3,840 acres. The project area contains 7 individual landtypes where timber harvesting, road construction/ reconstruction, or road obliteration are proposed. The analysis area for soil impacts will be the area within harvest units and where proposed road activities would take place. This analysis area will adequately allow for disclosure of existing conditions and direct, indirect, and cumulative impacts. This analysis also looks at cumulative effects for the entire project area.

ANALYSIS METHODS

Methods for disclosing impacts include using general soil descriptions and the management limitations for each landtype. *Landtype* refers to a unit of land with similar designated soil, vegetation, geology, topography, climate, and drainage. This analysis will qualitatively assess the risk of negative effects to soils from erosion, compaction, and displacement from each alternative, using insight from previously collected soils-monitoring data from over 70 DNRC postharvest monitoring projects.

While the anticipated impacts from each alternative will disclose the direct/indirect effects, the cumulative impacts will be the result of previous and proposed activities.

EXISTING CONDITIONS

GENERAL CONDITIONS

The *Soil Survey of Flathead National Forest Area, Montana* (*Martinson and Basko, 1998*) combines landform and soil information with habitat types to inventory and map soils in the project area. Seven landtypes were identified in the project area. *TABLE II-5 - PROJECT AREA LANDTYPE DESCRIPTIONS* provides a brief description of the landtypes within the project area while *FIGURE II-1 – LANDTYPES IN THE PROJECT AREA* provides a visual depiction of the landtype locations.

Stillwater State Forest, like much of northwest Montana, is dominated by bedrock consisting of metasedimentary rocks from the Proterozoic age. Rocks in this formation are generally comprised of argillites, quartzites, and siltites. Surface deposits of glacial till, outwash, and lacustrine sediments can be found

throughout the area. Overlying these sediments is a layer of loess that has been influenced by volcanic ash deposited and redeposited from Mount Mazama approximately 6,700 years ago (*Martinson and Basko, 1998*).

CUMULATIVE EFFECTS

DNRC strives to maintain soil productivity by limiting cumulative soil impacts to 15 percent or less of a harvest area, as noted in the State Forest Land Management Plan (*DNRC, 1996*). As a recommended goal, if existing detrimental soil effects exceed 15 percent of an area, proposed harvesting should minimize any additional impacts. Harvest proposals on areas with existing soil impacts in excess of 20 percent should avoid any additional impacts and include restoration treatments, as feasible, based on site-specific evaluation and plans. Past monitoring on DNRC timber sales from 1988 to 2004 has shown an average of 13.9 percent soil impacts across all parent materials. Stratifying the results by texture similar to the majority of the proposed harvesting shows an average of approximately 14.7 percent of the harvest areas impacted by displacement or severe compaction (*DNRC, 2004*). Furthermore, when winter harvesting is implemented on these areas, the impacts are typically much less than summer operations due to frozen soils being more difficult to compact or displace.

Cumulative effects from past and current uses on the *proposed harvest units* are limited. Timber harvesting activities have been implemented in some of the *proposed harvest units*, although evidence of selective or salvage actions is present in some of the proposed harvest areas. In addition, stands adjacent to proposed harvest areas have been entered in the past. During field reconnaissance, it was noted that impacts in these areas are limited to skid trails and roads. Past harvesting operations in the *project area* includes harvests from 1966, 1971, 1981, 1982 and 1990. Other forest product removals include firewood gathering and individual Christmas tree harvesting throughout the last 70 years.

Within the 3,840-acre project area, approximately 1,728 acres have been harvested since 1966. Potential impacts from compaction or displacement in skid trails from these harvests are estimated at approximately 254 acres in skid trails and landings. An additional area estimated at 101 acres has been taken out of production for roads, including Highway 93 and private driveways near Olney.

While some of these skid trails and roads are still discernable, vegetation similar to the surrounding vegetation is generally present and growing. Through the freeze-thaw cycles and root mass penetrating the soil, impacts from past entries are substantially reduced.

TABLE II-5 - PROJECT AREA LANDTYPE DESCRIPTIONS

Note: For the table below,

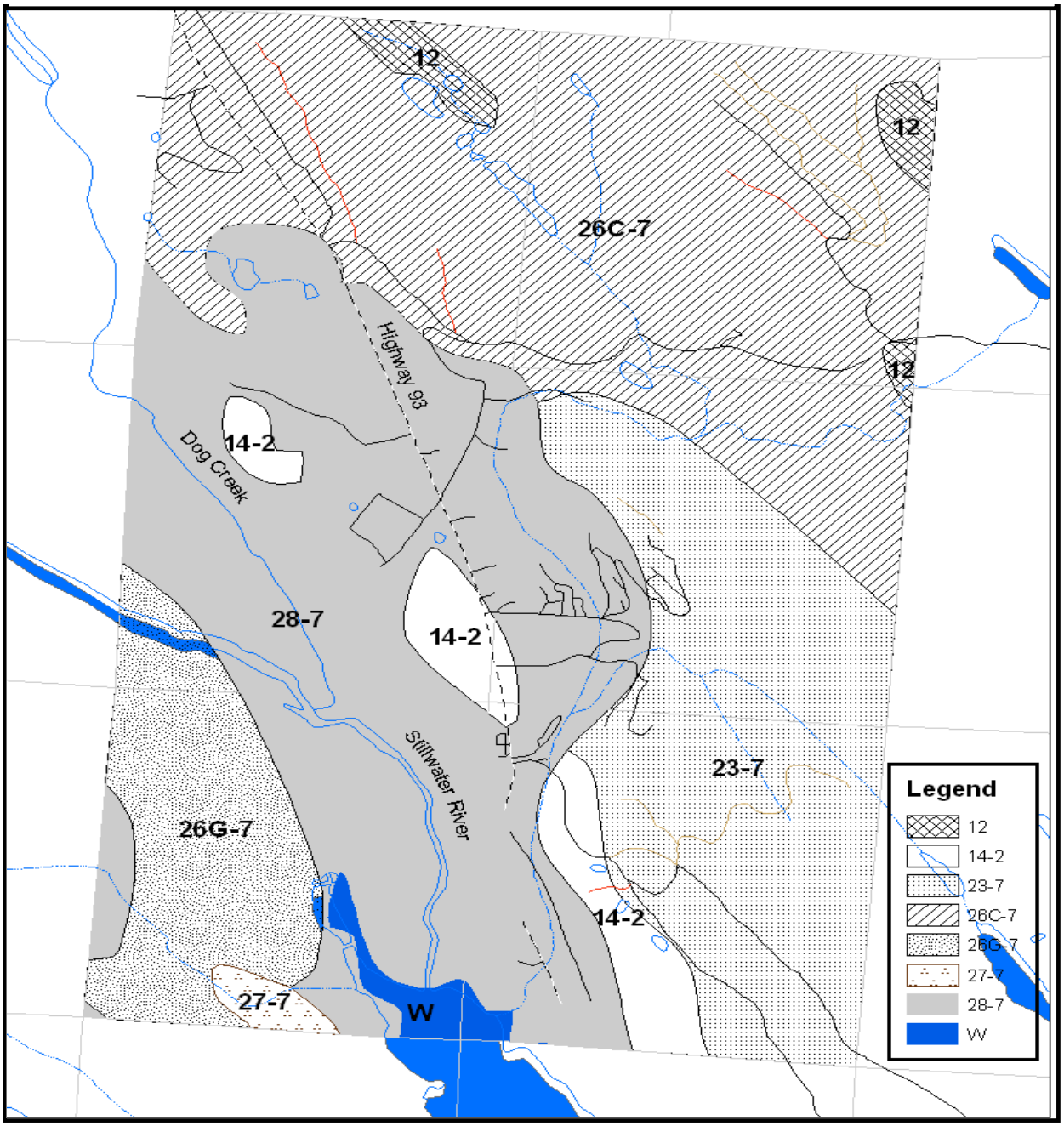
** Erosion Potential is based on slope and soil erosion factor K**. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 70 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight (low), moderate, severe, or very severe. A rating of slight indicates that erosion is unlikely under ordinary climatic conditions; moderate indicates that some erosion is likely and that erosion-control measures may be needed; severe indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and very severe indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion–control measures are costly and generally impractical. (NRCS, 1996)*

***Erosion Factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. (NRCS, 1996)*

LANDTYPE	NAME	SOIL AND VEGETATION DESCRIPTIONS	MANAGEMENT CONSIDERATIONS			
			K FACTOR**/ EROSION POTENTIAL	TIMBER	ROADS	COMMENTS
12	Depressions on terraces and floodplains 0-2% slopes	This landtype is comprised of soils formed in deep organic deposits overlying alluvial, lacustrine, or glacial deposits. These depressions may not have defined drainage outlets. Vegetation is typically wet meadows.	K = 0.02 Erosion potential is low to moderate. Sediment delivery efficiency is moderate.	Poorly suited to timber.	Wetness limits road location and construction—low bearing strength.	Substantial riparian vegetation for wildlife habitat and water quality.
14-2	Stream bottoms and depressions 0-20% slopes	This landtype is found on stream bottoms and in depressions on moraines. The lower soil layers are formed in lacustrine. Vegetation is made up of mixed-conifer species that grow in most moist environments of the Northwest. The under story is dominated by forbs and low shrubs.	K = 0.37 Erosion potential is moderate to severe. Sediment delivery efficiency is low. Fine sediment from these soils has a high potential for damaging spawning habitat.	Potential Productivity: High Equipment: Tractor Regeneration: Can be limited by wet soil, frost pockets, and competition.	Cutbanks on terraces tend to slough. Unsurfaced roads rut when wet	
23-7	Glaciated mountain slopes. 20-40% slopes.	Soils of this landtype are formed in glacial till. Vegetation found ranges from a moist, mixed forest to a dry, mixed forest.	K = 0.32 Erosion potential is low to moderate. Sediment delivery efficiency is moderate.	Potential Producitivity: Moderate/high Equipment: Tractor Regeneration: Can be limited by wet soil, frost pockets and competition.	Roads perform well with standard location, construction, and maintenance practices. Some cutslopes may be difficult to revegetate due to moisture stress.	

LANDTYPE	NAME	SOIL AND VEGETATION DESCRIPTIONS	MANAGEMENT CONSIDERATIONS			
			K FACTOR**/ EROSION POTENTIAL	TIMBER	ROADS	COMMENTS
26C-7	Morraines, glacial till deposits 10-20% slopes	This landtype is characterized by up to 12 inches of volcanic ash influenced loess overlying very gravelly silt loam. Subsoils contain 35 to 60 percent rounded rock fragments. Vegetation is consistent with a mixed moist forest: Douglas fir, lodgepole pine, western larch, western white pine, western red cedar, Engelmann spruce, and subalpine fir are present with an understory of forbs and low shrubs.	K = 0.32 Erosion potential is moderate. Sediment delivery efficiency is moderate.	Potential Productivity: High Equipment: Tractor Regeneration: Frost pockets and competition.	Roads perform well with standard location, construction, and maintenance practices. Tread erosion of fine material from unsurfaced roads can result in a rough, cobbly road	
26G-7	Morraines, glacial till deposits 10-20% slopes	Soils in this Landtype have up to 7 inches of volcanic ash influenced loess overlying a calcareous subsoil with 15 to 50 percent rounded rock fragments. The vegetation is a dry, mixed forest with Douglas-fir, grand fir, western larch, and lodgepole pine in the overstory. The understory is dominated by low shrubs.	K = 0.32 Erosion potential is moderate. Sediment delivery efficiency is high.	Potential Productivity: Moderate Equipment: Tractor Regeneration: Frost pockets and competition.	Tread erosion of fine material from unsurfaced roads can result in a rough, cobbly road. Some cutslopes may be difficult to revegetate due to moisture stress.	Trees are susceptible to windthrow due the restricted root penetration from lime.
27-7	Kettles, kames, terraces 10-20% slopes	Cobbly, sandy, glacial till sorted by meltwater, but not stratified ,underlies a surface loess influenced by 2 to 10 inches of volcanic ash. Vegetation consists of Douglas-fir, ponderosa pine, subalpine fir, lodgepole pine, and western larch over an understory dominated by low shrubs.	K = 0.32 Erosion potential is low to moderate. Sediment delivery efficiency is moderate.	Potential Productivity: Moderate Equipment: Tractor Regeneration: Can be limited by frost pockets and droughtiness in low lying areas.	Material exposed during construction tends to ravel on steep cutbanks. Moisture stress can make revegetation difficult.	
28-7	Terraces 0-20% slopes	Stratified glacial outwash underlies a volcanic ash influenced loess layer approximately 2 to 7 inches thick. Vegetation consists of Douglas-fir, ponderosa pine, subalpine fir, and lodgepole pine over an understory dominated by low shrubs.	K = 0.43 Erosion potential is low to moderate. Sediment delivery efficiency is moderate.	Potential Productivity: Moderate Equipment: Tractor Regeneratiion: Can be limited by droughtiness,	Moisture stress can make revegetation difficult. Tread erosion of fine material from unsurfaced roads can result in a rough, cobbly road.	Trees are susceptible to windthrow because the coarse-texture substrate restricts root penetration

FIGURE II-1 - LANDTYPES IN THE PROJECT AREA



ENVIRONMENTAL EFFECTS

DESCRIPTION OF ALTERNATIVES

- ***No-Action Alternative***

  No timber harvesting or associated activities would occur.

- ***Action Alternative***

  Nineteen units totaling approximately 896 acres would be commercially harvested under this alternative. Approximately 843 acres would be harvested using conventional ground-based equipment, while the remaining 53 acres would be treated using cable methods. In addition, approximately 0.4 miles of new system road and 1.8 miles of temporary road would be constructed, 0.37 miles of road would be obliterated, and 12 to 18 miles of road would be maintained or have minor drainage improvements installed as necessary to protect water quality. Three of the harvest units (423 acres) would be completed under winter conditions, which require frozen and/or snow-covered conditions. The remainder of the units (473 acres) may be completed under summer or winter conditions.

ALTERNATIVE EFFECTS ON SOILS

Direct and Indirect Effects of the No-Action Alternative on Soils

No timber harvesting or associated activities would occur under this alternative. Skid trails from past harvesting would continue to recover from compaction as freeze-thaw cycles continue and vegetation root mass increases.

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

  To provide an adequate analysis of potential impacts to soils, a brief description of implementation requirements is necessary. *ARM 36.11.422 (2)* and *(2)(a)* state that appropriate BMPs shall be determined during project design and incorporated into implementation. To ensure that the incorporated BMPs are implemented, the specific requirements would be incorporated into the DNRC Timber Sale Contract. As part of this alternative design, the following BMPs are considered appropriate and, therefore, would be implemented during harvesting operations:

1) Limit equipment operations to periods when soils are relative-ly dry, (less than 18 percent), frozen, or snow-covered to minimize soil compaction and rutting and maintain drainage features. Check soil moisture conditions prior to equipment start-up.

2) On ground-based units, the logger and sale administrator will agree to a general skidding plan prior to equipment operations. Skid-trail planning would identify which main trails to use and how many additional trails are needed. Trails that do not comply with BMPs (i.e. trails in draw bottoms) would not be used and may be closed with additional drainage installed where needed or grass seeded to stabilize the site and control erosion.

3) 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.

4) Keep skid trails to 20 percent or less of the harvest unit acreage. Provide for drainage in skid trails and roads concurrently with operations.

5) Slash disposal - Limit the combination of disturbance and scarification to 30 to 40 percent of the harvest units. No dozer piling on slopes over 35 percent; no excavator piling on slopes over 40 percent unless the operation can be completed without causing excessive erosion. Consider lopping and scattering or jack-pot burning on the steeper slopes. Accept disturbance incurred during skidding operations to provide adequate scarification for regeneration.

6) Retain 10 to 15 tons of large woody debris and a majority of all fine litter feasible following harvesting operations. On units where whole tree harvesting is used, implement one of the following mitigations 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 to disperse tops as skidding progresses.

Considering data from the *DNRC SOIL MONITORING REPORT (DNRC, 2004)*, the implementation of Forestry BMPs has resulted in less risk of detrimental soil impacts from erosion, displacement, and severe compaction. While the report noted that the impacts were more likely on the fine-textured soils and steep slopes, reduced soil productivity due to compaction and displacement may occur on coarser parent materials similar to those found in the state parcels. Also, the greatest impacts were noted where harvesting implementation departed from BMPs, such as limiting ground-based skidding to slopes of 40 percent or less.

Comparing the soil type map, field reconnaissance notes, and topographic map features with the proposed harvest unit map indicates that ground-based skidding would occur on slopes of up to 40 percent under this alternative. The extent of impacts expected would likely be similar to those reported by *Collins (DNRC, 2004)*, or approximately 14.7 percent of the harvest area. Potential impacts to soils from the cable-yarding units would be less than 10 percent of the area. This level of impact assumes corridor spacing of at least 75 feet, and impacts generally confined to a 6- to 8-foot width. Potential impacts to soils from cable yarding would generally be displacement, although some compaction could occur. In addition, cable corridors may pose a slight risk of routing water because the corridor is generally parallel to the fall-line of the hill slope. *TABLE II-6 – EXPECTED ACRES OF IMPACT TO SOIL FROM COMPACTION AND DISPLACEMENT* summarizes the expected impacts to soils within harvest units.

In addition to the potential impacts from harvesting, approximately 8.6 acres would be impacted by new roads. Approximately 3.3 of these acres (.77 miles of temporary road) would be recontoured. Other temporary road would not be recontoured, but instead would be seeded with grass and littered with slash and brush. The remaining acres would essentially be removed from timber production. Road construction

II-6 – EXPECTED ACRES OF IMPACT TO SOIL FROM COMPACTION AND DISPLACEMENT

HARVEST METHOD AND SEASON	NO-ACTION ALTERNATIVE	ACTION ALTERNATIVE
Ground based - summer harvest (420 acres with impacts up to 14.7 percent of the harvest area)	0	61.7 acres
Ground based - winter harvest (423 acres with impacts up to 12.7-percent of the harvest area)		53.7 acres
Cable (53 acres with impacts up to 10 percent of the harvest area)	0	5.3 acres
Total area of impacts	0	120.7 acres
Total harvest	0	896 acres
Percent of area impacted	0	13.4 percent

would likely result in more erosion than native topography; however, BMP implementation would minimize the risk of erosion. Because no stream crossings are proposed, the risk of delivering soil to watercourses would be very low.

As vegetation begins to establish on the impacted areas and freeze-thaw cycles occur, the area of reduced productivity would decrease.

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

Cumulative effects would be controlled by limiting the area of adverse soil impacts to less than 15 percent of the harvest units (as recommended by the SFLMP) through implementation of BMPs, skid trail planning on tractor units, and limiting operations to dry or frozen conditions. Future harvesting opportunities would likely use the same road system, skid trails, and landing sites to reduce additional cumulative impacts. Large woody debris would be retained for nutrient cycling for long-term soil productivity.

On a project-area analysis, DNRC estimates that an additional 121 acres of land may be impacted by skid trails and landings; an additional 8.6 acres of ground would be removed from production or have reduced productivity due to road construction. This would result in a total project area having up to 375 acres (10.2 percent) in skid trails and landings. The total area in roads would be approximately 109.6 acres.

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.

REFERENCES

DNRC, 2004. DNRC Compiled Soils Monitoring Report on Timber Harvest Projects. Missoula, MT.

DNRC, 1996. State Forest Land Management Plan. Montana Department of Natural Resources and Conservation. Missoula, MT.

Martinson, A. H. and W. J. Basko. 1998. Soil Survey of Flathead National Forest Area, Montana. USDA Forest Service, Flathead National Forest, Kalispell, Montana.

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. During the initial scoping, several comments were received regarding the effects of proposed timber harvesting that led to the following list of issues:

- Concern was expressed that 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.
- Concern was expressed that 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 dependant upon these resources, which could alter their survival and/or reproductive ability.
- Concern was expressed that 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.
- Concern was expressed that 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.
- Concern was expressed that timber harvesting and associated activities could displace gray wolves from important habitats, particularly denning and rendezvous sites, and/or alter prey availability.
- Concern was expressed that timber harvesting and associated activities could reduce bald eagle nesting and perching habitats and/or disturb nesting bald eagles.
- Concern was expressed that 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.
- Concern was expressed that 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 two different scales. The first will be the 'project area', which consists of portions of Sections 5, 6, 7, 8, 17, and 18 in T32N, R23W. The

second scale or the 'analysis area' relates to the surrounding landscape for assessing cumulative effects to wildlife 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., land type, 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, 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.

RELEVENT 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 ARMs* and the *Endangered Species Act, Migratory Bird Treaty Act,* and *Bald and Golden Eagle Protection Act.*

COARSE FILTER 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 seven reptile species have also been documented in Flathead County (*Maxell et al. 2003*) and at least 163 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 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: Concern was expressed that timber harvesting could reduce forested cover that 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 on 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 fires differentially burned various habitats across the landscape.

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 other animals that prosper in edge habitats.

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 GIS analysis. Factors considered in the analysis include the level of harvesting, amount of densely forested habitats, and connectivity.

Existing Environment

The project area currently contains approximately 2,533 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, lodgepole pine, Engelmann spruce, and mixed-conifer stands of varying ages and stocking densities.

Connectivity within the project area has been compromised with past timber harvesting, Highway 93, the Burlington Northern Santa Fe Railroad (BNSFRR), and other human development on private lands. The proposal to construct a new U.S. Post Office building in the project area would reduce forested cover on approximately 1 acre; these habitats would be permanently lost.

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 Point of Rocks, Duck-to-Dog, and West Fork of Swift Creek timber sale projects, along with the Chicken Creek gravel pit expansion, would continue reducing forested habitats and/or altering connectivity. Similarly, the proposed Chicken/Antice and Beaver/Swift/ Skyles timber sale projects could further alter forested habitats and connectivity. However, across Stillwater State Forest, landscape connectivity has largely been retained and considerable forested, interior habitats exist. Considerable amounts (approximately 52,725 acres) of mature western larch/Douglas fir, subalpine fir, and mixed-conifer habitats, which have a reasonably closed canopy, exist across Stillwater State Forest.

Environmental Effects

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

  Forest conditions would continue to age and move toward denser stands of shade-tolerant tree species with high amounts of canopy cover. 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, a 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 896 acres of western larch/ Douglas-fir and mixed-conifer stands would be harvested, including roughly 840 acres of mature stands with a closed canopy. Most of these acres of mature, forested habitats proposed for treatments would receive a regeneration-type treatment (a minimum of 593 acres), which would reduce habitat for those species relying on mature, closed-canopied forested habitats. This includes the 25-acre stand in Unit 1 that meets the old-growth definition (see *VEGETATION ANALYSIS*). Conversely, some of the mature stands in the project area with a closed canopy would receive a

commercial-thin treatment and would be expected to potentially meet habitat requirements of those wildlife species that would need a mature, closed-canopied stand sooner. Overall, the resultant changes in stand age and density would reduce habitats for species associated with older stands, such as the American marten and pileated woodpecker, which benefited from the increasing stand ages and densities caused by modern fire suppression. Minor reductions in landscape connectivity would be anticipated with the proposed harvesting; however, landscape connectivity has been compromised in the vicinity with the diversity of ownership, past harvesting, human development, roads, and BNSFRR. 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 that could affect wildlife in the project area would be expected since: 1) harvesting would reverse succession in several 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 on Stillwater State Forest are a mosaic of habitat types and age classes. Past harvesting has reduced the amount of mature, forested habitats; however, the general trend on Stillwater State Forest is conversion to mature forests. This alternative would continue to contribute to the mature forested stands on Stillwater State Forest. 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 would be expected by species favoring dense stands of shade-tolerant tree species and those species requiring larger areas of mature forests. Habitat for forested-interior species and old-stand-associated species, such as 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 the advancing succession leading to 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 and ongoing harvesting activities and the ongoing Chicken Creek gravel pit expansion. Across the analysis area, extensive

forested habitats would still exist and landscape connectivity would 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 would be expected. Thus, minor adverse cumulative effects to mature forested habitats and connectivity that could affect wildlife in the cumulative effects analysis area would be expected 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: Concern was expressed that 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 dependant upon these resources, which could alter their survival and/or reproductive ability.

Introduction

Snags and coarse woody debris are an important component of the forested ecosystems. The 5 primary functions of deadwood in the forested ecosystems are to 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 (partially dead, spike-topped, broken-topped) 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 the 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.

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. Primary risk factors include loss to legal and illegal firewood cutting, prescribed burning, removal for wood fiber, purposeful felling for human safety during timber-harvesting operations, and incidental loss during logging due to equipment operation and yarding activities.

The tree species and the diameter, height, decay stage, species, and densities of snags determine the snag-habitat value for wildlife species. 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. Typically, older-aged stands will have greater numbers of large snags. 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. 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 structural diversity and promotes biological diversity by providing habitat for many wildlife species. Many small mammals require coarse woody debris to survive. In turn, these species distribute fungi that are beneficial for seedling establishment and tree growth (Graham et al. 1994). Additionally, coarse woody debris can provide feeding substrates for species such as pileated woodpeckers and black bears, as logs will often host high densities of insects (*Aney and McClelland 1985*). Forest carnivores such as pine marten and lynx rely on coarse woody debris to provide resting and denning habitat (*Patton and Escano 1985, Squires et al. in press*).

The quality and distribution of coarse woody debris can affect habitat quality for wildlife species that rely on it to meet various life requisites. Longer lengths of large diameter downed wood typically provide higher quality habitat for wildlife than do smaller and/or shorter pieces. Single scattered logs can provide lookout and travel sites, while log piles provide denning and resting habitat. Under natural conditions, logs tend to occur in patches or clumps, often where a blow-down event has occurred, with scattered lone logs occasionally distributed in between.

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 risk level of firewood harvesting.

Existing Environment

During field visits, 0 to 6 variably spaced snags per acre and differing quantities of coarse woody debris were observed in the project area. The snags and coarse woody debris in the project area exhibit a range of sizes and decay classes, ranging from small to large and sound to almost fully decayed. The fairly extensive network of open roads in the project area has facilitated firewood gathering, which has affected snag and coarse woody debris levels in the vicinity. The proposal to build a new U.S. Post Office in the project area would reduce snags and coarse woody debris on approximately 1 acre; these habitats would be permanently lost.

Past harvesting on Stillwater State Forest has reduced the availability of snags and snag recruits while increasing coarse woody debris levels; however, the minimum retention threshold for each of these resources has been retained in the recent past. Ongoing harvesting associated with

the Point of Rocks, Duck-to-Dog, and West Fork of Swift Creek timber sale projects, as well as any potential harvesting associated with the proposed Chicken/Antice 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. Considerable firewood gathering has reduced snags and coarse woody debris densities near open roads. Additionally, several areas in the proposed units either lack sufficient snags due to the size of trees in the stand or extensive firewood gathering.

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 the number 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 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 would be reduced due to timber harvesting, and coarse woody debris levels may be increased on 896 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 availability of large snags and/or coarse woody debris since these attributes currently are 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), and 10 to 15 tons of coarse woody debris per acre retained within the proposed units where they exist. However, some snags and/or snag-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*. Meeting snag-retention requirements and, subsequently, habitat needs for those wildlife using snags would be challenging in a number of the proposed units because: 1) some areas (such as Units 4, 6C, 6D, and 6E) currently lack sufficient large snags, 2) other areas (such as Units 5 and 6B) are quite close to private property and or open roads where snag loss could continue due to legal and illegal firewood and forest-product gathering, and 3) other areas would have a higher level of woody-

material removal prescribed for fire-protection purposes. Future snag quality in the harvested units 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. Slight decreases in human access would occur that would reduce the acreage accessible for legal and illegal firewood gathering and increase the likelihood of retaining snags and coarse woody debris into the future. Thus, minor adverse direct and indirect effects to snags and coarse woody debris that would affect wildlife species requiring these habitat attributes for 30 to 100 years would be anticipated since: 1) harvesting would reduce snag, snag-recruitment trees, and coarse woody debris, and 2) negligible 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 Stillwater State Forest, 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 Stillwater State Forest and are being retained with the ongoing projects (except the U.S. Post Office proposal) and would be retained with the proposed projects should an action alternative be selected. Firewood and other forest product gatherings have reduced these deadwood resources in the vicinity. 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) the level of firewood gathering would not change.

- ***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 Stillwater State Forest, snags and coarse woody debris are common, and past activities have placed an emphasis on retention of these landscape attributes. The loss of snags and coarse woody debris associated with this alternative would be additive to the losses associated with past harvesting, ongoing harvesting, any harvesting associated with the proposed projects, firewood gathering, the ongoing Chicken Creek gravel pit expansion, and the U.S. Post Office proposal. 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. Areas would exist where these requirements would not be met due to a lack of snags, risk of firewood gathering, or the higher removal requirements for fire protection purposes. Obliterating the 2 segments of open road would reduce human access slightly, which would increase the likelihood of retaining existing snags and coarse woody debris into the future. 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, on proposed harvest sites following treatment. Thus, minor adverse effects to wildlife species requiring snags and coarse woody debris would be anticipated in the cumulative-effects analysis area for 30 to 100 years 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) a slight decrease 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 would increase slightly in the long term.

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 II-7 – STATUS OF SPECIES CONSIDERED IN THE FINE FILTER ANALYSIS FOR THIS PROPOSED PROJECT* 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 II-7 –STATUS OF SPECIES CONSIDERD IN THE FINE FILTER ANALYSIS FOR THIS PROPOSED PROJECT

SPECIES		DETERMINATION - BASIS
Threatened and Endangered Species	Grizzly bear	***Included*** – Portions of the project area are in the Lazy Creek Grizzly Bear Subunit of the North Continental Divide Ecosystem, while the remaining portions are in the 'occupied habitat' area.
	Canada lynx	***Included*** – Canada lynx habitats occur in the project area.
	Gray wolf	***Included*** – Portions of the project area are within the annual home range of the Lazy Creek wolf pack.
Sensitive Species	Bald eagle	***Included*** – Portions of the project area are within the home range of the Lower Stillwater bald eagle territory home range.
	Black-backed woodpecker	No further analysis conducted – 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	No further analysis conducted – 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	No further analysis conducted – 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	No further analysis conducted – Although a small portion of Lower Stillwater Lake is in the project area, the loons that typically nest on Lower Stillwater Lake tend to nest in the south-central portion of the lake outside of the project area and would not be expected to be affected by either alternative. Other lakes in the vicinity that are known to support loons include Dog, Upper Stillwater, and Meadow lakes, but none of these territories would be affected by either alternative. Thus, no direct, indirect, or cumulative effects to common loons would be expected to occur as a result of either alternative.
	Fisher	***Included*** – Potential fisher habitats occur in the project area.

SPECIES		DETERMINATION - BASIS
Sensitive Species	Flammulated owl	No further analysis conducted – Although scattered ponderosa pine trees exist in the project area, no suitable dry ponderosa pine habitats occur within the project area. Thus, no direct, indirect, or cumulative effects to flammulated owls would be expected to occur as a result of either alternative.
	Harlequin duck	No further analysis conducted – No suitable high-gradient streams occur in the project area. Thus, no direct, indirect, or cumulative effects to harlequin ducks would be expected to occur as a result of either alternative.
	Northern bog lemming	No further analysis conducted – 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	No further analysis conducted – 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	***Included*** – Western larch/Douglas-fir and mixed-conifer habitats occur in the project area.
	Townsend's big-eared bat	No further analysis conducted – No caves or mine tunnels 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 further analysis conducted – No white-tailed deer, mule deer, or elk winter range exists in the project area. Thus, no direct, indirect, or cumulative effects to big game winter range would be anticipated as a result of either alternative.
	Elk security habitat	No further analysis conducted – No elk security habitat exists in the project area and no large blocks of security habitat exist that contribute to a larger block of elk security habitat outside of the project area. Thus, no direct, indirect, or cumulative effects to elk security habitat would be anticipated as a result of either alternative.

THREATENED AND ENDANGERED SPECIES

In northwestern Montana, 3 terrestrial species are classified as 'threatened' or 'endangered' under the Endangered Species Act of 1973. The grizzly bear and Canada lynx are classified as 'threatened,' and the gray wolf is classified as 'endangered' under this act. The USFWS recently delisted the gray wolf (March 28, 2008); however, a preliminary injunction recently (July 18, 2008) lead to the relisting of wolves in this area as 'endangered'.

Grizzly Bear

Issue: Concern was expressed that 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 and are currently listed as 'threatened' under the Endangered Species Act. Preferred grizzly bear habitats are meadows, riparian zones, avalanche chutes, subalpine forests, and big game winter ranges, all of which provide seasonal food sources. Within the project area, primary habitat components 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 41,565-acre area that includes the 34,560-acre Lazy Creek Grizzly Bear Subunit of the North Continental Divide Ecosystem (NCDE) and the 7,005-acre portion of the 'occupied habitat' area west of Highway 93 and within the boundaries of the contiguous Stillwater State Forest. This combined area approximates the home range of a female grizzly bear. The cumulative-effects analysis area is largely managed by DNRC (20,776 acres; 50.0 percent), with a sizeable block owned by Plum Creek Timber Company (15,000 acres; 36.1 percent) and smaller amounts of USFS ownership (4,201 acres; 10.1 percent), small, private ownership (1,250 acres, 3.0 percent), and open water (339 acres; 0.8 percent).

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 included areas that exceeded an open-road density of 1 mile per square mile and areas that are free of motorized human access. Security habitats

are areas that are greater than 0.3 miles (500 meters) from any open road, restricted road, 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 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

The project area partially lies within the Lazy Creek Grizzly Bear Subunit of the NCDE Recovery Area (*USFWS 1993*); meanwhile, the remaining portions are in '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 (*T. Wittinger, Unpub. Interagency Map*). Grizzly bears are known to inhabit the project area. Use of the project area is likely greatest during the spring; meanwhile, use would be lower during the summer and fall. Primary habitat components in the project area include meadows, riparian areas, and older harvest units. The proposal to build a new U.S. Post Office building in the project area would reduce forested cover on approximately 1 acre; these habitats would be permanently lost.

Managing human access is a major factor in management for grizzly bear habitat. Open-road densities in both the subunit (47.6 percent of the subunit) and the state-managed portion of the subunit (70.5 percent of the state-managed portion) are at the 1996 thresholds. Open-road densities in the 'occupied habitat' portion of the cumulative-effects analysis area are also fairly high at approximately 2.75 miles/square mile (simple linear calculation). No security core exists in the project area, and security habitat is fairly limited on DNRC-managed lands in the subunit based on the existing network of open roads. Considerable hiding cover exists within both the project area and Lazy Creek Subunit. There is no ongoing harvesting in the cumulative-effects analysis area, but the proposed Beaver/Swift/Skyles Timber Sale Project could further alter grizzly bear habitats and/or human disturbance levels.

Alternative 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, 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.

- ***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. Most of the proposed harvesting in the recovery zone would occur during the winter, which would result in no direct effects to grizzly bears since no known dens are in the vicinity. Portions of a couple of units could be harvested from along open roads where disturbance from the open road has already reduced habitat quality; harvesting in some of the other units, along with the proposed temporary road construction and maintenance, would ideally occur during short, intensive periods during the fall to minimize disturbance to grizzly bear habitats. Generally, the fall habitats in the project area are fairly low quality, and the potential displacement of bears during the fall period could result in increased energy expenditures and decreased forage consumption; however, since extensive use is not anticipated during the fall, this negligible level of disturbance and displacement should not appreciably alter any individual bear's winter survival or reproduction. Overall, the proposed activities would occur in areas where low levels of grizzly bear use would be anticipated or during the time periods when grizzly bears would not be using the area, leading to negligible disturbance and displacement of grizzly bears.

Hiding cover, defined as vegetation that will hide 90 percent of a grizzly bear at a distance of 200 feet, would be reduced on much of the 896 acres in the proposed harvest units in the short-term; however, hiding cover would improve with time as shrubs and trees regenerate. 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 units would be expected to regenerate in 5 to 10 years. Security core would not be entered or altered with this alternative.

However, since open roads reduce habitat quality for grizzly bears, the location of proposed road construction and obliteration would be important to bears; all proposed new construction and associated reductions in habitat quality would occur in the 'occupied habitat' area where grizzly bear use would be less likely; meanwhile, all proposed road obliteration and associated improvements in habitat quality would occur in the recovery zone where grizzly bear use would be more likely. Closed roads that would be opened with this alternative, along with 1.8 miles of temporary roads constructed to access additional areas, would be closed in a manner to discourage motorized access after the proposed harvesting. Most of the proposed units in the recovery zone (including Units 2, 3, 7, and 7A) would be harvested during the denning period, and the roads accessing these units would not alter open-road densities. Short duration (less than 30 days annually), intensive use of restricted roads during the nondenning period for road construction, road maintenance, or timber harvesting could occur in some of these units, which could disturb bears, but would not cause long-term avoidance or reduced reproduction and survival. Several small units (including Units 1A, 5, and 11) would be

harvested from open roads or other accessible areas that already receive considerable disturbance. Collectively, negligible changes in open-road and total-road densities would be anticipated. Thus, minor adverse direct or indirect effects to grizzly bears in the local area would be expected in the short-term since: 1) negligible disturbance and displacement would be anticipated, 2) hiding cover would be lost in the short-term, but would be expected to recovery fairly rapidly, 3) no changes to security habitats would be expected, and 4) long-term open-road densities would be reduced.

- ***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. Any potential disturbance and/or habitat modification associated with the proposed Beaver/ Swift/Skyles Timber Sale Project could continue. 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 of the areas in the cumulative-effects analysis area already experiencing relatively high levels of human disturbance, largely associated with open roads and private ownerships. Collectively, minor increases in human disturbance would be expected in the recovery zone with moderate increases in human-disturbance levels anticipated in the 'occupied habitat' area. Continued use of the cumulative-effects analysis area, Lazy Creek Subunit, and Stillwater State Forest by grizzly bears would be anticipated. Reductions in hiding cover would be additive to the reductions from past timber 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 units could provide foraging opportunities that do not exist in some mature stands. No changes to existing security habitats would be anticipated. Negligible reductions 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 portion of the cumulative-

effects analysis area, negligible reductions in open-road densities would be anticipated. Any potential disturbance and/or habitat modification associated with the proposed Beaver/Swift/Skyles Timber Sale Project could continue. Thus, minor adverse cumulative effects to grizzly bears would be expected in the short-term since: 1) minor increases in human disturbance levels would be expected in the recovery zone and moderate increases in human disturbance levels would be anticipated in the 'occupied habitat' area, 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 recovery fairly rapidly, 3) no changes to security habitats would be expected, and 4) long-term open-road densities would be reduced.

Canada Lynx

Issue: Concern was expressed that 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 listed as 'threatened' under the Endangered Species Act. Currently, no recovery plan exists for Canada lynx, but a draft recovery plan outline has been written (*USFWS 2005*) and is being further developed and considered by USFWS. Additionally, critical habitat has been proposed by USFWS, which includes portions of Stillwater State Forest. However, since this proposal has not been finalized, critical habitat will not be discussed further in this analysis.

Canada lynx are associated with subalpine fir forests, generally between 4,000 and 7,000 feet in elevation in western Montana (*Ruediger et al. 2000*). The proposed project area ranges from approximately 3,040 to 3,640 feet in elevation and on state ownership is dominated by Douglas-fir/ western larch with smaller amounts in mixed conifers and lodgepole pine. Lynx habitat in western Montana consists primarily of stands that provide habitat for snowshoe hares; either dense, young coniferous stands or dense, mature forested stands, 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) in 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 41,565-acre cumulative-effects analysis area defined in the grizzly bear section. This scale of analysis approximates the home range size of a 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 critical 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 3,180 acres of lynx habitat (*TABLE II-8 – LYNX HABITATS*) occur in the 3,498-acre project area. Much of this habitat was identified as forested travel/other and mature foraging habitats, with lesser amounts of denning and temporarily not available habitats. Connectivity within the

TABLE II-8 – LYNX HABITATS. *Existing acres and proportions of lynx habitat elements on state lands in the project area, the Lazy Creek subset of the cumulative-effects analysis area, and cumulative-effects analysis area.*

LYNX HABITAT ELEMENT	PROJECT AREA		LAZY CREEK GRIZZLY BEAR SUBUNIT		CUMULATIVE-EFFECTS ANALYSIS AREA	
	ACRES	PERCENT OF LYNX HABITATS	ACRES	PERCENT OF LYNX HABITATS	ACRES	PERCENT OF LYNX HABITATS
Denning	637	20	2,452	19	2,722	15
Mature foraging	952	30	3,885	31	4,788	26
Forested travel/other	1,112	35	3,634	29	7,145	39
Young foraging	0	0	0	0	0	0
Temporary non-habitat	479	15	2,639	21	3,697	20
Grand Total-Lynx Habitats	3,180	100	12,610	100	18,351	100
Permanently unsuitable	318		1,835		2,484	
Total acres	*3,498*		*14,445*		*20,835*	

project area has been compromised with past timber harvesting, Highway 93, BNSFRR, and other human development on private lands. The proposal to construct a new U.S. Post Office building in the project area would reduce forested cover on approximately 1 acre; these habitats would be permanently lost.

Canada lynx have been documented in the cumulative-effects analysis area on several occasions. Habitats in the cumulative-effects analysis area are dominated by mature foraging habitats with slightly lesser amounts of temporary nonhabitat and denning habitat (*TABLE II-8 – LYNX HABITATS*). The distribution of the various lynx habitat elements in the cumulative-effects analysis area is the result, primarily, of past timber harvesting and the lack of recent wildfires. Although it appears that no young foraging habitats are on DNRC-managed lands in the subunit, some of these younger stands that may be classified as forested travel/other habitats contain young foraging attributes and may support sufficient snowshoe hare densities to be suitable foraging habitats for lynx. Similarly, on adjacent Plum Creek Timber Company (Plum Creek) lands, young foraging habitats exist, resulting from past harvesting. The lack of fire, including the effects of fire suppression, across the cumulative-effects analysis area has led to the development and maintenance of mature foraging, denning, and forested travel/other habitats. *ARM 36.11.435 (7)(a)* and *(b)* require a minimum of 5 percent and 10 percent of the lynx habitats on DNRC-managed lands in a bear management subunit to be in denning and foraging habitats, respectively. Currently, both the Lazy Creek Subunit and the larger cumulative-effects analysis area exceed the minimum thresholds for both foraging and denning habitat requirements (*TABLE II-8 – LYNX HABITATS*). No harvesting is ongoing in the cumulative-effects analysis area, but the proposed Beaver/Swift/Skyles Timber Sale Project could further alter lynx habitats; however, limited lynx habitats exist in the vicinity of that proposed project. Connectivity at the cumulative-effects analysis level has been compromised by past harvesting and road construction.

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 a 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 (479 acres) 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. Thus, minor beneficial direct and indirect effects to lynx habitats would be expected to occur in the project area for 10 to 20 years since: 1) adequate denning habitats would persist, 2) sufficient mature foraging habitat would exist, 3) longer term availability of young foraging habitats would likely decline without disturbance, 4) 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 5) landscape connectivity would not be altered.

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

  Approximately 850 acres of lynx habitats would be harvested with this alternative (*TABLE II-9 - CHANGES IN LYNX HABITATS*). In units proposed to receive regeneration prescriptions, 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. Conversely, units proposed to receive a prescription of commercial thinning would retain greater than 40-percent canopy cover, thereby converting any specific lynx habitat element into the forested travel/other category (*TABLE II-9 - CHANGES IN LYNX HABITATS*). Of these acres, the majority of the lynx habitats are denning habitats, with lesser amounts of foraging and forested travel/ other habitats; after the proposed harvesting, these habitats would move into temporary non-lynx habitats until tree seedlings and shrubs recover and begin providing habitats for snowshoe hares. 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 the proposed even-aged harvest treatments would provide young foraging habitats further into the future as tree seedlings and shrubs recover and begin providing

TABLE II-9 – CHANGES IN LYNX HABITATS. *Acreage changes in lynx habitat elements following implementation of the alternatives considered.*

CHANGES TO LYNX HABITATS	ALTERNATIVES	
	A	B
Denning habitat converted to temporary non-lynx habitat	0	354
Mature foraging habitat converted to temporary non-lynx habitat	0	139
Other habitat converted to temporary non-lynx habitat	0	163
Temporary non-lynx habitat treated but remaining as temporary non-lynx habitat	0	11
Total increase in temporary non-lynx habitat	*0*	*667*
Denning habitat converted to other habitat	0	29
Mature foraging habitat converted to other habitat	0	105
Other habitat treated but remaining as other habitat	0	48
Total other habitat resulting from treatments	*0*	*182*
Total lynx habitat affected	*0*	*849*

habitats for snowshoe hares. Up to 10 years could be needed for seedlings to provide snowshoe hare habitats; these ephemeral habitats would then gradually outgrow usefulness to snowshoe hares in another 10 to 20 years. Except in areas where a higher removal standard would be included for fire protection purposes, 15 to 20 tons of coarse woody debris in the proposed units would be retained to provide some horizontal cover and security structure for lynx. In the short-term, lynx would likely avoid the 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 proposed commercial-thin units would be expected to continue at some level. Forest connectivity around the openings created with these alternatives would be largely maintained through riparian buffers and other forested habitats in the project area, but overall connectivity would be reduced. Collectively, minor adverse direct and indirect effects to lynx habitats would be expected to affect Canada lynx in the project area for 20 to 50 years since: 1) adequate denning habitats would persist, 2) sufficient mature foraging habitats would exist, 3) young foraging habitats would continue developing in the next 10 to 30 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) some further reduction in landscape connectivity would be anticipated.

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

  No appreciable change in lynx habitats would occur under this alternative (*TABLE II-10 - CHANGES IN LYNX HABITATS IN THE CUMULATIVE-EFFECTS ANALYSIS AREA*) except the continued maturation of stands. DNRC's proposed Beaver/Swift/Skyles Timber Sale Project and the proposed U.S. Post Office building in the cumulative-effects analysis area could affect lynx habitats; however, lynx habitats are somewhat limited in the vicinity of those proposed projects. Some modifications of lynx habitats could be possible with any management that may occur on Plum Creek lands. Across all ownerships, in the absence of other disturbance, continued stand maturation would move temporary non-lynx habitat towards young foraging habitat or forested travel/other habitat. 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. Similarly, 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. In the longer-term, without disturbance, young foraging opportunities could decrease as stands mature toward mature foraging, denning, and forested travel/other habitats. No further changes in landscape connectivity would be anticipated due to

TABLE II-10 - CHANGES IN LYNX HABITATS IN THE CUMULATIVE-EFFECTS ANALYSIS AREA. *Acres of lynx habitats after each alternative and the proportion that each suitable habitat represents out of all suitable lynx habitats in the Lazy Creek Subunit.*

LYNX HABITAT		NO-ACTION ALTERNATIVE		ACTION ALTERNATIVE	
		LAZY CREEK SUBUNIT	CUMULATIVE EFFECTS ANALYSIS AREA	LAZY CREEK SUBUNIT	CUMULATIVE EFFECTS ANALYSIS AREA
Denning	Acres posttreatment Percent of lynx habitats	2,452 19%	2,722 15%	2,160 17%	2,339 13%
Foraging	Acres posttreatment Percent of lynx habitats	3,885 31%	4,788 26%	3,813 30%	4,544 25%
Forested travel	Acres posttreatment Percent of lynx habitats	3,634 29%	7,145 39%	3,569 28%	7,116 39%
Temporary non-lynx habitat	Acres posttreatment Percent of lynx habitats	2,639 21%	3,697 20%	3,068 24%	4,353 24%
Total lynx habitat	*Acres posttreatment*	*12,610*	*18,351*	*12,610*	*18,351*
Permanently unsuitable		1,835	2,484	1,835	2,484
Total analysis area		*14,445*	*20,835*	*14,445*	*20,835*

DNRC activities. Thus, minor beneficial cumulative effects to lynx habitats would be expected to affect Canada lynx in the cumulative-effects analysis area for 20 to 40 years since: 1) adequate denning habitats would persist, 2) sufficient mature foraging habitats would exist, 3) young foraging habitats would continue to provide habitat for snowshoe hares, 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 (*TABLE II-10 - CHANGES IN LYNX HABITATS IN THE CUMULATIVE-EFFECTS ANALYSIS AREA*). Reductions in mature foraging, denning, and forested travel/other habitats in the proposed units would not be expected to appreciably alter lynx use of the cumulative-effects analysis area. These reductions and the subsequent increase in temporary non-lynx habitats would be additive to existing temporary non-lynx habitats that exist in the cumulative-effects analysis area. Following harvesting, sufficient denning and foraging habitats would be retained

(*TABLE II-10 –CHANGES IN LYNX HABITATS IN THE CUMULATIVE-EFFECTS ANALYSIS AREA*) to satisfy DNRC's commitment (*ARM 36.11.435*) of retaining 5-percent lynx denning habitats and 10-percent mature foraging or young foraging habitats in the Lazy Creek Subunit. Some additional harvesting could occur with the proposed Beaver/ Swift/Skyles Timber Sale Project, and the proposed U.S. Post Office development could affect lynx habitats; however, lynx habitats are somewhat limited in the vicinity of those proposed projects. Additionally, some modifications of lynx habitats could be possible with any management that may occur on Plum Creek lands in the cumulative-effects analysis area. Across all ownerships, continued stand maturation would move habitats towards forested travel/other, mature foraging, and denning habitats and away from the young foraging stage, which would decrease habitat quality for snowshoe hares, thereby reducing the availability of prey for lynx in the long term. Existing denning habitat would be expected to persist in the absence of timber harvesting or natural disturbances that reduce habitat quality. Landscape connectivity would be further reduced to varying degrees with all alternatives, but moderate levels of landscape connectivity (see *WILDLIFE- MATURE FORESTED HABITATS AND LANDSCAPE CONNECTIVITY*) would persist that would facilitate lynx movements. Thus, minor adverse cumulative effects to lynx habitats would be expected to affect Canada lynx in the cumulative-effects analysis area for 20 to 50 years 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) modest 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.

Gray Wolf

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

Introduction

Under the *Endangered Species Act*, the gray wolf was listed as 'endangered'in the northern portion of Montana, which includes the project area. 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 2007, 107 packs that met the definition of a 'breeding pair' were documented within the tri-state region (*USFWS et al. 2008*). Of those 107 packs, 73 occurred in Montana, with 23 of those found in the northern Montana portion of the recovery area, along with 13 additional packs that didn't meet the requirements to be considered a 'breeding pair' (*Sime et al. 2007*). Therefore, the USFWS delisted gray wolves on March 28, 2008; however, a recent lawsuit and preliminary injunction reestablished gray wolves as 'endangered'.

Wolves are a wide-ranging, mobile species. Adequate habitat for wolves consists of areas

with 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 7 years and has been a breeding pair counted towards the recovery goals for 4 of the last 5 years. The home range for this pack is variable, but typically includes part or all of the project area (*USFWS et al. 2008*).

The *Northern Rocky Mountain Wolf Recovery Plan* (*USFWS 1987*) identified the key components of wolf habitat as: 1) a sufficient, year-round prey base of ungulates (big game) and alternate prey, 2) suitable and somewhat secluded denning and rendezvous sites, and 3) sufficient space with minimal exposure to humans.

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 have shown 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 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 41,565-acre cumulative-effects analysis area defined in the grizzly bear section. 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 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, indirect, and cumulative effects were all 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 abundant in the project area, although a big game winter range does not exist in the project area. Numerous landscape features commonly associated with denning and rendezvous sites occur in the project area. Wolves from the Lazy Creek wolf pack have utilized the project area in the past and would be expected to continue in the future. The proposal to construct a new U.S. Post Office building in the project area would reduce forested cover on approximately 1 acre; these habitats would be permanently lost.

Big game species are abundant in the larger cumulative-effects analysis area, but winter range is largely nonexistent. Numerous landscape features commonly associated with denning and rendezvous sites, including meadows and other openings near water and in gentle terrain, occur in the cumulative-effects analysis area. The known den site, along with the suspected rendezvous sites for this wolf pack, occurs on private ownership in the vicinity (*K. Laudon, DFWP, personal communication, September 18, 2008).* Wolves from the Lazy Creek wolf pack have utilized much of the cumulative-effects analysis area in the past and would be expected to continue in the future. Past harvesting on all ownerships in the subunit altered big game and wolf habitats. Similarly, any potential harvesting associated with the proposed Beaver/Swift/ Skyles Timber Sale Project could further alter wolf and big game habitats; however, all of these activities, as well as any proposed harvesting, would be expected to have negligible effects to wolves or their prey.

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 forested cover on white-tailed deer, mule deer, or elk winter ranges 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 Lazy Creek wolf pack since: 1) no changes in human disturbance levels would occur, and 2) no changes to big game winter ranges 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 have been completed, human disturbance levels would likely revert to preharvest levels and slight decreases in human access and open-road densities would be anticipated with the proposed road closures. Likewise, wolf use of the project area for denning and rendezvous sites would likely revert to preharvest levels. In the short term, the proposed harvest units could lead to shifts in big game use, which could lead to a shift in wolf use of the project area. Thus, negligible direct and indirect effects would be expected to affect gray wolves in the Lazy Creek wolf pack 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 ranges 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. Proposed harvesting associated with the Beaver/ Swift/Skyles Timber Sale Project 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. Thus, no further cumulative effects would be expected to affect gray wolves in the Lazy Creek wolf pack 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***

  Since the expected effects of this project on wolves would be negligible, cumulative effects would also be negligible. 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. No changes to white-tailed deer, mule deer, or elk winter ranges would be anticipated. These reductions in cover would be additive to losses from past timber-harvesting activities and any potential habitat alterations associated with the proposed Beaver/Swift/Skyles Timber Sale Project 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 substantive change in wolf use of the Lazy Creek wolf pack home range would be expected; wolves would continue to use the area in the long term. Thus, negligible further cumulative effects would be expected to affect gray wolves in the Lazy Creek wolf pack 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.

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 common loons and bald eagles in the vicinity of the project area. As shown in *TABLE II-7 - 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, pileated woopeckers, and fisher.

Bald Eagle

Issue: Concern was expressed that 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 site distances of lakes and rivers and are screened from disturbance by vegetation.

Analysis area

Direct and indirect effects were analyzed on the project area. Cumulative effects were analyzed on the Lower Stillwater bald eagle territory home range. This cumulative-effects analysis area includes the areas used by the pair of eagles using the nesting 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 the availability of large, emergent trees with stout horizontal limbs for nests and perches.

Existing Environment

Portions of the project area are within the home range identified for the Lower Stillwater Lake bald eagle territory. This territory has produced at least 6 chicks in the last 4 years; one year the nesting success was unknown.

Within the bald eagle home range, DNRC manages approximately 84 percent of the terrestrial acres, while roughly 15 percent of the terrestrial acres are in private ownership. Human disturbance, including timber harvesting, residential development, various forms of recreation, and the Highway 93 and BNSFRR corridors 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.

- ***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 Lower Stillwater Lake bald eagle territory. However, within the home range, proposed timber harvesting would alter forested canopy on approximately 23 acres in portions of Units 10 and 12.

During the proposed activities, eagles could be displaced; however, the 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. Prescriptions for these units would generally be an intermediate harvest strategy as opposed to a regeneration harvest and stands would be fairly stocked after completion, which would lead to only slightly increased visibility that could increase disturbance distances. 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 potential for introducing additional human disturbance to this territory. Thus, minor direct and indirect effects would be expected to affect bald eagles using the territory since: 1) disturbance would be elevated within the territory 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 Lower Stillwater Lake, as well as disturbance associated with Highway 93 and BNSFRR. Additionally, human developments on private lands would continue to provide potential sources of disturbance to the territory. 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 in the home range area. Thus, no cumulative 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.

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

  Nesting bald eagles would continue to experience varying levels of disturbance from the ongoing recreational use of Lower Stillwater Lake as well as disturbance associated with Highway 93 and BNSFRR. Additionally, human developments on private lands would continue to provide potential sources of disturbance to the territory. 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 territory since: 1) disturbance would be elevated within the territory 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: Concern was expressed that 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 generalist predators that prey upon a variety of small mammals and birds, as well as snowshoe hares and porcupines. 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 does 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

Direct and indirect effects were analyzed for activities conducted in the project area. Cumulative effects were analyzed on the 41,565-acre cumulative-effects analysis area defined in the *Grizzly Bear* section. This scale includes enough area to approximate 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 in 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. Direct and indirect effects were analyzed using field evaluations and GIS analysis of potential habitat. Cumulative effects were analyzed using field evaluations and GIS analysis of potential habitat and aerial-photograph interpretation of potential habitat on all other lands in the cumulative-effects analysis area. Factors considered include the amount of suitable fisher habitats, landscape connectivity, and human access.

Existing Environment

The project area ranges from 3,040 to 3,640 feet in elevation, with approximately 4.3 miles of perennial streams and at least another 4.2 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 a moderate to well-stocked density *(ARM 36.11.440[1][b][i]*). Approximately 166 acres are in these riparian areas in the project area along the 8.5 miles of Class 1 and 2 streams. Modeling fisher habitats using SLI data generated an

estimate of 1,971 acres of fisher foraging, resting, denning, and travel habitats (1,876 upland acres and 95 riparian acres) in the project area (*Heinemeyer and Jones 1994*). In the riparian areas, most of the preferred fisher covertypes (95 of 101 acres, or 94 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. The proposal to build a new U.S. Post Office building in the project area would reduce forested cover on approximately 1 acre; these habitats would be permanently lost.

In the cumulative-effects analysis area, roughly 2,167 acres are within 100 feet of the 82 miles of Class 1 streams and 50 feet of the 20 miles of Class 2 streams. In the riparian habitats on DNRC-managed lands, roughly 96.6 percent (870 of 901 acres) of the area in preferred fisher covertypes presently provides structural features necessary for use as fisher resting and denning habitats. However, since, *ARM 36.11.440(1)(a)* requires analysis for each grizzly bear management subunit, the analysis will also identify habitat values at the subunit level as well; presently 96.6 percent (634 of 657 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. Within the cumulative-effects analysis area, no harvesting is ongoing, but the proposed Beaver/Swift/Skyles Timber Sale Project and the U.S. Post Office development project could further alter fisher habitats.

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

  No effects to fishers would be expected under this alternative. Little change to the stands providing fisher denning and foraging habitats would be expected. 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 1 acre of the 95 acres of riparian habitats in the project area would be included in the proposed units. All of these acres are presently meeting the structural requirements of fisher. Overall negligible changes to potential fisher habitats would occur with the proposed prescriptions for improvement cutting and commercial thinning; some of this minimal acreage may continue meeting structural requirements for fisher after the proposed treatments. Additionally, approximately 565 of the 1,876 acres (30.1 percent) of upland fisher habitats in the project area would receive treatments, and roughly 465 of those acres are proposed to receive treatments that would likely yield stands too open for appreciable fisher use. Slight reductions in open roads would be anticipated, which could lessen trapping pressure and the potential for fisher

mortality. Minor reductions in connectivity would be expected in a landscape where connectivity has already been compromised (see *WILDLIFE - MATURE FORESTED HABITATS AND LANDSCAPE CONNECTIVITY*), but activities would 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 for 70 to 100 years since: 1) harvesting would largely avoid riparian areas, 2) harvesting would reduce or remove upland fisher habitats and mature upland stands in preferred covertypes, 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) motorized human access levels would be slightly reduced.

- ***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 the Lazy Creek Subunit and cumulative-effects analysis area. Landscape connectivity in both the cumulative-effects analysis area and Lazy Creek Subunit is largely intact, particularly along the numerous streams in the area. Road access in the cumulative-effects analysis area would not appreciably change; therefore, fisher vulnerability to trapping would remain unchanged. Fisher habitats could be altered with the proposed Beaver/Swift/Skyles Timber Sale Project and the U.S. Post Office development. Thus, no further cumulative effects to fishers would be anticipated in the cumulative-effects analysis area since: 1) no changes to existing habitats on state ownership would occur, 2) landscape connectivity afforded by the stands on state ownership 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 1 acre 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 96.6 to 96.4 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 96.5 percent of the subunit, which exceeds the 75-percent threshold established in *ARM 36.11.440(1)(b)(i)*. Roughly 565 acres of the 10,937 acres (5.2 percent) of potential fisher foraging and travel habitats in the uplands would be harvested. These reductions would be additive to the losses associated with past timber harvesting in the cumulative-effects analysis area, the proposed Beaver/Swift/Skyles Timber Sale Project, and the proposed U.S. Post Office development. Landscape connectivity in the cumulative-effects analysis area and subunit would remain largely intact. Human disturbance and potential trapping mortality would be negligibly reduced with the proposed road closures.

Thus, minor adverse cumulative effects would likely affect fisher in the project area for 70 to100 years since: 1) harvesting would remove upland fisher habitats and mature upland stands in preferred fisher covertypes, but considerable upland habitats would persist, 2) negligible changes to preferred covertypes or fisher habitats associated with the riparian areas in the cumulative-effects analysis area would be anticipated, 3) negligible reductions in landscape connectivity would be anticipated, 4) harvesting would partially reduce snags and snag recruits, while increasing the coarse woody debris levels, largely in the smaller-sized pieces, and 5) negligible changes to motorized human access would occur.

Pileated Woodpecker

Issue: Concern was expressed that 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. For cumulative effects analysis purposes, the contiguous Stillwater State Forest was used as the scale of the analysis. 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 old, have greater than 40-percent canopy closure, and occur 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, indirect, and 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 1,452 acres that are dominated by western larch/Douglas-fir. Additionally, 1,301 acres of sawtimber stands are dominated by western larch/Douglas-fir and mixed conifers in the project area; the foraging stands on these acres may be of lower quality. 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 activities has reduced the quality of habitat for pileated woodpeckers. Large live and dead trees are less common in portions of the project area than would occur naturally due to these past timber-harvesting activities. Black cottonwood trees occur in some riparian areas in the project area. Large (greater than 21 inches dbh) western larch, which could become suitable nesting sites, exist within the project area, and Douglas-fir/western larch and mixed-conifer stands likely provide foraging habitats. During field visits, numerous feeding sites and 0 to 6 variably spaced, large (greater than 14 inches dbh) snags per acre were observed in the project area. Additionally, the proposal to construct a new U.S. Post Office building in the project area would reduce forested cover on approximately 1 acre, which could alter pileated woodpecker habitats; these habitats would be permanently lost.

In the cumulative-effects analysis area, potential pileated woodpecker nesting habitat exists on approximately 19,833 acres, with at least an additional 48,791 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. Extensive harvesting has occurred in the cumulative-effects analysis area 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 Point of Rocks, Duck-to-Dog, and West Fork of Swift Creek timber sale projects, along with the Chicken Creek gravel pit expansion, would continue reducing pileated woodpecker habitats. Similarly, the proposed Chicken/Antice and Beaver/Swift/Skyles timber sale projects could further affect pileated woodpecker habitats.

- ***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. Harvesting 896 acres would reduce continuously forested habitats for pileated woodpeckers. At least 349 acres of potential nesting would be removed with another 155 acres altered, some to the point of being unusable; meanwhile an additional 347 acres of potential foraging habitats would be modified, some to the point of being unusable. Where regeneration harvests are proposed, potential pileated nesting and foraging habitats would be removed for 30 to 100 years, depending on the density of trees retained. 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 and would be expected to persist without being lost to firewood gathering), coarse woody debris (15 to 20 tons per acre), numerous leave trees, and snag recruits (a minimum of 2 trees per acre greater than 21 inches dbh where they exist), would be retained in the proposed units. Meeting snag retention requirements and, subsequently, habitat needs for those wildlife using snags would be challenging in numerous of the proposed units because: 1) some areas (such as Units 4, 6C, 6D, and 6E) currently lack sufficient large snags, 2) other areas (such as Units 5 and 6B) are quite close to private property and/or open roads where snag loss could continue due to legal and illegal firewood and forest-product gathering, and 3) other areas would have a higher level of woody-material removal prescribed for fire protection purposes. 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 896 acres, with at least 638 acres that would be too open to be considered pileated woodpecker habitats. The silvicultural prescriptions would retain healthy western larch, western white pine, western red cedar, and Douglas-fir while promoting the regeneration of these same species, which would benefit pileated woodpeckers in the future by providing nesting, roosting, and foraging habitats. Thus, minor direct and indirect effects would be anticipated to affect pileated woodpeckers in the project area for 30 to 100 years 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 units would be included, and 4) harvest prescriptions would promote seral species in the proposed units.

- ***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 Stillwater State Forest that would be in mature, forested covertypes. Similarly, proposed harvesting, the Chicken Creek gravel pit expansion, and U.S. Post Office development 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 would occur, which are valuable to pileated woodpeckers.

- ***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 some potential nesting trees would be retained in the project area; however, future recruitment of these attributes may be reduced by the proposed activities. Canopy on at least 638 acres in the project area that are proposed for regeneration-type treatments would likely be too open for appreciable pileated woodpecker use. Recently harvested stands in the project area and elsewhere on Stillwater State Forest reduced pileated woodpecker habitats as well. The ongoing harvesting and Chicken Creek gravel pit expansion projects would continue to remove potential pileated woodpecker habitats while reducing the amount of Stillwater State Forest that would be in mature, forested covertypes. Additionally, any potential harvesting associated with the proposed projects could also further alter pileated woodpecker habitats. The loss of pileated woodpecker habitats under this alternative would be additive to habitat losses associated with past harvesting on Stillwater State Forest; continued widespread use of Stillwater State Forest would be expected. Additionally, continued maturation of stands across Stillwater State Forest is increasing suitable pileated woodpecker habitats. Thus, overall minor cumulative effects would likely affect pileated woodpeckers on Stillwater State Forest for the next 30 to 100 years 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 units; however, mitigation measures would retain some of these attributes in several of the units, and 4) harvest prescriptions would promote seral species in the proposed units.

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ATTACHMENT III
PRESCRIPTIONS

HARVEST TREATMENTS

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 the 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.

Improvement harvest - Harvesting would improve the form, quality, health, and wildlife potential of the remaining stand.

Combination treatments (seedtree or shelterwood with reserves, commercial thin, and/or improvement harvests) - Depending on stand conditions, this treatment would vary across a harvest unit. Varying the prescription across the unit would help break up openings and create shapes that are more irregular to emulate the variation of natural disturbances, such as a mixed-severity fire, across the landscape.

PROPOSED UNIT 1

Acres: 114 **Volume (Mbf):** 500

Proposed Treatment(s): Modified seedtree with reserves (87 acres)/commercial thin (37 acres)

Harvest Particulars: This area adjacent to U.S. Highway 93 is a mixed-conifer covertype; growth is slowing and a commercial thin would benefit this area. This proposal would remove trees that are inferior in quality while favoring western larch, Douglas-fir, and western white pine, with an emphasis on species, form, and size. The commercial-thin treatment adjacent to U.S. Highway 93 would retain a good visual buffer and would also be a good demonstration area for urban interface treatments. On the northern 30 percent of the unit and the southwest-facing areas where the forest health is less viable, the prescription would change to a seedtree with reserves treatment. To facilitate natural regeneration, 6 to 8 trees per acre would be retained, favoring western larch, western white pine, and Douglas-fir. Where available, 2 snags and 2 snag recruits (21 inches dbh and greater) would be left per acre, favoring western larch, western white pine, western red cedar, and Douglas-fir. In the absence of 21-inch-plus trees, the largest-diameter trees available would be retained.

Follow-Up Treatments:

- Slash would be piled and burned at the landings.
- The area would be mechanically site prepped.
- Regeneration would be natural.
- Regeneration survey - 5 years following site preparation; plant at that time if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following harvesting.

PROPOSED UNITS 2, 3

Acres: 227 **Volume (Mbf):** 2,000

Proposed Treatment(s): Modified seedtree with reserves

Harvest Particulars: To facilitate natural regeneration, 6 to 8 trees per acre would be retained, favoring western larch, western white pine, Douglas-fir, and western red cedar. Where available 2 snags and 2 snag recruit trees (21 inches dbh and greater) would be left per acre, favoring western larch, western white pine, western red-cedar, and Douglas-fir. 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 Stryker Face 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.

Follow-Up Treatments:

- Slash would be piled and burned.
- The area would be mechanically site prepped.
- Regeneration would be natural.
- Regeneration survey - 5 years following site preparation; plant at that time if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.

PROPOSED UNITS 4, 6C, 6D

Acres: 20 **Volume (Mbf):** 30

Proposed Treatment(s): Improvement cut: Commercial thin to seedtree with reserves

Harvest Particulars: These stands have healthy western larch and Douglas-fir; lodgepole pine that is stagnant in growth and has very poor crown ratios (15 percent) is interspersed. If all lodgepole pine is removed, along with any Douglas-fir that is poorly formed or has poor crowns, the remaining Douglas-fir/western larch will be a commercial thin to seedtree/shelterwood spacing. Two snags and two snag recruits per acre would be left where possible.

Follow-Up Treatments:

- Slash would be piled and burned.
- The area would be mechanically site prepped.
- Regeneration would be natural.
- Regeneration survey - 5 years following site preparation; plant at that time if necessary.
- Precommercial thinning survey (TSI Evaluation) – 12 to 15 years following site preparation.

PROPOSED UNIT 5

Acres: 5 **Volume (Mbf):** 20

Proposed Treatment(s): Modified seedtree with reserves

Harvest Particulars: This unit is a series of small pockets (1 to 1.5 acres) in an old leave strip along Upper Whitefish Road. The whitewoods (subalpine fir, grand fir, and Engelmann spruce) would be removed, and healthy and well-formed Douglas-fir and western larch would be retained.

Follow-Up Treatments:

- Regeneration would be natural.
- Regeneration survey - 5 years following site preparation; plant at that time if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.

PROPOSED UNITS 6A, 6F

Acres: 6 **Volume (Mbf):** 25

Proposed Treatment(s): Improvement cut

Harvest Particulars: These units are 2 pockets of Douglas-fir bark beetle-infested trees; 6A would resemble a commercial thin and 6F a seedtree with reserves. Two snags and 2 snag recruit trees per acre (21 inches dbh and greater) would be left favoring western larch and Douglas-fir.

Follow-Up Treatments:

- Slash would be piled and burned.
- Regeneration would be natural.

PROPOSED UNIT 6B

Acres: 20 **Volume (Mbf):** 60

Proposed Treatment(s): Modified seedtree with reserves (12 acres)/commercial thin (8 acres)

Harvest Particulars: This unit would consist of 60-percent commercial thin and 40-percent seedtree harvest treatments. 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, favoring western larch, western white pine, western red cedar, and Douglas-fir.

Follow-Up Treatments:

- Slash would be piled and burned.
- The area would be mechanically site prepped.
- Regeneration would be natural.
- Regeneration survey - 5 years following site preparation; plant at that time if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.

PROPOSED UNITS 6E, 1A

Acres: 28 **Volume (Mbf):** 75

Proposed Treatment(s): Improvement cut

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 and the healthiest and largest Douglas-fir and western larch would be retained at approximately a 30-foot spacing (commercial thin) or a spacing of 10 feet or more between live crowns.

Follow-Up Treatments:

These areas are adjacent to homesites; a high level of hazard reduction would remove 90 percent of the slash.

PROPOSED UNIT 7

Acres: 188 **Volume (Mbf):** 1,500

Proposed Treatment(s): Commercial thin and improvement cut

Harvest Particulars: To facilitate natural regeneration, 6 to 8 trees per acre would be retained, favoring western larch, western white pine, Douglas-fir, and western red cedar. Where available, 2 snags and 2 snag-recruit trees (21 inches dbh and greater) would be left per acre, favoring western larch, western white pine, western red cedar, and Douglas-fir. 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 are scattered throughout the units; these would be commercially thinned.

This is a combination skyline and tractor unit and would be winter logged.

Follow-Up Treatments:

- Slash would be piled and burned.
- The area would be mechanically site prepped.
- Regeneration would be natural.
- Regeneration survey - 5 years following site preparation; plant at that time if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.
- Adjacent to homesites, a high level of hazard reduction would remove 90 percent of the slash.

PROPOSED UNIT 7A

Acres: 32 **Volume (Mbf):** 100

Proposed Treatment(s): Commercial thin and improvement cut

Harvest Particulars: This unit will employ a combination of tractor/cable harvest methods. The unit would be marked to a commercial-thin prescription that favors western larch, ponderosa pine, and Douglas-fir for retention. To help address the visual concerns identified during public scoping, the commercial-thin prescription area would have an irregular spacing in areas where clumps of inferior trees are removed; superior trees would be left at a slightly denser spacing than the traditional commercial-thin prescription. Two snags and 2 snag-recruit trees (21 inches dbh and greater) would be retained per acre, favoring western larch, Douglas-fir, and ponderosa pine.

Follow-Up Treatments:

- Slash would be piled at the landings and burned.
- Regeneration would be natural.
- Adjacent to homesites, a high level of hazard reduction would remove 90 percent of the slash.

PROPOSED UNIT 8

Acres: 61 **Volume (Mbf):** 20

Proposed Treatment(s): Commercial thin

Harvest Particulars: Approximately 13 acres west of the powerline and east of the railroad tracks would be treated with a seedtree harvest, leaving the best western larch and Douglas-fir at a 60- to 80-foot spacing.

The area east of the powerline would receive an improvement cut that would primarily be a commercial thin with some small areas (less than 0.5 acre) of group selection. These group-selection areas would consist of lodgepole pine, grand fir, subalpine fir, and Engelmann spruce and make up approximately 15 percent of the unit.

The areas immediately adjacent to private ownerships in Olney and the hillside immediately above the Stillwater Unit office will be treated as a commercial thin with an emphasis on thinning from below for fire hazard reduction and a strong emphasis on aesthetics. The areas near private land would receive the high hazard-reduction standard.

Follow-Up Treatments:

- Adjacent to homesites, a high level of hazard reduction would remove 90 percent of the slash.
- Slash would be piled and burned.
- The area receiving a seedtree prescription would be mechanically site prepped.
- Regeneration would be natural.
- Regeneration survey - 5 years following site preparation; plant at that time if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.

PROPOSED UNIT 9

Acres: 152 **Volume (Mbf):** 800

Proposed Treatment(s): Commercial thin (58 acres)/modified seedtree with reserves (94 acres)

Harvest Particulars: The southern 58 acres of this unit would be commercially thinned; retention would favor western larch, western white pine, and Douglas-fir. In the northern 94 acres, 6 to 8 trees per acre would be retained, favoring western larch, western white pine, and Douglas-fir. In the areas where mistletoe is present in the western larch, enough Douglas-fir is available to provide an adequate number of leave trees. The east-facing portion of the unit is an area of high visibility; opportunities to leave clumps of good-quality leave trees would be used to help reduce visual impacts. Where available, 2 snags and 2 snag recruit trees (21 inches dbh and greater) would be left per acre, favoring western larch, western white pine, western red cedar, and Douglas-fir. In the absence of 21-inch-plus trees, the largest diameter trees available would be retained. This is a combination skyline/tractor unit.

Follow-Up Treatments:

- Slash would be piled and burned.
- The area would be mechanically site prepped.
- Regeneration would be natural.
- Regeneration survey - 5 years following site preparation; plant at that time if necessary.
- Precommercial thinning survey (TSI Evaluation) - 12 to 15 years following site preparation.

PROPOSED UNIT 10

Acres: 28 **Volume (Mbf):** 75

Proposed Treatment(s): Improvement cut

Harvest Particulars: This unit would consist of several small blocks of harvest areas. In each block, an improvement cut would be prescribed with the spacing of a commercial thin. The purpose of this proposed treatment is to reduce competition, promote growth, reduce fire hazards, and reduce the component of whitewoods (lodgepole pine, grand fir, subalpine fir, and Engelmann spruce). Where available, 2 snags and 2 snag recruit trees (21 inches dbh and greater) would be left per acre, favoring western larch, western white pine, western red cedar, and Douglas-fir. In the absence of 21-inch-plus trees, the largest-diameter trees available would be retained.

Follow-Up Treatments: Slash would be piled and burned.

PROPOSED UNIT 11

Acres: 2.4 **Volume (Mbf):** 10

Proposed Treatment(s): Improvement cut

Harvest Particulars: This unit consists of two small areas; one is east of the helipad, the other is at the helipad approach. The helipad would be expanded to the east slightly. The taller trees at the helipad approach from the south would be removed.

Follow-Up Treatments: Slash would be piled and burned.

PROPOSED UNIT 12

Acres: 6 **Volume (Mbf):** 10

Proposed Treatment(s): Improvement cut

Harvest Particulars: This treatment would reduce fire hazards and promote growth in residual trees. The treatment would remove whitewoods (lodgepole pine, grand fir, subalpine fir, and Engelmann spruce) and leave the largest, healthiest Douglas-fir and western larch at an approximate 30-foot spacing (commercial thin) or a spacing of approximately 10 feet or more between the live crowns.

Follow-Up Treatments: Adjacent to homesites, a high level of hazard reduction would remove 90 percent of the slash.

ATTACHMENT IV
STIPULATIONS AND SPECIFICATIONS

AESTHETICS

- Damaged residual vegetation will be slashed.
- Pockets of sawtimber-sized hardwoods (aspen, birch, and cottonwood) would 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 would have designated "uncut" areas within them and most areas would have trees remaining in clumps or groups. This, along with strips of small trees along roads, helps reduce the sight distance into a harvest area.
- Where possible, temporary roads would be located on breaks to limit steep sideslopes where cuts and fills may be visible.

ARCHAEOLOGY

A 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

- Limit equipment operations to periods when soils are relative-ly dry, (less than 18 percent), frozen, or snow-covered to minimize soil compaction and rutting and maintain drainage features. Check soil moisture conditions 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 would identify which main trails to use and where additional trails are needed. Trails that do not comply with BMPs (i.e. draw bottom trails) would 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.
- Slash disposal - Limit the combination of disturbance and scarification to 30 to 40 percent of the harvest units. No dozer piling on slopes over 35 percent; no excavator piling on slopes over 40 percent unless the operation can be completed without causing excessive erosion. Consider lopping and scattering or jack-pot burning on the steeper slopes. Accept disturbance incurred during skidding operations to provide adequate scarification for regeneration.
- Retain 10 to 15 tons of large woody debris and a majority of all fine litter feasible following harvesting. On units where whole tree harvesting is used, implement one of the following mitigations 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-administrating officer 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 the next spraying season after the work is done.

FUELS MANAGEMENT

- Within 1,000 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.

WILDLIFE

- Consult a DNRC biologist if a threatened or endangered species is encountered to determine if additional mitigations that are consistent with the administrative rules for managing Threatened and Endangered Species (*ARM 36.11.428* through *36.11.435*) are needed.
- Limit disturbance to grizzly bear habitats by either harvesting during the denning period (November 16 through March 15) or during short-duration, high intensity periods of less than 30 days on closed roads in the recovery zone. In the 'occupied habitat' area, minimize disturbance by avoiding the spring period (April 1 through June 30) when grizzly bears are more likely to be in the vicinity.
- Restrict public access at all times on restricted roads that are opened by using signs during active periods and a physical closure (gate, barriers, equipment, etc) during inactive periods (nights, weekends, etc.).
- Reclose roads and skid trails opened with the proposed activities to reduce the potential for unauthorized motor vehicle use.
- Use a combination of topography, group retention, and roadside vegetation to reduce views into harvest units along open roads.
- Retain forested corridors to maintain landscape connectivity and patches of dense vegetation, when possible, to provide security cover.
- Manage for snags, snag recruits, and coarse woody debris according to *ARMs 36.11.411* through *36.11.414*, particularly favoring western larch and western white pine.
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while operating on restricted roads.

ATTACHMENT V
PREPARERS AND CONTRIBUTORS

Beck, Margaret	Graphics/Publications Technician, DNRC, Stillwater State
Evans, Pete	Project Leader, DNRC, Stillwater State Forest, Olney, MT
Hulett, Wanemah	Office Manager, DNRC, Swan River State Forest, Swan Lake,
McMahon, Michael	Forest Management Specialist, DNRC, Stillwater State Forest,
Schairer, Garrett	Wildlife Biologist, NWLO, DNRC, Kalispell, MT
Vessar, Marc	Hydrologist, NWLO, DNRC, Kalispell, MT

DECISIONMAKER

Manning, Brian	Forest Management Specialist, DNRC, Stillwater State Forest, Olney, MT

ACRONYMS

ARM	Administrative Rules of Montana
BLM	Bureau of Land Management
BMP	Best Management Practices
BNSFRR	Burlington Northern/Santa Fe Railroad
dbh	diameter at breast height
DEQ	Montana Department of Environmental Quality
DFWP	Department of Fish, Wildlife and Parks
DNRC	Department of Natural Resources and Conservation
EA	Environmental Assessment
ECA	Equivalent Clearcut Acres
EPA	Environmental Protection Agency
FOGI	Full Old-Growth Index
MCA	Montana Codes Annotated
MMbf	million board feet
MNHP	Montanan Natural Heritage Program
NCDE	Northern Continental Divide Ecosystem
NWLO	Northwestern Land Office
RMZ	Riparian Management Zone
SFLMP	State Forest Land Management Plan
SLI	Stand Level Inventory
SMZ	Streamside Management Zone
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

ID Team	Interdisciplinary Team
Forest Management Rules	Administrative Rules of Forest Management
Land Board	Montana Board of Land Commissioners
Plum Creek	Plum Creek Timber Company
124 Permit	Stream protection Act Permit
3A Authorization	Authorization A—Short-term Exemption from Montana's Surface Water Quality Standards

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
STILLWATER UNIT OFFICE – STILLWATER STATE FOREST
P.O. BOX 164
OLNEY, MT 59927
(406) 881-2371

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