

SOUTH LINCOLN TIMBER SALVAGE ENVIRONMENTAL ASSESSMENT

MONTANA DEPARTMENT of NATURAL RESOURCES and CONSERVATION

**SOUTHWESTERN LAND OFFICE
LINCOLN FIELD OFFICE of the CLEARWATER UNIT**



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CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	South Lincoln Timber Salvage
Proposed Implementation Date:	November 2009
Proponent:	Lincoln Station, Clearwater Unit, Southwestern Land Office, Montana DNRC
Location:	Sections 22, 28 and 34 T.14N., R.8W and Sections 28 and 34 T.14N., R.9W
County:	Lewis and Clark

I. TYPE AND PURPOSE OF ACTION

The Montana DNRC, Clearwater Unit, is proposing to harvest approximately 3.0 MMBF of trees from approximately 365 acres. Harvesting would primarily include lodgepole pine trees. Many of these trees have been killed or are within stands infested by mountain pine beetle (*Dendroctonus ponderosae*). Nearby lodgepole pine would also be cut due to the high likelihood of beetle attack. Other tree species would be cut, however these trees only represent approximately ten percent of the total harvest volume.

Approximately 0.75 miles of permanent new road would be constructed to access the proposed harvest units. Road maintenance, to ensure Montana's Best Management Practices for Forestry are met, would take place on all existing access roads.

The project objectives are to:

- 1) Seek to maximize revenue over the long-term for the School Trust accounts from the timber resources and salvage timber on state forests that is dead, dying or is threatened by insects, disease, fire, or windthrow as mandated by State Statute 77-5-207, MCA,
- 2) Manage the identified parcel intensively for healthy and biologically diverse forests to provide long-term income for the Trust.
- 3) Improve timber stand health and vigor.

The lands involved in this project are held by the State of Montana in trust for the support of specific beneficiary institutions such as public schools & state colleges (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners and Department of Natural Resources and Conservation (DNRC) are required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run for these beneficiary institutions (Section 7 –1–202, MCA).

DNRC would manage lands involved in this project in accordance with the State Forest Land Management Plan (DNRC 1996) and the Administrative Rules for Forest Management (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.

The initial proposal, which was published in the Blackfoot Valley Dispatch and mailed to interested parties in July 2009, proposed to harvest approximately 3.0 MMBF and included the possibility of new road construction being required to access harvest units. In addition to public scoping, resource professionals in state agencies were scoped. Comments were received from within the DNRC, Montana Fish Wildlife and Parks, Defenders of Wildlife, F.H. Stoltze Land and Lumber and two private individuals. Comments were used to help guide the development of the action alternative.

The mailing list of parties receiving initial scoping notices for this project is located in the project file at the Lincoln Field Office. Public scoping comments are also located in the project file at the Lincoln Field Office.

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

Montana Department of Environmental Quality, burning restrictions.
Montana Fish Wildlife and Parks, 124 Permit.

3. ALTERNATIVES CONSIDERED:

Alternative A – No Action. Under this alternative no large scale timber harvest would occur, however the DNRC would continue current uses including firewood permits and small timber permits. The bark beetle epidemic would continue, likely killing the majority of lodgepole pine trees within the sections. The beetles could also infest and kill ponderosa pine trees, resulting in a shift away from desired future conditions as outlined in ARM 36.11.405. No new road would be constructed and no existing road would be improved to meet Montana Best Management Practices guidelines. Substantial value would be lost by not salvaging the trees that have already been attacked by beetles and allowing the remaining live lodgepole pine on project area to succumb to bark beetle attack.

Alternative B – Timber Harvest Alternative. Under this alternative, the DNRC would continue current uses, and also harvest approximately 3.0 MMBF of timber from approximately 365 acres. Approximately 90 percent of this volume would be dead, dying and at risk lodgepole pine. The remainder of the harvest volume would be spruce and subalpine fir that would be harvested due to the likelihood of blowing down following harvest, and trees that are in skid trails or landings or other species that have died from various forest pests such as Douglas-fir bark beetle or Western spruce budworm.

Approximately 0.75 miles of permanent new road would be constructed to access the proposed harvest units. Additional temporary roads may be constructed to access harvest units but these would be less than 0.75 miles in length, situated on moderate slopes and reshaped to near natural contours following harvest. Road maintenance, to ensure Montana’s Best Management Practices for Forestry are met, would take place on all existing access roads.

The majority of the timber would be harvested under one large sale to be sold in the summer of 2010. Some smaller patches would be sold as timber permits, or small sales.

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.

The proposed harvest areas are located on varied soils formed mainly in deep glacial till and alluvial deposits derived from, sedimentary rocks (limestone, argillites and quartzites), with localized clay rich tertiary age valley fill deposits on the footslopes and lower mountain sideslopes. Bedrock outcrops are few and fractured limestone bedrock was noted in Section 34, T14N, R8W and on minor convex slopes in other parcels. No unique geologic features were noted. Shallow rock occurs near the ridgelines and upper slopes, but should be common excavation or rippable on the proposed road location and do not limit proposed road construction.

Soils on forest sites are shallow to moderately deep gravelly to clayey in texture with low to moderate erosion risk. Portions of stands have historic harvest that was over 40 years ago and all stands are fully stocked with only localized past impacts on main skid trails and landings. With no action, forest soils would continue to ameliorate, yet road segments with inadequate drainage or vegetative cover may continue to erode.

With the proposed action, planned harvest and ground skidding operations should have low risk of direct, in-direct and cumulative impacts based on implementing BMP's and mitigation measures. Ground based harvest would be limited to slopes less than 45% to prevent excessive disturbance. Mitigations (see appendix) include season of use limits to prevent rutting and compaction, skidding plans to limit area of impacts, retaining woody debris for soil nutrients and prompt revegetation of disturbed sites on roads to control erosion and protect soil resources.

Please see attachment B for a detailed geology and soils analysis.

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.

The proposed DNRC lodgepole salvage sale is located within the Upper Blackfoot River/Lincoln, Willow Creek and the Humbug Creek watersheds within 5 miles of Lincoln, Montana. The Upper Blackfoot River/Lincoln watershed has a drainage area of 15,439 acres. Humbug Creek is a Class 1 perennial stream with a drainage area of 11,390 acres and no direct delivery to the Blackfoot River, due to the to subsoil loss, dewatering and irrigation diversions. Willow Creek is a Class 1 perennial stream with a drainage area of 12,088 acres, and is tributary to the Blackfoot River. The Upper Blackfoot River has been identified on the 2008 303d list as only partially supporting aquatic life and cold water fisheries. Willow Creek and the Humbug Creek watersheds are not listed as impaired. A Total Maximum Daily Load Assessment and Restoration plan was completed for the Upper Blackfoot River by The Blackfoot Challenge and Montana DEQ that recommends Best Management Practices (BMP) implementation for grazing, and forestry, with the goal to reduce pollution so that the water resources can fully support all beneficial uses. In addition, Montana FWP & Trout Unlimited have inventoried the Humbug Creek Watershed and drafted a Restoration/Management Plan for that drainage.

A watershed analysis and field survey was completed by a DNRC hydrologist for the proposed sale area to determine direct, indirect and cumulative effects to water quality. A course filter cumulative effects analysis, Per ARM 36.11.423 (1) (a-b) was completed by the hydrologist for this proposed timber sale. The water quality evaluation included a review of existing inventories for soils and water resources (NRIS 2009, DNRC 2008), the 2005 Upper Blackfoot Restoration Plan (BFC 2005), the FWP Draft Humbug Creek Restoration & Management Plan, reference to previous DNRC projects, and comparisons of aerial photos combined with GIS analysis to estimate the area of past timber harvest and vegetative recovery. Field reviews were completed for the proposed harvest units, access roads and associated streams, then the observations, information and data were integrated into the watershed analysis and design of project mitigations.

DNRC ownership is minor in partial sections 28, & 34 T14N, R9W that are located within the lower footslopes of Willow Creek watershed. Precipitation is low, with an average 19-20 inches/year mainly as snow, with surface runoff rare and subsoil moisture low. The droughty nature of the foothills is apparent by the sagebrush on open forest sites and along roads. There are no streams or water resources in DNRC parcels of section 28 T14N, R9W, the north ¼ of section 34, T14N, R9W, and section 28 T14N, R8W that would be affected by the proposed project, and these parcels will be dismissed from further watershed analysis.

The watershed analysis will focus on potentially affected water resources and streams associated with proposed harvest and access roads to; 1) Bear Gulch SW ¼, Section 34, T14N, R9W, a tributary to Willow Creek, 2) partial section 22, T14N, R8W, (Blackfoot River segment), and 3) Section 34, T14N, R8W that includes South Fork Humbug Creek & unnamed tributary. Existing impacts to water quality that have been identified in the Humbug Creek and Willow Creek project areas are limited to erosion and sediment delivery, mainly associated with current grazing practices and stream crossings that do not meet BMP's. Existing cumulative effects include 1) grazing impacts along stream channels, 2)

sedimentation on roads 3) agricultural uses/irrigation/ dewatering on Humbug Creek, 4) trending increase in water yield associated with insect tree mortality. One damaged culvert is a sediment source on Bear Gulch, a tributary to Willow Creek, and is planned for replacement. The proposed haul roads were recently reconstructed in September 2009 to meet BMP's for improved road drainage and sediment control at crossing sites. The road repairs are considered as part of baseline condition.

Under the No Action Alternative, no man made changes would occur within the project areas. Sedimentation on existing roads such as Bear Gulch road, with inadequate surface drainage would continue to impact water quality unless mitigations or remedial actions are taken. Grazing management on DNRC would continue and should gradually improve over time as inspections and management modifications are made. A trend towards more extensive insect infestations and mortality, or possibly wildfire in the area could considerably reduce tree canopy and may increase water yield in the future relative to increasing canopy loss.

The action alternative would implement all BMP's, SMZ laws and DNRC Forest Management Rules for water resource and fish habitat protection. The proposed project would construct approximately 0.75 mile of new road on moderate grades and no new stream crossings. The culvert on Bear Gulch road would be replaced and would cause a low level, short term increase in sediment that should quickly stabilize and result in long term sediment reduction. Roads would be graded and maintained concurrent with operations to control erosion and sedimentation and grass seeded to prevent erosion. BMP's would be implemented to minimize the risk of additional sediment delivery occurring during access and hauling of DNRC timber concurrent with operations for the period of use. The proposed salvage harvest is approximately 365 acres spread across 6 DNRC land parcels in 3 watersheds and is minor in any one watershed. Proposed harvest units have boundaries that parallel Bear Gulch and an unnamed tributary to Humbug Creek would include Streamside Management Zones that meet or exceed the buffer distances required in SMZ law. No harvest is proposed within the first 50 feet of the SMZ. Selective harvest would occur within a few short segments of the Riparian Management Zone, which extends from 50 feet to 100 feet away from the stream and there would be a low risk of sedimentation. Harvest of dead, dying and trees at high risk for mortality due to insect infestations is not expected to generate measurable substantial levels of additional water yield than would be expected under no action. The proposed harvest is a very small (less than 1 %) area compared to the watersheds.

Based on implementation of BMP's, and mitigation measures, the very small area of harvest compared to the watershed area, and improvements to existing road drainage, there is low risk of direct, indirect or cumulative effects to water quality or downstream beneficial uses with the proposed action

Please see attachment B for a detailed water quality and water resources analysis.

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.

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

The project area is in Airshed 6 which encompasses all of Lewis and Clark County. Currently, this airshed does not contain any impact zones. This project is located approximately 1 mile south of Lincoln. Numerous residential properties are found interspersed throughout the project area. The Scapegoat Wilderness area lies approximately 12 miles north of the project area. This wilderness area exceeds 5,000 acres and as such, is considered a Federal Class I Area that ultimately receives protection under the Federal Clean Air Act of 1977.

No Action

Under the No Action Alternative, no slash piles would be burned within the project areas. Thus, there would be no effects to air quality within the local vicinity and throughout Airshed 6.

Action

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

Burning within the project area would be short in duration and would be conducted when conditions favored good to excellent ventilation and smoke dispersion as determined by the Montana Department of Environmental Quality and the Montana/Idaho Airshed Group. Prior to burning a "Prescribed Fire Burn Plan" would be done for the area. The DNRC, as a member of the Montana/Idaho Airshed Group, would burn only on approved days. Thus, direct and indirect effects to air quality due to slash pile burning associated with the proposed action would be minimal.

Burning that may occur on adjacent properties in combination with the proposed action could potentially increase cumulative effects to the local airshed and the Class I Areas. The United States Forest Service and large scale industrial forestry operations in the area participate as airshed cooperators and operate under the same Airshed Group guidelines as the DNRC. Non-industrial timberland operators are regulated by the Montana Department of Environmental Quality and burning is only allowed during seasons that provide good ventilation and smoke dispersion. Thus, cumulative effects to air quality due to slash pile burning associated with the proposed action would also be expected to be minimal.

Harvesting and log hauling could create dust which may affect local air quality. Harvesting operations would be short in duration and could occur during the winter months which would minimize dust dispersal. Thus, direct, indirect, and cumulative effects to air quality due to harvesting and hauling associated with the proposed action would be minimal.

7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify cumulative effects to vegetation.

Existing Condition

RARE PLANTS AND WEEDS

No sensitive plants have been identified in the project area by DNRC personnel, nor cataloged in the area by the Montana Natural Heritage Program. Access roads are heavily infested with noxious weeds such as knapweed, houndstongue, black henbane and thistle. Many of these weeds, particularly houndstongue are also present throughout the entire project area, including the proposed harvest units.

STANDARD VEGETATIVE COMMUNITY

The project area consists primarily of Douglas-fir and lodgepole cover types at approximately 37 and 18 percent, respectively. Other cover types that exist within the project area include approximately 13 percent ponderosa pine and 9 percent mixed conifer. A significant portion, 23 percent, of the project area is non-forested. Lodgepole pine is found most heavily in the lodgepole pine cover type, followed by Douglas-fir and mixed conifer. Lodgepole pine is generally not well represented in the ponderosa pine cover type. Based on DNRC modeling of desired future conditions the Douglas-fir cover type is over-represented by approximately 7 percent and the mixed conifer cover type is over-represented by approximately 9 percent. The ponderosa pine cover type is under-represented by approximately 17 percent. It could be inferred that Douglas-fir and other shade tolerant species have encroached upon and supplanted ponderosa pine cover types as a result of fire suppression.

At the larger scale, DNRC lands managed by the Clearwater Unit are approximately 85% forested, mostly in the ponderosa pine and western larch/Douglas-fir cover types. Compared to the desired future condition at this scale, Douglas-fir, subalpine fir, and mixed-conifer cover types are slightly over-represented while ponderosa pine and western larch/Douglas-fir are slightly under-represented. Overall, however, about 84% of these lands do have a cover type that matches the desired future condition. This area falls within climatic section 332B, which was historically about 79% forested. Within the climatic

section, the historically dominant cover type was lodgepole pine, followed by Douglas-fir and ponderosa pine on lower slopes (Losensky, 1997).

Most of the stands proposed for harvest are in the sawtimber size class and have medium to high sawtimber stocking. Stands within the project area currently have a high susceptibility and risk of mountain pine beetle damage, based on the species, age, stand density, elevation, and existing mountain pine beetle presence. Lodgepole pine within the project area are dead, infested, or at risk, as are the ponderosa pine within the project area.

Stand structure characterizes stand development, disturbance and how a stand may continue to develop. Stand structure is classified as single-storied, two-storied, or multi-storied if there are one, two, or three main canopy layers, respectively. Single storied stands cover approximately 70% of the proposed harvest area. Single storied stands are typical of lodgepole pine forests as lodgepole pine often regenerate in nearly pure, even-aged stands following stand replacing fire.

DNRC has adopted old-growth definitions based on Green et al. (1992). Based on Stand Level Inventory age data and field reconnaissance no stands in the project area contain enough trees of sufficient size and age to meet the definition of old growth based on Green et al. (1992).

The age of the mature lodgepole pine trees, in the project area, range between 70 and 140 years. The primary insect and disease concern in these trees is the mountain beetle epidemic. Currently the amount of mountain pine beetle caused mortality varies from stand to stand. In some areas mortality is nearly 100% while in other stands the beetle remains at endemic levels. The health and vigor of these trees is also being affected by dwarf mistletoe, stem decays and overstocking.

The Douglas-fir, ponderosa pine, subalpine fir, and spruce in the stands proposed for harvest vary greatly in age, health, and percentage of the stand composition. Across the mature stands containing appreciable amounts of lodgepole pine, it is the most highly represented tree species; in many areas stands are almost purely lodgepole pine, but some stands have large ponderosa pine and Douglas-fir scattered throughout or are two storied stands with fully stocked Douglas-fir and subalpine fir regeneration established under the nearly pure lodgepole overstory.

Other mature stands in the project area have little to no lodgepole pine and are dominated either by ponderosa pine or Douglas-fir. Those mature stands not dominated by lodgepole pine are generally in poor to fair health. Douglas-fir bark beetle has caused some mortality throughout the project area, although it is generally concentrated near the center of section 34 T14N R8W. Douglas-fir and subalpine fir are beginning to suffer heavy defoliation caused by western spruce budworm. Usually budworm does not kill trees, however as close as one mile east of the project area the budworm defoliation has been so severe and of such long duration that extensive mortality has occurred. It is possible that the project area could suffer such losses over the next few years. Another stand type found on the project is young, seedling and sapling stands. Overall the younger stands are generally in a good health and vigor.

No Action

No large scale timber harvest would occur at this time. Small timber permits and firewood permits would continue. Compared to the existing condition, no immediate changes would be expected. Mountain pine beetle would likely continue to infest and kill lodgepole and ponderosa pine within the DRNC ownership and surrounding area. The increased fuel loading within these stands could become a concern as these trees die. With the existing rate of infestation and the likelihood that dead trees will be blown down, openings would occur within the stands regardless of harvest. As the attack of these beetles is a natural event, it is conceivable that the sale area has experienced it in the past. Over time, natural conifer regeneration would probably establish in most areas. Weed treatment could occur as funding allows.

Action

The proposed harvest is primarily designed to remove bark beetle attacked and highly susceptible lodgepole pine from approximately 365 acres. Approximate harvest units are shown on attachments A-2, A-3, and A-4. Areas not shown on the map may also be harvested. These areas are generally smaller than 5 acres in size and are scattered throughout the affected parcels in such a way that timber harvest may only be economically feasible if current market conditions change. If feasible these areas would be harvested, the total estimated harvest acreage would remain the same, but some spatial characteristics

of the proposed harvest may change.

The amount of mature lodgepole pine in the pre-harvest stand will determine the post harvest sawtimber stocking and appearance. The amount of lodgepole pine varies from approximately 20 percent all the way up to stands consisting almost entirely of lodgepole pine. The appearance of post harvest stands would be a direct result of the pre-harvest species composition. From approximately half the area proposed for harvest, less than half the trees would be removed, thus maintaining a forested appearance. On approximately 25 percent of the harvest area between 50 and 80 percent of the trees would be removed, these stands would resemble shelterwood or seed tree harvests. Approximately 25 percent of the proposed harvest area consists of over 80 percent lodgepole pine, harvest in these areas would resemble a seed tree or clearcut harvest.

Due to its likelihood of windthrow following harvest, spruce and sub-alpine-fir would also be harvested. In areas where Douglas-fir or ponderosa pine trees have been recently killed by bark beetles or other damaging agents these trees would also be salvage harvested. Recently dead ponderosa pine and Douglas-fir would be cut using individual tree selection. As a result no major changes in forest stocking, or species composition would be expected, although a few small openings could be created.

Fuel loading concerns would vary according to the pre-harvest stand. In accordance with ARM 36.11.410 and ARM 36.11.414 the majority of fine slash foliage and approximately 5 to 15 tons of coarse woody debris would be left scattered on the forest floor in all harvest units that are not adjacent to open roads. This would increase the intensity and reduce the ability to control ground fires in all harvest units for approximately three years. In stands that have numerous leave trees following harvest this could result in ground fires killing trees and an increased risk of crown fires. In areas with few leave trees the risk of a catastrophic crown fires would decrease.

At the larger scale, the proposed harvest in combination with other salvage projects dating back to 2001 would reduce stand density on approximately 10% of the forested area managed by the Clearwater Unit.

Lodgepole pine, Douglas-fir, and ponderosa pine regeneration would likely become established through natural regeneration. Planting of the proposed harvest units with a stand specific species mix favoring seral species would take place if sufficient natural regeneration does not occur. This mix would also be planted along open roads to reduce the time screening cover is regained following harvest. A diverse species mix within timber stands would make the stand less susceptible to major losses from insects and disease in the future and would move the stand towards desired future conditions.

The proposed harvest would create favorable conditions for existing weeds to spread throughout the harvest units. These conditions include scarified soil for easier weed seed germination and increased sunlight reaching the forest floor

To prevent introduction of new weeds, off-road equipment would be cleaned and inspected prior to entry into harvest areas. Newly disturbed roads and landing would be seeded to grass. Roadsides with existing weeds and some spot infestations away from the roads would be treated with herbicides.

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

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.

During scoping the following list of issues and concerns was developed regarding wildlife species that are not considered sensitive, threatened, or endangered.

~There is concern that the proposed action would affect a wildlife movement zone.

~There is concern that the proposed timber harvest would negatively impact big game winter range beyond what is expected to result from the mountain pine beetle infestation.

After a detailed analysis that can be found in attachment C the following was determined:

~Under both the no action and action alternatives there would likely be a moderate risk of direct and indirect effects to the wildlife movement zone. Under the no action alternative there would likely be a moderate risk of cumulative effects compared to the action alternative which would likely have low to moderate risk of cumulative effects.

~ Under the proposed action, there would be reductions in elk winter range habitat suitability within the project area, but the effects would likely be less than expected under the no action alternative.

~ The proposed action would likely have minimal increases in cumulative effects to elk winter range over the no action alternative.

During Scoping the following comments were received regarding fisheries

Please see EA part 9 Unique, endangered, Fragile, or Limited Resources and Attachment B for fisheries effects.

Fisheries-

Fisheries resource concerns include: the proposed forest management actions may affect fisheries and fish habitat components, including sedimentation, decreasing large woody debris (LWD) recruitment through the removal of trees near the stream channel, increased stream temperatures due to reduced canopy density (shading), and connectivity. The Upper Blackfoot River is a high-value fisheries resource and supports Westslope cutthroat trout, brook trout, and bull trout. Westslope cutthroat trout occurs in Willow Creek and Humbug Creek.

Existing impacts to fish habitat include sedimentation associated with grazing impacts along stream channels and roads, limitations on connectivity at road crossings on private lands, agricultural uses/irrigation/ dewatering on Humbug Creek. With no action, no road construction or timber harvest would occur, yet current sediment sources would continue. Existing sediment sources and cumulative effects from grazing, existing roads and land uses would continue to contribute sediment to streams in the analysis areas until remedial action were implemented or natural stabilization occurs. The no-action alternative is not expected to have substantial effect to stream shading, stream temperature, LWD recruitment, or other fish habitat features. Some natural shading loss from dying trees will occur along streams, but is not expected to substantially alter water temperatures or fish habitat. We would expect a 3-5 year increase in the amount of LWD as trees die and fall into streams. A positive effect could develop as a trending increase in water yield due to tree mortality could partially offset dewatering effects.

As disclosed in the Water Quality section, only existing road crossings would be used and the new access road would be constructed away from riparian areas and presents low risk of off-site erosion or sedimentation. The action alternative is designed to minimize impacts to water quality, and maintain or improve stream conditions important to fish habitat. Streams would be protected by designating stream (SMZ), riparian (RMZ's) and wetland protection zones (WMZ's) as defined by DNRC Forest Management Rules.

No SMZ harvest would occur along Class 1 perennial streams. Harvest units that parallel Bear Gulch and an unnamed tributary to Humbug Creek would include Streamside Management Zones that meet or exceed the buffer distances required in SMZ law. No harvest is proposed within the first 50 feet of the SMZ. Selective harvest would occur within a few short segments of the Riparian Management Zone, which extends from 50 feet to 100 feet away from the stream and there would be a low risk of sedimentation, or effects to stream shading or potential large woody debris (LWD) recruitment to these short stream segments. Harvest of dead, dying and trees at high risk for mortality due to insect infestations is not expected to generate measurable levels of additional water yield than would be expected under no action. The proposed harvest is a very small (less than 1 %) area compared to the watersheds.

Cumulative Effects to Fish Habitat of the Action Alternative

There is low risk of additional cumulative impacts to fisheries in the project area including South Fork Humbug Creek, Willow Creek or the Blackfoot River with the proposed timber harvest and road

maintenance, due to the following reasons: 1) No harvest is planned in streamside management zones adjacent to fish bearing streams, 2) SMZ and RMZ boundaries will be established to limit disturbance near water resources and protect vegetation to trap sediment , 3)combined mitigation measures for harvest operations and season of use are all directed at minimizing soil disturbance to prevent erosion and sedimentation, 4) no new roads would be constructed adjacent to fisheries streams or in locations that could contribute sediment to streams, 5) current grazing management would continue as in existing conditions, and be modified as needed based on periodic inspections, 6) streamside snags and recruitable trees would be retained to provide adequate levels of long term woody debris recruitment to stream channels.

Please see attachment B for a detailed fisheries analysis.

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.

During scoping the following list of issues and concerns was developed regarding wildlife species that are considered sensitive, threatened, or endangered.

~There is concern that the proposed action would negatively affect grizzly bear habitat beyond habitat changes expected to result from the mountain pine beetle infestation.

~There is concern that the proposed action would reduce the quantity of suitable lynx habitat in the project area beyond what is expected to result from the mountain pine beetle infestation.

~There is concern that the proposed timber harvest would negatively impact bald eagles, pileated woodpeckers, and flammulated owls beyond what is expected to result from the mountain pine beetle infestation.

~There is concern that the proposed timber harvest would negatively impact northern goshawks beyond what is expected to result from the mountain pine beetle infestation.

After a detailed analysis that can be found in attachment C the following was determined.

~With the implementation of the grizzly bear mitigation measures outlined in attachment C there would likely be low risk of the proposed action increasing the direct, indirect and cumulative effects above baseline conditions.

~ Under the proposed action alternative there would likely be minimal to low risk of increasing the direct and indirect effects to lynx habitat beyond baseline conditions. The cumulative effects of the proposed action would not likely reduce suitable Canada lynx habitat beyond what is expected under the no action alternative.

~There is a low risk of direct, indirect, or cumulative effects effects to bald eagles under both alternatives. Under both alternatives there is a low to moderate risk of direct or indirect effects to flammulated owls and pileated woodpeckers. The risk of cumulative effects to pileated woodpeckers is minimal to low under the no action alternative and low to moderate under the action alternative. The risk of cumulative effects to flammulated owls is minimal to moderate under the no action alternative and a low to moderate risk under the action alternative.

Fisheries

Bull trout and westslope cutthroat trout— Bull trout and westslope cutthroat trout are identified as Class-A Species of Concern in Montana. Bull trout occur in the Blackfoot River that flows through section 22, T14N, R9W and are identified as a “threatened” species by the US Fish and Wildlife Service. Westslope cutthroat trout occurs in Willow Creek and Humbug Creek. The DNRC Forest Management Program has also identified bull trout and westslope cutthroat trout as Sensitive Species under ARM 36.11.436. Based

on implementation of BMP's, SMZ's, Forest Management Rules, as described in section 8 above and the fisheries analysis, there is low risk of direct, indirect and cumulative impacts to westslope cutthroat trout or bull trout that would be expected to occur under the proposed action alternative.

Please see attachment B for more information regarding potential impact to fisheries.

10. HISTORICAL AND ARCHAEOLOGICAL SITES:

Identify and determine effects to historical, archaeological or paleontological resources.

The DNRC archaeologist conducted a Class III level inventory for cultural and paleontological resources during August of 2009. No such resources were identified within the area of potential effect, so there should be no effect to Antiquities.

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.

The proposed sale area is located on scattered lands south of the town of Lincoln, MT. No proposed harvest areas are visible from Lincoln or from Highway 200, but some proposed harvest areas would be visible from secondary public roads and vantage points around the Lincoln area. There are public roads adjacent to or passing through sections 28 and 34 T 14 N R 9 W. The road passing through section 28 is a county road used both by recreationists and homeowners accessing full time residences. In the winter there is a snowmobile trail routed adjacent to this county road. The road through section 34 is a designated block management travel route and is used primarily in the fall by hunters. In the winter this road receives recreational use as a designated snowmobile route

Public access on these scattered parcels is controlled by adjacent private landowners, therefore different parcels in the area receive varying amounts of public use. Sections 28 and 34 T 14 N R 9 W are part of a Block Management area and have open roads running through them resulting in heavy public use. Public use of sections 22, 28 and 34 T 14 N R 8 W is much more limited because there is no public road access and the adjacent private landowners restrict access.

If the No Action Alternative were selected the tree mortality on the parcels would be noticeable to varying degrees dependant on the above mentioned variables. Where these stands are visible from public areas or public access is allowed the tree mortality would first be noticed by red needled trees. This would be noticeable both in the foreground, from within the stand, and in middleground and distance viewing from select vantage points. Over time these trees would lose there needles, leaving just the bole of the tree standing, and the forest would appear more open. Eventually the dead trees would fall over creating an open forest with a deep layer of toppled over trees.

If the Action Alternative were selected harvested stands would appear much more open. Most areas would still retain a forested appearance. However some areas of pure lodgepole pine will be devoid of trees until sufficient regeneration fills in the area. Some large woody debris and most slash foliage would be left throughout the harvest units.

Should some of the proposed actions take place during the summer, skidding equipment and log trucks may cause temporary dust clouds that would quickly disperse, and only occur during harvest. Some noise from harvesting equipment and log hauling may be heard within the project area and on haul routes.

The potential effects of each alternative would be perceived differently by different people, but overall it could be said that the Action Alternative would likely result in a low risk of direct, indirect, or cumulative effects, beyond what is expected under the No Action Alternative.

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 negative direct, indirect or cumulative effects are expected to occur as a result of the proposed project.

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.

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

Beaver Lodge Salvage Timber Sale EA, DNRC 2009, harvest 3.00 MMBF on sections 4 and 16 T14N R9W and section 16 T14N R10W.

Whiskey Gulch Salvage Timber Sale EA, DNRC 2008, harvest 2.5 MMBF on section 36 T15N R07W.

Draft Humbug Creek Restoration/Management Plan, Montana Fish Wildlife and Parks and Big Blackfoot Chapter of Trout Unlimited 2008.

Still Cool Bugs Salvage Timber Sale EA, DNRC 2007, harvest of 1.0 MMBF on section 10 T14N R08W.

Keep Cool Bugs Timber Sale EA, DNRC 2005, harvest of 1.3 MMBF on section 10 T14N R08W.

Golden Arches EA, DNRC 2004, harvest of 5.6 MMBF in the Landers Fork drainage.

Cool Flat 4X4 EA, DNRC 2005, harvest of 1.5 MMBF on Sections 8, 16, 19, and 22 of T14N, R8W.

Snow Talon Burned Area Emergency Rehabilitation Plan, FS 2003, assesses post-fire conditions.

Helena National Forest Weed EIS, FS 2004, proposes weed control on FS ground in the Lincoln area.

Lincoln Post-Fire Rehabilitation Project Categorical Exclusion, FS 2004, proposal to address non-emergency fire rehabilitation needs within the Snow Talon and Moose Wasson burned areas such as tree and shrub plantings, biological weed control, insect monitoring, pesticide, and pheromone treatments, and administrative site maintenance and repair.

Snow Talon Fire Salvage FEIS, FS 2005, proposal to salvage approximately 25 MMBF, from approximately 2700 burned acres, and associated reclamation all within the Copper Creek drainage and associated haul road in the Landers Fork and Copper Creek drainage.

See the cumulative effects analysis for associated effects to resources.

IV. IMPACTS ON THE HUMAN POPULATION
<ul style="list-style-type: none">• <i>RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.</i>• <i>Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.</i>• <i>Enter "NONE" if no impacts are identified or the resource is not present.</i>

14. HUMAN HEALTH AND SAFETY:

Identify any health and safety risks posed by the project.

Human health would not be impacted by the proposed timber sale or associated activity. Safety considerations and temporary risks would increase for the professional contractors working within the sale area. Log truck traffic would increase but safety concerns would be minimized by posting signs and, imposing a speed limit, if necessary. There are no unusual safety considerations with the proposed timber

sale. The general public and local residents would not face increased health or long term safety hazards because of the proposed timber sale

Timber sale activities could take place during the winter months. The DNRC would work with the local snowmobile club to minimize effects and safety hazards to their trail system.

No additional negative effects would be expected as a result of the proposed action

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:

Identify how the project would add to or alter these activities.

A grazing lease currently exists for all parcels within the proposed timber sale. These leases produce approximately \$3,450.00 per year. Under the no action alternative no short term changes would be expected. As trees die and expose the forest floor to more sunlight an increase in forage production would be expected, eventually these trees would fall over possibly impeding livestock's ability to use these areas. Under the proposed action alternative a similar increase in forage production would be expected, additionally slash from harvest activities could impede livestock's' ability to use the areas, much like in the no action alternative.

People are currently employed in the wood products industry in the region. Due to the relatively small size of the timber sale, there would be no measurable effects or cumulative impact from this proposed action on industrial, commercial and agricultural activities and production.

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.

A few short-term jobs in the local area may be created for the duration of the proposed action.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

Estimate tax revenue the project would create or eliminate. Identify cumulative effects to taxes and revenue.

The proposed action has only indirect, limited implications for tax collection.

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

Aside from contract administration there would be minimal impacts related to demand for government services due to the relatively small size of the timber sale, the short-term impacts to traffic, and the small possibility of a few people temporarily relocating to the area.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

In June 1996, DNRC began a phased-in implementation of the State Forest Land Management Plan (SFLMP 1996) and the State Forest Land Management Rules (ARM 36.11.401-450 DNRC) followed. The management direction provided in the Plan comprises the framework within which specific project planning and activities take place. The Rules and Plan philosophy and appropriate Resource Management Standards have been incorporated into the design of the proposed action.

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 project area is used by the public primarily for hunting, and snowmobiling. There are snowmobile trails within the project area. These trails could be impacted by winter timber harvest operations. The DNRC would work with the local snowmobile club to ensure impacts to the snowmobile are minimal.

As a result of the proposed action there would likely be a low risk of direct, indirect and cumulative impacts beyond what would be expected under the no action alternative.

The closest wilderness is located approximately ten miles north of the project area. No direct, indirect, or cumulative effects would be expected as a result of the proposed project.

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.

There would be no measurable direct, indirect, or cumulative impacts related to population and housing due to relatively small size of the timber sale proposed project.

22. SOCIAL STRUCTURES AND MORES:

Identify potential disruption of native or traditional lifestyles or communities.

No negative direct, indirect, or cumulative effects would be expected under either alternative.

23. CULTURAL UNIQUENESS AND DIVERSITY:

How would the action affect any unique quality of the area?

No negative direct, indirect, or cumulative effects 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.

No Action: A grazing lease on the parcels would continue to generate approximately \$3,450.00 annually.

Action Alternative: Revenue from grazing would continue. The timber harvest would generate approximately \$270,000 for the school trust. This is based on a stumpage rate of \$15.00 per ton, multiplied by the estimated volume of 19,500 tons. This stumpage rate was derived by comparing attributes of the proposed timber sale with attributes and results of other DNRC timber sales recently advertised for bid. Costs related to the administration of the timber sale program are only tracked at the Land Office and Statewide level. DNRC doesn't track project-level costs for individual timber sales. An annual cash flow analysis is conducted on the DNRC forest product sales program. Revenue and costs are calculated by land office and statewide. The most recent revenue-to-cost ratio of the Southwestern Land Office was 2.43. This means that, on average, for every \$1.00 spent in costs, \$2.43 in revenue was generated. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return.

EA Checklist Prepared By:	Name: Neil Simpson	Date: 10/10/2009
	Title: Management Forester	

V. FINDING

25. ALTERNATIVE SELECTED:

Action Alternative – *Timber Harvest Alternative*.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

This proposed project put forth three objectives to be met by this project:

- 1) Seek to maximize revenue over the long-term for the School Trust accounts from the timber resources and salvage timber on state forests that is dead, dying or is threatened by insects, disease, fire, or windthrow as mandated by State Statute 77-5-207, MCA.
- 2) Manage the identified parcel intensively for healthy and biologically diverse forests to provide long-term income for the Trust.
- 3) Improve timber stand health and vigor.

I find that this project meets the objective given in number one. The No Action alternative (Alternative A) would not meet that need (*EA part 3 Alternatives Considered and EA part 24 Other Appropriate Social and Economic Circumstances*). Estimations of the return of this harvest of the salvaged predict a payment of stumpage volume to be around \$270,000.00 dollars. Currently, there are grazing leases on these parcels, but this income (\$3,450.00 per year) is far outweighed by the estimated timber harvest payments (*EA part 24 Other Appropriate Social and Economic Circumstances*). As described within the EA, approximately 70% of some stands structures within the project area are single storied. Generally, these single storied stands are lodgepole pine (*EA part 7 Vegetative Cover, Quantity and Quality*). Within the part 3 of this EA (*Alternatives Considered*) it is well stated “... and also harvest approximately 3.0 MMBF of timber from approximately 365 acres. Approximately 90 percent of this volume would be dead, dying and at risk lodgepole pine. The remainder of the harvest volume would be; spruce and subalpine fir, which would be harvested due to there likelihood of blowing down following harvest, trees that are in skid trails or landings or other species that have died from various forest pests such as Douglas-fir bark beetle or Western spruce budworm”. The expected harvested volume should be around 19,500 tons (*EA part 24 Other Appropriate Social and Economic Circumstances*) yielding the approximated return of \$270,000.00 mentioned above.

The second objective is met through removal of lodgepole pine and assorted other shallow rooted tree species that may blow down after harvest (*EA part 7 Vegetation Cover, Quantity and Quality*). Coarse woody debris requirements would be met as stated in the EA (*part 7 Vegetative Cover, Quantity, and Quality*) and is stated: “In accordance with ARM 36.11.410 and ARM 36.11.414 the majority of fine slash foliage and approximately 5 to 15 tons of coarse woody debris would be left scatted on the forest floor in all harvest units that are not adjacent to open roads. This would increase the intensity and reduce the ability to control ground fires in all harvest units for approximately three years”. This level has been determined to provide soil productivity (*Attachment B page 29*). This project would also propose planting a mix of ponderosa pine and Douglas-fir, but natural regeneration would also be expected in some areas (*EA part 7 Vegetation Cover, Quantity and Quality*). These stands are less likely to be affected in this manner by mountain pine beetle in the future and would fulfill the third objective. No old growth (defined using Greene et. al.) stands or rare or endangered plants are located within this sale area (*EA part 7 Vegetative Cover, Quantity and Quality*).

During the scoping of the project, several potential concerns were discovered. These are within a project file at the Lincoln office (*EA part 1 Public Involvement, Agencies, Groups or Individuals Contacted*). It has been determined that the proposed project could impact a wildlife movement zone and big game winter range. The DNRC Wildlife Biologist has stated that the Action Alternative could cause moderate direct and indirect effects to the wildlife movement zone given the harvest (*EA part 8 Terrestrial, Avian, and Aquatic Life*

and Habitats, Attachment C page 53). Big game winter range concerns are predicted to show reductions of habitat suitability within the project area under the Action Alternative (EA part 8 Terrestrial, Avian, and Aquatic Life and Habitats, Attachment C page 60). As was stated by the DNRC Wildlife Biologist, "On the winter range acreage that is proposed for treatment, due to stand composition, there would be a 30 to 89% reduction (between stand variation) in snow intercept cover within the treated stands. Thus, under the proposed action, there would be reductions in elk winter range habitat suitability within the project area, but the effects would likely be less than expected under the no action alternative" (Attachment C page 60). The proposed action would likely have minimal increases in cumulative effects to elk winter range over the no action alternative (EA part 8 Terrestrial, Avian, and Aquatic Life and Habitats, Attachment C page 61).

Grizzly bear populations are predicted to show low increases from the baseline if planned mitigations are met. This would increase visual screening cover and show no net increase in road densities (*EA part 9 Unique, Endangered, Fragile, or Limited Environmental Resources, Attachment C page 55*). Canada Lynx are also predicted to show low increases to direct and indirect effects, and is assumed to not likely to increase the cumulative effects. This will primarily be because of the increased ability to regenerate stands and would not likely reduce suitable Canada lynx habitat beyond what is expected under the no action alternative (*EA part 9 Unique, Endangered, Fragile, or Limited Environmental Resources, Attachment C page 56*). Bald eagles are expected to show low effects to all categories given the distance to a known nest (1.25 miles) (*EA part 9 Unique, Endangered, Fragile, or Limited Environmental Resources, Attachment C page 58*). Concerns regarding Pileated woodpeckers and a decrease in habitat showed a possibility of low to moderate effects. Protection of snags would reduce possible effects and would be required under ARM 36.11.411 and 414 (*EA part 9 Unique, Endangered, Fragile, or Limited Environmental Resources, Attachment C page 59*). Flammulated owls would see low to moderate effects in direct, indirect, and cumulative effects given the harvest plans and the reduced availability for these stands to show value to them for 40-60 years (*EA part 9 Unique, Endangered, Fragile, or Limited Environmental Resources, Attachment C page 60*). Goshawks are expected to have low increases in effects primarily due to a change in overstory species to Douglas-fir, and the increased number of trees per acre (*EA part 9 Unique, Endangered, Fragile, or Limited Environmental Resources, Attachment C page 62*).

Hydrologic and fisheries concerns were also raised. To protect water resources and coldwater fish habitats, BMP's, SMZ laws, and DNRC Forest Management Rules for water resource and fish habitat protection would be used (*EA part 5 Water Quality, Quantity, and Distribution and Attachment B*). A culvert the on Bear Gulch road would be replaced and would cause a low level, short term increase in sediment that should quickly stabilize and result in long term sediment reduction (*EA part 5 Water Quality, Quantity, and Distribution and Attachment B page 42*). As was stated in the EA, "Harvest of dead, dying and trees at high risk for mortality due to insect infestations is not expected to generate measurable substantial levels of additional water yield than would be expected under no action. The proposed harvest is a very small (less than 1 %) area compared to the watersheds" (*EA part 5 Water Quality, Quantity, and Distribution*). Fisheries concerns included the proposed forest management actions and their affect fisheries and fish habitat components. This included "sedimentation, decreasing large woody debris (LWD) recruitment through the removal of trees near the stream channel, increased stream temperatures due to reduced canopy density (shading), and connectivity" (*EA part 8 Terrestrial, Avian, and Aquatic Life and Habitats*). Existing sediment concerns (grazing, dewatering for irrigation, etc.) would be of largest concern, with the harvest contributing only a small amount to the sedimentation and no streams will be built were sediment could affect streams (*EA part 8 Terrestrial, Avian, and Aquatic Life and Habitats*). Some loss to natural shading will occur, but his should not increase water temperatures (*EA part 8 Terrestrial, Avian, and Aquatic Life and Habitats*). Large woody debris concerns should be minimized given the State SMZ law and see an increase in CWD for the next 3-5 years (*EA part 8 Terrestrial, Avian, and Aquatic Life and Habitats*).

Concerns over bull trout and west slope cutthroat trout were considered. There is little to no increase in direct, indirect, or cumulative effects to their populations given the Action Alternative (*EA part 9 Unique, Endangered, Fragile, or Limited Environmental Resources*).

With the proposed action, planned harvest and ground skidding operations should have low risk of direct, in-direct and cumulative impacts upon soils within the area based on implementing BMP's and mitigation measures (*EA part 4 Geology and Soil Quality, Stability, and Moisture*). This proposed harvest would create areas that would be conducive to the spread of noxious weeds, but, the DNRC requirements would be expected to result in low to moderate direct, indirect, and cumulative impacts (*EA part 7 Vegetation Cover, Quantity and Quality*).

Stand health would obviously be increased with the removal of the lodgepole pine and ponderosa pine that would be harvested. As was stated in the EA, "*Stands within the project area currently have a high susceptibility and risk of mountain pine beetle damage, based on the species, age, stand density, elevation, and existing mountain pine beetle presence. Lodgepole pine within the project area are dead, infested, or at risk, as are the ponderosa pine within the project area*" (*EA part 7 Vegetation Cover, Quantity and Quality*). The reduction of the bug infested trees would increase slash loadings, but should be reduced within three years (*EA part 7 Vegetation Cover, Quantity and Quality*). Although as stated in Attachment C, "*The proposed action would not stop mountain pine beetle activity*", this treatment will reduce the availability of trees (primarily ponderosa pine) for the beetle to attack on DNRC lands.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

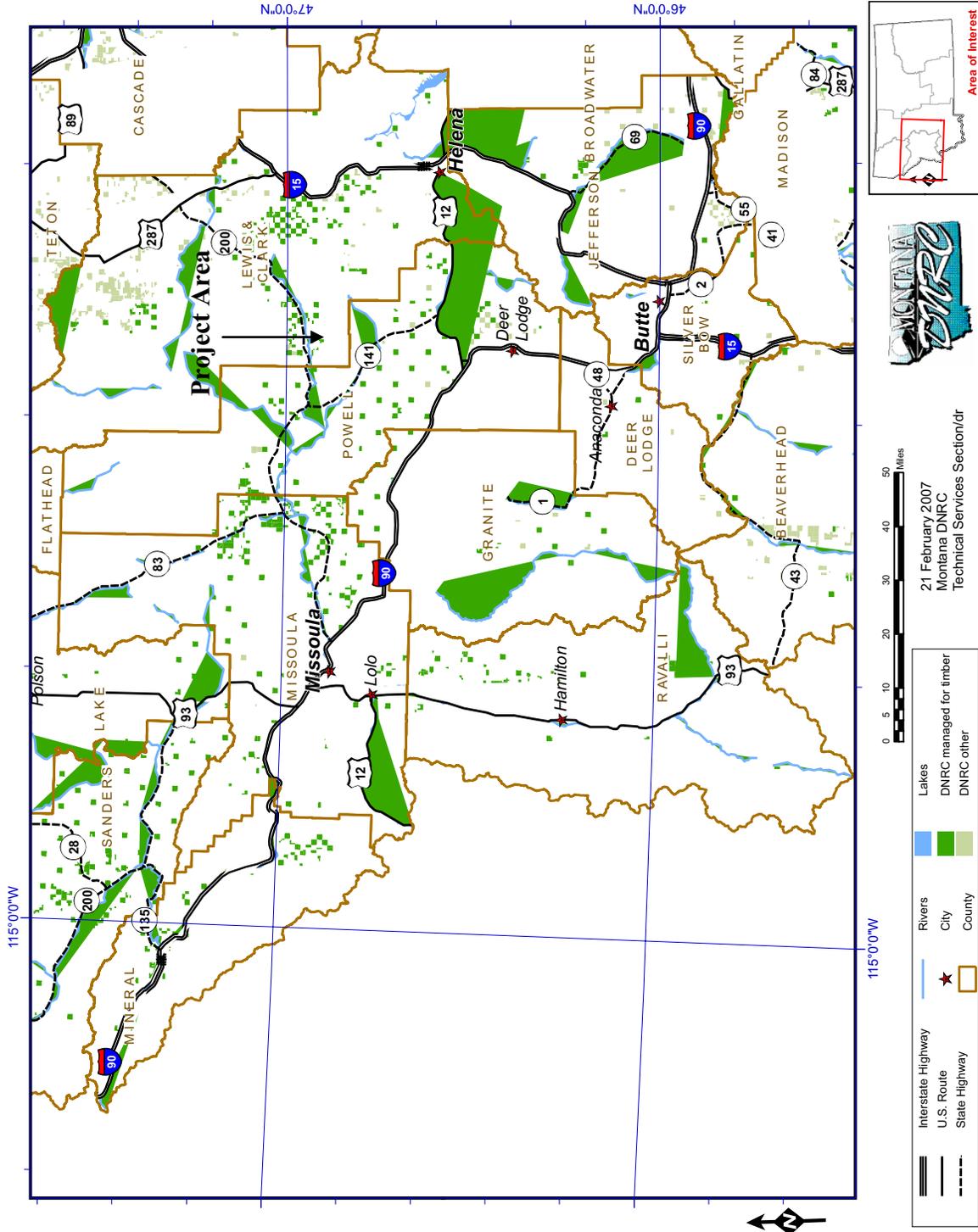
EIS More Detailed EA No Further Analysis

EA Checklist Approved By:	Name Craig V. Nelson
	Title: Supervisory Forester
Signature: /S/ Craig V. Nelson	Date: October 20, 2009

Attachment A
Maps

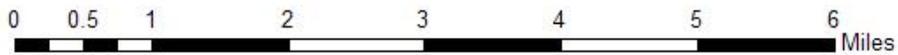
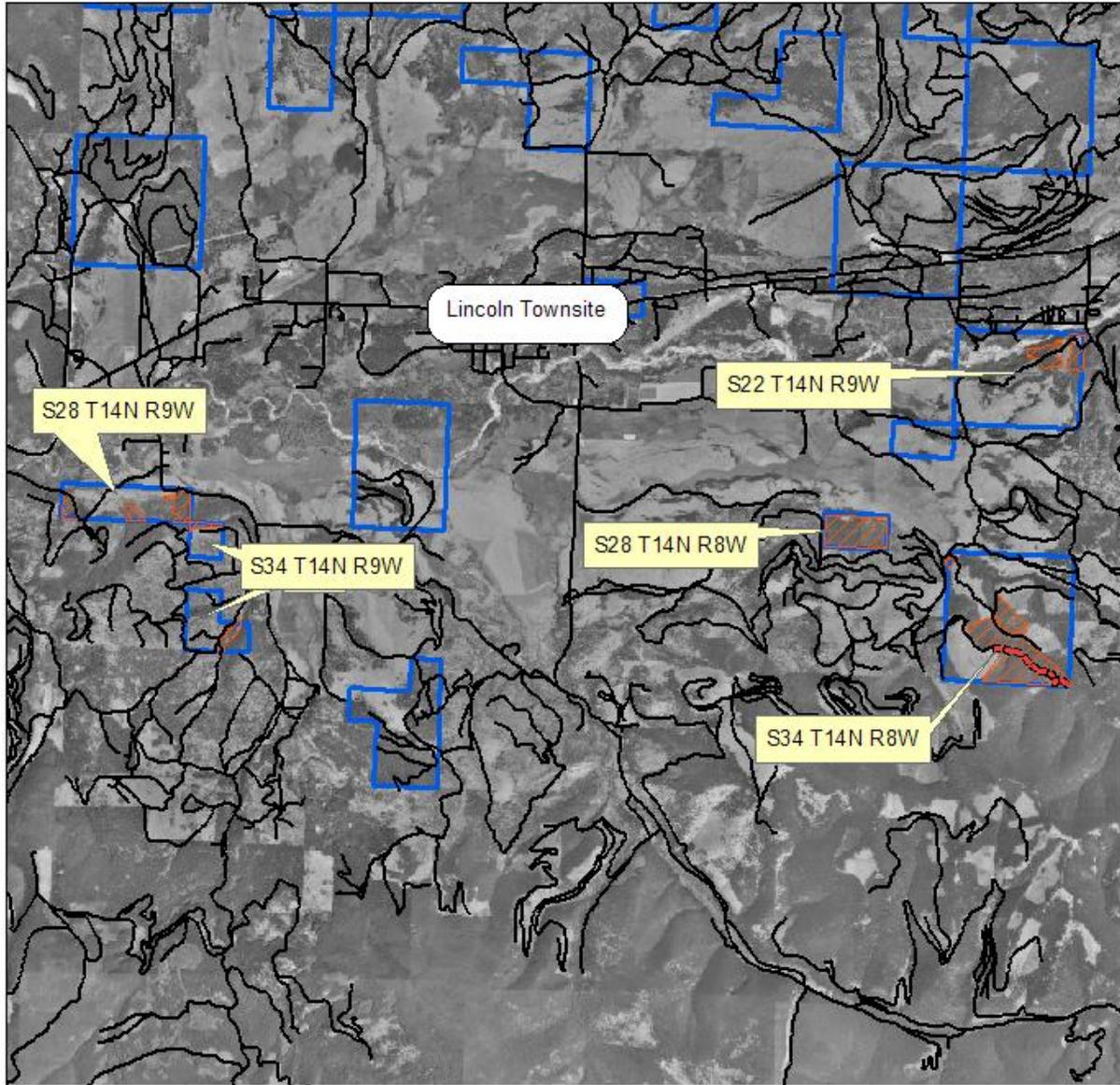
SOUTH LINCOLN TIMBER SALVAGE

Lincoln Field Office, Montana DNRC

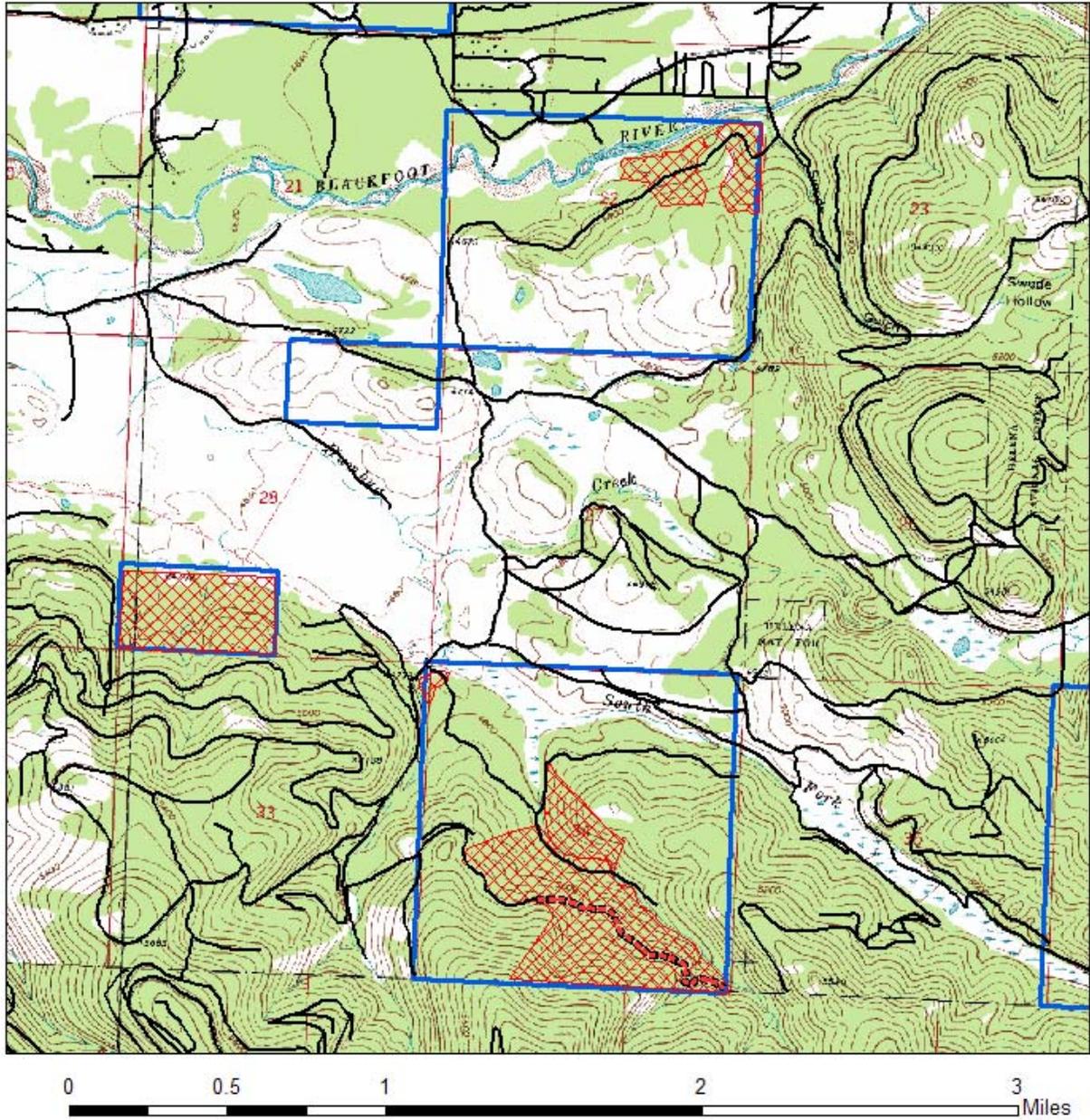


21 February 2007
 Montana DNRC
 Technical Services Section/dr

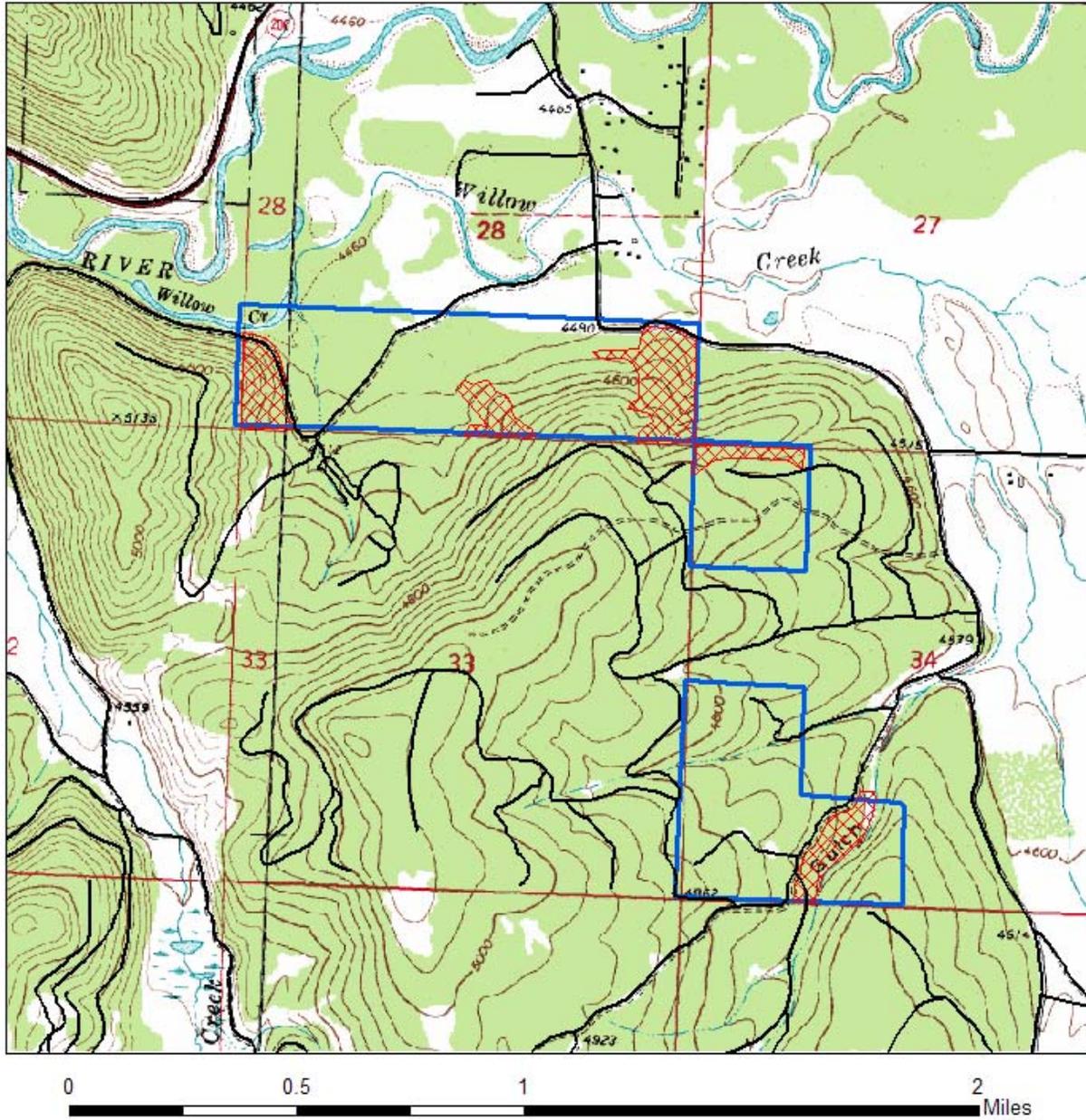
South Lincoln Proposed Salvage Harvest T14N R9W and T14N R8W



South Lincoln Proposed Salvage Harvest Sections 22, 28 and 34 T14N R8W



South Lincoln Proposed Salvage Harvest Sections 28 and 34 T14N R9W



Legend

- Existing Roads
- ▨ Proposed Harvest Units
- ▭ State of Montana (DNRC)



Attachment B
Watershed / Soils / Fisheries Analysis

South Lincoln Timber Salvage Watershed / Soils / Fisheries Analysis

Introduction

The following includes an existing condition and anticipated indirect, direct and cumulative effects assessment for water resources, fisheries and soils for the proposed South Lincoln Timber Salvage Sale Environmental Assessment. The following issue statements were developed from internal and public scoping regarding the effects of proposed timber harvest and road systems to water resources, fisheries and soils.

* Soil Resources/Geology - The proposed forest management activities may adversely effect geologic or soil resources through excavation, displacement or compaction.

*Water Quality/Quantity- The proposed forest management activities may cause impacts to water quality as a result of increased erosion and sediment delivery to streams.

*Cumulative Watershed Effects

The proposed timber harvest may cause or contribute to cumulative watershed impacts as a result of increased water yields.

*Cold Water Fisheries- The proposed forest management actions may have effects to fisheries and fish habitat features on project site streams that include: sedimentation, habitat connectivity, woody debris recruitment and increased stream temperature, due to reduced tree canopy.

Project Parcels in Analysis Area

The proposed timber management project area includes the following State trust lands:

T14N, R8W, Section 22 =	Blackfoot River Flat
T14N, R8W, S1/2,S1/2 Section 28 =	Mid Gehring Road
T14N, R8W, Section 34 =	S. Fork Humbug & Tributary
T14N, R9W, Parcels in Section 28	Lower Willow Creek drainage
T14N, R9W, Parcels in Section 34 =	Bear Gulch/Willow Creek Tributary.

Soils Analysis Area & Methods

The analysis area for geology and soil resources includes the project sections and the access roads to those DNRC sections proposed for timber harvest. The soils analysis included an evaluation of Lewis & Clark County soil survey data, air photos, past harvest design and on-site field review for soil properties and current conditions to assess past and predicted effects compared with DNRC soil monitoring results.

Existing Conditions-Geology and Soils

The proposed harvest areas are located on varied soils formed mainly in deep glacial till and alluvial deposits derived from, sedimentary rocks (limestone, argillites and quartzites), with localized clay rich tertiary age valley fill deposits on the footslopes and lower mountain sideslopes. Bedrock outcrops are few and fractured limestone bedrock was noted in Section 34, T14N, R8W and on minor convex slopes in other parcels. No unique geologic features were noted. Shallow rock occurs near the ridgelines and upper slopes, but should be common excavation or rippable on the proposed road location and does not limit proposed road construction.

Overall, slopes are stable in the project areas. Several old slumps have occurred in the area as part of geologic mountain building processes. Within the proposed project area, one localized area of marginal slope stability was noted in a draw in the SE corner of Section 34 T14N, R8W. This small site did not show signs of recent movement and should not be affected, based on avoiding road construction and harvest in this small area and slope stability will be dismissed from further analysis.

Within partial sections 28 and 34, T14N, R9W and section 28, T14N, R8W, the most common soils include; Worock stony loam(MU19F), Stemple/Tigeron channery loams (MU 290F) and (415D)Crow clay

loams. These are well drained soils on relatively low precipitation areas of 19-21 inches average precipitation with interspersed range sites that support sagebrush. The Worock, Stemple and Tigeron are deep soils with high contents of stone and rock fragments and are well drained. These soils are well suited to ground based equipment operations on slopes less than 45%. Slopes over 45% are subject to severe displacement and erosion of surface soils by ground based skidding. This limitation can be overcome by cable skidding or forwarder operations on simple terrain. These soils have a long season of use.

Crow soils that occur in section 34, T14N, R9W, have deep clay rich subsoils and are the most sensitive to rutting and compaction if operated on when wet and soil strength is low. These finer textured soils occur on more concave and moderate slopes, and are higher productivity sites that tend to remain moist later into the spring. Erosion potential is moderate on this soil and can be mitigated by more closely spaced surface drainage features on skid trails and road locations. Crow soils have a high risk of compaction and rutting if operated on when wet, which can be mitigated by season of use limitations. Localized sites, such as stream crossings and drain-dips on moist sites may require gravel surfacing to prevent deep rutting.

Soils on partial section 22 T14N, R8W are Worock stony loams (MU119E) on 8-35% slopes and Yourame stony loams on forested midslopes. The Worock 119E map unit has similar interpretations as Worock 19E, but occurs on a drier site. Yourame stony loams are forming in glacial till and residual soils with deep stony silt loams grading to shallower depths along convex slopes. These moderate slopes are well suited to ground based operations. Deep alluvial and coarse glacial outwash soils form the gently sloping valley terrace soils along the Blackfoot River and south fork Humbug Creek. The alluvial soils include Silvercity gravelly loams (MU4B) on 1-4% slopes that are well drained and have few limitations. Soils on the proposed harvest areas on DNRC ownership are noted in table S-I and appendix soil maps 1 & 2. Proposed harvest areas are located well back from the riparian area and do not include any poorly drained soils, or short steep slopes that occur along segments of the Blackfoot river.

Table S1 Lincoln South Project- Soils Descriptions and Interpretations

Map #	Map Unit Name	Parent Material	Soil Texture	Drainage	Erosion	Displace	Comp
15E	Worock-Mikesell stony loams, 8 to 35 percent slopes - Forest	Deep glacial till and colluvium of igneous and mixed rock types	Worock gr loam/stony clay loams, Mikesell	Well drained	Low-Mod	Moderate	High when wet
19E	Worock stony loam, 8 to 35 percent slopes - Forest	Deep glacial till and colluvium of igneous and mixed rock types	Stony clay loams	Well drained	Low-Mod	Moderate	High when wet
119E	Worock stony loam, warm, 8 to 35 percent slopes - Forest	Deep glacial till & colluvium of igneous & mixed rock types	Stony clay loams	Well drained	Low-Mod	Moderate	Moderate

19F	Worock stony loam, 35 to 60 percent slopes - Forest	Deep glacial till and colluvium of igneous and mixed rock types	Stony clay loams	Well drained	high on slopes >45%	high on slopes >45%	moderate
290F	Stemple-Tigeron very channery loams, 30 to 60 percent slopes - Forest	Deep glacial till and colluvium of argillite and quartzite	Vgr loam/channery clay loams, Acid	Well drained	high on slopes >45%	high on slopes >45%	moderate
390F	Helmville channery loam, 25 to 60 percent slopes - Forest	Deep colluvium of limestone & argillite	Channery loam/channery clay loams, calcareous @22inches	Well drained	high on slopes >45%	high on slopes >45%	moderate
590F	Helmville channery loam, warm, 30 to 60 percent slopes - Forest	Mod Deep colluvium of limestone & argillite	Channery loam/channery clay loams, calcareous @22inches	Well drained, Droughty	high on slopes >45%	high on slopes >45%	moderate
415D	Crow loam, 4 to 25 percent slopes	Alluvium footslopes	Silt loam/Silty clay loam	Well drained	Low-Mod	Moderate	High when wet
484F	Trapps channery loam, 25 to 60 percent slopes - Forest	Deep glacial till & colluvium of limestone	Channery loam/channery clay loams, calcareous @23inches	Well drained	high on slopes >45%	high on slopes >45%	moderate
499D	Farnuf Hilger Stony Loams Cool 4-25% Slopes	alluvium, glacial till Rangeland & Open forest	Silt loam/ stony loam	Well drained droughty	Mod Mod	Low Low	Mod Low
701b	Fluvaquents-endoaquolls complex, 0 to 4 percent slopes	alluvium, glacial till and colluvium	Silt/ clay loam	Poorly drained		Wetlands Wetlands	Wetlands locate SMZ/WMZ/RMZ
784D	Yourame stony loam, 8 to 35 percent slopes - Forest	alluvium, glacial till and colluvium	Gr loam / stony clay loam	Well drained		Low-Mod Moderate	Moderate

Soils in Section 34, T14N, R8W include Helmville channery loams on 35-60% slopes, and Trapps channery loams on 35-60% slopes. This area is underlain by fractured limestone bedrock and both soils are calcareous soils. Helmville channery loams are formed in moderate to deep colluvium and glacial till deposits on mountain sideslopes. Helmville soils are well drained and the 590 map unit tends to be more droughty. Trapps gravelly loams occur on convex slopes and are well drained and have moderate erosion risks as described above. Both soils are suitable for ground based skidding on slopes up to 45%. Slopes over 45% are subject to severe displacement of erosion of surface soils by ground based skidding. This limitation can be overcome by cable skidding or forwarder operations on simple terrain. These soils have a long season of use. Map Unit 701B includes somewhat poorly drained fluvaquents that forms wetlands and riparian areas adjacent to the South Fork Humbug Creek and unnamed tributary in section 34. The wetland site is broad and subject to rutting and compaction except during winter conditions or exceptionally dry years. These alluvial soils support mainly a complex of riparian shrubs, deep sod with sedges and some spruce. The deep sod provides a buffer that traps sediment. No harvest is planned in the wetland.

The existing forest access roads to the DNRC project parcels cross segments of clay rich soils that will limit access during spring thaw up to approximately mid-June. Previous harvest sites across the project parcels are well regenerated to conifer species. Historic harvest effects have largely recovered with few major skid trails still apparent on less than 15% of the old units. Historic skid trails were vegetated and no BMP restoration needs for past harvest areas were identified. On all sites reviewed, there are moderate levels of existing downed course woody debris across the proposed harvest areas, similar to historic conditions established by Graham et al. (1994). The tree mortality from insects has resulted in many trees shedding their needles, which helps return nutrients to the soil.

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

The No-action alternative would have little effect on soil resources. Existing access roads are in the process of reconstruction and maintenance repairs as analyzed in the Golden Arches E.A. The implementations of these road repairs in the fall of 2009 will comply with BMP's and reduce current erosion problems on roads.

Direct, and Indirect, Effects of the Action Alternative on Soils

The primary risks to long term soil productivity and hydrologic function are excessive impacts to soil properties caused by rutting, compaction and displacement of surface soils by equipment operation and road construction. Potential effects are a reduction in long-term soil productivity, and regeneration potential as well as impacts to course woody debris distribution and nutrient cycling. Most sensitive soils to operation effects are small areas of steep slopes, erosive soils and wet sites which will be avoided or protected with mitigation measures.

For the proposed harvest, BMP's and mitigations would be implemented to minimize the area and degree of detrimental soil impacts (displacement, erosion, and compaction). Mitigations include general skid trail planning, limit tractors to moderate slopes, avoiding wetlands and controlling soil disturbance to meet silvicultural goals to promote conifer regeneration. Ground based harvest operations would be limited to slopes less than 45%. Steeper slopes would be harvested by cable/line skidding where needed. A portion of old and new course woody debris (>3" dia.) at ~10-15 tons/acre and fine litter would be retained or return skidded on harvest units for conservation of soil nutrients.

Based on DNRC soil monitoring on comparable sites (DNRC 2004), implementation of BMP's and the recommended mitigation measures, harvest operations present low risk of detrimental impacts to soils if impacts are restricted to ~15% of the proposed harvest areas. We expect that by protecting ~85% of a harvest area in non-detrimental soil impacts, soil properties important to soil productivity will be maintained.

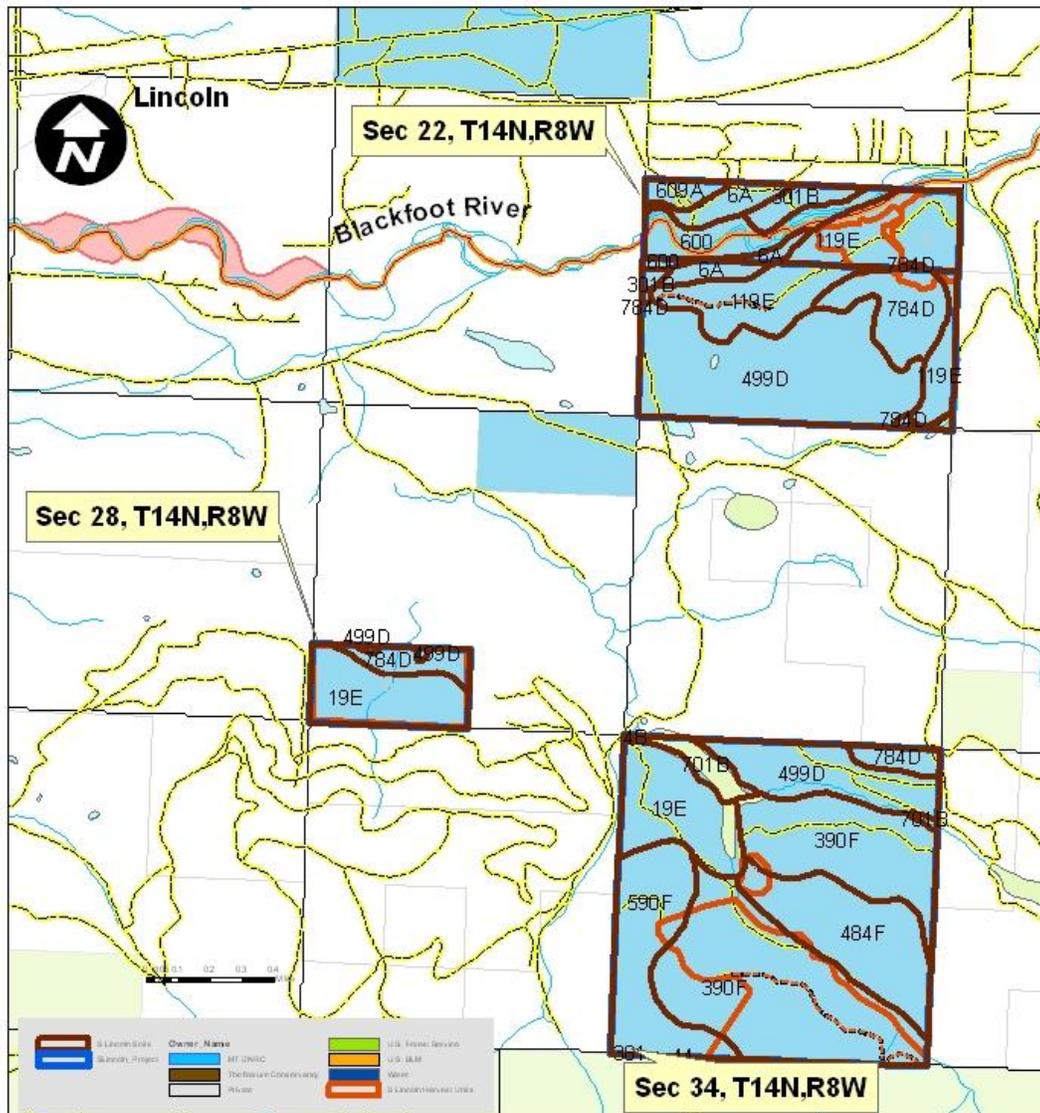
Sale administrators will monitor on-going harvest and road construction activities to meet contract requirements, BMP'S for soil and water protection and silvicultural objectives. For all of these reasons the proposed harvest operations and mitigation measures are expected to maintain soil properties important to plant growth and hydrologic function and present low risk of direct and indirect impacts to soils.

Cumulative effects to soils

Cumulative effects to soils can occur from repeated ground skidding entries into the harvest area and additional road construction, depending on area and degree of detrimental impacts. Past harvest has left minimal effect on the soils, with few trails still evident. Most harvest sites proposed have not been previously entered with a few sites that historically had selective harvest over 40 years ago with minimal effects.

Considering nutrient cycling, the high level of tree mortality has already caused many needles and fine litter to fall to the forest floor. Most needles and fine foliage that have not already fallen would be expected to break off during logging operations. Coarse woody debris would be maintained on the site with a goal of 5-15 tons/acre (Graham 1994). Coarse wood will be distributed throughout the units and trampled to help promote decay processes, maintain nutrient cycling for long term soil productivity and to encourage micro growing sites for reforestation. Improved tree spacing is expected to reduce competition for nutrients and soil moisture, enhance growth of retained trees, and promote regeneration of conifers. There is low risk of cumulative effects to soils with the proposed harvest based on minimal previous harvest effects in the proposed harvest units and implementation of skidding and slash disposal mitigation measures to limit the area impacted.

South Lincoln Salvage Project Area Soil Map 2



Water Resources-Analysis Area & Methods

The primary concerns relating to water resources within the analysis area are potential impacts to water quality from sediment sources outside the stream channels as well as inside the channels. In order to address these issues the following parameters are analyzed for each alternative:

- ~Miles of new road construction and road improvements
- ~Potential for sediment delivery to streams
- ~Potential for water yield increase impacts to stream channel stability

A watershed analysis and field survey was completed by a DNRC hydrologist for the proposed sale area to determine direct, indirect and cumulative effects to water quality. The water quality evaluation included a review of existing inventories for soils and water resources (NRIS 2009, DNRC 2008), the 2005 Upper Blackfoot Restoration Plan (BFC 2005), the FWP Draft Humbug Creek Restoration & Management Plan, reference to previous DNRC projects, and comparisons of aerial photos combined with GIS analysis to estimate the area of past timber harvest and vegetative recovery. Field reviews were completed for the proposed harvest units, access roads and associated streams and the observations, information and data were integrated into the watershed analysis and design of project mitigations.

The analysis of sediment delivery is limited to the harvest units and roads used for hauling and will focus on the stream previously described. This includes in-channel and upland sources of sediment that could result from this project. In-channel areas include stream channels adjacent to and directly downstream of harvest areas. Upland sources include harvest units and roads that may contribute sediment delivery as a result of this project. Past management activities in the proposed project areas that affect sediment delivery include; timber harvest, mining, grazing, irrigation, road construction, fire suppression and recreation. For this project, a DNRC hydrologist evaluated streams, roads and proposed harvest units. The field review compared the current road conditions and repair needs to previous road inventories and planned road reconstruction and maintenance plans for the access roads to this project area. Road reconstruction and maintenance for the primary access roads is being implemented in September 2009 as part of operations associated with the Golden Arches Timber Sale plan and environmental assessment

A DNRC hydrologist completed a coarse filter qualitative assessment of watershed conditions and cumulative effects as outlined in the Forest Management Rules (ARM 36.11.423) concerning watershed management. The analysis areas for watershed cumulative effects include the watersheds that wholly surround the DNRC project sections and the access roads to those parcels.

Affected Watersheds

The proposed salvage project area includes the following State trust lands located south of Lincoln, Montana:

T14N, R8W, Section 22 =	Blackfoot River Flat
T14N, R8W, S1/2,S1/2 Section 28 =	Mid Gehring Road
T14N, R8W, Section 34 =	S. Fork Humbug & Tributary
T14N, R9W, Parcels in Section 28	Lower Willow Creek drainage
T14N, R9W, Parcels in Section 34 =	Bear Gulch/Willow Creek Tributary

The analysis areas were designated using 6th code HUC scale watershed boundaries as noted on the S. Lincoln Salvage Project Area, Watershed Map W-1. The proposed harvest and road projects are located within three watersheds of the Upper Blackfoot River watershed, which is a tributary to the Upper Clark Fork River basin. DNRC ownership in partial sections 28, & 34 T14N, R9W, are located within the Willow Creek watershed, HUC 170102030308) and is 12,088 acres in area. DNRC ownership in partial section 22, T14N, R8W is located within the Blackfoot River/Lincoln watershed, HUC 170102030301) and is 15,439 acres in area. DNRC ownership in partial sections 28, & 34 T14N, R8W are located within the Humbug Creek watershed (HUC 170102030310) and is 11, 390 acres in area.

DNRC ownership is minor in partial sections 28, & 34 T14N, R9W that are located within the lower footslopes of Willow Creek watershed. Precipitation is low, with an average 19-20 inches/year mainly as snow, with surface runoff rare and subsoil moisture low. There are no streams or water resources in DNRC parcels of section 28 T14N, R9W, the north ¼ of section 34, T14N, R9W, and section 28 T14N,

R8W that would be affected by the proposed project. The existing forest access roads to these sections are being reconstructed to meet BMP's, and these parcels will be dismissed from further watershed analysis. The road repairs are considered as part of baseline condition.

The watershed analysis will focus on potentially affected water resources and streams associated with proposed harvest and access roads to; 1) Bear Gulch SW ¼, Section 34, T14N, R9W, a tributary to Willow Creek, 2) partial section 22, T14N, R8W, (Blackfoot River segment), and 3) Section 34, T14N, R8W that includes South Fork Humbug Creek & unnamed tributary as referenced on South Lincoln watershed map W-1.

Water Quality & Regulations

All the watershed areas listed in this report are classified as B-1 in the Montana Surface Water Quality Standards. The water quality standards for protecting beneficial uses in B-1 classified watersheds are described in ARM 17.30.623. The B-1 classification is for multiple use waters suitable for; domestic use after conventional treatment, growth and propagation of cold-water fisheries, associated aquatic life and wildlife, agricultural, and industrial uses. Other criteria for B-1 waters include; no increases are allowed above naturally occurring concentrations of sediment, which will prove detrimental to fish or wildlife and a maximum 1 degree Fahrenheit increase above naturally occurring water temperature is allowed within the range of 32 to 66 degrees Fahrenheit. Naturally occurring includes conditions or materials present from runoff or percolation on developed land, where all reasonable land, soil, and water conservation practices have been applied. Reasonable conservation practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses. The State has adopted Forestry Best Management Practices through its Non-point Source Management Plan as the principle means of controlling non-point source pollution from silvicultural activities. Stream temperatures are discussed in detail in the fisheries section.

The Upper Blackfoot from Landers Fork to Arrastra Creek is identified on the 2008 Montana 303(d) list as an impaired waterbody. The Upper Blackfoot River is listed as impaired for not fully supporting aquatic life and cold water fisheries. A Total Max Daily Load (TMDL) analysis and restoration plan has been completed for the Upper Blackfoot watershed (DEQ 2004). Sediment and/or habitat related impairments are siltation dewatering and habitat alterations. Probable sources of impairment are due to, roads, bank modification, agriculture and timber harvest, which may be associated with related past, existing or proposed activities in the project area.

The Blackfoot River and its tributaries including Willow Creek and Humbug Creek are identified as moderate priority for restoration (BFC 2005). TMDL recommendations include improving fish passage and reducing sedimentation through implementation of Best Management Practices (BMPs) on land management projects. There is a surface water right on section 22, T14N, R8W, but no water rights or developments are listed within the DNRC project sections. There are numerous downstream water rights on The Blackfoot River, Willow Creek and Humbug Creek. The downslope beneficial uses in the three watersheds described include: recreation, cold-water fisheries, agriculture, irrigation, wildlife and livestock watering.

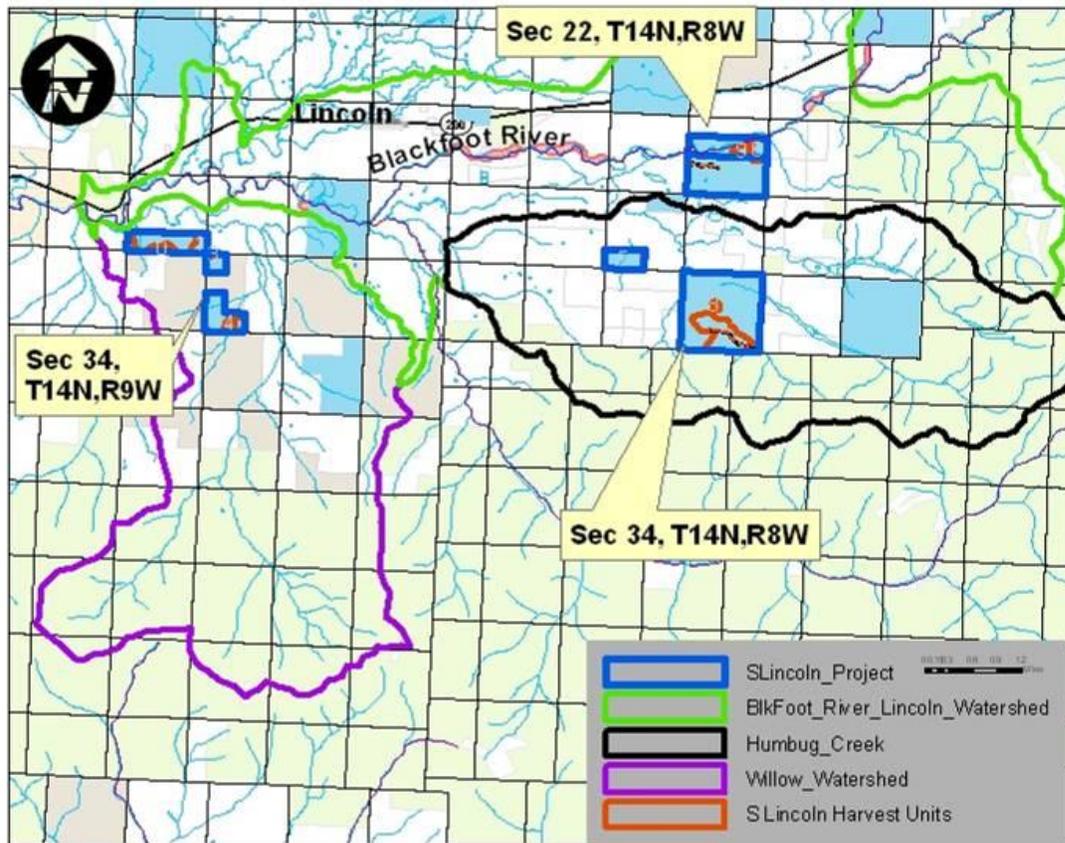
Table W2 -Water Quality status of the streams on the Montana 303(d) list of impaired waterbodies in the analysis areas (MTDEQ, 2006)		
Analysis Areas	Stream Segment	Beneficial Uses Support and TMDL Status
Blackfoot River	Upper Blackfoot River.	Full support of DWS, AG, IND, PCR. Partial support of CWF Cold Water Fisheries and AL Aquatic life due to siltation. Probable sources are agriculture, road runoff, streambank modifications. One or more uses are impaired and a TMDL was completed as part of the Upper Blackfoot River Assessment.
Humbug Creek	Humbug Creek and S. Fork Humbug Creek	Humbug Creek is not on 303(d) list of impaired streams.
Willow Creek	Willow Creek	Willow Creek is not on 303(d) list of impaired streams.
DWS (Drinking Water Supply), PCR (Primary Contact Recreation), CWF (Cold Water Fishery), AL (Aquatic Life), AG (Agricultural), IND (Industrial),		

Existing Conditions

The SW ¼ of section 34, T14N, R9W includes 120 acres of DNRC ownership and approximately ¼ mile segment of Bear Gulch, a tributary to Willow Creek. The DNRC ownership is located on the lower elevation footslopes of Bear Gulch. Precipitation is low, with an average 19-20 inches/year mainly as snow, with surface runoff rare and subsoil moisture low. Grassland and sagebrush occur on the edge of the DNRC ownership reflecting the dry nature of the area. Bear Gulch is approximately 2.5 miles long and provides fish habitat for cutthroat trout in the lower reaches. The stream flows across several ownerships and has varied levels of grazing use with minor effects on the DNRC ownership. The stream segment and associated wetlands are in fair to good condition across DNRC ownership. There are no stream crossings or proposed crossings on this parcel. Less than 30 acres of harvest is proposed. The access road across private ownership in section 34 has inadequate road surface drainage and has a damaged culvert with inadequate fill. Sedimentation occurs at the culvert and is partially trapped in a wetland downstream of the site.

Section 34, T14N, R8W, The DNRC ownership is located on the lower footslopes to mid elevation mountainside above the South Fork Humbug Creek. Precipitation is low, with an average 19-21 inches/year mainly as snow, with surface runoff rare and subsoil moisture low in high coarse fragment soils. DNRC section 34 ownership includes the S.Fork Humbug Creek that flows along a NE boundary line and a small unnamed perennial tributary "A" watershed. Tributary A is approximately 2 ¼ miles long, originating as headwaters from the SE and flows NW to a point above the state line where flow becomes intermittent and goes subsurface, then resurfaces just below the SE DNRC property boundary for several hundred yards. Flow is intermittent at an upper DNRC road crossing (CMP 10, FWP) and then goes subsurface down gradient again for several hundred feet. Below CMP 10, a spring begins perennial class 1 stream flow, about 110 feet above a culvert crossing CMP 9, and continues through a broad wetland and beaver pond to a confluence with S. Fork Humbug Creek. MTFWP has determined that tributary "A" supports westslope cutthroat trout up to the spring.

South Lincoln Salvage Project Area -Watershed Map



Primary sources of sediment in the Humbug drainage are sediment from roads, agriculture, including grazing and stream channel modification. DNRC lands are licensed for grazing and there are apparent effects of grazing. MT FWP (2008) contracted a Riparian Assessment (NRCS method) to determine the present condition of riparian habitats on Humbug Creek and its tributaries relative to grazing effects. The riparian condition ratings for each stream reach were identified as “sustainable”, “at risk” or “not sustainable” based on a numeric rating of stream incision, bank erosion, sediment balance, vegetation and other important factors. Tributary A was rated as sustainable with current practices. Approximately ½ mile of the S. Fork Humbug Creek (SFK-02) is rated At-risk due to grazing effects above the confluence with unnamed tributary. This stream reach would not be affected by the current or proposed forest management actions, but would be considered for future grazing management improvements. Mid term grazing on licenses that include watercourses are evaluated every 5 years and the management is modified based on conditions. The grazing options presented in the draft Humbug Creek Restoration/ Management Plan will be considered for future grazing evaluations.

An unnamed tributary B on private land in east ½ section 33 was rated as “not sustainable” and current grazing practices will likely continue until a plan is adopted. The S. Fork Humbug Creek Sections 34 T14N, R8W and Section 22 T14N, R8 W share the same access roads across range sites. Several stream crossings are undersized and had poor surface drainage prior to crossing locations, but are in the process of being repaired under DNRC contract that will improve baseline conditions prior to the proposed harvest as noted previously. We expect an increase in large woody debris to tributary A as dead and dying trees fall onto the banks and river bed.

Section 22, T14N, R8W includes approximately 1 mile segment of perennial flow and the DNRC ownership south of the Upper Blackfoot River. The Blackfoot River has a relatively wide channel

migration zone and braided channel flowing through deep alluvial and glacial till deposits. No harvest activities are proposed in the streamside management zone that parallels the channel migration width. No road, timber harvest or grazing related sediment sources were noted on this DNRC parcel. Past harvest units are well regenerated to mixed conifer species and are located on footslopes above the stream terraces. Existing roads are stable and well vegetated with grasses and no erosion stabilization or BMP problem were noted. The average annual precipitation is low at on this site and extensive sagebrush is common on this section. We expect an increase in large woody debris recruitment to the river as dead and dying trees fall onto the banks and river bed.

Existing Cumulative Watershed Effects

Cumulative watershed effects can be characterized as impacts on water quality and quantity that result from the interaction of past, current or foreseeable future disturbances, both natural and human-caused. Past, current, and future planned activities within each analysis area have been taken into account for the cumulative effects analysis. Past management activities in the proposed project areas include timber harvest, mining, grazing, road construction, irrigation diversions (downstream of Section 34, T14N, R8W), and fire suppression. Tree canopy reduction by timber harvest activities, tree mortality or wildfire can affect the timing of runoff, increase peak flows and increase the total annual water yield of a particular drainage. Increased water yield can increase stream channel scour and in-stream sediments that impact water quality. Within the project areas, infiltration rates exceed most precipitation rates on these soils due in part to the low precipitation, yet high intensity thunderstorms can lead to flashy flow response in the perennial stream reaches. Water yield is not a constraint for the watershed analysis areas as compared to studies (MacDonald & Stednik 2003, Romme et al. 2006) that have found no increases in streamflow in watersheds with total annual precipitation of less than 20 inches, when less than 20% of the drainage is harvested.

Stream channel stability varies, and several stream reaches on S. Fork Humbug Creek exhibit marginal channel stability associated with roads, undersized crossings (installation at old dam site in SWSW section 27, T14N, R8W) and grazing within the drainage. A resource inventory of the Humbug Creek drainage (FWP draft 2008) identified 9 culverts in the Humbug Creek watershed that are undersized, perched or causing fish passage problems for cutthroat trout. Only one of the undersized culverts is on a perennial stream on DNRC ownership in section 34, T14N, R8W and is only 110 feet below the originating spring.

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

No direct, indirect or cumulative effects to water quality or quantity would be expected to result other than those described under Water Resource Existing Conditions. Sedimentation on existing roads such as Bear Gulch road, with inadequate surface drainage would continue to impact water quality unless mitigations or remedial actions are taken. Grazing management would continue and should gradually improve over time as inspections and management modifications are made. A trend towards more extensive insect infestations and mortality, or possibly wildfire could considerably reduce tree canopy and may increase water yield in the future relative to increasing canopy loss.

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

The primary risk to water quality associated with timber management activities is sediment delivery from roads. DNRC's sale design focused on avoiding new stream crossings and limiting the extent of new roads, construction costs and included temporary use roads where feasible and consistent with BMP planning. The proposed project would salvage harvest approximately 3 mmbf. of dead dying and high risk trees on up to 365 acres across the project sections. Under the action alternative, road construction is minor and primarily planned on DNRC Section 34, T14N, R8W at up to 0.75 mile plus minor temporary roads to landings.

Maintenance work would be completed on all existing DNRC haul routes to improve drainage adequate to meet BMP's. Temporary roads could result in some rutting and compaction but impacts would be largely restored with ripping the soils surface and installing adequate drainage. Following use, temporary roads will be closed, stabilized with long-term drainage features installed, and reseeded with site adapted grass

to control erosion and compete with noxious weeds. No perennial stream crossings are proposed. A class 3 SMZ crossing is proposed on a stable location where there is no established stream channel.

One road crossing improvement would be made by replacing a damaged culvert and sediment source on the private access road in section 34, T14N, R9W of Bear Gulch. This culvert replacement would likely result in a low level and short term increase in sediment that will quickly subside and long term sediment would be reduced in the Bear Gulch tributary to Willow Creek. Clay rich soils in section 34, T14N, R9W will require season of use limits to avoid rutting, erosion and maintain drainage features. The area has restricted access and there would be no increase in open road density. Long term we would expect that the implementation of BMP's and site specific mitigation measures would promote an improving trend in water quality with a reduction in sediment at the crossing sites and roads during DNRC's period of use and as long as road are maintained.

No SMZ harvest is proposed adjacent to class 1 streams including the Blackfoot River in section 22, T14N, R8W, Bear Gulch in SW1/4 section 34, T14N, R9W and Section 34, T14N, R8W. RMZ harvest of dead, dying and high risk trees could occur in the 50-100 foot zone away from streams. Snags and a representative portion of trees would be retained for potential large woody debris recruitment to the stream. All harvest operations are designed to minimize surface disturbance and potential for erosion and sediment delivery. Ground based harvest would be limited to slopes less than 45% to minimize disturbance and potential erosion.

This analysis considered possible sources of sedimentation to the Blackfoot River from the proposed harvest areas and from use of the existing access road crossings of Humbug Creek and the S. Fork Humbug Creek. DNRC proposes to use the existing access roads with drainage maintenance as needed, and with minor road reconstruction. Road drainage is currently being improved during September 2009 to meet BMP's and control erosion at stream crossings. The proposed salvage harvest in DNRC section 22 will meet the TMDL recommendations to avoid SMZ harvest, maintain riparian vegetation, and reduce sediment from roads. No Streamside Management Zone (SMZ) harvest is proposed adjacent to the Blackfoot River and harvest boundaries are well back from SMZ locations

In summary, there is a moderate probability of a low level and short term adverse impacts to water quality with the proposed limited actions in the Bear Gulch, Blackfoot River and S. Fork Humbug Creek analysis areas due to the following reasons; 1) the minor extent of DNRC ownership across three separate watersheds, 2) no SMZ harvest is proposed adjacent to class 1 fish bearing streams, 3) use of existing roads that have low risk of off-site erosion and (4) the proposed SMZ salvage harvest is minor in extent and on flat terrain with well established vegetation that provides an effective sediment buffer to the stream.

Cumulative Watershed Effects of No-Action Alternative:

Under the no-action alternative, cumulative effects would remain the same as described in existing conditions including existing roads, agricultural and grazing effects. The effects would be most likely to decline over time as hydrologic recovery occurs and TMDL measures are implemented.

Cumulative Watershed Effects of the Action Alternative:

There would be low risk of adverse cumulative impacts from the proposed actions to water quality and beneficial uses based on; the limited area of harvest operations, minimal road construction that is away from streams, implementation of forestry BMPs and mitigation measures during timber harvest and road construction operations.

Roads are being reconstructed to meet BMP's and new road construction would be limited to about 0.75 miles in a tributary drainage to the South fork Humbug Creek watershed, and short segments of temporary roads for log landings. Grazing effects would be similar to existing conditions, but should trend lower over time as hydrologic recovery occurs and TMDL measures are implemented. The combination of proposed mitigations including ground based harvest on moderate slopes, cable harvest on steep slopes and use of existing roads is expected to result in low risk of erosion and sediment delivery to streams and would not substantially increase sediment or impact channel form and function compared to existing conditions.

The proposed harvest presents a very low risk of water yield increase in the watershed, compared to no-action for the following reasons. The low to moderate precipitation zone with averages of 19-21 inches /year provides low runoff and subsoil moisture is typically at a deficit. The timber harvest is well distributed across 6 DNRC land parcels and represents small areas within three separate watersheds. Proposed harvest represents less than 1% in the Willow Creek and Blackfoot River watersheds. The most extensive harvest would be in section 34, T14N, R8W and would affect less than 1.5% of the drainage area of Humbug Creek. This level of harvest and potential change in water yield would be undetectable and immeasurable compared to the no-action alternative and natural ranges associated with disturbances insect mortality and fire (MacDonald & Stednick. 2003, Romme et.al.2006). With minimal if any increases in water yield, in-stream sediments and channel form and function would be similar to no-action.

Fisheries Analysis methods, and area

Fisheries resource issues include: the proposed forest management actions may affect fisheries and fish habitat components, including sedimentation, decreasing large woody debris recruitment through the removal of trees near the stream channel, increased stream temperatures due to reduced canopy density (shading), and connectivity.

These issues can be evaluated by reviewing available resource inventories and analyzing the anticipated effects of sediment delivery on fish habitat in the project area, connectivity and the potential reduction in available woody debris and shading to streams due to timber harvest activities. The fisheries analysis will focus on potentially affected water resources and streams associated with proposed harvest and access roads to known fisheries in 1) Bear Gulch SW ¼, Section 34, T14N, R9W, a tributary to Willow Creek, 2) partial section 22, T14N, R8W, (Blackfoot River segment), 3) Section 34, T14N, R8W that includes South Fork Humbug Creek & unnamed tributary and road crossings as referenced on South Lincoln watershed map W-1. DNRC reviewed the Upper Blackfoot TMDL, the Montana FWP/Trout draft Inventory of fishery resources and sediment in the Humbug Creek drainage. Field reviews of the project area and fishery streams listed above were conducted by DNRC hydrologist and fish biologist in August 2009. Expected effects to fisheries habitat will be addressed qualitatively using the current condition as a baseline in comparison to the expected changes due to the alternatives proposed.

Cumulative Effects

The cumulative effects analysis area for sediment delivery is limited to the harvest units and roads used for hauling. This includes in-channel and upland sources of sediment that could result from this project. The cumulative effects analysis area for woody debris recruitment is the portion of the DNRC parcels that are adjacent to a fish-bearing stream.

Sediment Delivery

The analysis area for sediment delivery is limited to the harvest units and roads used for hauling as displayed in the water resources analysis. This includes in-channel and upland sources of sediment that could result from this project. The analysis methods for sediment delivery will follow those used in the Hydrology portion of this report. Potential sediment sources from roads, stream crossings and in-channel sources were identified during field reconnaissance. Stream channel stability varies, and several stream reaches on S. Fork Humbug Creek exhibit marginal channel stability associated with roads, undersized crossings (installation at old dam site in SWSW section 27, T14N, R8W) and grazing within the drainage. All potential sediment sources identified as part of the existing condition are discussed in the Hydrology Analysis portion of this EA.

Connectivity

The analysis area for stream connectivity includes the haul routes and stream crossings. A resource inventory of the Humbug Creek drainage (FWP draft 2008) identified 9 culverts in the Humbug Creek watershed that are undersized, perched or causing fish passage problems for cutthroat trout. Only one of the undersized culverts is on a perennial stream on DNRC ownership in section 34, T14N, R8W and is only 110 feet below the originating spring.

Woody Debris Recruitment and Stream Temperature/Shading

The analysis area for woody debris and stream temperature is the portions of the DNRC parcels that are adjacent to a fish-bearing stream. The analysis method for woody debris recruitment will evaluate the potential reduction in available woody debris due to timber harvest activities.

Existing Condition-Fisheries

The Upper Blackfoot River, supports spawning runs of bull trout and westslope cutthroat trout (WCT). Humbug Creek, S. Fork Humbug Creek, Bear Gulch/ Willow Creek and perennial tributaries in the project area support native westslope cutthroat trout (FWP-MFISH 2008). Both westslope cutthroat trout and bull trout are considered sensitive species by DNRC (ARM 36.11.436 MFISH 2009, and bull trout is listed as an endangered species.

Section 22 T14N, R8W Blackfoot

The section 22 access road parallels the south flank of the Blackfoot River at least 200 feet away from the main channel. There are no channels or locations on the upland slopes that contribute sediment to the Blackfoot River that would affect sedimentation. All proposed harvest is located above the highest stream terrace and no harvest is planned in the channel migration zone or SMZ of all Class 1 fishery streams. There is a high proportion of lodgepole pine along the Blackfoot River and upper terraces. With the extensive mortality we expect a surge in large woody debris falling towards the stream and a partial reduction in shade, but it is unlikely that stream temperatures would change substantially.

Section 34, T14N, R8W

Tributaries to S.Fork Humbug Creek. Perennial tributary A (refer to water resources section) begins as a spring 110 feet above an undersized culvert (CMP10) crossing for fish passage, and flows from NE to NW. The 110 foot short segment above the culvert provides a very small amount of marginal seasonal habitat (DNRC fish biologist evaluation). Below the culvert 10, fish habitat has connectivity and extends over ½ mile to the confluence with the S.Fk. Humbug Creek. A historic low head impoundment, an undersized culvert in SW section 27, T14N, R8W, and beaver activity limits connectivity downstream of the dam and is a source of sediment during high flows. Stream channel stability is on perennial tributary "A" is good, with minimal sedimentation and there is considerable large woody debris. Stream shading is a combination of bank edge riparian shrubs and trees that maintains cold, clear water (a single measurement found: 5.9 degrees C at 2:30pm on August 19, 2009). With the extensive mortality we expect a surge in large woody debris falling towards the stream and a partial reduction in shade, but it is unlikely that stream temperatures would change substantially. The Riparian Management Zones (RMZ) will be designated at 80-90 feet based on site potential tree heights (SPTH) at 100-years as required by ARM 36.11.425. Harvest of dead trees would be allowed in the RMZ, but equipment would be limited to frozen or dry conditions to avoid excessive disturbance.

Tributary B flows through private section 33 along the west boundary of the DNRC section and provides a temporary haul route to section 34. A private logging access road parallels the tributary stream generally with some short road segments where the road fill is on the stream floodplain. Road improvements to drainage features are being completed to reduce current sediment introduction to the stream. Road repairs may be short term unless maintained concurrent with use. The dominant overstory trees are a combination of Douglas fir, spruce and lodgepole. The lodgepole pine is dead or dying and shade is declining as needles fall. This is a drier alluvial terrace and vegetation transitions to historic grasslands and sage, with less tree overstory and more riparian shrubs. There is considerable well anchored large woody debris incorporated into the streambed and banks. Some trees have been removed by past harvest.

The SW ¼ of section 34, T14N, R9W includes minor DNRC ownership and approximately ¼ mile segment of Bear Gulch, a tributary to Willow Creek which provides fish habitat. A damaged culvert on the private Bear Gulch access road is a source of sediment and the culvert is planned for replacement. The culvert is in a small warm marsh and does not provide connectivity for fish habitat.

Proposed prescriptions for all DNRC project parcels

No SMZ harvest is proposed along class 1 streams. There are limited locations where harvest units are adjacent to streams or wetlands in section 34, T14N, R8W and section 34, T14N, R9W. These streams and wetlands would be protected by implementing all rules and regulations for Streamside Management

Zones (SMZ), Riparian Management Zones (RMZ's) and Wetland Management Zones (WMZ), as required by law. Based on field reviews, DNRC determined a SMZ width of 50 feet, as required for Class 1 and 2 streams would be adequate to effectively filter and trap fine sediment, on stream segments of unnamed tributary of S. Fork Humbug Creek and an unnamed tributary of Willow Creek, when the slope is 35% or less. On more moderate slopes of <35%, this 50 foot SMZ width has been found to be effective and adequate harvest buffer in preventing sedimentation to streams as determined in BMP audits. (DNRC 2008). On the fish bearing stream segments, RMZ's would be designated adjacent to and incorporating the full width of the SMZ to retain adequate levels of recruitable large woody debris and stream shading, The RMZ will be designated at 80 feet based on site potential tree heights (SPTH) at 100-years as required by ARM 36.11.425. Harvest of dead trees would be allowed in the RMZ, but equipment would be limited to frozen or dry conditions to avoid excessive disturbance and potential erosion.

RMZ harvest of dead, dying and high risk trees would occur in the 50-80 foot zone away from the stream. Snags and a representative portion of trees would be retained for potential large woody debris recruitment to the stream. WMZ of 50 feet would be required for wetlands of 0.25 acres and would be located adjacent to larger wetland sites on appropriate sites in Section 34, T14N, R8W.

Direct and Indirect Effects of the No- Action Alternative on Fish Habitat

With no action, no road construction or planned timber harvest would occur. The direct, in-direct to fisheries would be similar to the existing condition. The most apparent change would be the natural shading loss from dying trees that will occur in the upper Blackfoot River valley and more specifically the Humbug watershed and the unnamed tributary stream that flows through section 34, T14N, R8W to the South Fork Humbug Creek. The loss of shading from tree mortality or fire has historically influenced available shade and stream temperatures, and a potential for increase in stream temperatures would be expected to be similar to historic conditions. Connectivity associated with undersized and perched culvert would remain the same as the existing condition.

Direct and Indirect effects, of the Action Alternative on Fish Habitat

With the action alternative, timber harvest of dead and dying trees would be removed from upland sites. No harvest or disturbance of riparian soils or vegetation would occur within class 1, SMZ's adjacent to fishery streams, and there would be very low risk of impacts to; recruitable large woody debris, shading or stream temperature occur under the action alternative. Selective harvest of dead, dying and high risk trees would occur within RMZ's of 50 to 80 feet from streams and on SMZ's of Class 2 and 3 streams. RMZ's would be designated to provide adequate retention of recruitable trees for large woody debris as outlined above. If the Action Alternative is selected, no measurable or detectable sedimentation to fish-bearing streams from upland equipment operations is expected to occur. No change in the existing limitations to connectivity of fish bearing streams would occur along the haul route.

For these reasons there would be a low risk of additional long term impacts to sediments, stream channels or components of fish habitat including shade and large woody debris, compared to the no-action alternative.

Harvest along selected segments of class 2 and Class 3 stream segments along the tributary in the northwest corner of section 34, T14N, R8W would have a minimum 50 foot SMZ and an 80 foot RMZ. Operations within the RMZ's would be limited to dry or frozen ground conditions to minimize soil disturbance and maintain a vegetative buffer to trap sediment.

Selective harvest of trees within segments of class 2 SMZ's would retain standing trees representative of the size of trees in the pre-harvest stand for stream shading and retain (LWD) for stream stability. Most tree shading would be maintained along class 1 and class 2 streams since no harvest would occur within the first 50 feet of streams. Salvage harvest of dead and dying trees in the 50 to 100 foot segment of the RMZ represent a small proportion of trees that could fall into streams and would not be expected to substantially affect LWD or shading. Consequently stream temperature is not expected to be affected by the proposed timber harvest. Considering the mixed conifer species that will survive in the riparian areas

and provide some shading and future LWD, we would not expect water temperatures to change compared to no action and the historic range of conditions, and riparian shrubs should improve in vigor and increase bank edge shading. For these reasons; there would be moderate risk of short term impacts and a low risk of long term impacts to LWD and stream shading on the limited segments of class 2 and 3 streams where selective salvage harvest occurred.

Roads and sedimentation As disclosed in the Hydrology Analysis, effects to sediment delivery from roads would be reduced through BMP implementation, and improved road maintenance. Only short segments of temporary road would be constructed for landing locations and stabilized after use. On section 34, T14N, R8W one new access road would be constructed away from riparian areas and presents low risk of off-site erosion or sedimentation. On section 34, T14N, R9W an 18" culvert replacement would likely result in a very short term increase in sediment to Bear Gulch, which would quickly subside and provide a long term reduction in sedimentation. No new stream crossings are proposed, and there is low potential for sediment to fish bearing streams associated with the proposed operations. Based on the tree retention requirements and mitigations listed, there is moderate risk of low impacts to sediment, due to harvest, road use and road construction.

Cumulative Effects to Fish Habitat of the No-Action Alternative

No timber harvest or road construction is associated with this alternative. Existing sediment sources from existing roads, grazing and land uses would continue to contribute sediment to streams in the analysis areas until remedial action were implemented or natural stabilization occurs.

Cumulative Effects to Fish Habitat of the Action Alternative

There is low risk of additional cumulative impacts to fisheries in the project area including South Fork Humbug Creek, Willow Creek or the Blackfoot River with the proposed timber harvest and road maintenance, due to the following reasons: 1) No harvest is planned in streamside management zones adjacent to fish bearing streams, 2) SMZ and RMZ boundaries will be established to limit disturbance near water resources and protect vegetation to trap sediment , 3)combined mitigation measures for harvest operations and season of use are all directed at minimizing soil disturbance to prevent erosion and sedimentation, 4) no new roads would be constructed adjacent to fisheries streams or in locations that could contribute sediment to streams, 5) current grazing management would continue as in existing conditions, and be modified as needed based on periodic inspections, 6) streamside snags and recruitable trees would be retained to provide adequate levels of long term woody debris recruitment to stream channels.

Mitigations for Protection of Water quality, Soils & Noxious Weed Management

* DNRC would implement all applicable BMP's, Montana Administrative Rules for Forest Management and reasonable mitigation and erosion control practices during timber harvest, road maintenance, and road construction and road use activities

* DNRC would locate, clearly mark and maintain suitable water resource protection boundaries on Streamside Management Zones (SMZ's). Riparian Management Zones (RMZ's), and Wetland Management Zones (WMZ's) adjacent to streams and wetlands would be designated consistent with State Forest Land Management rules.

*The logger and sale administrator would agree to a general skidding plan prior to equipment operations on complex terrain or draw crossings. Ground based skidding would be limited to slopes of 45% or less.

* Limit equipment operations to periods when soils are relatively dry, frozen or snow covered to minimize soil rutting, compaction and maintain drainage features. Check snow/frozen ground conditions prior to operations.

* On moderate to densely stocked stands, whole tree skidding can reduce slash hazard, but also remove a portion of nutrients from growing sites. Target woody debris levels are to retain 10-15 tons/acre well distributed on site while meeting the requirements of the slash law. On sites with lower basal area, retain

large woody debris as feasible since it may not be possible to retain 5 tons/acre and the emphasis will be on providing additional CWD in the future.

* Existing road segments would be maintained concurrent with harvest operations to ensure adequate road surface drainage during the period of use.

*Road use will be limited to dry or frozen ground conditions to reduce rutting and erosion. New road construction, including drainage features must be completed in the fall prior to freeze-up.

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

*Newly constructed or reconstructed road cuts, fills and disturbed soils would be grass seeded immediately after excavation.

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***Attachment C
Wildlife Report***

South Lincoln Timber Salvage Wildlife Analysis

Chapter 1

Issues and Concerns

There is concern that the proposed action would affect a wildlife movement zone.

There is concern that the proposed action would negatively affect grizzly bear habitat beyond habitat changes expected to result from the mountain pine beetle infestation.

There is concern that the proposed action would reduce the quantity of suitable lynx habitat in the project area beyond what is expected to result from the mountain pine beetle infestation.

There is concern that the proposed timber harvest would negatively impact bald eagles, pileated woodpeckers, and flammulated owls beyond what is expected to result from the mountain pine beetle infestation.

There is concern that the proposed timber harvest would negatively impact big game winter range beyond what is expected to result from the mountain pine beetle infestation.

There is concern that the proposed timber harvest would negatively impact northern goshawks beyond what is expected to result from the mountain pine beetle infestation.

Issues Eliminated from Further Study

Gray Wolf—The home range of the nearest known wolf pack is located approximately 5 miles northwest of the project area. Because the pack's den and rendezvous sites are located within their home range, and the distance of the home range from the project area, there would likely be minimal risk of direct, indirect, or cumulative effects to this species from the proposed action.

Black-backed Woodpecker—While this species does inhabit stands infested with bark beetles (*Dendrochthonous* spp.), the affected parcel has been heavily infested with spruce budworm, a defoliator. As such, the affected parcel would not likely provide much currently suitable habitat for black-backed woodpeckers. However, in 2007, several large fires have occurred within a 50-mile radius of the parcel, burning approximately 190,627 acres burned on 8 large project fires. Given the abundance of recently created habitat within 50 miles of the project area, there would likely be minimal risk of direct, indirect, or cumulative effects to this species from the proposed action.

Wolverine—There is concern that timber harvest activities would negatively impact wolverine. Dating back to 1989, at least four wolverine have been encountered within a

ten mile radius of the project area (Montana Natural Heritage database). Two occurrences are for wolverine that had been trapped, and two records are for tracks in the snow. Wolverine can have home ranges ranging from 100 km² to 900 km², typically avoiding human development with natal dens dependent upon areas with snowpack occurring into April (Banci 1994). Because of the project area's low elevation, existing levels of recreational use, primarily hunting and camping, and road development, the project area would likely be marginal habitat for wolverine. As a result, there would likely be minimal risk of direct, indirect, or cumulative effects to this species from the proposed action.

The following species were considered but eliminated from detailed study due to lack of habitat present: Peregrine Falcon, fishers, Harlequin Duck, Townsend's Big-eared Bat, Coeur d'Alene Salamander, Northern Bog Lemming, Mountain Plover, and Columbian Sharp-tailed Grouse.

Chapter 3: Affected Environment

Description of Relevant Affected Resources

Wildlife

Issue: Potential impacts to a wildlife movement zone.

Wildlife movement zones, or corridors, provide travel lanes for animals between refugia, or are viewed as a major means to link otherwise fragmented and isolated patches (Morrison et al. 1992). Habitat fragmentation occurs when contiguous blocks of habitat are separated from one another, and can be permanent, such as from human development; or temporary, due to vegetative manipulation or natural disturbance. Within the Lincoln Valley, the Blackfoot River, and its associated riparian area, serves as a corridor by which many wildlife species travel, obtain resources (e.g., food, water, cover), and evade human disturbance associated with the town of Lincoln, MT. For species such as the grizzly bear, it can also serve as a corridor providing cover to public lands among the private land matrix of the valley. Of the affected project area, two parcels in particular, have been determined through radio-telemetry to provide connectivity both to and from public lands and the Blackfoot River's riparian area (Montana Fish, Wildlife & Parks [MFWP] scoping comments, 5 August 2009; J. Jonkel, MFWP, pers. comm., 17 August 2009). An approximately 50 sq. mile analysis area was developed for analysis of the wildlife movement corridor, and includes portions of the Lincoln canyon, Blackfoot River, Willow, Sauerkraut Creek, Poorman Creek, and Swede Gulch drainages. From 2005 through 2008, approximately 209 acres of the project area were affected by mountain pine beetles, Douglas-fir beetles, and spruce budworm. During the same period, approximately 19,120 acres of the analysis area were affected by the same insect species.

Issue: Potential negative impacts to grizzly bear habitat beyond what is expected to result from the mountain pine beetle infestation.

During scoping, public comments indicated a concern that the proposed action would reduce security and hiding cover beyond what is expected to result from the mountain pine beetle infestation alone. Security, typically related to security core areas, means areas typically greater than 2,500 acres that during the non-denning period: (1) are free of motorized access; (2) consider the geographic distribution of seasonal habitats important to grizzly bears; (3) remain in place for long periods, preferably 10 years; and (4) are at least 0.3 mile from the nearest access route that can be used by a motorized vehicle (ARM 36.11.403 (75)). Hiding cover means vegetation that provides visual screening capable of obstructing from view 90% of an adult grizzly bear at 200 feet (ARM 36.11.403 (32)). In general, grizzly bears prefer areas with low road densities throughout the non-denning period. However, during spring bears may be found within 0.3 mile of closed roads and roads with <10 vehicles/day because they are utilizing cutting units or avalanche chutes (Mace et al. 1996). Seasonally, grizzly bears prefer riparian habitats during spring; open-forest burns and open burns during summer; and riparian, forest, and open forest habitats in autumn (McLellan and Hovey 2001). Thus, grizzly bears tend to select a variety of seasonal habitats in areas with low road densities and along an elevational gradient during the non-denning period.

An approximately 203 square mile analysis area was established between the Continental Divide, Nevada Reservoir, the junction of Hwy 200 and MT 141, and the Blackfoot River. Within the project area, there are approximately 62 acres in 35 riparian/wetlands (National Wetlands Inventory data), located within sections 22 and 34 of T14N R8W, and sections 28 of T14N R9W. Within the analysis area, there are approximately 1,137 acres in 912 riparian/wetlands (National Wetlands Inventory data). During the period of 2005 through 2008, approximately 209 acres within the project area, and approximately 92,589 acres of the analysis area, were affected by mountain pine beetles, Douglas-fir beetles, and spruce budworm.

Grizzly bears are known to be more vulnerable to human interaction in areas with high open road densities or ineffective road closures. Currently there are 2.11 miles of open road per square mile (simple linear calculation; 429 miles of open road), and 2.77 total miles of road per square mile (562 miles of road), within the 203 square mile grizzly bear analysis area. Within the project area, there are approximately 0.77 miles of open road per square mile (project area is approximately 2.38 square miles), and approximately 3.86 miles of total road per square mile (simple linear calculation). As part of a large block of security habitat, there is a total of 663 acres of security habitat within the project area, all are located within sections 22 and 34 of T14N R8W. Within the analysis area, there are approximately 43,455 acres of security habitat within five blocks.

Issue: Potential to reduce the quantity of suitable lynx habitat in the project area beyond what is expected to result from the mountain pine beetle infestation.

Lynx are currently classified as threatened under the Endangered Species Act. In North America, lynx distribution and abundance is strongly correlated with snowshoe hares, their primary prey. Lynx foraging habitat has recently been characterized as having high horizontal cover, an abundance of shrub cover, large diameter trees during winter, and is typically in spruce-fir forest (Vinkey 2003). Typically, lynx inhabit early- to mid-

successional lodgepole pine, subalpine fir, and Engelmann spruce forest. For denning sites, the primary component appears to be large woody debris, in the form of down logs, root wads, and rock piles (Koehler 1990) surrounded by high horizontal cover (Vinkey 2003, Squires and Laurion 2000, Squires and Laurion 2000, Mowat et al. 2000). These den sites are usually in mature, mesic forests on northeast aspects. Lynx also den along the edges of regenerating forests where trees have blown down into jackstrawed piles of woody debris (Vinkey 2003, Ruediger et al. 2000).

Elevations in the project area range from 4,480 to 5,640 feet, and approximately 7 acres of suitable habitat (mature foraging) occur in the project area, all occurring in section 36 of T14N, R8W (SLI database 20080908 version). Snowshoe hares are important lynx prey and are associated with dense young lodgepole pine stands, as well as mature stands with subalpine fir understories. An approximately 60,191 acre analysis area was developed for lynx that encompassed the project area and utilized topography and habitat for its creation. During the period of 2005 through 2008, approximately 209 acres within the project area, and approximately 40,244 acres of the analysis area, were affected by mountain pine beetles, Douglas-fir beetles, and spruce budworm. These levels of insect infestations have the potential to kill the overstory, or understory (e.g., spruce budworm on fir seedlings and saplings), and could impact the ability of a stand to provide suitable habitat for lynx.

Issue: Potential for negative impacts to bald eagles beyond what is expected to result from the mountain pine beetle infestation.

Bald eagles typically nest and roost in large diameter trees within 1 mile of open water. They are sensitive to a variety of human caused disturbances, ranging from residential activities to resource use and heavy equipment operation, among others (Montana Bald Eagle Working Group 1994). Bald eagle response to such activities may range from spatial and temporal avoidance of disturbance activities to total reproductive failure and abandonment of breeding areas (MBEWG 1994). While foraging, they typically perch within 500 m of shoreline habitat (Mersmann 1989); and roost in trees ranging in diameter from 12 to 39 inches and 49 to 200 feet in height (Stalmaster 1987). Eagles are generally associated with aquatic foraging habitat. However, roost trees are located away from houses and roads throughout their range (Buehler 2000). School Trust parcels in sections 28 and 34 of T14N R9W are located within 2 miles of the Lincoln bald eagle nest, for which the Montana Bald Eagle Working Group has records dating back to 1986. The territory has fledged a single chick in the past 5 years, with other species using the nest 2 out of the past 5 years.

Issue: Potential for negative impacts to pileated woodpeckers beyond what is expected to result from the mountain pine beetle infestation.

The pileated woodpecker is one of the largest woodpeckers in North America (15-19 inches in length), feeding primarily on carpenter ants (*Camponotus* spp.) and woodboring beetle larvae (Bull and Jackson 1995). The pileated woodpecker nests and roosts in larger diameter snags, typically in mature to old-growth forest stands (Bull et al. 1992, McClelland et al. 1979). Due primarily to its large size, pileated woodpeckers require nest snags averaging 29 inches dbh, but have been known to nest in snags as small as 15

inches dbh in Montana (McClelland 1979). Pairs of pileated woodpeckers excavate 2-3 snags for potential nesting sites each year (Bull and Jackson 1995). Snags used for roosting are slightly smaller, averaging 27 inches dbh (Bull et al. 1992). Overall, McClelland (1979) found pileated woodpeckers to nest and roost primarily in western larch, ponderosa pine, and black cottonwood. The primary prey of pileated woodpeckers, carpenter ants, tend to prefer western larch logs with a large end diameter greater than 20 inches (Torgersen and Bull 1995). Thus, pileated woodpeckers generally prefer western larch and ponderosa pine snags > 15 inches dbh for nesting and roosting, and would likely feed on downed larch logs with a large end diameter greater than 20 inches.

The most abundant habitat type (Pfister et al. 1977) within the affected area is Douglas-fir/twinflower/snowberry phase (Stand Level Inventory database). Within the project area, there are approximately 657 acres that are predominately ponderosa pine or western larch, with average stand diameter \geq 15 inches dbh that would be considered suitable pileated woodpecker habitat (crown cover \geq 40%; SLI database). The cumulative effects analysis area will encompass the project area and a one mile radius surrounding it. During the period of 2005 through 2008, approximately 209 acres within the project area, and approximately 2,265 acres of the analysis area, were affected by mountain pine beetles, Douglas-fir beetles, and spruce budworm. Of the approximately 657 acres of pileated woodpecker habitat within the project area, approximately 125 acres were affected by these insect species through 2008.

Issue: Potential for negative impacts to flammulated owls beyond what is expected to result from the mountain pine beetle infestation.

The flammulated owl is a tiny forest owl that inhabits warm-dry ponderosa pine and cool-dry Douglas-fir forests in the western United States and is a secondary cavity nester. Nest trees in 2 Oregon studies were 22-28 inches dbh (McCallum 1994). Habitats used have open to moderate canopy closure (30 to 50%) with at least 2 canopy layers, and are often adjacent to small clearings. It subsists primarily on insects and is considered a sensitive species in Montana. Periodic underburns may contribute to increasing habitat suitability for flammulated owls because low intensity fires would reduce understory density of seedlings and saplings, while periodically stimulating shrub growth. Within the project area there are approximately 689 acres of flammulated owl preferred habitat types. Of these acres, approximately 100 acres were affected by mountain pine beetles, Douglas-fir beetles, and spruce budworm from 2005 through 2008.

Issue: Potential for negative impacts to big game winter range beyond what is expected to result from the mountain pine beetle infestation.

Densely stocked thickets of conifer regeneration and overstocked mature stands provide thermal protection and hiding cover for elk in winter, which can reduce energy expenditures and stress associated with cold temperatures, wind, and human-caused disturbance. Thus, removing cover that is important for wintering elk through forest management activities can increase their energy expenditures and stress in winter. Reductions in cover could ultimately result in a reduction in winter range carrying capacity and subsequent increases in winter mortality within local elk herds. Within the project area, there are approximately 507 acres of winter range habitat. Within the

approximately 43,437 acre cumulative effects analysis area, as defined by MFWP mapped elk and mule deer winter ranges, there is approximately 21,471 acres of winter range habitat (elk99 and muledr2004 GIS layers from Montana Fish, Wildlife & Parks). During the period of 2005 through 2008, approximately 209 acres within the project area, and approximately 22,910 acres of the analysis area, were affected by mountain pine beetles, Douglas-fir beetles, and spruce budworm. Of the winter range habitat acres within the project (507 ac) and analysis areas (21,471 ac), approximately 143 acres and 11,321 acres, respectively were affected by these insect species through 2008.

Issue: Potential for negative impacts to northern goshawks beyond what is expected to result from the mountain pine beetle infestation.

The northern goshawk (hereafter goshawk) is a forest habitat generalist with specific nesting habitat requirements (McGrath et al. 2003, Squires and Reynolds 1997, Reynolds et al. 1992). The goshawk forages on a wide range of species, with the most predominant prey being snowshoe hare, Columbian ground squirrels, red squirrels, blue and ruffed grouse, northern flickers, American robins, gray jays, and Clark's nutcrackers (Squires 2000, Clough 2000, Watson et al. 1998, Cutler et al. 1996, Boal and Mannan 1996, Reynolds et al. 1992). Thus, given the diverse array of prey species, goshawks forage from a diverse array of habitats. However, (Beier and Drennan 1997) found goshawks to forage in areas based primarily on habitat characteristics rather than prey abundance. Beier and Drennan (1997) found goshawks to forage selectively in forests with a high density of large trees, greater canopy closure, high basal area, and relatively open understories. For nest stands, goshawks will nest in pine, fir, and aspen stands on north-facing slopes that are typically in the stem exclusion or understory reinitiation stages of stand development, with higher canopy closure and basal area than available in the surrounding landscape (McGrath et al. 2003, Finn et al. 2002, Clough 2000, Squires and Reynolds 1997, Reynolds et al. 1992). Nests are typically surrounded by stem exclusion and understory reinitiation stands (with canopy closure $\geq 50\%$) within the 74 acres surrounding the nest; higher habitat heterogeneity than the surrounding landscape, and an avoidance of stands in the stand initiation stage of stand development typify habitat in the 205 acres surrounding goshawk nests (McGrath et al. 2003). Goshawk home ranges vary in area from 1,200 to 12,000 acres depending on forest type, prey availability, and intraspecific competition (Squires and Reynolds 1997).

An active goshawk nest, with 2 young in the nest, was found in the southern half of section 34, T14N R9W during a field visit on 29 June 2009 along Bear Creek. The goshawk analysis area is approximately 8,307 acres, and is comprised of approximately 540 acres of DNRC, approximately 2,166 acres of The Nature Conservancy (TNC; formerly managed by Plum Creek Timber Company), approximately 1,466 acres are US Forest Service, and the remainder (4,135 acres) is privately managed. Within the analysis area, approximately 1,990 acres would be available for potential nesting habitat (crown cover $\geq 50\%$, pole or mature forest), with approximately 127 those acres occurring on the project area. During the period of 2005 through 2008, approximately 209 acres within the project area, and approximately 1,849 acres of the analysis area, were affected by mountain pine beetles, Douglas-fir beetles, and spruce budworm. Of the approximately 127 acres of goshawk habitat within the project area, approximately 69 acres were

affected by these insect species through 2008. Previous land management activities by adjacent private land owners and recent insect infestations have reduced the capacity of the analysis area for potential nest sites.

Chapter 4: Environmental Consequences

Wildlife

Issue: Potential impacts to a wildlife movement zone.

No Action Alternative

Direct and Indirect Effects

Through the 2008 flight of pine beetles approximately 209 acres of the project area had been affected. A review of the stand level inventory database for the project area parcels indicates that there are approximately 1,041 acres susceptible to infestation due to the presence of mature lodgepole or ponderosa pine. While lodgepole pine is likely to fall within 10 years of dying, ponderosa pine snags are likely to remain standing and provide some screening cover for a longer period of time. Additionally, while the additional approximate 1,041 acres are susceptible to insect infestation, Douglas-fir is the predominate tree species on approximately one-third of these stands. As a result, while there would be a loss of cover in these stands, Douglas-fir would continue to provide screening cover. Habitat loss would likely be temporary (15 to 25 years), until the forest has regenerated and replaced screening cover that would otherwise be provided by lodgepole pine poles and sawlogs. However, wildlife use of the project area would likely continue due to the mix of tree species in the affected area. Thus, under the no action alternative, it is likely that additional acreage would be affected by pine beetles and spruce budworm, and there would be temporary losses in vegetative screening. As a result, there would likely be moderate risk of direct and indirect effects to the wildlife movement zone from the no action alternative.

Cumulative Effects

Through 2008, approximately 19,120 acres of the analysis area have been affected by mountain pine beetle and spruce budworm, largely on USFS land in the Sauerkraut Creek, Poorman Creek, and Swede Gulch drainages to the south and east. In all likelihood, lodgepole pine and Ponderosa pine along the Blackfoot River corridor would be affected in the near future. To the point, the mountain pine beetle populations expanded into these areas in 2007 and 2008. Thus, much of this wildlife movement corridor had previously been impacted by human development associated with the town of Lincoln, MT, improving livestock grazing opportunities on private grounds through reductions in tree stocking densities, and most recently through infestations of mountain pine beetles and spruce budworms. Unlike the former two factors, the impacts associated with the bugs would likely only be temporary (15 to 25 years) until vegetative screening that had been provided by lodgepole pine poles and sawlogs is replaced through forest regeneration. Wildlife would likely continue to use these corridors during this time; albeit potentially during times to avoid human conflicts. As a result, there would likely be moderate risk of cumulative effects to the wildlife movement zone from the no action alternative.

Action Alternative

Direct and Indirect Effects

The proposed action would harvest approximately 3 MMBF of affected lodgepole pine (90%), and ponderosa pine, Douglas-fir, subalpine fir, and Engelmann spruce (10%) within the project area, while continuing to maintain cover within 50 feet of class 2 streams and 100 feet of class 1 streams, as per the SMZ law. Similar to the no action activity, there would be a temporary loss of vegetative screening cover until the forest has regenerated. However, associated with the proposed harvest, timber-felling machinery would provide soil scarification, thus establishing good growing sites for future trees. As such, forest regeneration may be established sooner than under the no action alternative. During this time, the insect infestation is likely to continue to run its course. The proposed action would not stop mountain pine beetle activity. Therefore, the proposed action would likely be similar to the no action alternative in terms of temporary losses in vegetative screening. As a result, there would likely be moderate risk of short term direct and indirect effects to the wildlife movement zone from the proposed action.

Cumulative Effects

Through 2008, approximately 19,120 acres of the analysis area have been affected by mountain pine beetle and spruce budworm, largely on USFS land in the Sauerkraut Creek, Poorman Creek, and Swede Gulch drainages to the south and east. In all likelihood, lodgepole pine and Ponderosa pine along the Blackfoot River corridor would be affected in the near future. To the point, the mountain pine beetle populations expanded into these areas in 2007 and 2008. Thus, much of this wildlife movement corridor had previously been impacted by human development associated with the town of Lincoln, MT, improving livestock grazing opportunities on private grounds through reductions in tree stocking densities, and most recently through infestations of mountain pine beetles and spruce budworms. The proposed action would specifically target affected lodgepole and ponderosa pine, creating larger openings where the stands are pure lodgepole, and creating small openings where there is a mixture of tree species. Similar to the no action alternative, the proposed action would create temporary reductions in screening cover (15 to 25 years), which may be reduced due to soil scarification associated with timber felling machinery. Due to the presence of cottonwoods and willows along the Blackfoot River corridor, that wildlife movement zone would see no change from the proposed action, and likely limited reductions in cover from the pine beetles. However, Sauerkraut Creek experienced reductions in screening cover prior to this proposal due to activities associated with grazing, and its headwaters have experienced heavy mortality from mountain pine beetles since 2007. As a result there would likely be low to moderate risk of cumulative effects from the proposed action on this wildlife movement zone. However, the proposed action would continue to maintain cover within 50 feet of class 2 streams and 100 feet of class 1 streams, as per the SMZ law, which would help reduce impacts associated with the proposed harvest.

Issue: Potential negative impacts to grizzly bear habitat beyond what is expected to result from the mountain pine beetle infestation.

No Action Alternative

Direct and Indirect Effects

Through the 2008 flight of pine beetles approximately 209 acres of the project area had been affected. A review of the stand level inventory database for the project area parcels indicates that there are approximately 1,041 acres susceptible to infestation due to the presence of mature lodgepole or ponderosa pine. While lodgepole pine is likely to fall within 10 years of dying, ponderosa pine snags are likely to remain standing and provide some screening cover for a longer period of time. Additionally, while the additional approximate 1,041 acres are susceptible to insect infestation, Douglas-fir is the predominate tree species on approximately one-third of these stands. As a result, while there would be a loss of cover in these stands, Douglas-fir would continue to provide screening cover. Habitat loss would likely be temporary (15 to 25 years), until the forest has regenerated and replaced screening cover that would otherwise be provided by lodgepole pine poles and sawlogs. Under this alternative, security cover would not change, but there would likely be temporary reductions in hiding cover due to affected lodgepole pine. Additionally, there would not be increases in open or total road densities. However, seasonal habitats for grizzly bears may temporarily be increased through resultant open forests which would likely provide food sources in autumn (McLellan et al. 2001). As a result, there would likely be low to moderate risk of direct and indirect effects to grizzly bear habitat within the project area from the no action alternative.

Cumulative Effects

Approximately 71% of the analysis area has been affected by the mountain pine beetle since 2005. Examination of the aerial detection surveys indicates that the infestation has been working its way down in elevation to the Lincoln Valley over the past several years. This level of infestation is widespread throughout the analysis area, and would likely temporarily reduce hiding cover while increasing seasonal foods for grizzly bears. With the exception of reductions in visual screening cover surrounding riparian areas and wetlands within the analysis area, these seasonal habitats would likely experience little impact from the no action alternative. However, due to the widespread level of infestation, its progression towards the valley floor, and likely subsequent temporary reductions in hiding cover when the affected lodgepole pine fall to the ground, there would likely be moderate to high moderate risk of cumulative effects to grizzly bear habitat under the no action alternative.

Action Alternative

Direct and Indirect Effects

The proposed action would harvest approximately 3 MMBF of affected lodgepole pine (90%), and ponderosa pine, Douglas-fir, subalpine fir, and Engelmann spruce (10%) within the project area, while continuing to maintain cover within 50 feet of class 2 streams and 100 feet of class 1 streams, as per the SMZ law. Similar to the no action activity, there would be a temporary loss of vegetative screening cover until the forest has regenerated. However, associated with the proposed harvest, timber-felling machinery would provide soil scarification, thus establishing good growing sites for future trees. As such, forest regeneration may be established sooner than under the no action alternative.

During this time, the insect infestation is likely to continue to run its course. The proposed action would not stop mountain pine beetle activity.

Under this alternative, the following measures would be implemented for grizzly bear mitigations:

1. Visual screening cover adjacent to open roads would be retained to the extent practicable;
2. Where visual screening cover along open roads would not occur post-harvest in the affected parcels in T14N R9W, trees would be planted to reduce the time until screening cover is regained;
3. New roads constructed off of existing open roads in T14N R9W would be effectively closed by a road closure device or be obliterated post-harvest;
4. If the contractor chooses to camp on the sale area, they would be required to keep a clean camp. Food should be stored by hanging, or placement in bear resistant containers. Cleaning of the campsite and landings should be done every day.
5. If the Purchaser / contractor does not choose to camp onsite, lunches and other food would be stored within vehicle or equipment cabs.
6. Contractors and purchasers conducting contract operations would be prohibited from carrying firearms while operating (ARM 36.11.433 (1)(d)) and bear spray would be recommended for protection of personnel.

Given that approximately 209 acres between 2005 and 2008 were affected by mountain pine beetles within the project area, and approximately 1,041 acres susceptible to infestation due to the presence of mature lodgepole or ponderosa pine, the proposed action's planned removal of lodgepole pine would likely not be additive to baseline conditions. Implementation of the proposed grizzly bear mitigations would promote quicker recovery of visual screening cover, reduce the potential for human-bear conflicts during the proposed operation, and ensure no net increase in open road densities. Thus, there would likely be low risk of the proposed action increasing the direct and indirect effects above baseline conditions.

Cumulative Effects

Given the widespread infestation of mountain pine beetles in the analysis area, and the expected loss, or at least reduction, of hiding cover due to affected lodgepole pine falling to the ground within 15 years of death, grizzly bear habitat within the analysis area is expected to be compromised under baseline conditions. The proposed action would harvest affected lodgepole and ponderosa pine within the project area, plant trees post-harvest to provide for earlier visual screening cover along open roads in the affected parcels in T14N R9W, and effectively close or obliterate new roads constructed off of existing open roads within the aforementioned township. As such, the proposed action proposes to reduce the time visual screening cover is lacking in key areas of grizzly bear vulnerability while providing for no net increase in open road density or reductions in security. Therefore, there would be a low likelihood the proposed action would increase the cumulative effects to grizzly bear habitat beyond baseline conditions.

Issue: Potential to reduce the quantity of suitable lynx habitat in the project area beyond what is expected to result from the mountain pine beetle infestation.

No Action Alternative

Direct and Indirect Effects

Under this alternative, no new road would be constructed or timber harvested by the DNRC on School Trust land. The mountain pine beetle infestation would likely continue to grow, infest, and likely, eventually kill additional lodgepole pine stands. Where advanced regeneration is present, current mature foraging habitat would likely be converted to young foraging habitat due to mountain pine beetle-induced tree deaths. As a result, there would likely be a conversion of approximately all 7 acres of mature foraging habitat to young foraging habitat within the project area. Thus, there would likely be direct and indirect reductions in the quantity of suitable Canada lynx habitat within the project area under the no action alternative.

Cumulative Effects

Within the northwestern and north-central portions of the analysis area, lynx habitat has been compromised due to past harvest on approximately 8,734 acres of private timber lands, and on approximately 40,244 acres due to mountain pine beetle and western spruce budworm infestations on US Forest Service and school trust lands. Thus, a large portion of the analysis area would be affected by beetles or past timber harvest on private lands. As a result, there would likely be conversion of currently suitable habitat, which does not contain advanced regeneration, to unsuitable habitat. Where advanced regeneration is present in spruce/subalpine fir habitat types, there would likely be conversion from mature foraging to young foraging habitat, with potential den sites once lodgepole pine fall, and the creation of temporarily unsuitable habitat where advanced regeneration is currently absent. Thus, there may be moderate risk of cumulative effects to Canada lynx habitat with the no action alternative.

Action Alternative

Direct and Indirect Effects

The proposed action would directly affect approximately 7 acres of currently suitable lynx habitat (mature foraging habitat). Of the affected lynx habitat, the proposed treatment would likely accelerate natural forest regeneration due to ground scarification and increased sunlight, which would promote lodgepole pine regeneration. The site preparation associated with this treatment would likely shorten the time affected habitat would be unsuitable for lynx, in comparison to the no action alternative. Within the affected mature foraging habitat, damage to existing advanced regeneration could be reduced through skid trail planning. As a result, young foraging habitat characteristics could be retained within this patch. Thus, through likely accelerated forest regeneration from site preparation, and conversion of affected mature foraging habitat to young foraging habitat, the proposed action would likely produce shorter duration direct and indirect loss of Canada lynx habitat than the no action alternative. Therefore, there would likely be minimal to low risk of increasing the direct and indirect effects to lynx habitat beyond baseline conditions.

Cumulative Effects

Within the northwestern and north-central portions of the analysis area, lynx habitat has been compromised due to past harvest on approximately 8,734 acres of private timber lands, and on approximately 40,244 acres due to mountain pine beetle and western spruce budworm infestations on US Forest Service and school trust lands. Thus, a large portion of the analysis area would be affected by beetles or past timber harvest on private lands. As a result, there would likely be conversion of currently suitable habitat, which does not contain advanced regeneration, to unsuitable habitat. Where advanced regeneration is present in spruce/subalpine fir habitat types, there would likely be conversion from mature foraging to young foraging habitat, with potential den sites once lodgepole pine fall, and the creation of temporarily unsuitable habitat where advanced regeneration is currently absent. The proposed action would likely accelerate forest regeneration from site preparation and convert affected 7 acres of mature foraging habitat to young foraging habitat. Thus, the proposed action would not likely reduce suitable Canada lynx habitat beyond what is expected under the no action alternative.

Issue: Potential for negative impacts to bald eagles beyond what is expected to result from the mountain pine beetle infestation.

No Action Alternative

Direct and Indirect Effects

Of the project area, only sections 28 and 34 of T14N R9W occur within 2 miles of the Lincoln bald eagle nest. Through 2008, approximately 23 acres of these 2 parcels had been affected by mountain pine beetles. At approximately 1.25 miles from the nest, the affected parcels are part of the territory's home range, but likely do not provide potential foraging opportunities for the pair. Because the mountain pine beetle infestation is likely to continue growing for the next couple years, larger diameter lodgepole and ponderosa pine trees would be affected and could provide roosting opportunities for the eagles, as long as the snags continue standing. As such, there would likely be low risk of negative direct or indirect effects to bald eagles under the no action alternative.

Cumulative Effects

Within an analysis area that encompasses a 2 mile radius surrounding the bald eagle nest, approximately 386 acres of timber were affected by mountain pine beetles from 2005 through 2008. Stands affected by the mountain pine beetles are located throughout the analysis area, including along the Blackfoot River and on hillsides encompassing the project area. As previously discussed, because the mountain pine beetle infestation is likely to continue growing for the next couple years, larger diameter lodgepole and ponderosa pine trees would be affected and could provide nesting and roosting opportunities for the eagles, as long as the snags continue standing. However, these features would likely be short-lived (10 to 20 years), as lodgepole and ponderosa pine snags would decay and eventually fall. As a result, the no action alternative would likely have low risk of negative cumulative effects to bald eagles.

Action Alternative

Direct and Indirect Effects

Under the proposed action, the affected lodgepole and ponderosa pine within the project area would be removed. As such, potential future roost trees would be removed while

non-lodgepole pine species would remain and could serve the same purpose. As such, there would likely be little difference in the effects to bald eagles between the proposed action and the no action alternative, largely because the affected parcels are approximately 1.25 miles from the nest.

Cumulative Effects

For similar reasons stated under direct and indirect effects, there would likely be low risk of cumulative effects to bald eagles from the proposed action.

Issue: Potential for negative impacts to pileated woodpeckers beyond what is expected to result from the mountain pine beetle infestation.

No Action Alternative

Direct and Indirect Effects

As previously discussed, the affected parcels have been impacted by a mountain pine beetle infestation that has been killing, mature lodgepole pine on the project area and the surrounding area. As of the summer of 2008, the infestation had impacted approximately 125 of the approximately 657 acres of pileated woodpecker habitat in the project area. However, given that approximately 209 acres of the project area had been infested by mountain pine beetles between 2005 and 2008, and approximately 1,041 acres are susceptible to infestation due to the presence of mature lodgepole or ponderosa pine within the project area, increased infestation would be highly likely. Due to the prevalence of lodgepole pine and ponderosa pine in the potential pileated woodpecker habitat, virtually all of it would be susceptible to infestation by mountain pine beetles. As a result, canopy closure < 40% would be expected, which would reduce the suitability of the stands for nesting by pileated woodpeckers. However, there would be a large pulse of lodgepole pine snags, and eventually coarse woody debris, which could be used for foraging sites. The resulting stands may be of reduced value to pileated woodpeckers and increase their vulnerability to predation by avian predators. Thus, this alternative would likely have low to moderate risk of direct and indirect effects to pileated woodpeckers.

Cumulative Effects

Approximately 43% (6,540 acres) of the analysis area has been impacted by past timber harvest and human development, and approximately 15% has been affected by the current mountain pine beetle and spruce budworm infestation from 2005 through 2008. With the mountain pine beetle infestation, there has been a reduction in canopy closure due to infestations in mature lodgepole pine within the analysis area, and possibly mortality in a portion of these stands. Under this alternative, within potential pileated woodpecker habitat there would likely be a mosaic of new snags, and possibly entire stands that have succumbed to the infestation. As such, the effects of the infestation would increase the habitat potential of some stands, while reducing the potential of others. Therefore, the no action alternative may have minimal to moderate risk of cumulative effects to pileated woodpecker habitat within the analysis area.

Action Alternative

Direct and Indirect Effects

The proposed action would harvest approximately 3 MMBF of affected lodgepole pine (90%), and ponderosa pine, Douglas-fir, subalpine fir, and Engelmann spruce (10%) within the project area, while continuing to maintain cover within 50 feet of class 2 streams and 100 feet of class 1 streams, as per the SMZ law. As such, recruitment of snags and coarse woody debris that could be used for potential nest and foraging sites, would be greatly reduced compared to the no action alternative, as ARMs 36.11.411 and 414 would be implemented. Although the habitat suitability for the affected stands would be greatly reduced, due to reduced canopy closure, under the no action alternative, it would still retain valuable habitat features (i.e., more snags and downed wood) that could eventually be used by this species. However, reduction in snag and downed wood retention under the proposed action may reduce pileated woodpecker vulnerability to avian predators because this species may not utilize the post-harvest stands. As a result, there may not be a difference in the range of effects to pileated woodpeckers from either alternative. The proposed action would likely result in low to moderate risk of direct and indirect effects to pileated woodpeckers.

Cumulative Effects

Given the effects of the mountain pine beetle infestation, and past levels of human development and timber harvest within the rest of the analysis area (see No Action Alternative Cumulative Effects discussion), and that the proposed action would treat stands likely to be suitable pileated woodpecker habitat within the project area, the commensurate reduction in potential pileated woodpecker habitat, due to the proposed treatment, would likely result in low to moderate risk of cumulative effects to pileated woodpecker habitat within the analysis area.

Issue: Potential for negative impacts to flammulated owls beyond what is expected to result from the mountain pine beetle infestation.

No Action Alternative

Direct, Indirect, and Cumulative Effects

The mountain pine beetle infestation would reduce canopy closure, create legacy snags, and likely spur forest regeneration through the openings in the overstory that they create. Depending on the extent of the overstory mortality, the effects for flammulated owls could be variable under this alternative. In stands with limited to moderate overstory mortality, flammulated owl habitat could be improved within 15 years, provided forest regeneration occurs in the new openings. Stands that might experience more extensive mortality may suffer reductions in habitat suitability for this species, or may serve more as foraging areas. Thus, there may be minimal to low risk of direct, indirect, or cumulative effects for flammulated owls as a result of this alternative.

Action Alternative

Direct, Indirect, and Cumulative Effects

The proposed action would harvest approximately 3 MMBF of affected lodgepole pine (90%), and ponderosa pine, Douglas-fir, subalpine fir, and Engelmann spruce (10%) within the project area, while continuing to maintain cover within 50 feet of class 2 streams and 100 feet of class 1 streams, as per the SMZ law. As such, recruitment of snags that could be used for potential nest sites, would be greatly reduced compared to

the no action alternative, as ARM 36.11.411 would be implemented. Post-harvest, some treatment areas may resemble clearcuts with reserves, while still others may resemble seed tree harvests with reserves. The resulting stands will likely have limited value for flammulated owls for 40 to 60 years post-harvest. As a result, there would likely be low to moderate risk of direct, indirect, or cumulative effects for flammulated owls as a result of the proposed action.

Issue: Potential for negative impacts to big game winter range beyond what is expected to result from the mountain pine beetle infestation.

No Action Alternative

Direct and Indirect Effects

Within the project area, lodgepole and ponderosa pine is a component (20 – 90% by stand composition) of approximately 1,041 acres; subsequently, these same acres are susceptible to infestation by mountain pine beetles. Through 2008, approximately 143 acres of the approximately 507 acres of winter range habitat within the project area had been affected by the mountain pine beetle infestation. Thus, snow intercept cover on the majority of winter range within the affected parcels could be greatly reduced (reductions of 30 – 89%, by stand composition; Stand Level Inventory data) by beetle-induced tree mortality, causing commensurate reductions in elk winter range habitat suitability. As a result, the no action alternative would likely have low to moderate risk of direct and indirect reductions in elk winter range within the project area.

Cumulative Effects

Within the analysis area, habitat has been compromised due to past harvest on approximately 10,853 acres of private timber lands, and mountain pine beetle and western spruce budworm infestations in 2008 on approximately 22,910 acres of US Forest Service, Nature Conservancy, and school trust lands. Additionally, through 2008 mountain pine beetles and western spruce budworm affected approximately 11,321 acres of approximately 21,471 acres (53%) of elk winter range within the analysis area. As a result, there would likely be cumulative reductions in the suitability of winter range under the No Action alternative.

Action Alternative

Direct and Indirect Effects

The proposed action would primarily harvest affected lodgepole and ponderosa pine within elk and mule deer winter range. As such, the proposed harvest would directly affect more than 338 acres of winter range habitat, which is less than the approximately 1,041 acres of lodgepole pine within the project area that would be susceptible to the mountain pine beetle infestation under the no action alternative. On the winter range acreage that is proposed for treatment, due to stand composition, there would be a 30 to 89% reduction (between stand variation) in snow intercept cover within the treated stands. Thus, under the proposed action, there would be reductions in elk winter range habitat suitability within the project area, but the effects would likely be less than expected under the no action alternative.

Cumulative Effects

Within the analysis area, habitat has been compromised due to past harvest on approximately 10,853 acres of private timber lands, and mountain pine beetle and western spruce budworm infestations in 2008 on approximately 22,910 acres of US Forest Service, Nature Conservancy, and school trust lands. Additionally, through 2008 mountain pine beetles and western spruce budworm affected approximately 11,321 acres of approximately 21,471 acres (53%) of elk winter range within the analysis area. The proposed action would treat more than 338 acres of winter range habitat that has already been, or will likely be affected by the mountain pine beetle infestation. Thus, the proposed action would likely have minimal increases in cumulative effects to elk winter range over the no action alternative.

Issue: Potential for negative impacts to northern goshawks beyond what is expected to result from the mountain pine beetle infestation.

No Action Alternative

Direct and Indirect Effects

Within the project area located in T14N R9W, there are approximately 127 acres of potential goshawk nesting habitat, with approximately 69 of those acres (54%) affected by the mountain pine beetle infestation through 2008. All 127 acres of the potential goshawk nesting habitat in this portion of the project area would be susceptible to mountain pine beetle infestation due to the proportion of mature lodgepole and ponderosa pine in the affected stands. Thus, it would be foreseeable that the remaining 58 acres of potential goshawk nesting habitat that had not been affected by mountain pine beetles in 2008 could be affected within the next three years. As a result, with the proportion of these stands in pine ($\geq 20\%$), beetle-induced mortality would likely reduce the suitability of the affected stands for nesting. Stands comprised of greater proportions of Douglas-fir ($\geq 40\%$) would likely serve to provide potentially greater habitat suitability for nesting due to retained crown cover (McGrath et al. 2003). Thus, there would be the potential for moderate risk of direct and indirect effects to goshawk nesting habitat within the project area under the no action alternative.

Cumulative Effects

Within the analysis area, through 2008, approximately 961 acres of the approximately 1,990 acres of potential goshawk nesting habitat had been affected by the mountain pine beetle infestation. All but four of the potential goshawk nesting stands had been affected by the infestation by the end of 2008. As was discussed under direct and indirect effects, the greater the proportion of non-pine species present in these stands would help reduce the effects of beetle-induced tree mortality on habitat suitability for nesting by goshawks. However, nests located in affected stands would likely have an increased susceptibility for predation by other avian predators due to decreased crown cover, increases in the availability of flight lanes, and increased sight distance through the canopy. With the capacity of the analysis area to provide potential nesting habitat for goshawks reduced on privately managed lands due to reductions in stand density and intense grazing pressure, the potential for expansion of the mountain pine beetle infestation associated with the no action alternative would likely provide for a moderate to high risk of cumulative effects to a pair of northern goshawks.

Action Alternative

Direct and Indirect Effects

As previously stated, the proposed action would primarily harvest affected lodgepole and ponderosa pine while harvesting small components of other tree species, and retain snags as per ARM 36.11.411. This action would occur in potential, and actual, goshawk nesting habitat. To avoid conflicts with goshawks nesting along Bear Creek, harvest operations would occur between September 1 and May 1. In stands proposed for harvest, stands with lodgepole pine $\geq 20\%$ of the merchantable volume would likely experience reduced suitability for nesting post-harvest. Stands comprised of greater proportions of Douglas-fir ($\geq 40\%$) would likely serve to provide potentially greater habitat suitability for nesting due to retained crown cover (McGrath et al. 2003). Because the proposed action would target one of the tree species preferred by mountain pine beetles, there would likely be minimal increases in negative direct and indirect effects to goshawk nesting habitat beyond those projected for the no action alternative.

Cumulative Effects

Beyond the boundaries of the project area, cumulative effects would be expected to follow those outlined under the no action alternative. The proposed action would primarily remove affected lodgepole and ponderosa pine from within potential goshawk nesting habitat. As such, the greater the proportion of non-lodgepole pine species present in these stands would help reduce the effects of proposed harvest on post-harvest habitat suitability for nesting by goshawks. However, nests located in affected stands would likely have an increased susceptibility for predation by other avian predators due to decreased crown cover, increases in the availability of flight lanes, and increased sight distance through the canopy. The main difference between the proposed action and the no action alternative would be that under the proposed action, lodgepole pine would be removed from the site approximately 10 years prior to when it would be expected to fall to the ground under the no action alternative. The utility of standing dead timber to goshawk nesting habitat suitability would be speculative based upon remaining stand species composition, prey abundance and availability, and prevalence of other avian predators. As such, there would likely be minimal to low risk of increases in cumulative effects to habitat for a pair of goshawks beyond those projected for the no action alternative.

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Attachment D
Initial Proposal

Initial Proposal South Lincoln Timber Salvage

The Montana Department of Natural Resources and Conservation, Lincoln Field Office is proposing to salvage harvest timber on the following state owned parcels.

Section 22 T.14N., R.8W. School for the Deaf and Blind
Section 28 and 34 T.14N., R.8W., and Sections 28 and 34 T.14N., R.9W. Public Building Trust

The primary objective of the proposed project is to harvest lodgepole pine trees that have been, are currently, or are at risk of being attacked by the mountain pine beetle. Road maintenance and improvement would be needed on existing access road and some new road construction may be necessary to access proposed harvest units. Noxious weed management, property line surveys, and tree planting may also occur under the proposed action.

The proposed salvage harvest is in accordance with State Statute 77-5-207, the DNRC's intent is to salvage timber before there is substantial value loss. Additionally the proposed harvest would contribute to the DNRC's sustained yield as mandated by state statute 77-5-222.

The proposal is in the general vicinity of Humbug Creek, Willow Creek and the Blackfoot River. This area is known to contain numerous wildlife species and fish bearing streams run through the project area. Protective measures to fulfill the endangered species act, and protect other environmental considerations, would be used.

Due to the scattered nature of state lands in the project vicinity the proposed harvest would take place under various timber permits and sales. The proposal would harvest approximately three million board feet from approximately 350 acres. The proposed action would likely be implemented in the late summer of 2009 and be completed by 2011.

The DNRC is in the scoping phase of the project environmental assessment so all volumes and acreages are preliminary estimates. In preparation for this project, specialists such as wildlife biologists, hydrologists, soil scientists, and archeologists will be consulted. Neighboring landowners will also be asked for their input.

The Montana D.N.R.C. invites comments and suggestions concerning this proposal from all interested parties. Please respond by August 10, 2009 to:

Department of Natural Resources and Conservation
Attn: Neil Simpson
Lincoln Field Office
PO Box 127 Lincoln, MT 59639

or: <mailto:nsimpson@mt.gov>
or: (406) 362-4999