DNRC - Trust Land Management Division

ENVIRONMENTAL ANALYSIS

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LEGISLATIVE ENVIRONMENTAL POLICY OFFICE

FOR THE

HOT SPRINGS TIMBER SALE

PREPARED BY

Dale Peters, Management Forester

Plains Unit, Northwestern Lands Office

Montana Department of Natural Resources and Conservation

June 2004

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MEMORANDUM

To: Larry Ballantyne, Management Forester, Plains Unit, NWLO
From: Jon M. Hayes, Forest Management Supervisor, Plains Unit, NWLO
Re: Hot Springs Timber Sale
Date: May 15, 1998

Primary Objective

The primary objective of the Hot Springs Timber Sale is to generate income for the Public School (C. S.) Trust Grant. This sale should provide approximately 1.5 MMBF of merchantable timber toward the unit's FY00 goal of 4.5 MMBF.

Secondary Objectives

The secondary objectives for this sale is to improve overall forest health by identifying and treating insect and disease problem that occur within the sale area, with the intent of minimizing timber volume and income loss caused by I & D activity.

In planning and preparing this sale, management direction of the State Forest Land Management Plan shall be closely followed. All applicable Streamside Management Zone rules and regulations and all pertinent BMP guidelines shall be applied.

Jon M. Hayes

CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	Hot Springs Timber Sale
Proposed Implementation Date:	September 2004
Proponent:	DNRC, Northwestern Land Office, Plains Unit
Location:	Section 36 Township 22N Range 25W
County:	Sanders

I. TYPE AND PURPOSE OF ACTION

The Department of Natural Resources and Conservation proposes to sell an estimated 20,000 tons of timber (3.1 MMBF) in Section 36 T22N R25W, three air miles west of Hot Springs, Montana. This action would produce revenue for the Common School (C.S.) Trust Grant. Activities proposed would maintain and improve forest health, reduce fuel loadings, and increase forest productivity beneficial to future Trust actions.

The proposal would include nine harvest units totaling 578 acres. New road construction of 3.9 miles, reconstruction of 1.6 miles, temporary road construction of 0.4 miles, abandoning 0.7 of old road and maintenance of 11.0 miles of existing system roads to maintain would be required. Income to the Trust from this project is estimated at $600,000.00.

Lands involved in this proposed project are held by the State of Montana in trust for the support of the specific beneficiary institutions such as the public buildings trust, public schools, state colleges and universities, and other specific State institutions such as the School for the Deaf and Blind (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article 1 Section 11). The Board of Land Commissioners and the Department of Natural Resources and Conservation 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 77-1-202, MCA). In March 2003, DNRC adopted Administrative Rules for Forest Management (ARM 36.11.401 through 450). The DNRC would manage lands involved in this project in accordance with the Rules.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project.

Public involvement has been solicited through newspaper advertisements plus letters sent to adjacent landowners, Confederated Salish & Kootenai Tribes and other known interested parties and organizations. Public response was received and used to assist in defining issues surrounding the proposed project. DNRC specialists and field foresters identified management issues and concerns. Issues and concerns have been resolved or mitigated through project design or would be included as specific contractual requirements of the project (See Attachment 2, Resource analysis; Attachment 3, Prescriptions; Attachment 4, Mitigation; Attachment 5, Consultants and References).

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

Road Use Permit; U.S. Department of Agriculture, Plains/Thompson Falls Ranger District. (Secured)

Tribal and BIA road use permits have been applied for and would be secured prior to the project's implementation.

An Aquatic Lands Conservation Ordinance permit from the CS&KT would be secured prior to installing the stream/draw crossings.

3. ALTERNATIVES CONSIDERED:

Action Alternatives: No additional action alternatives were identified or proposed during the scoping analysis, therefore only forest product removal and sale are analyzed in this EA checklist. Recommended actions to reduce environmental effects would be incorporated into the proposed action.

No Action: The no-action alternative would propose no revenue-generating activities on this section. This alternative would not produce revenue for the Common School (C.S.) Trust Grant. No timber harvesting would occur. There would be no road management or closure activities other than limited maintenance in the event of damage. The no-action alternative would result in decreased current growth rates, continued decline of stand conditions and increased fuel loadings of timber stands. No action would be taken to alter insect and disease activities.

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.

Measures to minimize impacts and cumulative effects as recommended by a DNRC specialist have been included in the project design. (See Attachment 2, Resource analysis, Hydrology Analysis / Soils Analysis; Attachment 4, Mitigation. As detailed in the Soil analysis, limiting the area of adverse soil effects would control cumulative effects.)

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.

A DNRC hydrologist has reviewed the project area, transportation system, and harvest plan. Recommendations to minimize impacts have been incorporated into the project design (See Attachment 2, Resource analysis, Hydrology Analysis/ Soils Analysis; Attachment 4, Mitigation Measures). Cumulative effects to sediment delivery and water yield would be limited through BMP implementation.

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 project area is located within a Class 1 Air shed. Some particulate matter would be introduced into the Air shed from the burning of logging slash and broadcast burning as specified in the project plan. All burning would be conducted during times of adequate ventilation within the existing rules and regulations.

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.

Tree removal would cause changes in the vegetative structure of the project area. Silvicultural prescriptions have been developed to keep stands moving towards historical conditions, while maintaining good tree growth and vigor. The Action Alternative affects no old growth stands. No sensitive plants listed by the Montana Natural Heritage Program have been identified in the project area. (See Attachment 2, Resource analysis; Vegetation analysis; Attachment 3, Prescriptions.) Change to cover type distribution across the Plains unit and age class distribution would move only slightly towards a historic condition.

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.

The Hot Springs sale area is in big game habitat. (See attachment 2, Resource analysis; Wildlife Analysis.) The proposed activities are designed to limit impacts to wildlife habitat. Unit marking and treatments would retain some visual screening in the project area. Wildlife security would be maintained through active road management.

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.

Use by Threatened and Endangered species included in the analysis of this project area consists of the following species; Canada lynx, gray wolf, fisher, flammulated owl and the pileated woodpecker. Recommendations to minimize direct, indirect and cumulative impacts have been incorporated in the project design. (See attachment 2, Resource analysis; Wildlife Analysis.)

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

The CS&KT of the Flathead Nation, Tribal Preservation Office, Cultural and Historical Sites Review, has granted cultural clearance and a DNRC archeologist has reviewed this project. (See attachment 2, Resource analysis; Archaeological Analysis.)

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.

Portions of the project would be visible from Montana State Highway 28 and the town of Hot Springs, Montana. Topography is mountainous; therefore portions of the sale area would be hidden from view minimizing visual impacts. Prescriptions are designed to mimic historical stand conditions and current adjacent land management practices, therefore should not have an adverse visual impact on the area. (See attachment 4, Mitigation)

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 effect.

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.

No other projects have been identified.

IV. IMPACTS ON THE HUMAN POPULATION

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

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

No effect.

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

Timber harvest would provide continuing industrial production in Sanders County.

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

People are currently employed in the wood products industry in the region. Due to the relatively small size of the timber sale program, there would be no measurable cumulative impact from this proposed action on employment.

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.

No effect.

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

Log trucks hauling to the purchasing mill would result in temporary increases in traffic on the designated haul route and Montana State Highway 28. This increase is a normal contributor to the activities of the local community and industrial base and cannot be considered a new or increased source. Cumulative impacts are not likely to occur.

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 March 2003, DNRC adopted Administrative Rules for Forest Management (ARM 36.11.401 through 450). The DNRC would manage lands involved in this project in accordance with the Rules.

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.

No increase in recreational use is expected following the project. Roads through the area that would be closed after the project only access the immediate area, closure of them would not affect the ability of people to recreate on these parcels.

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

No effect.

22. SOCIAL STRUCTURES AND MORES:

Identify potential disruption of native or traditional lifestyles or communities.

None identified.

23. CULTURAL UNIQUENESS AND DIVERSITY:

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

None identified.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify cumulative economic and social effects likely to occur as a result of the proposed action.

Costs, revenues and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be absolute estimates of return. The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find a market value for stumpage. These sales have similar species, quality, average diameter, product mix, terrain, date of sale, distance from mills, road building and logging systems, terms of sale, or anything that could affect a buyers willingness to pay for stumpage. The project would harvest approximately 20,000 tons of timber (3.1 MMBF) returning approximately $600,000.00 to the Common School (C.S.) Trust Grant. Development costs borne by the purchaser have been included when determining the projected income to the Trust. The No Action alternative does not generate any return to the school trust at this time.

EA Checklist Prepared By:	**Name:**	Dale Peters	**Date:**	**June/2004**
	Title:	Management Forester		

V. FINDING

25. ALTERNATIVE SELECTED:

The Action Alternative as proposed meets the stated project objectives. It complies with all applicable environmental laws and DNRC Administrative rules. A consensus of professional opinion finds this alternative within the limits of acceptable environmental impact. The No Action Alternative meets none of the project objectives and does not provide fiscal income to the Trust. For these reasons I have selected the Action Alternative for implementation.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

After thorough review of the Project File and all scoping documents, I find all identified resource managerial concerns have been fully addressed in this environmental assessment. Specific mitigation measures surrounding resource concerns are listed in Attachment 4. The Action Alternative provides for Trust income in the present while assuring long-term productivity of the site. It does not eliminate other (currently unidentified) revenue generating opportunities. Specific project design features and resource management specialist recommendations have been included to insure this project will fall within the acceptable limits of environmental change. Considering the content of this analysis I find there would be no significant impact to the physical or human environment resulting from the implementation of the Action Alternative.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

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

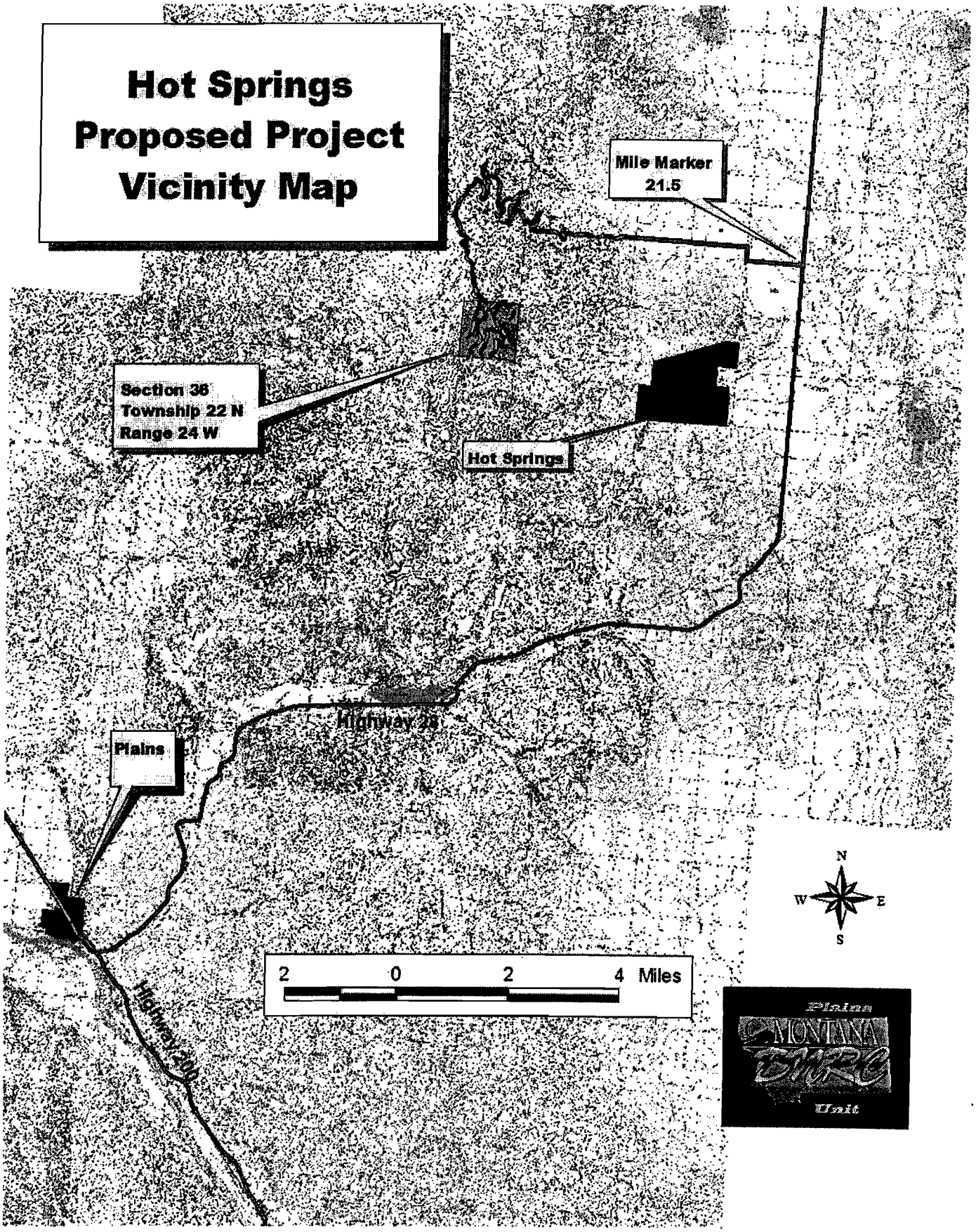
EA Checklist Approved By:	**Name:** Larry Ballantyne	
	Title: Resource Program Manager	
Signature: Larry Ballantyne		**Date:** 6-29-04

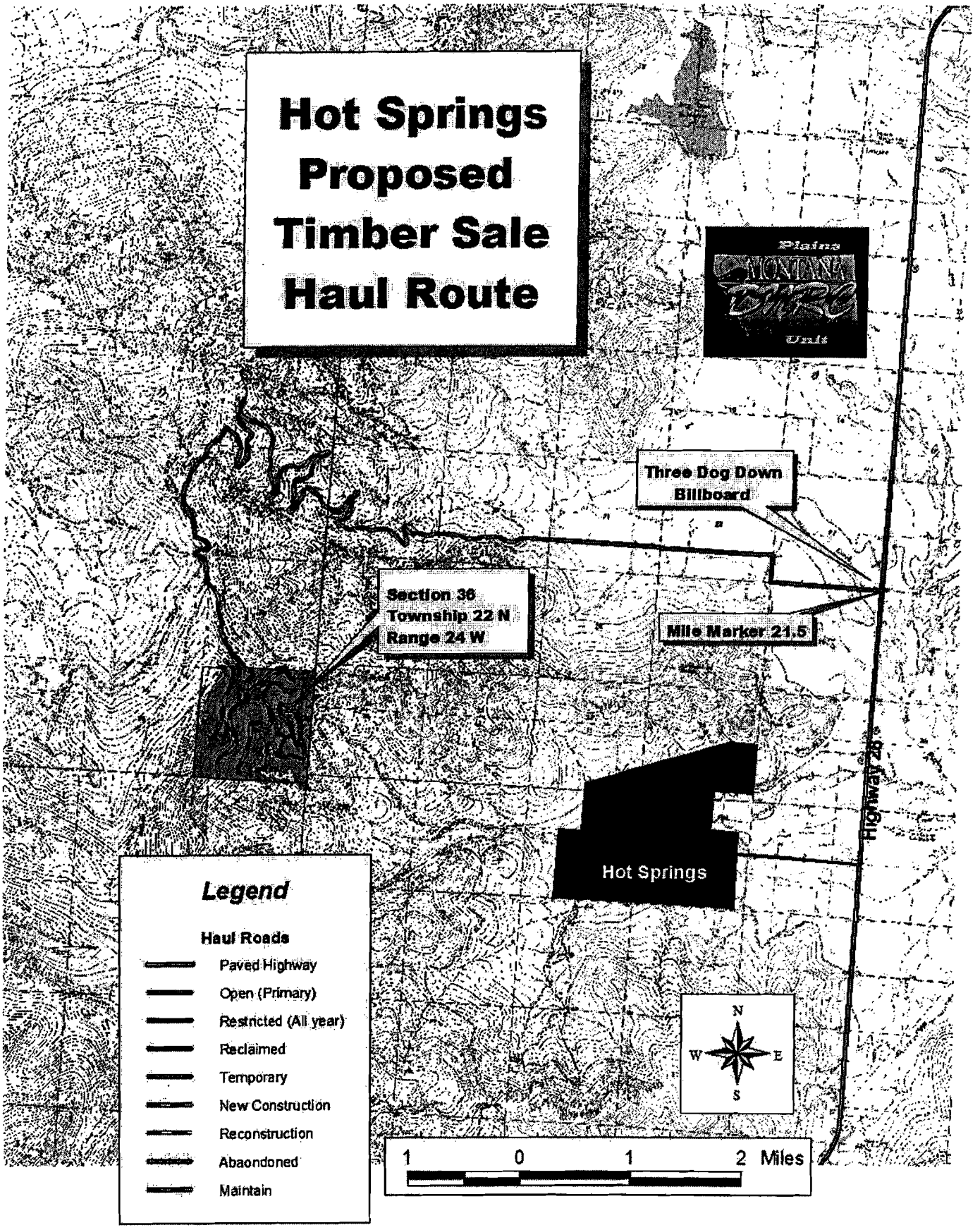
Attachment 1

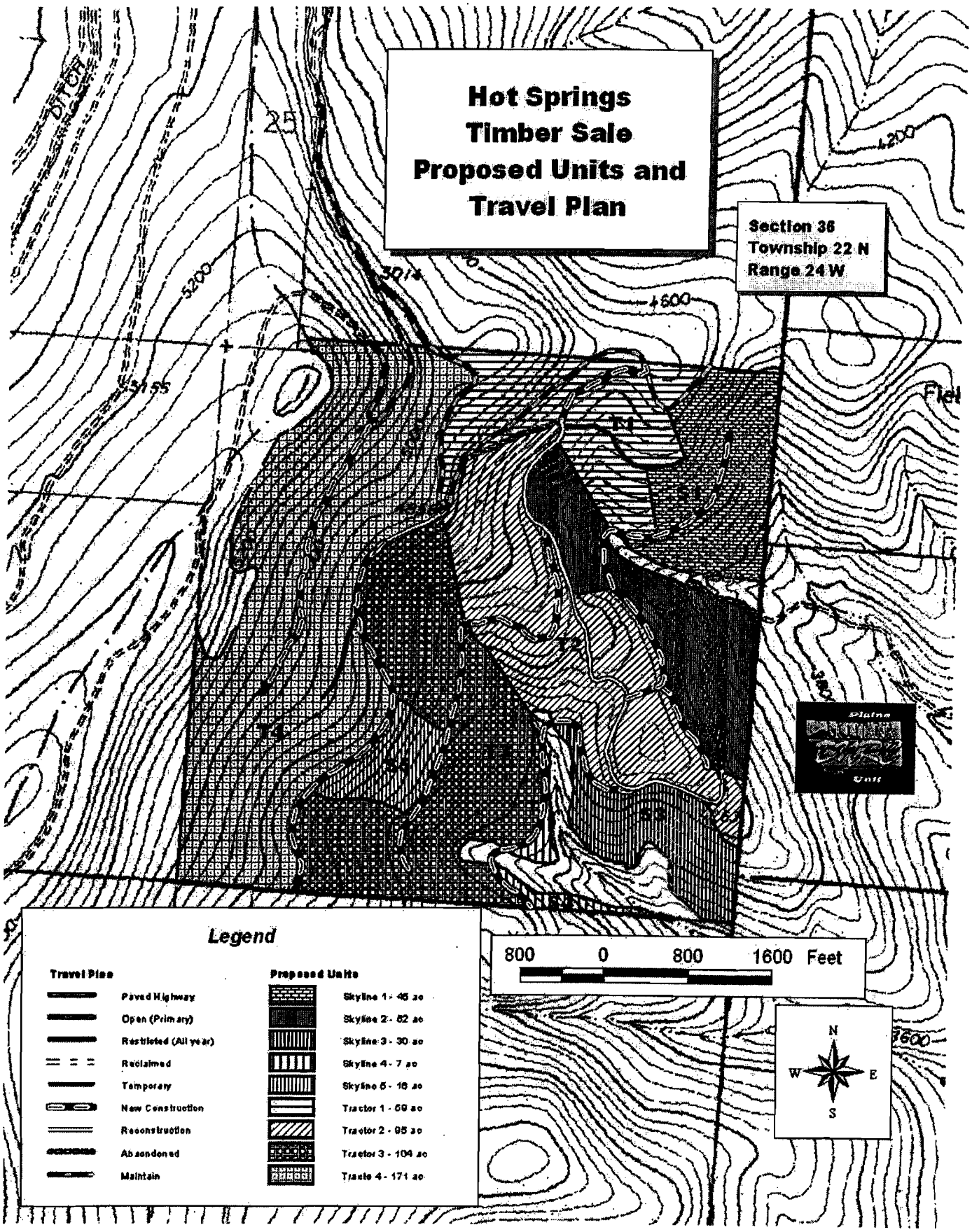
Sale & Access Maps

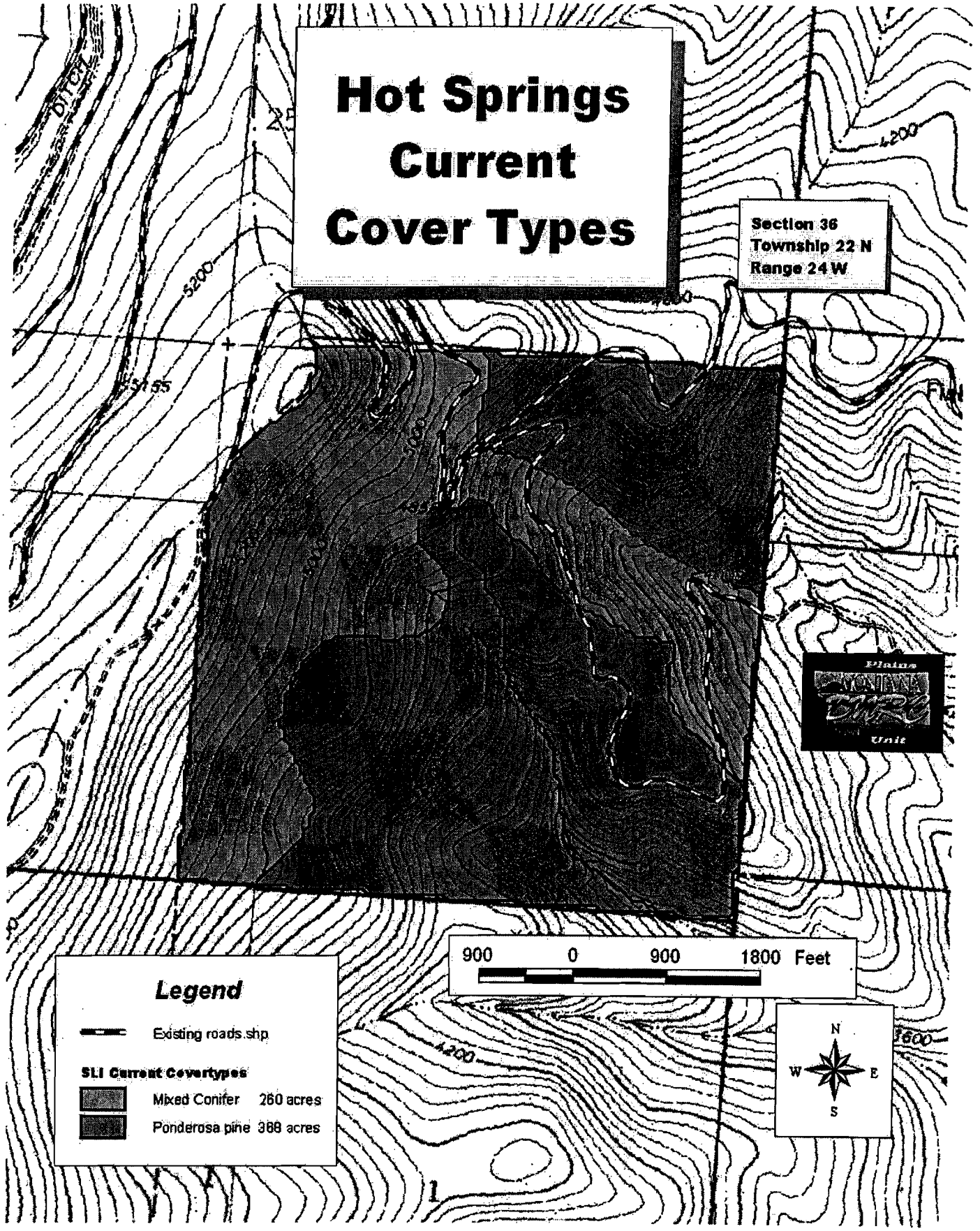
Harvest Unit & Travel Plan

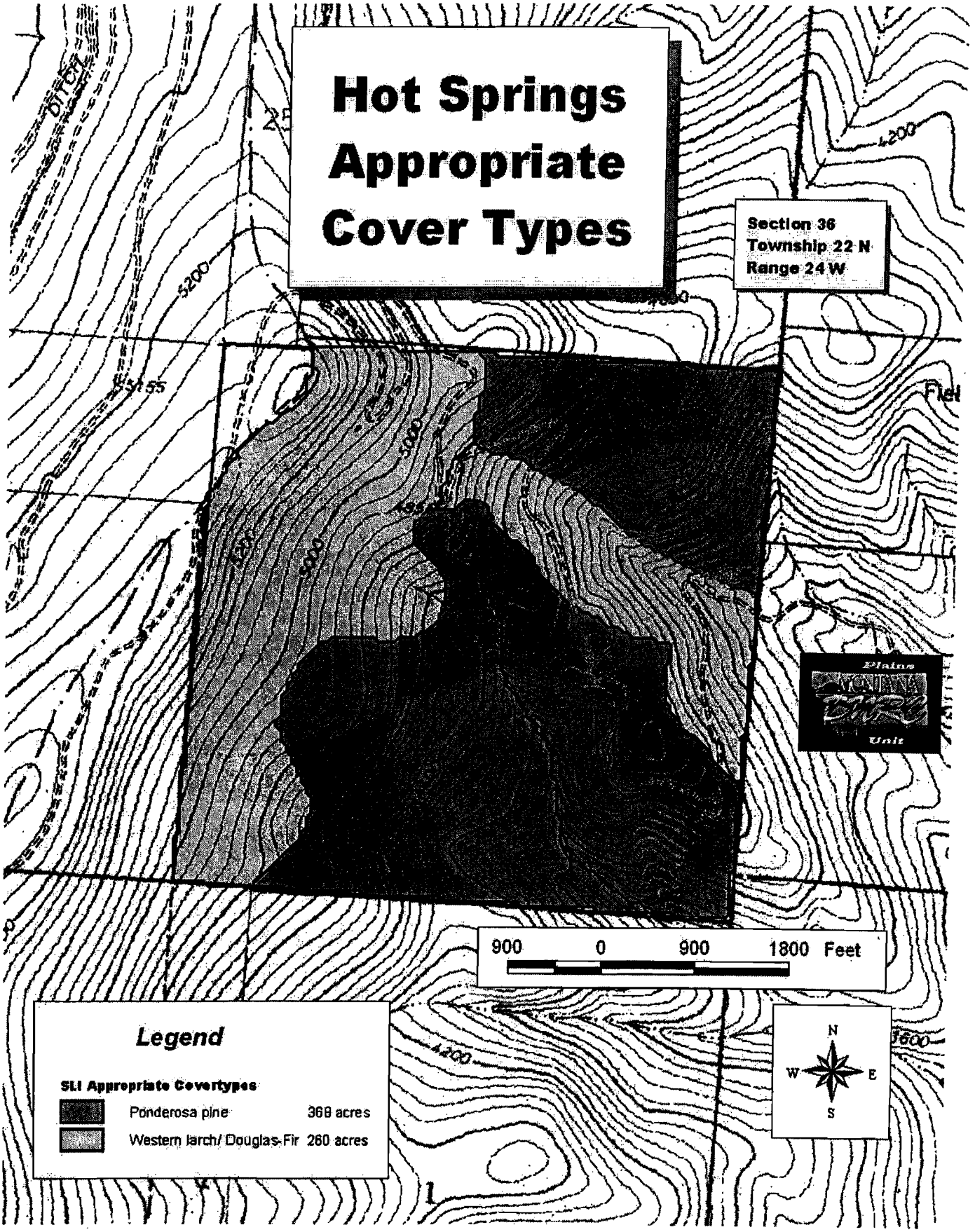
Cover Types


Hot Springs
Proposed Project
Vicinity Map
Mile Marker
21.5
Section 36
Township 22 N
Range 24 W
Hot Springs
Highway 28
Plains
Highway 200
N
W
E
S
2
0
2
4 Miles
Plains
MONTANA
Unit


Hot Springs
Proposed
Timber Sale
Haul Route
Plains
MONTANA
DNRC
Unit
Three Dog Down
Billboard
Section 36
Township 22 N
Range 24 W
Mile Marker 21.5
Highway 28
Hot Springs
Legend
Haul Roads
Paved Highway
Open (Primary)
Restricted (All year)
Reclaimed
Temporary
New Construction
Reconstruction
Abaondoned
Maintain
N
W
E
S
1
0
1
2 Miles


Hot Springs
Timber Sale
Proposed Units and
Travel Plan
Section 36
Township 22 N
Range 24 W
Legend
Travel Plan
Paved Highway
Open (Primary)
Restricted (All year)
Reclaimed
Temporary
New Construction
Reconstruction
Abandoned
Maintain
Proposed Units
Skyline 1 - 45 ac
Skyline 2 - 82 ac
Skyline 3 - 30 ac
Skyline 4 - 7 ac
Skyline 5 - 16 ac
Tractor 1 - 69 ac
Tractor 2 - 95 ac
Tractor 3 - 104 ac
Tractor 4 - 171 ac
800 0 800 1600 Feet
N
W
E
S


Hot Springs
Current
Cover Types
Section 36
Township 22 N
Range 24 W
Legend
Existing roads.shp
SLI Current Covertypes
Mixed Conifer 260 acres
Ponderosa pine 388 acres
900 0 900 1800 Feet
N
W
E
S
5200
4200
Plains
Unit


Hot Springs
Appropriate
Cover Types
Section 36
Township 22 N
Range 24 W
5200
5000
4200
900 0 900 1800 Feet
Legend
SLI Appropriate Covertypes
Ponderosa pine 368 acres
Western larch/ Douglas-Fir 260 acres
N
W
E
S

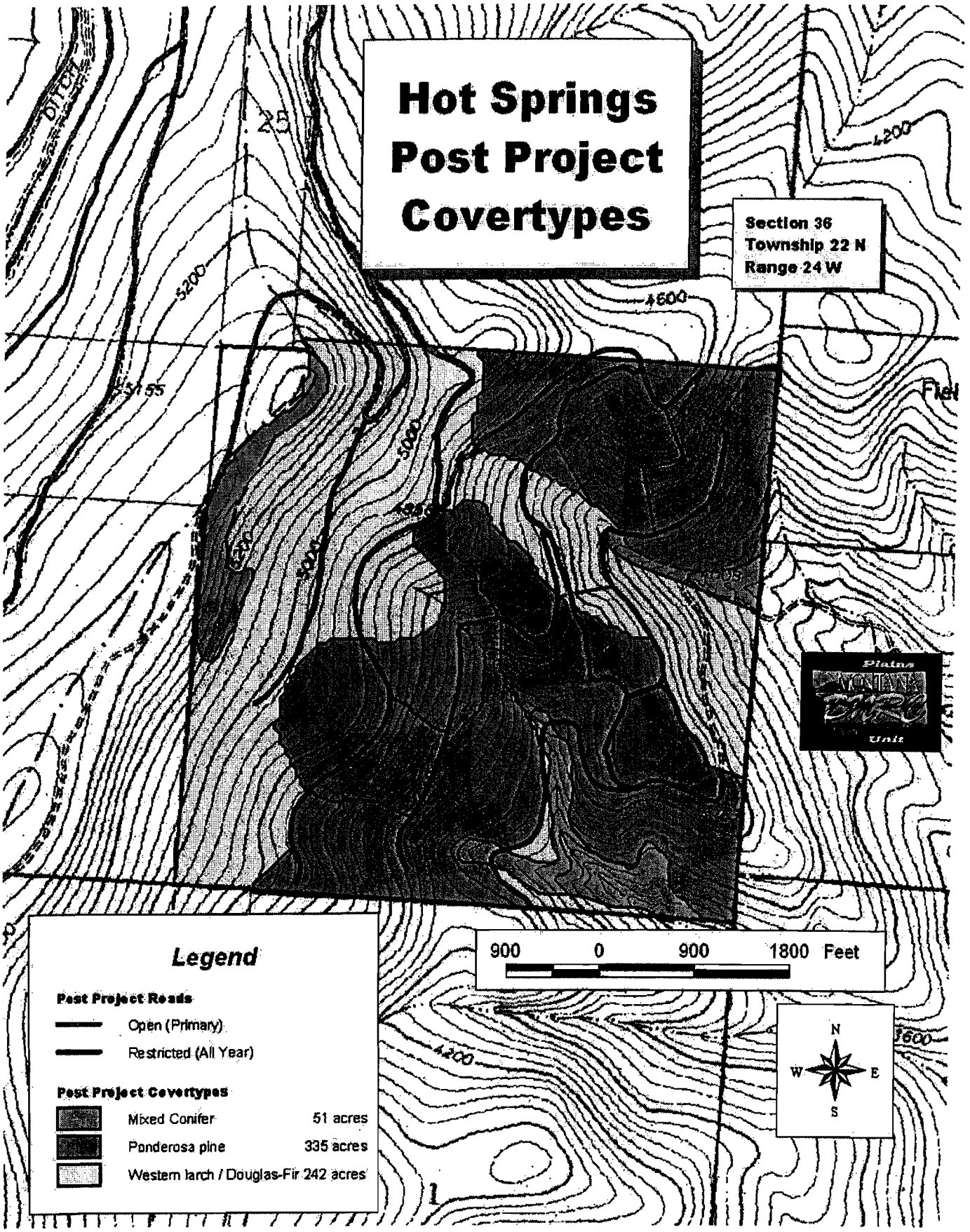

Hot Springs
Post Project
Covertypes
Section 36
Township 22 N
Range 24 W
Legend
Post Project Roads
Open (Primary)
Restricted (All Year)
Post Project Covertypes
Mixed Conifer 51 acres
Ponderosa pine 335 acres
Western larch / Douglas-Fir 242 acres
900 0 900 1800 Feet
N
W
E
S
Plains
Unit

TABLE 1

HOT SPRINGS PROJECT COVERTYPE COMPARATIVE TABLE

	SLI Current Cover types	SLI Appropriate Cover types	Post Project Cover types	Net Change Acres
MC	**260**	**0**	**51**	**-209**
PP	**368**	**368**	**335**	**-33**
WL/DF	**0**	**260**	**242**	**242**
Total Acres	**628**	**628**	**628**	

Attachment 2

Resource Analysis

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Vegetation Analysis

Introduction

This analysis is designed to disclose the existing condition of the vegetative resource and display the anticipated effects that may result from each alternative of this proposal. (During the initial scooping, issues were developed by the public and internally regarding vegetative conditions.)

- Concern regarding maximizing the return to the School Trust Fund by intensively managing for healththy and biologically diverse forests; Improve forest health.
- Concern regarding the cumulative impacts timber harvest activities would have on adjacent Tribal lands & the cultural, historic and recreational use of its members.
- Concern regarding impacts to threatened & endangered plant and animal species.

Analysis Area

The analysis area for vegetation is the state section 36 of T22N R25W referred to as the Hot Springs parcel. This analysis would adequately allow for the disclosure of existing conditions, direct, indirect, and cumulative impacts.

Analysis Method

The Plains Unit typically prepares two to four timber sales per year. Each proposed project is evaluated for its potential effects on lands managed by the DNRC and the surrounding landscape. Methods used in the analysis included review of stand level inventory (SLI) data, field visits, review of scientific literature, aerial photography, and consultation with other professionals.

Existing Condition

Past and current events have changed the forest conditions on the proposed parcel involved in the project area from what would have been present historically according to Losensky's "Historical Vegetation of Montana" (1997). The area was historically characterized by frequent, low-intensity wildfires prior to the early 1900's. Since the early 1900's fire has been virtually excluded from the project area. Logging activities have occurred on the proposed area since the 1930's. Section records show that 252mbf was removed in 1935, 172mbf in 1936 and 3,689mbf in 1938. Of this volume, 87% removed was ponderosa pine. 20mbf was removed in 1970. Commercial Christmas tree permits were issued in 1953, 1955 and 1959. See Attachment 3, Prescriptions, for detailed descriptions of current vegetative conditions. The previous logging and fire suppression history of this parcel has led to stands that are not appropriate timber types. Those stands that are appropriate timber types have become overstocked and are not regenerating with appropriate species composition. Current and post harvest stand maps can be seen in Attachment 1, Maps.

Some stands within the project area are beginning to show increases in fuel loading as mortality begins to take hold in both the overstocked understory and intermediate components of these stands. Contributing to the mortality in the intermediate components of these stands are heavy infestations of Dwarf mistletoe, *Arceuthobium douglasii* & *Arceuthobium laricis*, Fir Engraver beetle, *Scolytus ventralis*, Indian paint

fungus, *Echinodontium tinctorium* and root-rots. There is a small component of noxious weeds, primarily Spotted Knapweed, present along the open roads within the project area.

Direct and Indirect Effects of Activities on Vegetation

No Action Alternative
No timber harvest or associated activities would occur under this alternative. Timber types would continue to advance towards climax conditions with shade tolerant Douglas-fir and grand fir continuing to thrive in the understory. These species have already began to become dominate and are replacing the Ponderosa pine and western larch. Growth and vigor of the trees present in the analysis area would continue to decline. Noxious weeds would continue to exist along the roads and move into the forested areas as natural disturbances prepare appropriate seedbeds.

Action Alternative
The proposed action alternative would harvest timber on approximately 578 acres. Smaller, shade tolerant trees would be selected for removal, along with those affected by or susceptible to insect and disease mortality. More detailed information for treatment by individual units can be obtained in Attachment 3, Prescriptions. Obliteration of some access points as well as gated road closures would prevent the unauthorized removal of snags. Through harvest and site preparation activities, fuel loadings would be reduced by the removal of ladder fuels from the understory, intermediate components of these stands as well as crown spacing in the intermediate and overstory components. Growth and vigor would increase because residual tree spacing would allow full light to crowns and more access to water. Noxious weeds would be monitored and addressed through an integrated pest management plan including chemical and biological control methods.

Cumulative Effects
No Action Alternative
Under this alternative, stand structure and species composition on State land across the Plains Unit are expected to continue the change towards more shade tolerant species. Fuel loading is also expected to increase.

Action Alternative
Across the Plains Unit, there would be a slight increase toward appropriate cover types, as proposed treatments would alter the current type. The project area would be altered with regard to overall size class distribution and stocking levels. Fuel loading, ladder fuels, insect and disease incidence would be reduced. This change would have a minor impact across the landscape of the Plains Unit as this project affects only 578 acres of the 52,795 acres on the Plains Unit.

HYDROLOGY ANALYSIS

Introduction

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

- Timber harvesting and road construction has the potential to increase water yield which in turn may affect stream channel stability
- Timber harvesting and road construction activities may increase sediment delivery into stream and affect water quality.

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

Analysis Methods

Sediment Delivery
The methods applied to the project area to evaluate potential direct, indirect and cumulative effects include a field review to look at potential sediment sources from haul routes. Roads and stream crossings currently existing on Trust Lands were evaluated to determine existing sources of introduced sediment.

Water Yield
The water-yield increase for the watershed in the project area was determined using the Equivalent Clearcut Acres (ECA) method as outlined in *Forest Hydrology, Part II (Haupt et. al., 1976).*

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

In order to evaluate the watershed risk of water yield increase effectively, a threshold of concern for each watershed was established. Thresholds were established based on evaluating the acceptable risk level, resources value, and watershed sensitivity.

Water yield would be disclosed as a cumulative effect in the 'Existing Conditions' portion of this report because the existing condition is a result of all past harvesting and associated activities. In the 'Environmental Effects' portion of this report, water yield increases as a result of *this project* would be disclosed as a direct effect. The cumulative water yield increase as predicted to include each alternative would be disclosed as a cumulative effect.

Analysis Area

Sediment Delivery
The 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.

Water Yield and Cumulative Effects
The analysis area for water yield is the Hot Springs Creek watershed from the headwaters downstream the confluence of the unnamed tributary in section 4 within the town of Hot Springs. This is an appropriate scale of analysis due to the size of the project versus the watershed size and the low potential for impacts.

Water Uses and Regulatory Framework

Water Quality Standards
This portion of the Flathead River basin, including the tributaries to Hot Springs Creek are classified as B-1 by the Confederated Salish and Kootenai Tribes of the Flathead Reservation Surface Water Quality Standards and Antidegradation Policy (CS&KT, 1995). Water in B-1 classified waterways is suitable for drinking, culinary and food processing purposes after conventional treatment, bathing, swimming and recreation, growth and propagation of salmonoid fishes and associated aquatic life, waterfowl and furbearers, and agricultural and industrial water supply.
Water quality regulations prohibit any increase in sediment above naturally occurring concentration in water classified B-1. *Naturally occurring* means the range, mean, mode and other appropriate descriptors of seasonal water quality in Reservation waters occurs at levels over which humans have no control or material derived from runoff or percolation over developed land occurs where all reasonable and cost-effective best management practices have been applied (CS&KT, 1995).

Other water quality standards present in the Hot Springs drainage include a C-3 classification on Hot Springs Creek (mainstem) from the Hot Springs water supply intake to the Little Bitterroot River. Water classified C-3 are suitable for bathing, swimming and recreation, marginal growth and propagation of not-salmonid fishes and associated aquatic life, waterfowl, furbearers, as well as agricultural and industrial water supply.

Water Quality Limited Waterbodies
Waters included in the boundary of the Flathead Reservation are not included in the Montana Department of Environmental Quality 303(d) list. The 303(d) list is compiled by the DEQ as required by Section 303(d) of the Federal Clean Water Act and the Environmental Protection Agency Water Quality Planning and Management Regulations (40 CFR, Part 130). Under these laws, DEQ is required to identify water bodies that do no fully meet water quality standards, or where beneficial uses are threatened or impaired.

Streamside Management Zone Law (SMZ)
All rules and regulations pertaining to the Streamside Management Zone (SMZ) Law would be followed. An SMZ width of 100 feet is required on Class I and II streams when the slope is greater then 35%. An SMZ width of 50 feet is required when the slope is less than 35%.

Water Rights and Beneficial Uses

Water rights for surface water exist on Hot Springs Creek for stock watering, irrigation, commercial use, domestic water, municipal water, lawn and garden, fish propagation, geothermal heating, wildlife/waterfowl, and recreation.

Existing Condition

The proposed Hot Springs Timber Sale is located approximately three miles west of Hot Springs, Montana in Section 36, Township 22N, Range 25W. The majority of the section is within the Hot Springs Creek drainage with the remaining portion drained by McGinnis Creek, a tributary to the Thompson River. No harvest is proposed outside of the Hot Springs drainage; therefore McGinnis Creek would not be addressed.

Elevations in the analysis watershed range from 2840 feet in section 3, east of the Hot Springs town site to 6000 feet at the watershed divide. Precipitation varies from 18 inches per year at the lowest point to near 40 inches at the higher elevations.

The Hot Springs analysis area watershed is a mostly forested, 6,330-acre tributary to the Little Bitterroot River and ultimately the Flathead River. Management of the watershed is mainly Confederated Salish and Kootenai Tribe with a small amount owned by non-industrial private landowners. The Montana Department of Natural Resources and Conservation manages approximately 625 acres of Trust Lands within the watershed. Until recently, the creek was used as the municipal water supply for the town of Hot Springs. Currently groundwater wells are used as the water source for Hot Springs (BIA, 1995).

During field review, the main channel that flows out of the southeast corner of the state section was estimated to be a Rosgen 'B' channel. The channel gathers flow from the southern portion of the state section and from springs and appears to be the only perennial channel within the state section. The channel exhibits characteristics of stability such as moss on rocks that indicate bedload movement. Common small woody debris aggregates and larger woody debris have created sediment traps and resulted in overflow channels immediately below the state parcel. Riparian vegetation appears to be intact with cedar, grand fir and alpine fir creating a canopy.

Cumulative Effects

The CS&KT hydrologist modeled water yield in Hot Springs Creek in 1995 for the Hot Springs Management Area Proposed Timber Sale Environmental Assessment (BIA, 1995) using the WATSED model. Using the harvest data from CS&KT, the existing annual water yield increase was estimated at 7.8% using procedures outlined in *Forest Hydrology, Part II (Haupt et. al., 1976)*. As required by ARM 36.11.424, the threshold value for water yield is set at 14% after considering the channel characteristics, beneficial uses present and existing watershed conditions.

Environmental Effects

This section discloses the anticipated indirect, direct and cumulative effects to water resources within the affected environment from proposed actions.

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

-Miles of new road construction and road improvements
-Potential for sediment delivery to streams
-Increases in ECA and annual water yield

Description of Alternatives

No Action Alternative
Under this alternative, no timber harvest or associated activities would be implemented.

Action Alternative
Under this alternative, approximately 578 acres of timber harvest would be implemented using conventional ground based and cable yarding techniques. Harvest prescriptions would range from commercial thinning to regeneration harvest (seed tree, shelterwood).

Associated activities include:
11.0 miles road and drainage feature maintenance
3.9 miles new construction including 6 culvert installations,
1.6 miles reconstruction and improvement,
0.4 miles temporary road to be reclaimed after use
0.7 miles of road abandonment.

Direct and Indirect Effects

No Action Alternative

Sediment Delivery
No timber harvest or road construction is associated with this alternative. Changes in stream channel conditions and water quality would be dictated by natural events and future actions.

Water Yield
No timber harvest or road construction is associated with this alternative. Annual water yield increases would continue to decrease as vegetation increases or decreases due to natural and anthropogenic causes.

Action Alternative

Sediment Delivery
Approximately 578 acres of the state section would be treated with a silviculture prescription in the Hot Springs Creek watershed. This acreage would include 428 acres of ground based harvesting and 150 acres of cable yarded harvesting.

Of the three draws present in the state section; one has perennial flow and two are intermittent or ephemeral. Harvest within the Streamside Management Zone (SMZ) would not be implemented on the perennially flow draw. All timber harvest would be regulated by the SMZ law and prohibit equipment

operation within the SMZ. In addition to the resource protection provided by the SMZ law, forestry BMPs would be implemented in all aspects of the proposed timber harvest.

Road drainage improvements and reconstruction would be implemented on approximately 1.6 miles of road to reduce the potential for sediment introduction from haul routes. The drainage improvements may include adding drive-through drain dips and ditch-relief CMPs, cleaning culvert inlets/outlets and reshaping the road prism.

Six CMPs would be installed in association with the road construction. Five of the CMPs are 24 inches in diameter and would be installed during dry conditions on intermittent streams. The remaining CMP is a 36-inch diameter culvert that would be installed on the perennial stream. Standard installation procedures would be used during installation including using silt fences, slash filter windrows and rock armor around the inlet and outlet. Although all forestry BMPs would be implemented and caution would be taken to prevent sediment introduction into the stream, potential would exist for a short-term increase in turbidity. Prior to installing the stream/draw crossings DNRC would obtain an Aquatic Lands Conservation Ordinance permit from the CS&KT and other permits deemed necessary.

By implementing this alternative as presented and in accordance with the all applicable forestry BMPs, it is unlikely that adverse long-term impacts to water quality and beneficial uses, including cold-water fisheries, would result from the harvesting and road construction. Short-term impacts are possible during installation of the CMPs, however these impacts would be minimized with erosion control techniques and timing restrictions. A 318 permit (short term turbidity exemption) may be required if this alternative were selected.

Water Yield

Approximately 578 acres of timber harvest and 3.9 miles of new road construction in the Hot Springs Creek watershed would be implemented under this alternative. The timber harvest and road construction combined results in approximately 4.9% annual water yield increase in the Hot Springs Creek watershed.

Cumulative Watershed Effects

Sediment Delivery

No Action Alternative

No timber harvest or road construction is associated with this alternative. Existing sediment sources would continue to contribute sediment to streams until remedial action were implemented or natural healing occurs.

Action Alternative

After considering the stream channel characteristics, beneficial uses and past activities conducted by all landowners in the watershed, due to the harvest methods that would be employed on harvest, units this alternative would not likely result in adverse impacts to water quality. By implementing BMPs on all new and existing roads and harvest units, potential sediment introduction into surface water bodies would not likely result in measurable adverse cumulative effects to water quality. Short-term impacts may result as described in the direct and indirect effects portion.

Water Yield

No Action Alternative

No timber harvest or road construction activities are proposed under this alternative; therefore no water yield increase would result from implementation of this alternative. Water yield would continue at or near the current level and would decline as past harvest units within the watershed regenerate and move closer to pre-disturbance levels.

Action Alternative

The cumulative annual water yield increase from this alternative would be about 12.7% over modeled pre-disturbance levels. This includes all actions on all ownerships within the watershed that contribute to water yield increase. The threshold of concern set at 14% annual water yield increase; this alternative would be within the recommended threshold. As discussed on page 37 of the Hot Springs Management Area Proposed Timber Sale Environmental Assessment (BIA, 1995), general Forest Service guidelines in this region place the threshold range for increased runoff between 10% and 20%.

By keeping the annual water yield increases below the recommended threshold; it is unlikely that adverse impacts to beneficial uses would result from the implementation of this alternative.

Literature

BIA, 1995. Hot Springs Management Area Proposed Timber Sale Environmental Assessment. 93pp.

Haupt, H.F., et al., 1974. Forest Hydrology Part II Hydrologic Effects of Vegetation Manipulation. USDA Forest Service, Region 1. Missoula, Montana.

CS&KT, 1995. Confederated Salish and Kootenai Tribes of the Flathead Reservation Surface Water Quality Standards and Antidegradation Policy. 114pp.

SOILS ANALYSIS

Introduction

This analysis is designed to disclose the existing condition of the soil resources and display the anticipated effects that may result from each alternative of this proposal. During the initial scoping, no issues were identified by the public regarding soil productivity. The following issue statement was expressed from internal comments regarding the effects of proposed timber harvesting:

- Timber harvest activities may result in reduced soil productivity due to compaction and displacement, depending on area and degree of harvest effects.

Analysis Area

The analysis area for soils is the state parcel (Section 36, T22N, R25W). This analysis area would adequately allow for disclosure of existing conditions, direct, indirect and cumulative impacts.

Analysis Methods

Soil productivity would be analyzed by evaluating the current levels of soils disturbance in the proposed project area.

Existing Conditions

Geology/Soils

No especially unique or unstable geology was note in the project area. This parcel has three basic soil units with varying vegetation characteristics dependent upon slope, aspect and elevation.

The map unit 30Q consists of gravelly silt loams over fractured bedrock. Slope shape is complex with moderately sloping draws and convex side slopes. This terrain is moderately dissected by small, steep perennial and ephemeral drainages that typically flow only during runoff periods.

Soils are moderately coarse and somewhat excessively well drained. Typical soils range from 5 to 2 inches deep underlying organic layers 1 to 2 inches deep. Infiltration of precipitation is rapid and soil moisture retention is moderate to low dependent upon the surface litter.

Management Implications

Timber productivity varies with aspect due to the available moisture and solar heating. Sloes less than 35% are well suited to conventional ground-based harvest methods although compaction can lower soil productivity. Compaction potential can be limited by operating on dry, frozen or snow covered soils. Due the rapid infiltration capacity of the soils the season of use is long and equipment operations are limited for only the short wet period during spring runoff. The droughtiness of the soils in this parcel makes conifer regeneration a concern because of competition with grasses. Well-distributed scarification

of up to 30% of site can enhance establishment of serial conifers, yet maintain most of the duff, which is important for moisture and nutrient retention.

Material is well suited to road construction. Rocky outcrops are generally limited to ridge locations. Road cut and fillslopes are difficult to revegetate due to the droughty soils. Reseeding immediately following construction activities can mitigate revegetation difficulty. Providing proper road drainage can mitigate moderate erosion and sediment delivery hazards. Erosion hazard is low on skid trails, firelines and roads. Sediment delivery efficiency to streams is low. The map unit 32Q consist of gravelly soils forming in frost-churned residium of fragmented bedrock. Slope shape is convex on high elevation ridge tops. Soils are moderately deep (8-14 inches) and well drained with volcanic ash influence.

Management Implications
Timber productivity is moderate with the cold climate of ridge tops being the primary limiting factor to tree growth. Soil moisture does not limit regeneration although plant competition is a concern for tree regeneration. Soil moisture and nutrients are mainly in surface soils, therefore displacement or mixing of subsoils with surface soils should be avoided to maintain productivity.

Material is good for road construction with moderate erosion hazard potential that can be mitigated with proper surface drainage. Sediment delivery efficiency is low due to the general ridge top location of this soil type.

Cumulative Effects
Past harvesting in this section (1943-1944) employed conventional ground based equipment for harvest activities. Estimated skid trail spacing used during the past entry ranged from 60 to more than 100 feet apart however evidence exists that some skidding was done in draws. All skid trail observed during field reconnaissance were vegetated with the same species as surrounding areas, but productivity of the skid trails was reduced compared to adjacent areas.

Environmental Effects

Description of Alternatives

No Action Alternative
Under this alternative, no timber harvest or associated activities would be implemented.

Action Alternative
Under this alternative, approximately 578 acres of timber harvest would be implemented using conventional ground based and cable yarding techniques. Harvest prescriptions would range from commercial thinning to regeneration harvest (seed tree, shelterwood).

Associated activities include:
11.0 miles road and drainage feature maintenance
3.9 miles new construction including 6 culvert installations,
1.6 miles reconstruction and improvement,
0.4 miles temporary road to be reclaimed after use
0.7 miles of road abandonment.

Direct and Indirect Effects of Activities on Soil Productivity

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

Action Alternative
The majority of the area proposed for harvest under this alternative have been harvested in the past using ground based harvest methods. In order to limit cumulative impacts, existing skid trails would be used if they are properly located and adequately spaced. By reusing existing skid trails and mitigating the direct and indirect effects with soils moisture restrictions, season of use and method of harvest, the risk of detrimental long-term impacts to soil productivity would be low.

Under the action alternative cable yarding is required on 150 acres of the 578 total harvest areas. The remaining 428 acres would be harvested using conventional ground based yarding systems. Table SS exhibits the expected impacts to soil from compaction and displacement if:

1) Season of operation is during the summer and fall.
2) Trafficked areas of skid trails and landings are restricted to 20% of the harvest units
3) Summer harvest restricts harvest equipment operation to periods of 20% or less soil moisture at 6 inches below the soil surface.

Table SS: Expected acres of impact to soil from compaction and displacement

Harvest Method and Season	No Action Alternative	Action Alternative
Ground Based[1]	0	64.2
Cable[2]	0	15
Total (acres)	0	79.2
Total Harvest Acres	0	578
Percent Area Impacted	0	**13.7%**

[1] 75 percent of the summer ground-based skid trails may exhibit impacts
[2] 10 percent of the cable ground may exhibit impacts

In addition to the potential impacts from harvesting, approximately 8 acres would be removed from production and converted to roads.

Due to the compaction and displacement impacts to the soil as show in Table SS, DNRC would expect a reduction in soil productivity from the action alternative on the displayed acres. As vegetation begins to establish on the impacted areas, and freeze-thaw cycles occur, the area of reduced productivity would decrease. Therefore, direct effects to long-term soil productivity in the project area would be considered acceptable. Additional mitigation measures to maintain long-term soil productivity can be found at the end of this document.

Cumulative Soil Effects

Cumulative effects would be controlled by limiting the area of adverse soil impacts to less than 15% of harvest units through implementation of BMPs, skid trail planning on tractor units and limiting operations

to dry or frozen conditions. Future harvest opportunities would likely use the same road system, skid trails and landing sites to reduce additional cumulative impacts. Large woody debris would be retained for nutrient cycling long-term soil productivity.

GENERAL MITIGATION MEASURES:

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

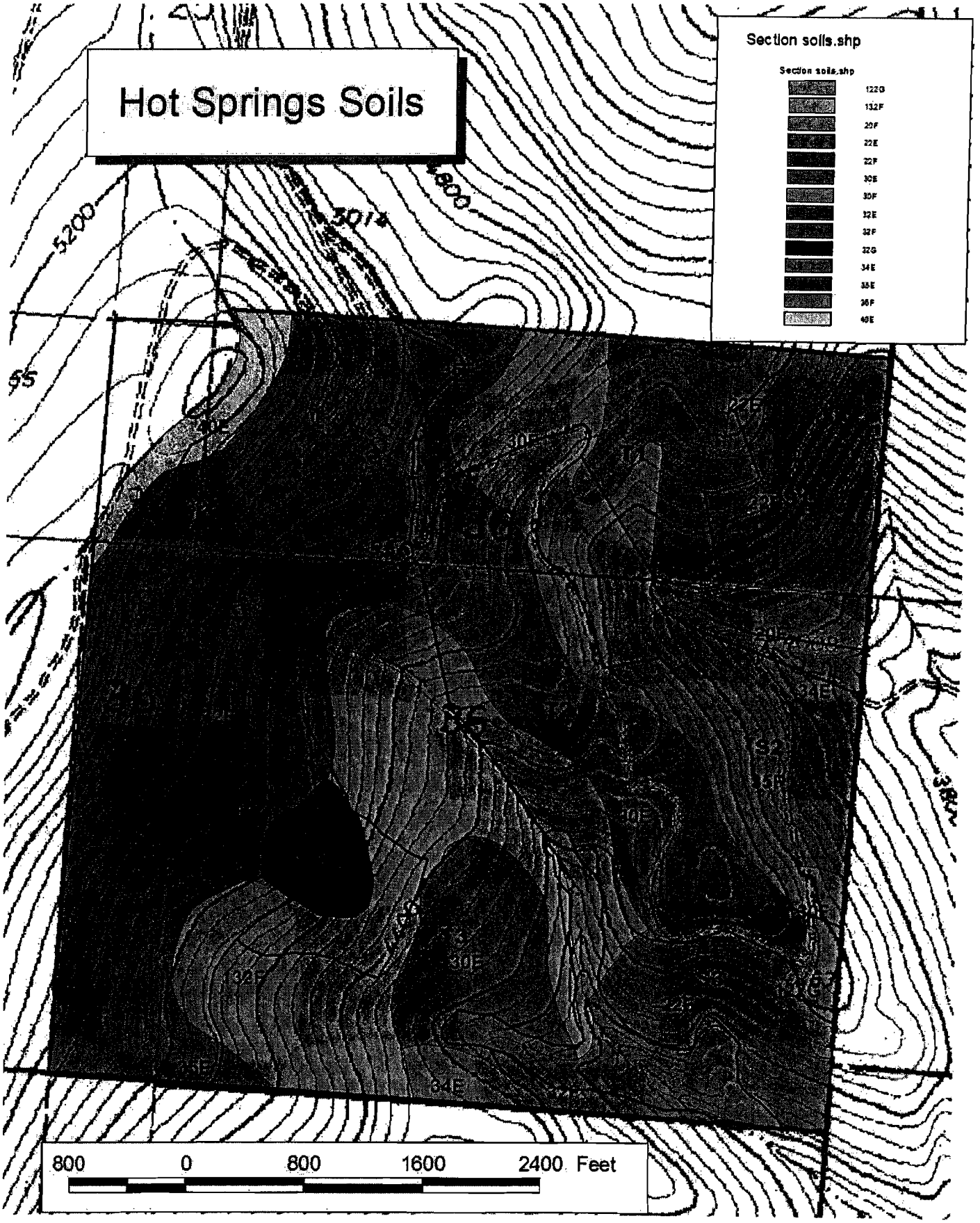
*On ground skidding units, the logger and sale administrator would agree to a general skidding plan prior to equipment operations. Skid trail planning would identify which main trails to use, and what additional trails are needed. Trails that do not comply with BMPs (i.e. draw bottom trails) would not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

*Tractor skidding should be limited to slopes less than 40%. Short steep slopes above incised draws may require a combination of mitigation measures based on site review, such as adverse skidding to ridge or winch line skidding from more moderate slopes less than 40%.

* Slash Disposal- Limit disturbance and scarification to 30-40% of harvest units. No dozer piling on slopes over 35%; no excavator piling on slopes over 40% unless the operation can be completed without causing excessive erosion. Consider lop and scatter or jackpot burning on steeper slopes. Accept disturbance incurred during skidding operations to provide adequate scarification for regeneration.

* Retain 10 to 15 tons large woody debris and a majority of all fine litter feasible following harvest. On commercial thin units where whole tree harvesting is used implement one of the following mitigations for nutrient cycling; 1) use in woods processing equipment that leaves slash on site, 2) for whole tree harvest, return skid slash and evenly distribute within the harvest area, or 3) cut off tops from every third bundle of logs so that tops are dispersed as skidding progresses.

*Seed disturbed areas such as landings and main skid trails within 7 days of completing use. NWLO hydrologist would provide grass seed mix. All road construction/reconstruction activity would be seeded and fertilized as recommended by DNRC hydrologist and approved by Forest Officer.


Hot Springs Soils
Section soils.shp
Section soils.shp
122G
132F
20F
22E
22F
30E
30F
32E
32F
32G
34E
35E
36F
40E
5200
3014
800
55
40E
30F
22E
34E
30E
34E
800
0
800
1600
2400 Feet

FISHERIES ANALYSIS

Introduction
This analysis is designed to disclose the existing condition of the fisheries resources and display the anticipated effects that may result from each alternative of this proposal. During the initial scoping the following issues were expressed regarding the effects of proposed timber harvesting:

- Timber harvesting and road construction activities may affect fish habitat by increasing sediment delivery to streams.

These issues can best be evaluated by analyzing the anticipated effects of sediment delivery on streams supporting fish habitat within the project area.

Analysis Area

Sediment Delivery
The 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 within the proposed project area that could result from no action and the proposed action.

Cumulative Effects
The 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 within the proposed project area that could result from no action and the proposed action.

Analysis Methods

Expected effects to fisheries habitat would be addressed qualitatively using the current condition as a baseline and disclosing the expected changes due to the alternatives proposed.

Sediment Delivery

The analysis methods for sediment delivery would mimic those used in the Hydrology portion of this report.

Existing Condition
Information regarding existing fish populations in Hot Springs Creek is limited. According to the Montana Rivers Information System (MRIS), Hot Springs Creek may contain a population of westslope cutthroat trout although no survey was conducted. The Hot Springs Management Area Proposed Timber Sale Environmental Assessment (BIA, 1995) states (page 31) that, "Hot Springs Creek supports a population of purestrain westslope cutthroat trout with densities of approximately 850 trout per mile of stream." This EA further characterizes the population as typical of other resident population on the Flathead Indian Reservation with only a few year classes present. The genetic purity is suggested as a result of a downstream barrier to migration from other species.

Due to the ephemeral flow regime and intermittent character of streams in the state parcel it is unlikely that fish are present on the state section except for potential habitation in the southeast corner of the Trust Land parcel. During field review and reconnaissance, no fish were observed on the state parcel.

Sediment delivery

Sediment delivery from the state parcel to fish bearing streams is limited in potential at best. The perennial stream in the southeast corner of the section does not have any road crossings and the vegetation is estimated at 85-140 with the average age of 100 years. This indicates that little to no harvest was done in the 1940's in this portion of the section. Other intermittent streams in the parcel are stable and were not identified as substantial sources of sediment during field review.

Environmental Effects

This section discloses the anticipated indirect, direct and cumulative effects to fisheries within the affected environment from proposed actions.

The primary concerns relating to fisheries within the affected environment are potential impacts to water quality from sources outside the channel as well as inside the channel. In order to address these issues the following parameters are analyzed by alternative:

-Miles of new road construction on fish bearing streams
-Potential for sediment delivery to streams

Description of Alternatives

No Action Alternative
Under this alternative, no timber harvest or associated activities would be implemented.

Action Alternative
Under this alternative, approximately 578 acres of timber harvest would be implemented using conventional ground based and cable yarding techniques. Harvest prescriptions would range from commercial thinning to regeneration harvest (seed tree, shelterwood).

Associated activities include:
11.0 miles road and drainage feature maintenance
3.9 miles new construction including 6 culvert installations,
1.6 miles reconstruction and improvement,
0.4 miles temporary road to be reclaimed after use
0.7 miles of road abandonment.

Direct and Indirect Effects

No Action Alternative

Sediment Delivery

No timber harvest or road construction is associated with this alternative. Changes in stream channel conditions and water quality would be dictated by natural events and future actions.

Action Alternative

Sediment Delivery

Approximately 578 acres of the state section would be treated with a silviculture prescription in the Hot Springs Creek watershed. This acreage would include 428 acres of ground based harvesting and 150 acres of cable yarded harvesting.

Of the three draws present in the state section, one has perennial flow and two are intermittent or ephemeral. Harvest within the Streamside Management Zone (SMZ) would not be implemented on the perennially flow draw. All timber harvest would be regulated by the SMZ law and prohibit equipment operation within the SMZ. In addition to the resource protection provided by the SMZ law, forestry BMPs would be implemented in all aspects of the proposed timber harvest.

Road drainage improvements and reconstruction would be implemented on approximately 1.6 miles of road to reduce the potential for sediment introduction from haul routes. The drainage improvements may include adding drive-through drain dips and ditch-relief CMPs, cleaning culvert inlets/outlets and reshaping the road prism.

Seven CMPs would be installed in association with the road construction. Five of the CMPs are 24 inches in diameter and one is 18 inches in diameter. These would be installed during dry conditions on intermittent streams. The remaining CMP is a 36-inch diameter culvert that would be installed on the perennial stream. Standard installation procedures would be used during installation including using silt fences, slash filter windrows and rock armor around the inlet and outlet. Although all forestry BMPs would be implemented and caution would be taken to prevent sediment introduction into the stream, potential would exist for a short-term increase in turbidity. Prior to installing the stream/draw crossings DNRC would obtain an Aquatic Lands Conservation Ordinance permit from the CS&KT and other permits deemed necessary.

By implementing this alternative as presented and in accordance with the all applicable forestry BMPs, it is unlikely that adverse long-term impacts to water quality and beneficial uses, including cold-water fisheries, would result from the harvesting and road construction. Short-term impacts are possible during installation of the CMPs, however these impacts would be minimized with erosion control techniques and timing restrictions. A 318 permit (short term turbidity exemption) may be required if this alternative were selected.

Cumulative Effects

No Action Alternative

No timber harvest or road construction is associated with this alternative. Existing sediment sources would continue to contribute sediment to streams until remedial action were implemented or natural stabilization occurs.

Action Alternative

Sediment Delivery

Due to the harvest methods that would be employed on harvest, units this alternative would not likely result in adverse cumulative impacts to water quality or fisheries habitat. By implementing BMPs on all new and existing roads and harvest units, potential sediment introduction into surface water bodies would not likely increase adverse cumulative effects to water quality. Short-term impacts may result as described in the direct and indirect effects portion.

Current fisheries habitat and populations would not likely be adversely affected with the implementation of this alternative due to the water yield increase as described in the Hydrology analysis and low potential for sediment introduction from harvest units. In order to ensure an acceptable level of risk for potential impacts, all applicable BMPs and mitigation measures would be implemented as described in the *Hydrology* and *Soils* analysis

REFERENCES

BIA, 1995. Hot Springs Management Area Proposed Timber Sale Environmental Assessment. 93pp.

WILDLIFE ANALYSIS

INTRODUCTION

This Appendix assesses the effects of the proposed project on the wildlife resource. The assessment occurs at 2 scales, the coarse filter and the fine filter. The coarse filter analysis assesses the general habitat conditions over the landscape, while the fine filter analysis focuses on specific wildlife species that could be affected by the proposed action.

The coarse filter assessment compares the current habitat conditions to those that could be expected on the site and addresses landscape scale issues. In this analysis, the current habitat conditions would be explored in the context of what might be expected to occur in the project area if natural disturbances were allowed to occur. Ageclass, cover type, and dead wood components of the stands were used to assess these conditions. Additionally, landscape scale issues, such as habitat patch size and connectivity were explored.

In the fine filter assessment, species of special concern or those that fill a specific ecological niche would be considered. The fine filter analysis considers species listed as threatened or endangered under the Endangered Species Act, species listed as sensitive by DNRC, and ungulates managed as big game by Montana Fish, Wildlife and Parks. These species provide a finer look at the effects of forest management on wildlife species. In most cases, these species serve as an assurance that specific habitat conditions or structures are not overlooked in the coarse filter analysis.

Within each filter analysis, a project and landscape level analysis would be conducted. In the project level analysis, existing condition and the changes to those conditions would occur within DNRC ownership in T22N R25W section 36. This analysis area includes 622 acres. In the landscape level analysis, the effects of the project level analysis are put into a landscape context and consider the cumulative effects of other projects. Habitat conditions produced by past human activities and natural events would be included in the existing condition, while on-going (all ownerships) or planned projects (state initiated projects, only) would be considered in the cumulative effects analysis. The size and location of the landscape analysis could vary to choose a biologically logical analysis area. In most cases, the home range size of the species being considered would be used. These home range boundaries could be biologically (grey wolf pack home range, big game winter ranges, telemetry data, etc.) or politically (grizzly bear subunits, Canada lynx analysis areas, etc.) defined. Where biologically or politically areas are not defined, an area that approximates the home range size of the species in question would be used.

METHODS

Scientific literature review was used to determine important habitat components for the coarse filter and for each species considered in the fine filter analysis. Based on these components, I model to assess the amount and location of potential habitat on DNRC ownership was based on the DNRC's stand level inventory database. After completion of the modeling efforts, field visits, data from the Montana Natural Heritage Program, aerial photography, consultations with other professionals, and professional judgment refined the potential habitat model. The results of these models provided the existing condition. The effects of each alternative were analyzed based on changes to the existing condition.

COARSE FILTER ANALYSIS

DNRC recognizes that it is an impossible and unnecessary task to assess an affected environment or the effects of proposed actions on all wildlife species. We assume that if landscape patterns and processes similar to those that species adapted to are maintained, then the full complement of species would be maintained across the landscape (*DNRC 1996*). This "coarse filter" approach supports diverse wildlife populations by managing for a variety of forest structures and compositions that approximate "historic conditions" across a landscape. DNRC typically considers cover type, stand age, stand structure, forest connectivity, and patch size. For each of these components, the existing conditions were compared to the perceived historic condition to assess the effects of each alternative.

To assess the effects of these alternatives in a landscape context, the project area and the adjacent 8 sections, totaling 5,747 acres, were considered. This area consists of Confederated Salish and Kootenai (3,532 acres), U.S. Forest Service (1,591 acres), and DNRC (622 acres) managed lands. The adjacent lands experienced varying intensities of harvest on a majority of the area in the past.

Cover Types:

Existing Condition: The project area consists of 5 stands totaling 622 acres. Presently, 411 acres exist in a mixed conifer cover type, while 211 acres exist in a ponderosa pine cover type. Based on the tree species present, DNRC believes that the mixed conifer stands were historically western larch/Douglas-fir cover type, while the ponderosa pine cover types remain unchanged from the historic condition. In both cover types, the absence of fire and removal of shade-intolerant by past logging allowed regeneration of shade-intolerant trees to develop and contribute to the mid and upper level canopy. These conditions resulted in denser stands with higher amounts of shade-tolerant tree species, thereby enhancing habitat quality and quantity for species that are adapted to closed canopy stands and/or shade tolerant tree species.

Effects of the No Action Alternative: Under this alternative, no timber harvest would occur. Shade tolerant species would continue to increase and eventually dominate the stand. The mixed conifer cover types would be retained with the ponderosa pine cover type converting to mixed conifer types over time, resulting in an increase of 364 acres of mixed conifer cover types in the future. The existing shade intolerant tree species would continue to die and not be replaced, thereby reducing quality cavity nesting material. Species that use dense stands and/or shade-tolerant tree species would benefit at the expense of species that use open habitats and/or shade-intolerant tree species.

Effects of the Action Alternative: This alternative would remove a majority of merchantable trees and focus on converting or maintaining cover types that are expected on these sites. Harvests would retain mature, large, shade-intolerant trees in seed tree units (355 acres) and dominant trees within the commercial thin units (223 acres). These treatments would convert dense stands to more open stands. The seedtree units would be very open with scattered seedtrees and pockets of regeneration. In the future (10-30 years), regeneration of shade intolerant species is expected, thereby adding another vegetative layer. In the commercial thin units, dominant trees of primarily shade intolerant species would be retained, while diseased and/or suppressed trees of primarily shade tolerant species would removed. The resulting condition would resemble a stand that received periodic non-lethal fire over a long period of time. This alternative is expected to convert or retain historic cover types on 559 acres. This conversion

and maintenance is expected to benefit species that rely on more open habitats of shade intolerant dominated trees, at the expense of species that use closed canopy stands with shade tolerant tree species. However, some (41 acres) of these areas, especially around riparian areas would be retained in their current condition and continue to convert to shade-tolerant tree species dominated, older, denser stands. These areas are moister and would be expected to experience longer fire return intervals. These areas would contribute to habitat diversity in the section.

Cumulative Effects of the No Action Alternative: The surrounding landscape is a patchwork of harvest units. It is assumed that these patches are regenerating in shade intolerant tree species and the lighter harvest units are expected to retain the more dominant shade-intolerant tree species. If this were the case, this alternative would retain habitat that is less common in the surrounding landscape.

Cumulative Effects of the Action Alternative: The surrounding landscape is a patchwork of harvest units. It is assumed that these patches are regenerating in shade intolerant tree species and the lighter harvest units are expected to retain the more dominant shade-intolerant tree species. If this were the case, this alternative would convert cover types to those that are more consistent with the perceived historical condition and add to the amount of these types in the surrounding landscape.

STAND AGE

Existing Condition: The project area contains 2 ageclasses; 40-99 (283 acres) and 100-150 (339 acres) years old. Both ageclasses are represented in mixed conifer and ponderosa pine cover types. The historical condition of ponderosa pine cover types typically tended toward the older ageclasses, while western larch/Douglas-fir cover types tended toward more uniformly distribution over the ageclasses (Losensky 1997). In the project area, a majority of ponderosa pine types tend to be younger than what would be expected presumably due to past timber harvests, while the mixed conifer age classes appears closer to what would be expected.

Effects of the No Action Alternative: Under this alternative, the stands would continue to age, thereby increasing the percentage of stands in the older ageclasses. However, not only would the stand age, but shade tolerant trees species would continue to encroach causing the stand to convert the mixed conifer cover types. Aging of the ponderosa pine cover types would move these stands toward more historical conditions, while aging of the western larch/Douglas-fir could artificially increase the amount of older ageclasses. This alternative could benefit species that use older stands with high amounts of dead wood and canopy closure.

Effects of the Action Alternatives: Under this alternative, harvests would remove predominantly subdominant, shade-tolerant trees, while retaining mature, dominant, and primarily shade-intolerant tree species. This situation would result in conditions more similar to those conditions expected under a natural disturbance regime. These conditions would benefit species that use more open stands with a majority of larger trees species.

Cumulative Effects of the No Action Alternative: The surrounding landscape is a patchwork of harvest units. This alternative would contribute older age classes to the surrounding landscape. However, these stands would be denser that what would be expected under a natural disturbance regime. This alternative is expected to benefit species that use dense stands with larger trees.

Cumulative Effects of the Action Alternative: The surrounding landscape is a patchwork of harvest units. This alternative would contribute older age classes to the surrounding landscape in more historic conditions than the no action alternative. This alternative is expected to benefit species that use more open stands with larger trees.

STAND STRUCTURE (DEAD WOOD)

Existing Condition: Dead wood (downed trees and snags) is an important component of the forested ecosystems. Five primary functions of dead wood in the forested ecosystems are: 1) increase structural diversity, 2) alter canopy microenvironment, 3) promote biological diversity, 4) provide critical habitat for wildlife, and 5) act as a storehouse for nutrient and organic matter recycling agents (Parks and Shaw 1996). This analysis focuses on the importance of dead wood as wildlife habitat and the effects of this project on those habitats.

Snags and downed trees provide feeding and rearing sites, along with shelter for an array of wildlife species. Dead wood provides insects, fungus, and wood food sources for small mammals. In turn, these small mammals provide prey for predatory birds and mammals. Additionally, dead wood provides areas with stable temperatures and moisture for animals, along with shelter from the environment, lookout areas, and food storage sites. Small mammals, such as red-backed voles, to large mammals, such as black bears, rely on dead wood for survival and reproduction.

The size, length, decay, and distribution of dead wood affect their capacity to provide specific habitat. Logs less than 6 feet in length tend to dry out and provide limited habitat for wildlife species. Single scattered downed trees could provide lookout and travel sites for squirrels or access under the snow for small mammals and weasels, while log piles provide foraging sites for weasels and denning sites for Canada lynx. Similarly, diameter, height, and snag densities determine the snag habitat value for wildlife species. Larger, taller snags tend to provide nesting sites, while shorter snags and stumps tend to provide feeding sites for birds and mammals. Cavity-nesting birds often nest in areas where several snags are available, while using individual snags as feeding or roosting sites. Therefore, it is important to consider the size and distribution of these resources.

The presence of insects and predaceous birds and mammals are important to forest management. Both insects and birds are suspected of controlling insects that are harmful to wood production, such as the Douglas-fir tussock moth and spruce budworm. However, at epidemic levels, mammalian and avian predators probably exhibit minor effects on population reductions (Torgensen 1994). Therefore, maintenance of habitats for insectivorous birds and mammals is important for long-term forest health.

Effects of the No Action Alternative: Under this alternative, no changes in the dead wood resources would be expected. Snags and downed wood would continue to be lost adjacent to the open roads. However, in the long-term, shade intolerant trees species and snags would decline. These species tend to provide important cavity nesting bird foraging and nesting structures.

Effects of the Action Alternative: Under this alternative, dead wood material would be reduced during the timber harvests. All snags 14" or greater would be planned for retention. However, some of this material would be lost due to safety and operational concerns. Based on data collected by the USFS on the Lolo National Forest, an estimate of snag loss during harvest activities ranged from 50-100% (Hillis 1993). On a recent DNRC timber sale where all snags >14" were to be retained; 60% were standing following harvests. However, when all snags were considered only 35% were left standing. A majority

of the loss of snags occurred in the medium size class, with retention of the larger snags appearing more successful. Therefore, it is expected that nearly ½ of the snags planned for retention in the area could succumb to operational or safety related felling. If any of these snags are cut, they should be left on site to provide potential feeding sites and structure for wildlife species. Snag loss could continue after the project, especially along the open road. Effective closure of the new and reconstructed road systems would limit addition snag attrition to an area around the open road. The area near the open road is probably already affected with a reduced amount of snags present by unauthorized firewood cutters. Therefore, this resource is expected to be reduced by ½ of the existing levels, resulting in reduced nesting and foraging habitat for species that rely on dead wood material.

Cumulative Effects of the No Action Alternative: Under this alternative, dead wood resources would not be altered in the project area. Previous timber harvests in surrounding areas presumably reduced these resources to an unknown degree.

Cumulative Effects of the Action Alternative: Under this alternative, the losses of dead wood resources would be additive to the previous harvests in the area.

FINE FILTER ANALYSIS

In the fine-filter analysis, individual species of concern are evaluated. These species include wildlife species federally listed as threatened or endangered, species listed as sensitive by DNRC, and species managed as big game by DFWP. No endangered terrestrial wildlife species would be affected under either alternative. These species are addressed below.

THREATENED AND ENDANGERED SPECIES

BALD EAGLE

Existing Condition: Bald eagle nests are identified, mapped, and monitored by a group of biologists and volunteers. This effort started in the early 1970's and continues to this day. Searching the database that contains the records of verified nests revealed no nests within 2.5 miles of the project area. The closest known nest (Lonepine) occurs approximately 9 miles to the north of the project area. The project area is not located near any large bodies of water and does not provide any big game winter range or other features that eagles could use to forage on carrion, waterfowl, or fish. Since bald eagle use or habitat is not expected in or near the project area, the bald eagle would not be considered any further in this project.

CANADA LYNX

Existing Condition: The US Fish and Wildlife Service listed the Canada lynx as a threatened species under the Endangered Species Act in 2000. Currently, no recovery plan exists for Canada lynx, but several reports have been written to summarize the research on lynx and develop a conservation strategy (Reedier et al 2000, Ruggerio et al 2000).

Lynx are associated with subalpine fir forests, generally between 4,000 to 7,000 feet in elevation, in western Montana (Ruediger et al 2000). Lynx habitat in western Montana consists primarily of young coniferous forest with plentiful snowshoe hares, stands with abundant coarse woody debris for denning and cover for kittens, and densely forested cover for travel and security. Additionally, the mature forests

provide habitat for red squirrels, an alternative prey source. These conditions are found in a variety of habitat types (Pfister et al 1977), particularly within the subalpine fir or hemlock habitat types.

To assess lynx habitat, DNRC SLI data were used to map specific habitat classes used by lynx. These areas were considered *lynx habitat*. Any of these habitats located on ungulate winter ranges, as defined by DFWP, were removed from consideration of lynx habitat due to reduced snow loads allowing competing predators to occupy these areas. Other parameters (stand age, canopy cover, amount of coarse woody debris) were used in modeling the availability of specific types of lynx habitat in the area (i.e. denning, forage, other, temporarily not available). The criteria used to define each specific type of lynx habitat are defined below.

- *Young forage* consisted of regenerating stands less than 40 years old in a well-stocked condition (more than 1,500 trees per acre).
- *Mature forage* included all stands in lynx habitat greater than 40 years old with more than 40 percent canopy closure.
- *Denning* habitat consisted of mature stands (older than 100 years) with more than 40 percent canopy closure and a high abundance of coarse woody debris present.
- *Temporary unsuitable habitat* included all stands with regeneration less than 15 years old, stands that received precommercial thinning within 10 years, and stands with less than 40 percent canopy closure.
- *Other* habitat included any habitat of a suitable habitat type with more than 40 percent canopy cover that could be used by lynx for travel or any other purpose.

Based on the above analysis, the project area does not provide lynx habitat. However, the mapping and management procedures of the Confederated Salish and Kootenai Tribe included approximately ½ of the project area as lynx habitat. To assess lynx habitat, the CS&KT buffered subalpine habitat types by ½ mile. By DNRC rules (ARM36.11.403(40)), these lands are not considered lynx habitat, but an analysis based on the inclusion of these lands by the CS&KT into lynx habitat is warranted.

According to the mapping efforts of the CS&KT, 367 acres of lynx habitat occurs on the western half of the Hot Springs Section. Of this, the mapping effort classified 203 acres of denning and 164 acres of travel. Field review indicates that the denning habitat classification is lacking large deposits of coarse woody debris and the habitat conditions in the area are more indicative of travel habitat. The analysis would consider all 367 acres as travel habitat, with no other specific habitats occurring in the project area.

Cumulative effects were analyzed for lands in the Hot Springs Lynx Analysis Unit (LAU). This area approximates the home range size of a female lynx (Ruediger et al 2000). The analysis area includes 5,760 acres of lynx habitat along the Reservation Divide. Of these acres, 5,374 acres and 386 acres of lands are managed by the CS&KT and DNRC, respectively. The project area lies on the north edge of the Hot Springs LAU. According to the CS&KT mapping efforts and refinement of these efforts on DNRC lands, this area contains approximately 277 acres of denning, 1,526 acres of forage, 3,600 acres of travel and 356 acres of temporary unsuitable habitat. The Lynx Conservation Strategy (Ruediger et al 2000) that the CS&KT adopted to set their lynx management criteria, puts a 15% limit on the amount of lynx habitat that could be converted to unsuitable habitat in a 15 year time period. Following this guideline, a maximum of 508 acres are available for conversion in this LAU.

Within the next 2 decades, temporary unsuitable habitat is expected to develop into *young forage* habitat on approximately 356 acres in this LAU. During this same time period, *young forage* would develop into *mature forage* and *other* habitat. Denning habitat could continue to develop if salvage harvesting does not remove future or current coarse woody debris.

Effects of the No Action Alternative: Under this alternative, the existing habitat conditions on DNRC lands would be retained. As the stands age and the amount of coarse woody debris increases, denning habitat could develop. However, because the project area lies on the boundary of suitable habitat and is lower and drier than preferred lynx habitat, the increase in denning structure is not expected to add appreciably the quality of lynx habitat.

Effects of the Action Alternative: Under this alternative, approximately 373 acres of lynx habitat would be modified through timber harvest. Only lynx travel habitat would be affected. In lynx travel habitat, a seedtree prescription would occur on 193 acres, while a commercial thin prescription would occur on 180 acres. The seedtree would render those lands temporarily unsuitable by removing a majority of the overhead canopy cover. Conversely, the commercial thin prescription would remove some canopy cover, but would retain at least 40% canopy coverage, which would continue to allow lynx to use and/or travel through the harvest unit. Distributed along the restricted road in Unit T4, several (approximately 3) slash piles would be retained to provide potential denning sites for lynx. When the seedtree units regenerate to a point where they are used for foraging by lynx, the commercial thin units could provide additional structure and/or mature foraging opportunities adjacent to the regeneration units. The habitat that would be affected is likely marginal habitat, therefore the effects of this alternative is expected to be negligible.

Cumulative Effects of the No Action Alternative: Under this alternative, no additional habitat would be converted to unsuitable. The presently unsuitable habitat would convert to foraging or travel habitat in the next 15 years or so. Denning habitat is also likely to increase through time barring any additional harvests or natural disturbances that would remove coarse woody debris or large reductions in canopy cover.

Cumulative Effects of the Action Alternative: Under this alternative, 193 acres would be rendered temporarily unsuitable by timber harvest due to removal of canopy cover. The acres affected are presently classified as travel habitat. Following harvests, the LAU would contain 277 acres of denning, 1,526 acres of forage, 3,407 acres of travel and 549 acres of temporary unsuitable habitat. This project would increase the amount of temporarily unsuitable habitat. This project would raise the amount of unsuitable habitat to 9.5%, which is within the 15% guideline adopted by the CS&KT. In the future (10-30 years), these areas could regenerate and provide additional foraging habitat for lynx. Additionally, retention of slash piles in the commercial thin unit could provide lynx with denning sites following harvest and into the future. Since the habitat that would be affected is likely marginal, the effects of this alternative are expected to be negligible both in the short and long term.

GRAY WOLF

Existing Condition: The U.S. Fish and Wildlife Service downlisted the gray wolf from "Endangered" to "Threatened" under the Endangered Species Act in April of 2003. At the end of 2002, the wolf population met the recovery goals outlined in the Northern Rocky Mountain Wolf Recovery Plan (USFWS 1987). Presently, delisting is hinged upon approval of Wyoming's wolf management plan.

At the end of 2003, northwest Montana supported approximately 92 wolves in 21 packs. The Lonepine (Little Thompson) Pack's 2002 distribution area encompasses the project area. This pack consisted of 2 wolves at the end of 2003 (USFWS et al 2004). No radio collared relocations or observations have been documented within the project area.

The wolf is a wide-ranging, mobile species. Adequate habitat for wolves consists of adequate vulnerable prey and minimal human disturbance, especially at den and/or rendezvous sites. Primary prey species in northwest Montana are white-tailed deer, elk, moose, and mule deer. Distribution of wolves is strongly associated with white-tailed deer winter ranges. Wolves in northwest Montana typically den in late April. Wolves choose elevated areas in gentle terrain near a water source (valley bottoms), close to meadows or other openings, and near big game wintering areas for dens and rendezvous sites. Since the project area is outside of deer and elk winter ranges, no dens or rendezvous sites are expected, although transient to foraging use of the project area is possible. This project could affect wolves through altering canopy coverage, hiding cover, and motorized access.

For cumulative effects analysis, the Lonepine Wolf Pack distribution area was considered. This area encompasses 391,169 acres of private, CS&KT, DNRC, and Plum Creek Timber Company managed lands. DNRC is developing another timber sale that could affect disturbance and habitat in the distribution area. The Big Prairie/Semen Timber Sale consists of 2 parcels of which one (T23N R27W section 12) is within the distribution area.

Effects of the No Action Alternative: No changes in canopy closure, hiding cover, or available motorized access would occur. The retention of hiding cover would continue to provide some security for wolves and their big game prey, but the current open and pioneered roads detract from this security.

Effects of the Action Alternative: Under this alternative, hiding cover would be removed in the seedtree units (193 acres) and would use 1.2 miles of existing road, build 3.7 miles of new road, reconstruct 1.0 mile, and abandon 0.7 miles of existing road. Following harvests, all but the existing open roads would be restricted. These factors could reduce security for wolves and their prey. To increase security, visual screening buffers along open roads and riparian areas would be retained. Since no denning or rendezvous sites are expected and no documented wolf use occurs in the project area, the effects of decreased security in the project area would likely be negligible.

Cumulative Effects of the No Action Alternative: Under this alternative, no additional affects to wolves would be expected. White-tailed deer winter range would not be affected, and substantive change in white-tailed deer population, distribution, or habitat use is not anticipated. Levels of human disturbance are expected to remain similar to present levels. Shifts in white-tailed deer use within the pack cumulative effects area associated with activities on adjacent lands may alter the distributions of wolf prey, but appreciable changes on the DNRC parcel are not anticipated. Within the pack cumulative

effects area, the DNRC is developing another timber sale in T23N R27W section 12 (Big Prairie/Semen Timber Sale), which could add to the disturbance and modify habitat within the distribution area. Implementation of this alternative would not cumulatively add to the effects discussed in the Big Prairie/Semen Environmental Analysis.

Cumulative Effects of Action Alternative: Under this alternative, additional disturbance in the area would occur. This disturbance would be additive to the existing condition. The disturbance produced from this project and other DNRC projects are expected to be short-term and would avoid the critical denning period. During harvest activities, areas outside the project area are expected to provide areas relatively free of disturbance. This project in combination with other DNRC actions could result in some slight shifts in big game use. Human-disturbance levels are expected to revert to levels similar to current levels after the proposed harvesting is completed. No substantive change in wolf use within the Lonepine pack cumulative effects analysis area is expected; wolves are expected to continue to use the cumulative effects area in the long term.

GRIZZLY BEAR

Existing Condition: Grizzly bears are listed as "threatened" under the Endangered Species Act. The Grizzly Bear Recovery Plan defines 6 recovery areas (USFWS 1993). The project area lies in between the Cabinet Yaak and the Northern Divide Ecosystem recovery areas. In recent years, grizzly bear sightings and encounters are occurring outside the recovery zones. In an attempt to address the expanded habitat use, the US Forest Service developed an occupied habitat map. Because the area is outside the recovery zone, the current occupied habitat, and the lack of documented observations in or near the project area (S.Courville, pers. comm.. 6 Nov. 2003), grizzly bears are not expected to use the project area. Since bears are not expected to use the area, grizzly bears and/or their habitat would not be modified by either alternative. This species was dropped from further analysis.

SENSITIVE SPECIES

When conducting forest management activities, the SFLMP directs DNRC to give special consideration to "sensitive" species. These species are sensitive to human activities, have special habitat requirements that may be altered by timber management, or may become listed under the Endangered Species Act if land management activities result in continued adverse impacts. Because sensitive species usually have specific habitat requirements, consideration of their needs serves as a useful "fine filter" for ensuring that the primary goal of maintaining healthy and diverse forests is met. The following sensitive species were considered for analysis. Each sensitive species either was included in the following analysis or was dropped from further consideration for various reasons (Table 1).

Table 1. Listed sensitive species for the Northwest Land Office showing the status of these species in relation to this project.

Species	Determination - Basis
Black-backed woodpecker	No further analysis conducted – No recently (<5 years) burned areas occur within the project area.
Coeur d'Alene Salamander	No further analysis conducted – no moist talus or streamside talus habitat occurs in the project area.
Columbian sharp-tailed grouse	No further analysis conducted – no suitable grassland communities occur in the project area.
Common loon	No further analysis conducted – No suitable lakes occur on or near the project area.
Ferruginous hawk	No further analysis conducted – no suitable grassland communities occur in the project area.
Fisher	**Included** – potential fisher habitat occurs in the project area.
Flammulated owl	**Included** – dry ponderosa pine habitats occur in the project area.
Harlequin duck	No further analysis conducted – no potential habitat available occurs in the project area.
Mountain plover	No further analysis conducted – no suitable grassland communities occur in the project area.
Northern bog lemming	No further analysis conducted – no sphagnum bogs or other fen/moss mats occur in the area.
Pileated woodpecker	**Included** – western larch/Douglas fir, ponderosa pine, and mixed conifer habitats occur in the area.
Townsend's big-eared bat	No further analysis conducted – no caves or mine tunnels occur in the project area.

FISHER

Due to their use of mature and late-successional forested habitats, fishers are listed by DNRC as a sensitive species (*DNRC 1996*). DNRC's strategy to conserve fishers in a managed landscape is aimed at protecting valuable resting habitat near riparian areas and maintaining travel corridors.

Fishers are generalist predators and use a variety of habitat types, but are disproportionately found in stands with dense canopy (*Powell 1982, Johnson 1984*). Fishers appear to be highly selective of resting and denning sites. In the Rocky Mountains, fishers appear to prefer late-successional coniferous forests for resting sites and use riparian areas (within 155 feet of water) disproportionately to their availability. Such areas contain large live trees, snags, and logs, which are used for resting and denning sites and dense canopy cover, which is important for snow intercept (*Jones 1991*). Timber harvesting and associated road construction could affect fishers by altering habitat and/or by increasing susceptibility to trapping.

The project area could provide habitat for fishers. However, no occurrences in the area have been documented (S.Courville, pers. comm.., 6 Nov 03). The stands (stands 1, 2, and 4) on the easterly aspects support habitat types used by fishers (Hillis et al 2003), while the stands on the western aspects appear too dry to provide fisher habitat. Stands 1 and 4 are considered preferred fisher cover types (ARM

36.11.403(60)). The existing dense canopy closure on these sites and the presence of mistletoe brooms add to the fisher habitat provided by these stands. The stands on western aspects may be too dry and have a lower canopy cover than those on the eastern aspects. However, there appears to be enough canopy closure to allow movement through any of these stands. Currently, approximately 411 acres of the project area is potential fisher habitat, of which 258 acres is in preferred cover types for fishers. An intermittent stream runs along the boundary of the stand (Stand 2) that meets the potential, but not the preferred, fisher habitat.

To assess cumulative effects, the project area and the surrounding sections were considered. In this area, several regeneration harvests occurred in the past. These stands appear to recover to a point that fishers can move through and potentially hunt in the area and the vegetation along the intermittent stream is intact.

Effects of the No Action Alternative: Under this alternative, the existing habitat in stands 1 and 4 would be unaltered. The mistletoe brooms and the canopy cover of these stands would not be reduced. Therefore, fisher habitat would remain unchanged in the short-term.

Effects of the Action Alternative: Implementation of this alternative would affect 376 acres of preferred fisher habitat, none of which occurs within 50' of an intermittent stream. Of these acres, canopy cover would be reduced below 40% canopy cover by implementing a seed tree prescription on 155 acres and near 40% on 221 acres by a commercial thin prescription. If canopy cover is reduced to less than 40%, fishers tend to avoid those areas. On the remaining 35 acres, some fisher habitat is expected to be retained in the commercial thin and exclusion area. However, structure important to fishers would be removed through removal of mistletoed trees. Retention of all snags over 14" in all units would provide fishers with habitat structure important for resting and foraging when the stands regenerate to a condition where fishers can start using them again. Some snags could be lost due to the harvest operations, but these snags would be left on site to provide coarse woody debris habitat. Retention of mistletoed trees could also benefit fishers and other wildlife species that use these rare structures.

Cumulative Effects of the No Action Alternative: Under this alternative, fisher habitat in the project area and the surrounding area is expected to remain unchanged in the near future. Over time fisher habitat might increase as stands convert to mixed conifer cover types. However, these increases would probably occur on drier sites that fishers are unlikely to use. The existing connectivity between the higher and lower elevation would remain intact.

Cumulative Effects of the Action Alternative: Under this alternative, fisher habitat and connectivity between higher and lower elevations could be affected. Timber harvesting is expected to remove 155-376 acres depending on the level of canopy retention in the commercial thin units. This would further reduce fisher habitat in the general area, however, some past regeneration units produce a barrier to fisher movement through the project area to adjacent ownerships. However, these are upland sites and would likely not cause a disruption to fisher movements because fishers generally move along stream course and through saddles. These reductions appear to occur in marginal habitats, therefore negligible effects are expected.

FLAMMULATED OWL

Existing Condition: Flammulated owls are listed by DNRC as sensitive due to their use of old, open-grown ponderosa pine old-growth habitats. They usually nest in cavities in 12- to 25-inch dbh quaking aspen, ponderosa pine, or Douglas-fir that have been excavated by pileated woodpeckers or northern flickers.

To assess flammulated owl habitat, SLI data were searched for preferred habitat types (ARM 36.11.403(28)) over 50 acres (ARM 36.11.437(1)). These habitat types occur in the ponderosa pine series and on dry Douglas-fir types. Based on this definition, approximately 211 acres of potential flammulated owl habitat occurs in stands 3 and 5 in the project area. These areas lost a majority of the open park like conditions favored by flammulated owls, however, they could provide marginal habitat for this species.

For the cumulative effects analysis, the project area and the surrounding sections were considered. The project area contains the upper extremities of stands that occur on adjacent ownerships. These stands are mostly intact with only a couple of small regeneration units intermixed in the area. The landscape surrounding the project area is a patchwork of a variety of timber harvests, ranging from regenerating clearcuts to commercial thinning units. The selective harvest units that retained mature ponderosa pine probably retained flammulated owl habitat, while this habitat was removed in clearcut units.

Effects of the No Action Alternative: Under this alternative, the existing condition of flammulated owl habitat would be retained on 211 acres. The remaining acreage in the project area does not or could not provide flammulated owl habitat.

Effects of the Action Alternative: This alternative would harvest timber off the 211 acres of potential habitat. These harvests would reduce canopy closure, while retaining the dominant ponderosa pine, all snags >14" Dbh, and pockets of regeneration. These characteristics are consistent with the needs of flammulated owls; therefore habitat conditions are expected to improve in the harvested areas.

Cumulative Effects of the No Action Alternative: Under this alternative, flammulated owl habitat would remain in the existing condition in the project area. Therefore, this alternative would not increase habitat quality or quantity in the cumulative effects analysis area.

Cumulative Effects of the Action Alternative: This alternative would improve flammulated owl habitat in the cumulative effects area. The amount and/or quality of flammulated owl habitat would increase by approximately 211 acres. These stands are the upper extremities of stands that occur on tribal lands below the section.

PILEATED WOODPECKER

Existing Condition: Pileated woodpecker are listed by DNRC as sensitive and play an important ecological role by excavating cavities that are used in subsequent years by many other species of birds and mammals.

Pileated woodpeckers excavate the largest cavities of any woodpecker. Preferred nest trees are western larch, ponderosa pine, cottonwood, and quaking aspen, usually 20 inches dbh and larger. Pileated

woodpeckers primarily eat carpenter ants, which inhabit large downed logs, stumps, and snags. The feeding, roosting, and nesting habitat requirements of this species include large trees, snags, or decayed trees. These characteristics closely tie these woodpeckers to mature forests with late-successional characteristics. The density of pileated woodpeckers is positively correlated with the amount of dead and/or dying wood in a stand (McClelland 1979).

Preferred pileated woodpecker nesting habitat was identified by searching the SLI database for mature stands containing an overstory of western larch, ponderosa pine, and Douglas-fir (ARM 36.11.403(58)) with 40% or more canopy closure. Based on these parameters, the entire project area (622 acres) provides preferred pileated woodpeckers habitat.

The cumulative effects area encompasses the project area and the adjacent sections of Forest Service and CS&KT managed lands. The project area contains the upper extremities of stands that occur on adjacent ownerships. These stands are mostly intact with only a couple of small regeneration units intermixed in the area. The landscape surrounding the project area is a patchwork of a variety of timber harvests, ranging from regenerating clearcuts to commercial thinning units. The selective harvest units that retained mature trees and large snags of ponderosa pine or western larch probably retained structure needed for pileated woodpecker use, while this habitat was removed in clearcut units.

Effects of the No Action Alternative: Under this alternative, the existing habitat would not be altered. The existing trees would continue to grow and die, thereby providing important pileated woodpecker habitat structure. Over time, the stands would continue to convert to mixed conifer types. This conversion could reduce the amount of shade-intolerant trees species that would be available for structural habitat.

Effects of the Action Alternative: Under this alternative, 352 acres of preferred habitat would be removed from implementing a seedtree prescription. The effects of the commercial thin prescriptions are unclear. The removal of the mid-story canopy and opening up the canopy could reduce nesting habitat, but still allow feeding and roosting if greater than 40% canopy closure is maintained. Retention of all snags greater than 14" Dbh would retain important structure in the existing stand. However, losses through timber harvests are expected. Based on data collected by the USFS on the Lolo National Forest, an estimate of snag loss during harvest activities ranged from 50-100% (Hillis 1993). On a recent DNRC timber sale where all snags >14" were to be retained; 60% were standing following harvests. However, few losses were experienced in the larger size class. If any of these snags are cut for safety purposes, they should be left on site to provide potential feeding sites for pileated woodpeckers. Snag loss could continue after the project, especially along the open road. Effective closure of the new and reconstructed road systems would limit addition snag attrition to an area around the open road. The area near the open road is probably already affected with a reduced amount of snags present by unauthorized firewood cutters.

BIG GAME

Existing Condition: The project area is used by big game in the nonwinter seasons. During the winter, the project area accumulates high amounts of snow. During the nonwinter season, big game is vulnerable to harvest. Road access, hiding cover and visual screening decrease big game vulnerability to human and other predators.

Effects of the No Action Alternative: Under this alternative, no changes in big game vulnerability are expected.

Effects of the Action Alternatives: Big game vulnerability would be increase due to timber harvests. Retention of visual screening along open roads and securing restricted roads would lessen the effects related to the timber harvest. As trees regenerate, hiding cover would redevelop.

Cumulative Effects of the No Action Alternative: No additional effects are expected.

Cumulative Effects of the Action Alternatives: Timber harvests would cumulatively increase big game vulnerability in the short-term, but as regeneration occurs, vulnerability would decrease.

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23-Jul-03

RP # 03-094 Agency Number: Project Name

Requesting Agency: DNRC Project Type: Timber Harvest

Location: West of Hot Springs, State DNRC section 36

The Tribal Preservation Office recommends the following conditions:

☐ *There are no known historical or cultural sites present. No further consultation is required.*

☑ *The potential exists for encountering historical or cultural sites. Therefore, we request that consultation with us be maintained throughout the period of activity.*

☐ *Site(s) are present which have cultural or historical significance. The following special conditions are recommended.*

Comments: No significant cultural resources identified in project area.

IMPORTANT STIPULATIONS: If the activity plan is altered, this clearance is no longer valid. This cultural clearance expires one year after the date issued. If historical or cultural artifacts or sites are discovered during the project activity, all impacts to the site of discovery should be halted and the Tribal Preservation Office should be contacted immediately.

Timothy R Ryan
Preservation Specialist

Concurred by

From: Rennie, Patrick
Sent: Monday, April 26, 2004 8:33 AM
To: Peters, Dale
Subject: Hot Springs Timber Sale

During April of 2004 Patrick Rennie and Dale Peters conducted a Class III inventory of cultural resources within the area of potential effect of the proposed Hot Springs Timber Sale. No cultural resources were identified during that inspection, but ground surface visibility was only fair to poor as a result of conifer needle duff deposits and moderately dense undergrowth. Follow-up cultural resource inspection work would take place if future proposed under-burns are carried out within the parcel containing the Hot Springs Sale.

Patrick Rennie
DNRC Archaeologist

Attachment 3

Prescriptions

PROPOSED HOT SPRINGS TIMBER SALE

HARVEST UNIT PRESCRIPTIONS

Section 36, T22N, R25W

****

Harvest Unit: S1 **Harvest Unit Acres:** 45

Elevation: 3960' – 4640' **Slope:** 35 – 55% **Aspect:** South - Southeast

Habitat Types: PSME/CARU

Current Cover Type: Ponderosa Pine
Appropriate Cover Type: Ponderosa Pine

Soil Type: Winkler gravelly sandy loam, cool, 35 to 60 percent slopes.

Description of Existing Stand: This unit is located in the Northeast corner of the section. This a ponderosa pine site with Douglas-fir encroachment. This multistoried stand is composed of an overstory of scattered larger ponderosa pine. Overstory age averages 100 ranging from 85-130 years; 18" dbh ranging from 12-30"and 85 feet in height.

The intermediate stand average age is 65 years and is comprised of second growth ponderosa pine (30%) averaging 10" dbh ranging from 6-14"and 60 feet in height; Douglas-fir (70%), averaging 11" dbh ranging from 6-16" and 65 feet in height.

Ponderosa pine regeneration is suppressed to almost non-existent. The Douglas-fir regeneration ranges from thickets of over stocked, suppressed 0"-6" dbh to scattered seedlings in the understory. The Douglas-fir shows varying degrees of Dwarf mistletoe, *Arceuthobium douglasii*, from light to heavy in 75-85% of the trees. Fuel loading is light on the easterly facing slopes to light pine duff on the more open south slopes.

Treatment Objectives:

- Remove the majority of the encroaching Douglas-fir to encourage movement toward the appropriate cover type.
- Considerably reduce the dwarf mistletoe affecting the Douglas-fir.
- Create and promote regeneration of ponderosa pine.

Prescribed Treatment: (S1)

- Selection of seed trees by species designation (ponderosa pine 14" & greater) and leave tree marking (western larch & Douglas-fir) to accomplish desired variable spacing of 55-65 feet (leaving 10–15 TPA).

- Retention of snags 14" dbh & greater and a minimum of 2 cull trees per acre to remain standing, where present, if they are not a safety hazard.

Harvest Method:

- Cable yarding (skyline) required; hand falling required.

Hazard Reduction:

- Yarding of tops required.

- Broadcast burn and burning of landing piles following harvest activities.

- Hazard reduction would be accomplished through the creation of fuel breaks and fireline construction.

Regeneration/Site Preparation:

- Slashing of damaged residual and all residual with Dwarf mistletoe.

- Broadcast burn to prepare exposed mineral seedbed.

- Leave trees to provide seed source for natural regeneration.

Anticipated Future Treatments:

- Unit to be monitored annually for the establishment of natural regeneration. If natural regeneration fails 5 years after site preparation, planting would be scheduled.

- Evaluation for non-commercial thinning to take place in 15-20 years.

- Stand conditions monitored and evaluated at regular intervals, as per calendar recall. Salvage and/or sanitation operations to occur after evaluation of a site altering event.

PROPOSED HOT SPRINGS TIMBER SALE

HARVEST UNIT PRESCRIPTIONS

Section 36, T22N, R25W

****

Harvest Unit: S2 **Harvest Unit Acres:** 52

Elevation: 3880' – 4600' **Slope:** 30 – 55% **Aspect:** East - Northeast

Habitat Types: ABGR/LIBO

Current Cover Type: Mixed Conifer
Appropriate Cover Type: Western Larch / Douglas-fir

Soil Type: Courville gravelly silt loam, 30 to 50 percent slopes.

Description of Existing Stand: This unit is located in the East central portion of the section. This mixed conifer stand is primarily made up of Douglas-fir, grand fir, western larch and ponderosa pine, with a scattering of large dominant ponderosa pine. The dominant ponderosa pine age averages 100 ranging from 95-130 years; 20" dbh ranging from 20-36"and 95 feet in height.

The average age of this stand is 85 ranging from 70-120 years. The Douglas-fir (40%) averages 11" dbh ranging from 6"-18" dbh and 65 feet in height; grand fir (40%), averaging 11" dbh ranging from 6"-20" dbh and 65 feet in height; western larch (10%) averaging 10" dbh ranging from 6"-20" dbh and 75 feet in height; ponderosa pine (10%) averaging 12" dbh ranging from 8"-18" dbh and 85 feet in height.

There is very little regeneration under this mostly closed canopy. The Douglas-fir shows varying degrees of Dwarf mistletoe, *Arceuthobium douglasii*, from light to heavy and has pockets of root-rot. The grand fir shows evidence of the Fir Engraver beetle, *Scolytus ventralis*, Indian paint fungus, *Echinodontium tinctorium* and root-rot. Western larch is also affected by dwarf mistletoe, *Arceuthobium laricis*. Fuel loading is light in that portion between the two roads with heavy concentrations below the lower road of grand fir and Douglas-fir mortality.

Treatment Objectives:

- Remove the merchantable grand fir to encourage movement toward the appropriate cover type.
- Promote a healthy stand of timber by considerably reducing the dwarf mistletoe affecting the Douglas-fir & western larch and the Douglas-fir affected by root-rot.

Prescribed Treatment: (S2)

- Commercial thinning.
- Selection of leave trees by species designation (ponderosa pine 14" & greater) and leave tree marking (western larch & Douglas-fir) to accomplish desired variable spacing of 35-40 feet (leaving 25-35TPA).
- Retention of snags 14" dbh & greater and a minimum of 2 cull trees per acre to remain standing, where present, if they are not a safety hazard.

Harvest Method:

- Cable yarding (skyline) required; hand falling required.

Hazard Reduction:

- Yarding of tops required.
- Burning of landing piles following harvest activities.
- Hazard reduction would be accomplished through the creation of fuel breaks and by lopping and scattering of the slash created within the unit.

Regeneration/Site Preparation:

- Slashing of damaged residual.
- Harvest operations to create adequate spacing to promote growth of the remaining thinned stand.
- Leave trees to provide seed source for natural regeneration.

Anticipated Future Treatments:

- Evaluation for a second harvest entry to take place in 10-15 years.
- Stand conditions monitored and evaluated at regular intervals, as per calendar recall. Salvage and/or sanitation operations to occur after evaluation of a site altering event.

PROPOSED HOT SPRINGS TIMBER SALE

HARVEST UNIT PRESCRIPTIONS

Section 36, T22N, R25W

****

Harvest Unit: S3 **Harvest Unit Acres:** 30

Elevation: 3880' – 4280' **Slope:** 30 – 55% **Aspect:** South

Habitat Types: PSME/CARU

Current Cover Type: Ponderosa Pine
Appropriate Cover Type: Ponderosa Pine

Soil Type: Winkler gravelly sandy loam, cool, 35 to 60 percent slopes.

Description of Existing Stand: This unit is located in the Southeast corner of the section, with the East section line as a unit boundary.

This stand is a ponderosa pine site with Douglas-fir encroachment. This stand is composed of an overstory of scattered larger ponderosa pine. Overstory age averages 100 ranging from 85-130 years; 14" dbh ranging from 12-30"and 75 feet in height.

This intermediate stand average age is 65 and is comprised of second growth ponderosa pine (70%) averaging 10" dbh ranging from 6-14"and 60 feet in height; Douglas-fir (30%), averaging 10" dbh ranging from 6-16" and 55 feet in height.

Ponderosa pine regeneration is suppressed to almost non-existent. The Douglas-fir regeneration ranges from thickets of over stocked, suppressed 0"-6" dbh to scattered seedlings in the understory. The Douglas-fir shows varying degrees of Dwarf mistletoe, *Arceuthobium douglasii*, from light to heavy in 75-85% of the trees. Fuel loading is light on the easterly facing slopes to pine duff on the more open south slopes.

Treatment Objectives:

- Remove the majority of the encroaching Douglas-fir to encourage movement toward the appropriate cover type.
- Considerably reduce the dwarf mistletoe affecting the Douglas-fir.
- Create and promote regeneration of ponderosa pine.

Prescribed Treatment: (S3)

- Selection of seed trees by species designation (ponderosa pine 14" & greater) and leave tree marking (western larch & Douglas-fir) to accomplish desired variable spacing of 55-65 feet (leaving 10–15 TPA).

- Retention of snags 14" dbh & greater and a minimum of 2 cull trees per acre to remain standing, where present, if they are not a safety hazard.

Harvest Method:

- Cable yarding (skyline) required; hand falling required.

Hazard Reduction:

- Yarding of tops required.

- Broadcast burn and burning of landing piles following harvest activities.

- Hazard reduction would be accomplished through the creation of fuel breaks and fireline construction.

Regeneration/Site Preparation:

- Slashing of damaged residual and all residual with Dwarf mistletoe.

- Broadcast burn to prepare exposed mineral seedbed.

- Leave trees to provide seed source for natural regeneration.

Anticipated Future Treatments:

- Unit to be monitored annually for the establishment of natural regeneration. If natural regeneration fails 5 years after site preparation, planting would be scheduled.

- Evaluation for non-commercial thinning to take place in 15-20 years.

- Stand conditions monitored and evaluated at regular intervals, as per calendar recall. Salvage and/or sanitation operations to occur after evaluation of a site altering event.

PROPOSED HOT SPRINGS TIMBER SALE

HARVEST UNIT PRESCRIPTIONS

Section 36, T22N, R25W

****

Harvest Unit: S4 **Harvest Unit Acres:** 7

Elevation: 3800' – 4120' **Slope:** 30 – 55% **Aspect:** East & Northeast

Habitat Types: ABGR/LIBO

Current Cover Type: Ponderosa Pine
Appropriate Cover Type: Ponderosa Pine

Soil Type: Mitten gravelly silt loam, 35 to 60 percent slopes.

Description of Existing Stand: This small cable unit is located on the south line sandwiched between the road and the SMZ boundaries. The current cover type map calls this unit a Ponderosa Pine type. Field reconnaissance reveals this site to be a Mixed Conifer site. This mixed conifer stand is primarily made up of Douglas-fir, grand fir and western larch with a scattering of large dominant ponderosa pine. The dominant ponderosa pine age is 100 ranging from 95-130 years; 20" dbh ranging from 20-36"and 95 feet in height.

This stand is comprised of Douglas-fir (50%) averaging 11" dbh ranging from 8-18"and 75 feet in height; grand-fir (40%) averaging 10" dbh ranging from 6-18"and 65 feet in height; western larch (10%) averaging 11" dbh ranging from 6-20"and 75 feet in height. Stand age averages 100 ranging from 85 – 140 years.

The Douglas-fir shows varying degrees of dwarf mistletoe, *Arceuthobium douglasii*, from light to heavy. The grand fir shows evidence of the Fir Engraver beetle, *Scolytus ventralis*, Indian paint fungus, *Echinodontium tinctorium* and root-rot. Western larch is heavily affected by dwarf mistletoe, *Arceuthobium laricis*. Regeneration is almost nonexistent and fuel loading is moderate.

Treatment Objectives:

- Remove the merchantable grand fir to encourage movement toward the appropriate cover type.
- Promote a healthy stand of timber by considerably reducing the dwarf mistletoe affecting the Douglas-fir & western larch and the Douglas-fir affected by root-rot.

Prescribed Treatment: (S4)

- Commercial thinning.
- Selection of leave trees by species designation (ponderosa pine 14" & greater) and leave tree marking (western larch & Douglas-fir) to accomplish desired variable spacing of 45-55 feet (leaving 15-20TPA).
- Retention of snags 14" dbh & greater and a minimum of 2 cull trees per acre to remain standing, where present, if they are not a safety hazard.

Harvest Method:

- Cable yarding (skyline) required; hand falling required.

Hazard Reduction:

- Yarding of tops required.
- Burning of landing piles following harvest activities.
- Hazard reduction would be accomplished through the creation of fuel breaks and by lopping and scattering of the slash created within the unit.

Regeneration/Site Preparation:

- Slashing of damaged residual.
- Leave trees to provide seed source for natural regeneration.
- Harvest operations to create adequate spacing to promote growth of the remaining thinned stand.

Anticipated Future Treatments:

- Evaluation for a second harvest entry to take place in 10-15 years.
- Stand conditions monitored and evaluated at regular intervals, as per calendar recall. Salvage and/or sanitation operations to occur after evaluation of a site altering event.

PROPOSED HOT SPRINGS TIMBER SALE

HARVEST UNIT PRESCRIPTIONS

Section 36, T22N, R25W

****

Harvest Unit: S5 **Harvest Unit Acres:** 16

Elevation: 4360' – 4720' **Slope:** 30 – 60% **Aspect:** East

Habitat Types: ABGR/LIBO

Current Cover Type: Ponderosa Pine
Appropriate Cover Type: Ponderosa Pine

Soil Type: Mitten-rubble land complex, 40 to 70 percent slopes.

Description of Existing Stand: This unit lies on steep ground located in the southwest quadrant of the section. The current cover type map calls this unit a Ponderosa Pine type; field reconnaissance reveals this site to be more of a Mixed Conifer site with dominant ponderosa pine throughout. The overstory age of ponderosa pine averages100 ranging from 85-140 years; 20" dbh ranging from 14"-28" dbh and 95 feet in height.

The intermediate stand average age is 65 years and is comprised of second growth Douglas-fir (60%) averaging 11" dbh ranging from 6-16" and 65 feet in height; grand fir (30%) averaging 11" dbh ranging from 6-16" and 65 feet in height.

The Douglas-fir shows varying degrees of dwarf mistletoe, *Arceuthobium douglasii*. The grand fir shows evidence of the Fir Engraver beetle, *Scolytus ventralis*, Indian paint fungus, *Echinodontium tinctorium* and root-rot. Western larch is affected by dwarf mistletoe, *Arceuthobium laricis*. Regeneration is almost nonexistent under this closed canopy. Fuel loading is moderate.

Treatment Objectives:

- Remove the merchantable grand fir and the majority of the Douglas-fir and to encourage movement toward the appropriate cover type.
- Considerably reduce the dwarf mistletoe affecting the Douglas-fir and western larch.
- Promote the regeneration of ponderosa pine.

Prescribed Treatment: (S5)

- Regeneration harvest.
- Selection of seed trees by species designation (ponderosa pine 14" & greater) and leave tree marking (western larch & Douglas-fir) to accomplish desired variable spacing of 65-90 feet (leaving 5–10 TPA).
- Retention of snags 14" dbh & greater and a minimum of 2 cull trees per acre to remain standing, where present, if they are not a safety hazard.

Harvest Method:

- Cable yarding (skyline) required; hand falling required.

Hazard Reduction:

- Yarding of tops required.
- Broadcast burn and burning of landing piles following harvest activities.
- Hazard reduction would be accomplished through the creation of fuel breaks and fireline construction.

Regeneration/Site Preparation:

- Slashing of **all** residual prior to broadcast burn.
- Broadcast burn to prepare exposed mineral seed bed.
- Leave trees to provide seed source for natural regeneration.

Anticipated Future Treatments:

- Unit to be monitored annually for the establishment of natural regeneration. If natural regeneration fails 5 years after site preparation, planting would be scheduled.
- Evaluation for non-commercial thinning to take place in 15-20 years.
- Stand conditions monitored and evaluated at regular intervals, as per calendar recall. Salvage and/or sanitation operations to occur after evaluation of a site altering event.

PROPOSED HOT SPRINGS TIMBER SALE
HARVEST UNIT PRESCRIPTIONS
Section 36, T22N, R25W

****

Harvest Unit: T1 **Harvest Unit Acres:** 58

Elevation: 4960' – 4280' **Slope:** 0 – 45% **Aspect:** South - Southeast

Habitat Types: PSME/CARU

Current Cover Type: Ponderosa pine
Appropriate Cover Type: Ponderosa pine

Soil Type: Tevis gravelly loam, 15 to 35 percent slopes.

Description of Existing Stand: This unit is located in the North-central part of the section. This stand is a ponderosa pine site with Douglas-fir encroachment. This multistoried stand is composed of an overstory of scattered larger ponderosa pine (70%) and Douglas-fir (30%). Overstory age averages 100 ranging from 85-130 years; 18" dbh ranging from 12-25"and 75 feet in height.

The intermediate stand average age is 65 years and is comprised of second growth ponderosa pine (20%) averaging 10" dbh ranging from 6-14"and 60 feet in height; Douglas-fir (50%), averaging 9" dbh ranging from 6-13" and 55 feet in height; grand fir (30%), averaging 9" dbh ranging from 6-13" and 55 feet in height; with traces of other species.

Ponderosa pine regeneration is suppressed to almost non-existent. The Douglas-fir and grand fir regeneration ranges from thickets of over stocked, suppressed 0"-6" dbh to scattered seedlings in the understory. The Douglas-fir shows varying degrees of Dwarf mistletoe, *Arceuthobium douglasii*, from light to heavy in 75-85% of the trees. The grand fir shows evidence of the Fir Engraver beetle, *Scolytus ventralis*, Indian paint fungus, *Echinodontium tinctorium* and root-rot. Fuel loading is light on the easterly facing slopes to pine duff on the more open south slopes.

Treatment Objectives:

- Remove the merchantable grand fir and the majority of the encroaching Douglas-fir to encourage movement toward the appropriate cover type.
- Considerably reduce the dwarf mistletoe affecting the Douglas-fir.

Prescribed Treatment: (T1)

- Selection of seed trees by species designation (ponderosa pine 14" & greater) and leave tree marking (western larch & Douglas-fir) to accomplish desired variable spacing of 55-65 feet (leaving 10–15 TPA).

- Retention of snags 14" dbh & greater and a minimum of 2 cull trees per acre to remain standing, where present, if they are not a safety hazard.

Harvest Method:

- Ground based logging system. Conventional or mechanized systems are acceptable.

Hazard Reduction:

- Hazard reduction would be accomplished through the use of excavator piling and burning of piles.

Regeneration/Site Preparation:

- Slashing of damaged residual and all residual with Dwarf mistletoe.

- Scarification while piling.

- Leave trees to provide seed source for natural regeneration of preferred species.

Anticipated Future Treatments:

- Unit to be monitored annually for the establishment of natural regeneration. If natural regeneration fails 5 years after site preparation, planting would be scheduled.

- Evaluation for non-commercial thinning to take place in 15-20 years.

- Stand conditions monitored and evaluated at regular intervals, as per calendar recall. Salvage and/or sanitation operations to occur after evaluation of a site altering event.

PROPOSED HOT SPRINGS TIMBER SALE

HARVEST UNIT PRESCRIPTIONS

Section 36, T22N, R25W

****

Harvest Unit: T2 **Harvest Unit Acres:** 95

Elevation: 4200' – 44840' **Slope:** 0 – 40% **Aspect:** South (East-West)

Habitat Types: ABGR/LIBO

Current Cover Type: Ponderosa Pine
Appropriate Cover Type: Ponderosa Pine

Soil Type: Tevis gravelly loam, 15 to 35 percent slopes.

Description of Existing Stand: This unit runs a ridge from the center of the section to the southeast, delineated by roads and approximant cover type. This is a ponderosa pine site with Douglas-fir encroachment. This multistoried stand is composed of an overstory of scattered larger ponderosa pine (80%) and Douglas-fir (20%). Overstory age averages 80, ranging from 65-130 years; 16" dbh ranging from 14-30" and 70 feet in height.

The intermediate stand average age is 65 years and is comprised of second growth ponderosa pine (30%) averaging 10" dbh ranging from 6-14" and 65 feet in height; Douglas-fir (50%) averaging 9" dbh ranging from 6-14"and 60 feet in height; western larch (10%) averaging 9" dbh ranging from 6-13"and 65 feet in height; grand fir (10%), averaging 9" dbh ranging from 6-12" and 60 feet in height.

Ponderosa pine regeneration is almost non-existent, that which is there is suppressed. The Douglas-fir and grand fir regeneration ranges from thickets of over stocked, suppressed 0"-6" dbh to scattered seedlings in the understory. The Douglas-fir and western larch show varying degrees of Dwarf mistletoe, *Arceuthobium douglasii*, from light to heavy in 75-85% of the trees. The grand fir shows some evidence of Fir Engraver beetle, *Scolytus ventralis*, Indian paint fungus, *Echinodontium tinctorium* and root-rot. Fuel loading is light on the side hills, to pine duff on the more open south slopes.

Treatment Objectives:

- Remove the merchantable grand fir and the majority of the encroaching Douglas-fir to encourage movement toward the appropriate cover type.
- Considerably reduce the dwarf mistletoe affecting the Douglas-fir and western larch.

Prescribed Treatment: (T2)

- Selection of seed trees by species designation (ponderosa pine 14" & greater) and leave tree marking (western larch & Douglas-fir) to accomplish desired variable spacing of 55-65 feet (leaving 10–15 TPA).

- Retention of snags 14" dbh & greater and a minimum of 2 cull trees per acre to remain standing, where present, if they are not a safety hazard.

Harvest Method:

- Ground based logging system. Conventional or mechanized systems are acceptable.

Hazard Reduction:

- Hazard reduction would be accomplished through the use of excavator piling and burning of piles.

Regeneration/Site Preparation:

- Slashing of damaged residual and all residual with Dwarf mistletoe.

- Scarification while piling.

- Leave trees to provide seed source for natural regeneration.

Anticipated Future Treatments:

- Unit to be monitored annually for the establishment of natural regeneration. If natural regeneration fails 5 years after site preparation, planting would be scheduled.

- Evaluation for non-commercial thinning to take place in 15-20 years.

- Stand conditions monitored and evaluated at regular intervals, as per calendar recall. Salvage and/or sanitation operations to occur after evaluation of a site altering event.

PROPOSED HOT SPRINGS TIMBER SALE

HARVEST UNIT PRESCRIPTIONS

Section 36, T22N, R25W

****

Harvest Unit: T3 **Harvest Unit Acres:** 104

Elevation: 4160' – 4840' **Slope:** 15 – 45% **Aspect:** East

Habitat Types: ABGR/LIBO

Current Cover Type: Ponderosa Pine
Appropriate Cover Type: Ponderosa Pine

Soil Type: Mitten gravelly silt loam, 35 to 60 percent slopes.
Tevis gravelly loam, 15 to 35 percent slopes.

Description of Existing Stand: This unit is located in the center of the section, extending to the south section line. The current cover type map identifies this unit as a ponderosa pine type; field reconnaissance reveals this site to be more of a Mixed Conifer site with scattered dominant ponderosa pine as the overstory. Overstory age averages 100, ranging from 85-140 years, 20" dbh ranging from 16-36"and 90 feet in height.

The intermediate stand average age is 65 years and is comprised of second growth Douglas-fir (35%) averaging 11" dbh ranging from 8-18"and 65 feet in height; grand-fir (50%) averaging 10" dbh ranging from 6-18"and 65 feet in height; western larch (15%) averaging 11" dbh ranging from 6-20"and 75 feet in height.

The Douglas-fir shows varying degrees of dwarf mistletoe, *Arceuthobium douglasii*, from light to heavy in 70-80% of the trees with pockets of root rot. The grand fir shows evidence of the Fir Engraver beetle, *Scolytus ventralis*, Indian paint fungus, *Echinodontium tinctorium* and root-rot. Western larch is heavily affected by dwarf mistletoe, *Arceuthobium laricis*. Regeneration is almost nonexistent under this closed canopy. Fuel loading is moderate.

Treatment Objectives:

- Remove the merchantable grand fir and the majority of the Douglas-fir to encourage movement toward the appropriate cover type.
- Considerably reduce the dwarf mistletoe affecting the Douglas-fir and western larch.
- Promote the regeneration of ponderosa pine.

Prescribed Treatment: (T3)

- Seed tree; regeneration harvest.
- Selection of seed trees by species designation (ponderosa pine 14" & greater) and leave tree marking (western larch & Douglas-fir) to accomplish desired variable spacing of 65-95 feet (leaving 5–10 TPA).
- Retention of snags 14" dbh & greater and a minimum of 2 cull trees per acre to remain standing, where present, if they are not a safety hazard.

Harvest Method:

- Ground based logging system. Conventional or mechanized systems are acceptable.

Hazard Reduction:

- Hazard reduction would be accomplished through the use of excavator piling and burning of piles.

Regeneration/Site Preparation:

- Slashing of <u>all</u> residual prior to piling.
- Scarification while piling.
- Leave trees to provide seed source for natural regeneration of preferred species.

Anticipated Future Treatments:

- Unit to be monitored annually for the establishment of natural regeneration. If natural regeneration fails 5 years after site preparation, planting would be scheduled.
- Evaluation for non-commercial thinning to take place in 15-20 years.
- Stand conditions monitored and evaluated at regular intervals, as per calendar recall. Salvage and/or sanitation operations to occur after evaluation of a site altering event.

PROPOSED HOT SPRINGS TIMBER SALE

HARVEST UNIT PRESCRIPTIONS

Section 36, T22N, R25W

****

Harvest Unit: T4 **Harvest Unit Acres:** 171

Elevation: 4720' – 5360' **Slope:** 15 – 45% **Aspect:** East

Habitat Types: ABGR/LIBO

Current Cover Type: Mixed Conifer
Appropriate Cover Type: Western Larch / Douglas-fir

Soil Type: Mitten gravelly silt loam, 15 to 35 percent.

Description of Existing Stand: This unit is located in the west side of the section, extending from the south section line, to the north section line. This Mixed Conifer site has scattered dominant ponderosa pine as the overstory. Overstory age averages 100, ranging from 85-140 years, 20" dbh ranging from 16-36"and 90 feet in height.

This intermediate stand's age averages 80 ranging from 65-120 years. It is made up of Douglas-fir (40%), averaging 11" dbh ranging from 6-20" and 65 feet in height; grand fir (30%), averaging 10" dbh ranging from 6-18" and 65 feet in height; western larch (20%), averaging 9" dbh ranging from 6-18" and 65 feet in height; with small volumes of other species.

The Douglas-fir shows varying degrees of dwarf mistletoe, *Arceuthobium douglasii*, from light to heavy in 50-60% of the trees with pockets of root rot. The grand fir shows evidence of the Fir Engraver beetle, *Scolytus ventralis*, Indian paint fungus, *Echinodontium tinctorium* and root-rot. Western larch is he affected by dwarf mistletoe, *Arceuthobium laricis*. Regeneration is almost nonexistent under this closed canopy. Fuel loading is moderate.

Treatment Objectives:

- Remove the merchantable grand fir to encourage movement toward the appropriate cover type.
- Promote a healthy stand of timber by considerably reducing the dwarf mistletoe affecting the Douglas-fir & western larch and the Douglas-fir affected by root-rot.

Prescribed Treatment: (T4)

- Commercial thinning.
- Selection of seed trees by species designation (ponderosa pine 14" & greater) and leave tree marking (western larch & Douglas-fir) to accomplish desired variable spacing of 30-35 feet (leaving 35–45 TPA).
- Retain snags 14" dbh & greater. A minimum of 2 cull trees per acre to remain standing for snag recruitment if not a safety hazard.

Harvest Method:

- Ground based logging system. Conventional or mechanized systems are acceptable.
- Leave trees marked to leave in addition to species designated leave trees.

Hazard Reduction:

- Hazard reduction would be accomplished through the use of excavator piling and burning of piles.

Regeneration/Site Preparation:

- Harvest operations to create adequate spacing for the remaining thinned stand.
- Scarification while piling; slashing of damaged residual prior to piling.
- Leave trees to provide seed source for natural regeneration.

Anticipated Future Treatments:

- Unit to be monitored annually for the establishment of natural regeneration. If natural regeneration fails 5 years after site preparation, planting would be scheduled.
- Evaluation for a second harvest entry to take place in 10-15 years.
- Stand conditions monitored and evaluated at regular intervals, as per calendar recall. Salvage and/or sanitation operations to occur after evaluation of a site altering event.

Attachment 4

Mitigations

Mitigation Measures

Roads: A transportation system minimizing road miles and meeting all BMP's has been designed by DNRC. This system proposes the construction of 3.9 miles of new road, which would remain in place following project activity. After activities have been completed the roads would be grass seeded and closed to use. There would be reconstruction and improvement totaling 1.6 miles, involving improving road surface drainage and opening roads for safe hauling traffic. Temporary road construction of 0.4 miles would be mechanically obliterated and returned to natural contour. There would be 0.7 miles of road that would be abandoned and permanently closed to motorized use. 11.0 miles of existing BIA and Tribal roads would be incorporated into the transportation plan. Upon completion of roadwork, all haul roads would meet Best Management Practices (BMP's) standards.

Wildlife: The following issues have been identified, with mitigation measures (italicized) incorporated into the proposed project:

Gray Wolf: Suspend operations and temporarily restrict use of roads within a 1-mile radius of any known active wolf den. Suspend operations and consult a DNRC biologist if a suspected rendezvous site is observed within 0.5 mile of any ongoing project activities. Close unnecessary roads and skid trails after the proposed activities to reduce the potential for motor vehicle disturbance. *These items would be specified in the Timber Sale Contract and monitored by the Forest officer.* Use a combination of topography, group retention, and roadside vegetation to reduce views into harvest units along open roads. *Contract specifications would require gates and/or earthen barriers to be constructed on all new roads in addition to the abandonment of current roads that would no longer be necessary for access to these parcels. To meet these requirements, a DNRC Forest officer would monitor skid trail and corridor location and placement.*

Fisher: Close roads and skid trails opened with the proposed activities to reduce the potential for unauthorized motor vehicle use. Retain vegetated buffers along streams to provide potential fisher resting and foraging habitats. *Retention of snags over 14" in all units, where available, would provide fishers with habitat structure important for resting and foraging when the stands regenerate to a condition where fishers can start using them again. Some snags could be lost due to the harvest operations, but these snags would be left on site to provide coarse woody debris habitat. All opened roads`` would be closed by contract specifications as listed above in "Gray Wolf".*

Pileated Woodpecker: Favor ponderosa pine and western larch in retention and regeneration decisions. *Harvest unit and stand prescriptions accomplish this.* Reduce motorized access to reduce potential loss of existing snags to firewood gathering. *Access would be controlled as above in "Gray wolf".* Manage for snags, snag recruits, and coarse woody debris according to ARM 36.11.411,36.11.413, and 36.11.414, particularly favoring western larch, ponderosa pine, and black cottonwood. *Retention of snags over 14" in all units, where available. If any of these snags were cut for safety purposes, they would be left on site to provide potential feeding sites for pileated woodpeckers. Contract provisions would be in place to accomplish this.*

Flammulated Owl: Favor ponderosa pine in retention and regeneration decisions. Restrict public access to reduce potential loss of existing snags to firewood gathering. Manage for large-sized snags and snag recruits according to ARM 36.11.411, particularly favoring ponderosa pine. *Mitigations identical to those above under "Pileated Woodpecker."*

Big Game: Retention of visual screening along open roads and securing restricted roads would decrease big game vulnerability to human and other predators related to the effects of timber harvest. *Harvest unit and stand prescriptions accomplish this.* Close roads and skid trails opened with the proposed activities to reduce the potential for disturbance from unauthorized motor vehicle traffic. *Same mitigation requirements as listed above under "Gray wolf".*

Westslope Cutthroat Trout: Due to the ephemeral flow regime and intermittent character of streams in the state parcel it is unlikely that fish are present. It is unlikely that adverse long-term impacts to cold-water fisheries would result from the harvesting and road construction. Short-term impacts are possible during installation of the CMPs, however these impacts would be minimized with erosion control techniques and timing restrictions. Although all forestry BMP's would be implemented and caution would be taken to prevent sediment introduction into the stream, potential would exist for a short-term increase in turbidity. Prior to installing the stream/draw crossings DNRC would obtain an Aquatic Lands Conservation Ordinance permit from the CS&KT.

Soils: Limit equipment operations to periods when soils are relatively dry, (less than 20% soil moisture content), frozen or snow covered to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up. On ground skidding units, the logger and sale administrator would agree to a general skidding plan prior to equipment operations. Skid trail planning would identify which main trails to use, and what additional trails are needed. Trails that do not comply with BMP's (i.e. draw bottom trails) would not be used and would be closed with additional drainage installed where needed or grass seeded to stabilize the site and control erosion. Tractor skidding would be limited to slopes less than 40%. Short steep slopes above incised draws may require a combination of mitigation measures based on site review, such as adverse skidding to ridge or winch line skidding from more moderate slopes less than 40%.

Slash Disposal: Limit disturbance and scarification to 30-40% of harvest units. No dozer piling on slopes over 35%; no excavator piling on slopes over 40% unless the operation can be completed without causing excessive erosion. Consider lop and scatter or jackpot burning on steeper slopes. Accept disturbance incurred during skidding operations to provide adequate scarification for regeneration. Retain 10 to 15 tons large woody debris and a majority of all fine litter feasible following harvest (ARM 36.11.410 and 36.11.414). On commercial thin units where whole tree harvesting is used implement one of the following mitigations for nutrient cycling; 1) use in woods processing equipment that leaves slash on site, 2) for whole tree harvest, return skid slash and evenly distribute within the harvest area, or 3) cut off tops from every third bundle of logs so that tops are dispersed as skidding progresses. *These measures would be specified in the Timber Sale Contract and would be monitored by the Forest Officer.*

Hydrology: All timber harvest would be regulated by the SMZ law and prohibit equipment operation within the SMZ. In addition to the resource protection provided by the SMZ law, forestry BMP's would be implemented in all aspects of the proposed timber harvest. Road drainage improvements and reconstruction would be implemented on approximately 1.6 miles of road to reduce the potential for sediment introduction from haul routes. The drainage improvements may include adding drive-through drain dips and ditch-relief CMPs, cleaning culvert inlets/outlets and reshaping the road prism. Six CMPs would be installed in association with 3.9 miles of new road construction. One 36-inch diameter culvert would be installed on the perennial stream. Standard installation procedures would be used during installation including using silt fences, slash filter windrows and rock armor around the inlet and outlet. Although all forestry BMP's would be implemented and caution would be taken to prevent sediment introduction into the stream, potential would exist for a short-term increase in turbidity. Prior to installing the stream/draw crossings DNRC would obtain an Aquatic Lands Conservation Ordinance permit from the CS&KT.

Noxious Weeds: Measures to control the introduction or increases to infestations of noxious weeds would be implemented through the Timber Sale Contract. Control measures include the washing of all equipment prior to entering the project area and seeding all areas of disturbed soil associated with road construction or upgrades. Roads and skid trail approaches would again be seeded at the close of project activity. Measures to control any unforeseen outbreak would be implemented as needed through and beyond the project operational period.

Insects and Diseases: Promotion of open healthy timber stands would assist in controlling insect and disease activity in the project area.

Visual Impacts/Aesthetic Values: Portions of the project would be visible from Montana State Highway 28 and the town of Hot Springs, Montana. Topography is mountainous; therefore portions of the sale area would be hidden from view minimizing visual impacts. Prescriptions are designed to mimic historical stand conditions and current adjacent land management practices, therefore should not have an adverse visual impact on the area.

Fuel Hazards: Harvest treatments would reduce ladder fuels and trees susceptible to fire. Slash would be treated either through logging system design, excavator piling or broadcast burning, as designated by prescription per each individual harvest unit.

Old Growth: There are no old Growth areas identified in any of the proposed harvest units.

Stand Growth and Vigor: A concern was brought up regarding the growth and vigor potential of the stands in this project area. Silvicultural prescriptions are designed to maintain and improve stand growth and vigor, while maintaining DNRC's commitments to managing for a biologically diverse landscape.

Attachment 5

Consultants & References

Individuals Consulted

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Special References

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