SKALKAHO TIMBER SALE ENVIRONMENTAL ASSESSMENT

Montana Department of Natural Resources and Conservation

Southwestern Land Office
Hamilton Unit

April 2006

SKALKAHO TIMBER SALE PROJECT
ENVIRONMENTAL ASSESSMENT (EA)

COVER SHEET

Proposed Action: The Montana Department of Natural Resources and Conservation proposes forest management activities on forested State Trust Lands. The planned activities would include the sale and harvest of up to approximately 1.8 million board feet of wood products from state land located 7 miles southeast of Hamilton, Montana. Management activities would include harvest from as much as 650 acres located in Section 16 of Township 5 North, Range 19 West (Gird Creek Section) and Section 36 of Township 5 North, Range 20 West (Sleeping Child Section). The proposed action plan could begin implementation as early as the summer of 2006.

Type of Document: Environmental Assessment

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Special Note: Comments received in response to this project will be available for public inspection and will be released in their entirety if requested pursuant to the Montana Constitution.

HOW TO READ THIS EA (ENVIRONMENTAL ASSESSMENT)

To read this EA more effectively, carefully study this page. Following State regulations, we have designed and written this document (1) **to provide** the Project Decision Maker with sufficient information to make an informed, reasoned decision concerning the proposed Skalkaho Timber Sale and (2) **to inform** members of the affected and interested public of this project's effects to the environment.

The EA consists of the following chapters:

1 Purpose and Need for Action
2 Alternatives, Including the Proposed Action
3 Existing Environment
4 Environmental Effects
5 References

Chapters 1 and 2 together serve as a summary overview of the Skalkaho Timber Sale Project. These two chapters have been written so that non-technical readers can understand the potential environmental, technical, economic, and social consequences of **taking** and of **not taking** action.

Chapter 1 introduces the Skalkaho Timber Sale. It provides a very brief description of the proposed Skalkaho Timber Sale and then explains three key things about the project:

(1) the relevant environmental issues,
(2) the decisions that the Project Decision Maker must make concerning this project, and
(3) the relevant laws, regulations, and consultations with which the DNRC must comply.

Chapter 2 provides detailed descriptions of Alternative A: No Entry (No Action), Alternative B, and Alternative C. It also includes a summary comparison of the two action alternatives.

Chapter 3 briefly describes the past and current conditions of the relevant resources (*issues*) in the project area that would be meaningfully affected, establishing a part of the baseline used for the comparison of the predicted effects of the alternatives.

Chapter 4 presents the detailed, analytic predictions of the consequences of implementing Alternative A: No Harvest (No Action), Alternative B, or Alternative C. These predictions include the direct, indirect, and cumulative effects of implementing the alternatives.

Chapter 5 findings of the Skalkaho Timber Sale project.

Chapter 6 lists preparers, references, and abbreviations used.

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CHAPTER 1: PURPOSE & NEED

1.1 DESCRIPTION OF PROPOSED ACTION

The Department of Natural Resources and Conservation (DNRC), Hamilton Unit, proposes to harvest timber on state lands to generate revenue for the Montana Common Schools Trust. The project area is located approximately 7 miles southeast of Hamilton, Montana, and involves sections 16, T5N, R19W (Gird Creek Section) and 36 in T5N, R20W (Sleeping Child Section) for a total gross sale area of approximately 1280 acres (see vicinity map, Figure 1). If a harvest alternative is selected approximately 1.4 to 1.8 million board feet (MMBF) would be harvested from approximately 500 to 650 acres with various even and uneven-aged silvicultural treatments. Harvesting could begin as early as the year 2006 with all associated activities being complete by the year 2008.

To accomplish this project and provide better access for future management of these parcels, up to 2.9 miles of new road would be constructed and approximately 17 miles of existing road would be improved to meet Montana's Best Management Practices (BMP's). Approximately ½ mile of road would also be closed and abandoned as part of this project.

1.2 NEED FOR ACTION

The lands involved in the proposed project are held by the State of Montana for the support of specific beneficiary institutions, such as public schools, State colleges and universities, and other specific State institutions, such as the school for the deaf and blind (Enabling Act of February 22 1889: 1972 Montana Constitution Article X, Section 11). The Board of Land Commissioners (Land Board) and DNRC are 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, Montana Code Annotated (MCA).

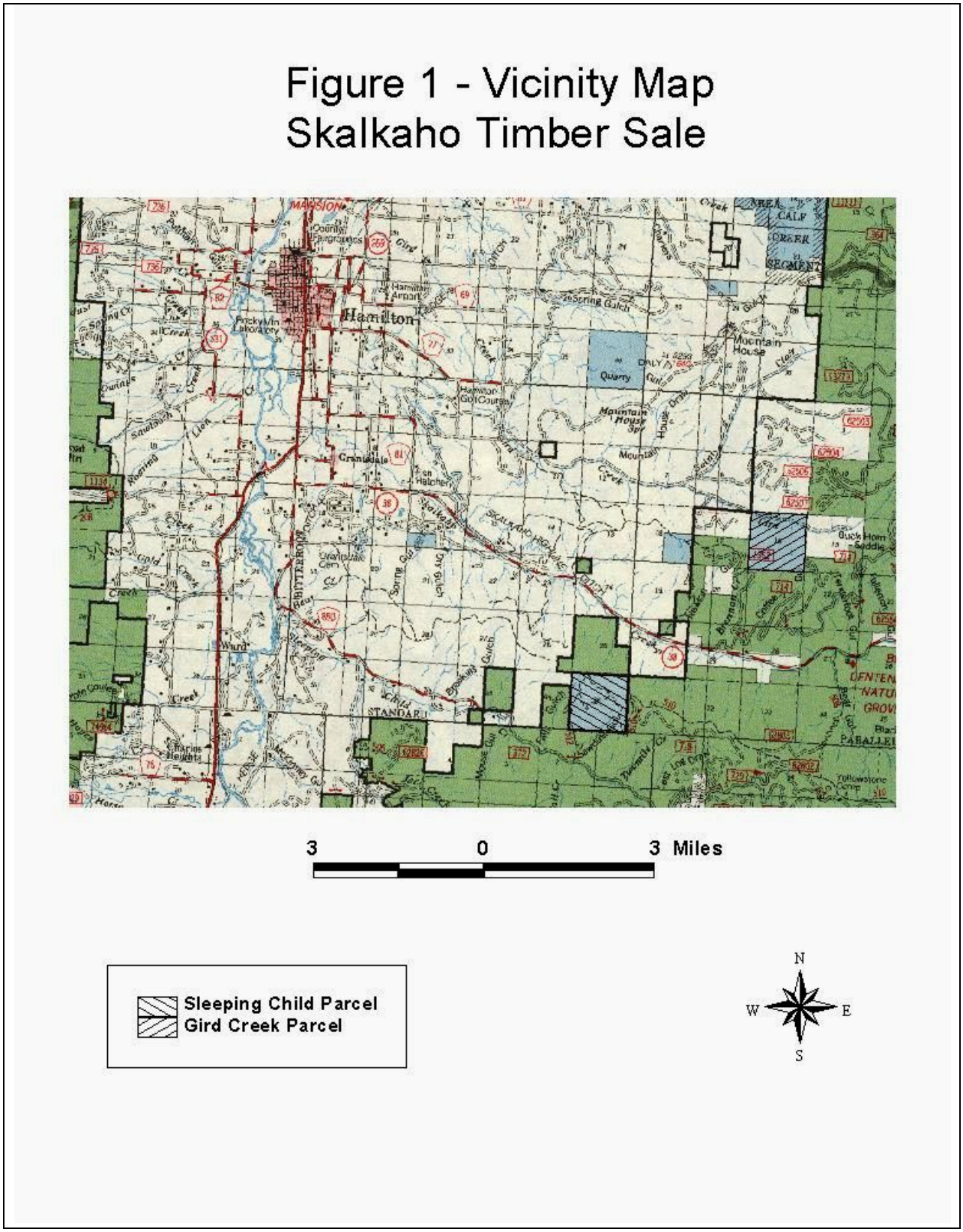
On June 17, 1996, the Land Board approved the State Forest Land Management Plan (SFLMP). The SFLMP provides the philosophy adopted by DNRC through programmatic review (DNRC, 1996). The DNRC will manage the lands in this project according to this philosophy, which states:

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

On March 13, 2003, the DNRC adopted Administrative Rules for Forest Management (Rules) (Administrative Rules of Montana [ARM] 36.11.401 through 450, DNRC 2003). The Rules provide DNRC personnel with consistent policy, direction, and guidance for the management of forested trust lands. Together, the SFLMP and Rules define the programmatic framework for this project.

The DNRC intends to manage these parcels for healthy and biologically diverse forests by managing toward more natural and historic stand structures and by reintroducing fire, where feasible, which is a natural process that these forest types evolved with and has been basically absent for the past century. The proposed harvests are designed, in part, to reflect the historical roles that fire played in the cover types that are represented. The proposed management regime for these parcels is to develop age class structures that would maximize long-term return to the school trust. The DNRC would plan to reenter these parcels as needed to harvest forest products and manage the stands for this long-term return. Intermediate entries such as thinnings, salvages, and maintenance projects may also be needed to fulfill these goals.

Figure 1 – Vicinity Map Skalkaho Timber Sale



1.3 OBJECTIVES OF THE SKALKAHO TIMBER SALE PROJECT

In order to meet the goals of the management philosophy adopted through programmatic review, the DNRC has set the following specific project objectives:

1. Maximize revenue over the long-term for the School Trust accounts from the timber resources and provide a sufficient amount of sawlog volume to contribute to the DNRC's sustained yield as mandated by State Statute 77-5-222, MCA.

2. Manage the identified parcel intensively for healthy and biologically diverse forests to provide long-term income for the Trust.

3. Improve timber stand growth and vigor.

1.4 COOPERATING AGENCIES AND ENTITIES WITH JURISDICTION AND REQUIRED PERMITS

- The Montana Streamside Management Zone (SMZ) Law administered by the Department of Natural Resources and Conservation (DNRC) would be adhered to when operations occur near streams.
- Open Burning regulations under the Montana DEQ would be followed for all burning and hazard reduction work.
- Temporary Road Use Permits would be obtained from the Bitterroot National Forest.
- The Clean Water Act and Environmental Protection Agency Water Quality Planning and Management Regulations require the determination of allowable pollutant levels in 303(d) listed streams through the development of Total Maximum Daily Load (TMDL) limits. Gird Creek is on the 303(d) list as only partially supporting aquatic life and cold water fisheries. At this time the Montana Department of Environmental Quality (DEQ) is in the process of developing guidelines by which landowners and agencies may conform to the requirements of the Clean Water Act with respect to section 303(d).
- A 124 permit may be required from Montana Department of Fish Wildlife and Parks.

1.5 OTHER RELEVANT ENVIRONMENTAL REVIEWS IN THE AREA

In order to address direct, indirect, and cumulative effects on resources, the analysis incorporates past, present, and future actions within a determined analysis area. The locations and sizes of the analysis areas vary by resource (watershed, soils, etc.) and species (grizzly bear, big game, etc.) and are further described by resource in Chapters 3 and 4. Effects from past projects are incorporated into DNRC databases over time and become part of the existing condition that is used in each analysis. Ongoing and proposed projects are considered for each resource based on the appropriate analysis area.

The following environmental reviews were located within analysis boundaries for the project.

- Environmental Analysis For The Sula State Forest Fire Mitigation, Salvage & Recovery Project; November 2000, Montana Department of Natural Resources & Conservation, Hamilton Unit Office, Sula State Forest.
- Department of Natural Resources & Conservation, Hamilton Unit Office; July 2001, Environmental Analysis for the Spring Child Fire Salvage Timber Sale.
- USFS, 2001. Burned Area Recovery: Draft Environmental Impact Statement. USDA Forest Service, Bitterroot National Forest, May 2001.

1.6 DECISIONS TO BE MADE

The Decision Maker will determine the following from this EA and will document their decision in the Finding found at the end of the document.

- Should the project be implemented or should an EIS be prepared?
- Do the alternatives presented in the EA meet the purpose of the project?
- Which alternative should be implemented?
- Are the proposed mitigations adequate and feasible?
- Does the selected alternative have a significant effect on the human environment?

These decisions would become DNRC's recommendations to the Land Board. The Land Board will make the final decisions regarding implementation of actions.

1.7 SCOPE OF THE ENVIRONMENTAL ANALYSIS

This section defines and explains the scope (boundaries/limits) of the Skalkaho Timber Sale Project. It briefly describes the history of the planning process, identifies the resource issues studied in detail, and identifies the issues eliminated from detailed study.

1.7.1 Public Scoping Process

The initial stage of an Environmental Assessment (EA) is the public scoping process, which is used to inform the public that a State agency is proposing an action and gather comments on the possible impacts of the project. The scope of this was determined by the professional judgment of resource specialists in DNRC, other State agencies, comments from the public, and other interested parties.

The Skalkaho timber sale was initially scoped for public comments in October of 1999, but due to the fires of 2000 the project was delayed. The Sleeping Child Section 36 burned with light, moderate and high intensity fires in 2000 and some salvage operations have taken place since the original scoping. The project proposal was modified in 2002 to account for fire salvage activities, and was scoped again in December of 2002, through distribution of a letter and the initial project proposal to individuals, adjacent landowners, organizations, industries, and agencies. Notices were also posted in local post offices, newspapers, and at entrances to the sections involved.

The mailing list of parties receiving initial scoping notices for this project is located in the project file at the Hamilton Unit Office. Public scoping comments as well as internal DNRC issues and concerns were summarized and can be found below. The original comments are also located in the project file at the Hamilton Unit Office.

1.7.2 Issues Studied in Detail

The Skalkaho ID team carefully considered comments received from DNRC resource specialists, the public, and other agencies. Through the scoping process, concerns were raised about the project's potential impacts on the environment. These comments and concerns were considered by DNRC in the development of project alternatives (see CHAPTER 2). The Project File contains additional details of scoping and issue identification. For the purposes of this environmental analysis, issues will be considered actual or perceived effects, risks, or hazards as a result of the proposed alternatives.

Issues were grouped by general resource area (Vegetation, Hydrology, etc.) and are listed below. Italicized comments clarify where an issue may be addressed under several resource areas. See Chapters 3 and 4 for more detailed descriptions and on relative importance of these issues and concerns.

The following issues were identified for detailed study:

Roads

- The proposed action may increase levels of illegal road use in the project area.

Vegetation

- If the proposed action does not take place, timber stand health could continue to decline with increased severity and spread of mistletoe, increased risk of insect and disease outbreaks, and increased competition stress from overstocking.
- If the proposed action does not take place, risk of high intensity stand replacing fires would continue to increase.
- Slash from timber harvest activities could increase fire hazard and could make the site look displeasing. *The visual component of this issue will be addressed as part of the aesthetics analysis.*

Hydrology and Fisheries

- Management activities associated with this project could have adverse effects on water quality
- The proposed project could affect Gird Creek, which is an important bull trout and westslope cutthroat fishery. *This concern was grouped with the next one; both species will be addressed within the fisheries analysis.*
- Proposed activities could have adverse effects on fisheries habitat.

Soils

- Increased levels of soil effects (displacement, erosion, and compaction) could occur as a result of the proposed harvest.

Weeds

- Proposed activities could spread noxious weeds.

Wildlife

- The proposed project could affect canopy cover and security cover for ungulates (deer and elk) in Section 16.
- The proposed activities could affect threatened and endangered species (i.e., bald eagles, gray wolves, grizzly bears, Canada lynx).
- The proposed activities could affect sensitive species.

Aesthetics

- The proposed project could change the aesthetics in the area.

1.7.3 Issues Eliminated from Detailed Study

The ID team eliminated the following issues from detailed study because they were beyond the scope of this project or because this project would not be likely to impact them. The Project File contains details dealing with these issues. This Environmental Assessment contains no further or minimal information on these eliminated issues.

1.7.3.1 Bald Eagle (Federally Threatened)

There is concern that timber harvest activities would alter bald eagle habitat or provide unnecessary disturbance. The project area is 9.0 miles SE of the nearest known bald eagle nest. This nest is also located approximately 1/3 of a mile east of Hwy 93. Thus, due to the distance between the nest and project area, there would be low risk of direct, indirect, or cumulative effects to bald eagles as a result of the proposed action.

1.7.3.2 Peregrine Falcon

There is concern that timber harvest activities would disturb nesting peregrine falcons. The nearest known peregrine falcon nest is located approximately 10 miles west of the affected area. Thus, the proposed action would have low risk of direct, indirect, or cumulative effects to this species.

1.7.3.3 Townsend's Big-eared Bat

There is concern that timber harvest activities would disturb Townsend's big-eared bats. This species requires caves, caverns, or old mines for hibernacula. The nearest mine is located approximately 0.5 mile south of the project area in section 2, T 4 N, R 20 W. Current conservation strategies for this species indicate that a 500-ft radius buffer be installed around mine entrances to partially mitigate for the effects of timber harvest (Pierson et al. 1999). Thus, with the proposed action located 0.5 mile from the mine entrance, there would be low risk of direct, indirect, or cumulative effects to this species.

1.7.3.4 Coeur D'Alene Salamander

There is concern that timber harvest activities could affect this species. This species requires waterfall spray zones, talus, or cascading streams. There are no known areas of talus, waterfalls, or splash zones within the affected area. Thus, the proposed action would have low risk of direct, indirect, or cumulative effects to this species.

1.7.3.5 Columbian Sharp-tailed Grouse

There is concern that timber harvest activities could affect this species. The nearest known population of Columbian Sharp-tailed grouse occurs near Ovando, MT. Thus, the proposed action would have low risk of direct, indirect, or cumulative effects to this species.

1.7.3.6 Common Loon

The common loon is a fish-eating bird that breeds and nests on lakes and ponds. The nearest known observations for common loons is approximately 12 miles SW of the project area, located along Lake Como in section 36, T4N, R22W (Montana Natural Heritage Database). Thus, this area is not connected through the stream network with the proposed project area. Therefore, low risk of direct, indirect, or cumulative effects would be expected to common loons as a result of the proposed project and this species will not be analyzed further in this document.

1.7.3.7 Northern Bog Lemming

There is concern that timber harvest activities could affect this species. The sphagnum meadows, bogs or fens with thick moss mats required by this species are not present within the harvest area. Thus, the proposed action would have low risk of direct, indirect, or cumulative effects to this species.

1.7.3.8 Mountain Plover

There is concern that timber harvest activities could affect this species. The short-grass prairie habitats required by this species are not present within the harvest area. Thus, the proposed action would have low risk of direct, indirect, or cumulative effects to this species.

1.7.3.9 Harlequin Duck

Harlequin ducks require white-water streams with boulder and cobble substrates. Such conditions do not exist within the analysis area. Thus, there would be low risk of direct, indirect, or cumulative effects to this species.

1.7.3.10 Sensitive Plants

A search of the Montana Natural Heritage Program was conducted and no sensitive plants were identified in the analysis area. In field reconnaissance, DNRC personnel have identified no sensitive plants. Since no sensitive plants have been identified on the project area, no direct, indirect, or cumulative effects are expected to occur.

1.7.3.11 Old Growth

There was a concern that timber harvest activities may adversely impact old growth stands. The project area was inventoried for the presence of old growth as defined under ARM 36.11.403 (48) and 36.11.418. These definitions refer to stands that meet or exceed the minimum number, size, and age of large trees. (Green et al., 2000). No stands meeting this definition were found to be present. Because no old growth stands are proposed for harvest, there are no expected direct, indirect, or cumulative effects to old growth.

1.7.3.12 Cultural Resources

A concern was raised that proposed activities might affect cultural or archeological sites within the project area. The State Historic Preservation Officer was consulted in an effort to determine whether or not cultural resources exist in the project area. No such resources were identified. No additional archaeological investigative work was recommended by the State Historic Preservation Officer in order for the proposed timber sale to proceed.

CHAPTER 2: ALTERNATIVES

2.1 INTRODUCTION

Chapter 2 describes the alternatives developed and considered for the Skalkaho Timber Sale Project. This chapter will introduce a no action alternative and two action alternatives. It contains summaries and comparisons of each alternative.

2.2 DEVELOPMENT OF ALTERNATIVES

The initial proposal and intent of this project was to treat these two sections of state ownership to achieve the objectives of generating income for the school trust and maintaining long term forest health and productivity. The initial proposal included the removal of between 2.3 and 4.0 MMBF and the construction of up to 5 miles of new road to access the harvest areas and provide long-term access to these parcels.

To initiate analysis of existing conditions in the project area by DNRC specialists, the project leader, and the decision maker, an interdisciplinary team was formed to develop alternatives and address the issues. Public comments were received, grouped into the concerns listed in Chapter I, and existing condition information was compiled. Using this information, the team met to develop a reasonable range of selectable alternatives.

It was decided that because public and resource concerns, identified through scoping and specialist review, were greater on the Gird Creek section than the Sleeping Child section, two action alternatives would be considered on this section. This allows the decision maker a choice between potential effects and meeting project objectives of two action alternatives. Alternative B would allow the construction of approximately 2.9 miles of new road on this section and would construct two road segments that diverged but basically paralleled each other across the section in order to maximize manageable acreage and revenue to the school trust. It also proposed to harvest timber along the entire length of the ridge that runs through the southern portion of the section, which was later identified as a relatively well-used travel and security corridor for wildlife. Alternative C involves the construction of a single 1.7mile segment of new road and harvests 136 fewer acres. Both alternatives would leave portions of the ridge undisturbed which was different from the original proposal.

The Sleeping Child section received few comments from public scoping, was found to be utilized less as security cover by wildlife, and had fewer other resource concerns. Therefore, it was decided that a majority of the timbered acreage on this section would receive silvicultural treatments that would maximize revenue to the school trust, provide healthy and biologically diverse forests, and move the stands toward more historic conditions. One alternative was developed that mitigated resource concerns and met the project objectives. Several potential changes to this proposed action were discussed but were either not different enough from the developed alternative or did not do enough to sufficiently meet project objectives

Through combining these proposals, three alternatives (a no action and two action alternatives) were developed (see descriptions below for details). It was concluded that both action alternatives found a balance between resource concerns and project objectives that would be acceptable to the interdisciplinary team and the decision maker.

2.3 ALTERNATIVE DESCRIPTIONS

This section describes the elements and mitigation measures of the action alternatives B and C, and also includes a description of No Action Alternative A. If an action alternative is chosen, actions designed to protect resources during harvesting, road construction, or site preparation activities would be incorporated into a timber sale contract as contract specifications and stipulations. These specifications and stipulations would be applied to an action alternative and are a form of mitigation. Mitigation measures that were designed to reduce impacts on a particular resource are discussed in section 2.3.3 of this chapter and in Chapters 3 and 4 under the particular resource.

2.3.1 No Action Alternative A

No Action Alternative A is used as a baseline for comparing the effects that the action alternatives would have on the environment. It is also considered a reasonable alternative for selection.

Timber harvesting as proposed would not occur and roads would not be built. Future harvest of wood products or firewood might occur to an unknown degree, depending on project proposals and environmental analyses.

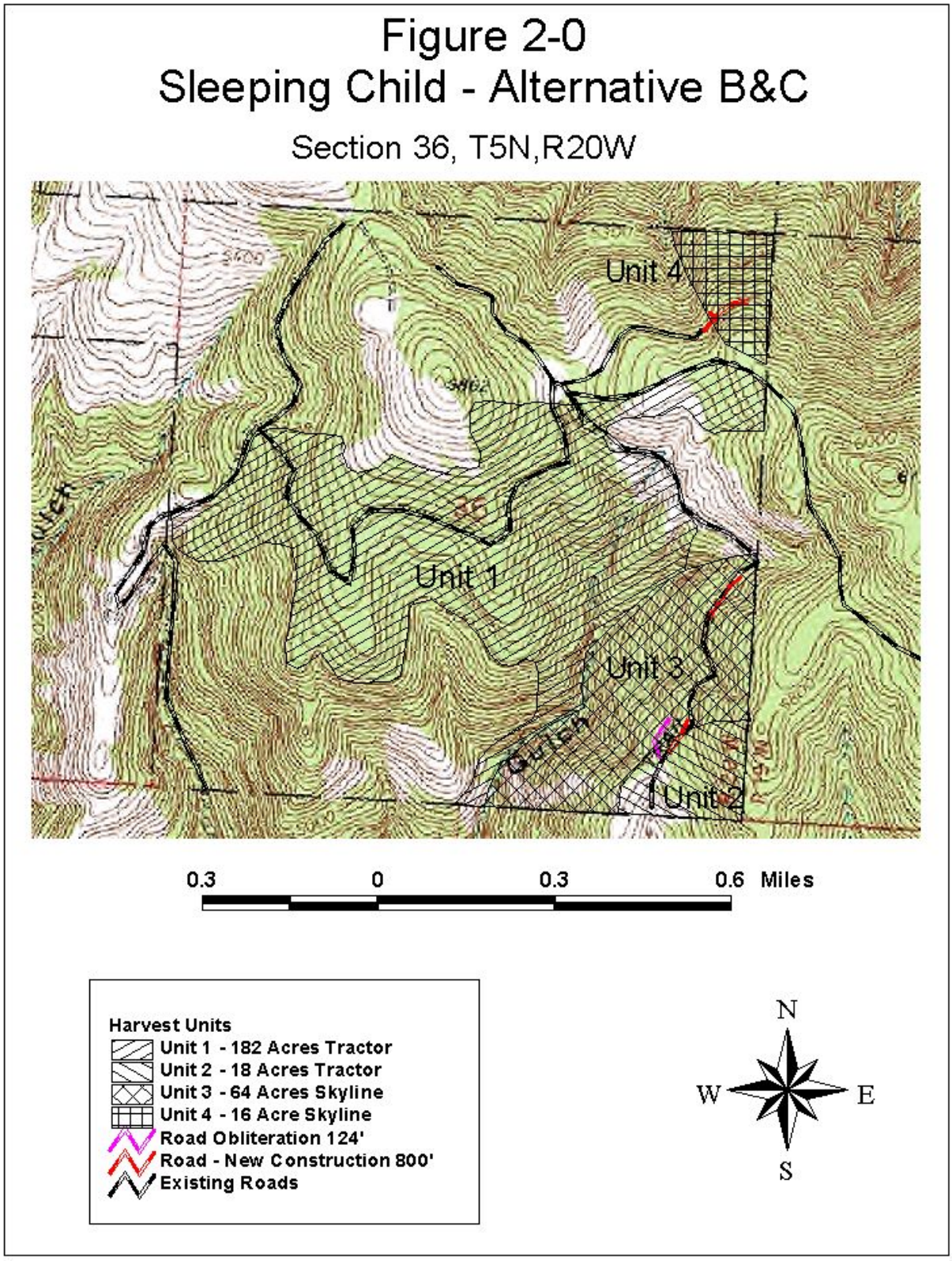
Existing grazing use would continue. Recreational uses of the area, both general and special would continue. Fuels mitigation and weed control efforts would continue as funding and priorities allow.

2.3.2 Components Common to Action Alternatives B & C

Both action alternatives are designed to improve timber stand productivity within the Skalkaho analysis area, as a necessary means for providing revenue generating opportunities in the future. Both alternatives are based on the trust mandate, principles of the State Forest Land Management Plan and the Administrative Rules, as well as other laws and/or rules applicable to timber harvesting activities.

Both action alternatives would harvest timber from 280 acres in the Sleeping Child section (Section 36, T5N, R20W) as displayed in Figure 2.0. Silvicultural treatments would include improvement harvest (216 acres), using individual tree selection, and sanitation harvest (64 acres). The Sleeping Child section roadwork would include 800 feet of new road construction and 124' feet of road obliteration. This new road would be closed year long, for motorized vehicles other than administrative and grazing lessee use. Existing grazing use would continue.

Figure 2-0 Sleeping Child – Alternative B & C



2.3.3 Mitigation Measures Common to Action Alternatives B & C

The following mitigations would be included as part of either action alternative:

Vegetation

- Grass seed new and disturbed roads and landings; spot spray new weed infestations
- Washing logging equipment prior to use.
- Slash placement in skid trails
- Treating existing weed populations along or within roads with herbicide spray.

Watershed and Soils

- Upgrade roads to incorporate Forestry Best Management Practices (BMPs) for adequate road drainage and maintain concurrent with hauling operations. If cutslope or fillslope slumps occur, they will be stabilized within the course of the harvest project to control erosion.
- Promptly seed disturbed soil on reconstruction sites and disturbed soils with site adapted grasses to reduce weed encroachment and stabilize roads from erosion.
- Mark and maintain Streamside Management Zone (SMZ) consistent with applicable rules and regulations. On Sawdust Gulch we would maintain a 50 foot no-cut buffer to all harvest units adjacent to perennial stream segments. We would maintain a 200 foot Riparian Management Zone which incorporates an SMZ and no-cut boundary parallel to along Gird Creek for water and wildlife concerns on the north boundary of Unit 2.
- Implement BMP's in all forest harvest operations and limit timber harvest activities to time when ground is frozen or soil moisture is below 20%
- Season of use- 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.
- Skid Trail Planning- The logger and sale administrator will agree to a general skidding plan prior to equipment operations. Skid trail planning would identify which main trails to use, and what additional trails are needed. Trails that do not comply with BMP's (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.
- Retain 5 to 15 tons of large woody debris and a majority of fine litter where biomass is low and as feasible during harvest operations. On harvest 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 or 2) for ground skid units, return skid a proportion of slash and evenly distribute within the harvest area, or 3) cut off a proportion of tops where biomass is low so that tops are dispersed as skidding progresses. Slash would be retained on segments of skidding corridors if bare soils are an erosion concern.

Weed Management

To reduce current noxious weed infestations and limit the spread of weeds the following integrated weed management mitigation measures of prevention and control would be implemented:

- All road construction and harvest equipment would be cleaned of plant parts, mud and weed seed to prevent the introduction of noxious weeds. Equipment would be subject to inspection by forest officer prior to moving on site.
- Revegetate all newly disturbed soils on road cuts and fills promptly with site-adapted grasses (including native species) to reduce weed encroachment and stabilize roads from erosion. For grass seeding to be effective it is important to complete seeding concurrent with road construction.
- Weed treatment measures include herbicide and/or biological applications along portions of project roads and accessible sites with a priority on spot outbreaks of noxious weeds and as designated by the forest officer. Any restricted use herbicide treatments would be implemented by a

certified applicator according to herbicide label directions in accordance with applicable laws and rules of the Ravalli County Weed District.

- DNRC would monitor the project area for two years. If new infestations of noxious weeds were noted, a weed management plan would be developed, implemented and coordinated with the lessee's efforts.

Wildlife

- Maintain a minimum of 2 snags and 2 snag recruitment trees over 21 inches dbh per acre, on average, for all harvest units. If unavailable, retain the next largest size class. Additional snag resources could be retained within the harvest units.
- Retain 10-15 tons CWD post harvest.
- Prohibit contractors from carrying firearms on restricted roads.

2.3.4 Action Alternative B

Action Alternative B would apply silvicultural treatments to a total of 641 acres, harvesting approximately 12,413 tons (~ 1.8 million board feet) of timber. Regeneration harvests would be used to treat 258 acres, and intermediate harvests would be used to treat 383 acres. In addition to the intermediate harvest in the Sleeping Child Area (described in Section 2.3.2), 361 acres would be treated in the Gird Creek Section, as displayed in Figure 2-1. Those treatments would include 258 acres of regeneration harvest and 103 acres of intermediate harvest. Broadcast burning would be used on up to 100 acres, depending on slash loading, weather and funding.

Action Alternative B would include approximately 2.78 miles of new road building and 1100 feet of road abandonment in the Gird Creek area. The total new road for this alternative (Sleeping Child and Gird Sections) would be 2.9 miles. This new road would be closed year long to motorized use on the Gird Creek section. The total road abandonment with this alternative would be ½ mile. The new road would be closed year long to motorized use. This alternative would treat a larger acreage and require more road construction than Alternative C.

2.3.5 Action Alternative C

Action Alternative C would apply silvicultural treatments to a total of 514 acres, harvesting approximately 9524 tons (~ 1.4 million board feet) of timber. Regeneration harvests would be used to treat 238 acres, and intermediate harvests would be used to treat 276 acres. In addition to the intermediate harvest in the Sleeping Child Area (described in Section 2.3.2), 234 acres would be treated in the Gird Creek Section, as displayed in Figure 2-2. Those treatments would include 174 acres of regeneration harvest and 60 acres of intermediate harvest. Also in Gird Creek, 50 acres of advanced regeneration would be pre-commercially thinned. Broadcast burning would be used on up to 100 acres, depending on slash loading, weather and funding.

Action Alternative C would include approximately 1.7 miles of new road building and 1100 feet of road abandonment in the Gird Creek area. The total new road built with this alternative (Sleeping Child and Gird Sections) would be 1.85 miles. This new road would be closed year long to motorized use. The total road abandonment for this alternative would be ½ mile.

This alternative would treat fewer acres and require less extensive road construction than Alternative B.

Figure 2-1 Gird Creek – Alternative B

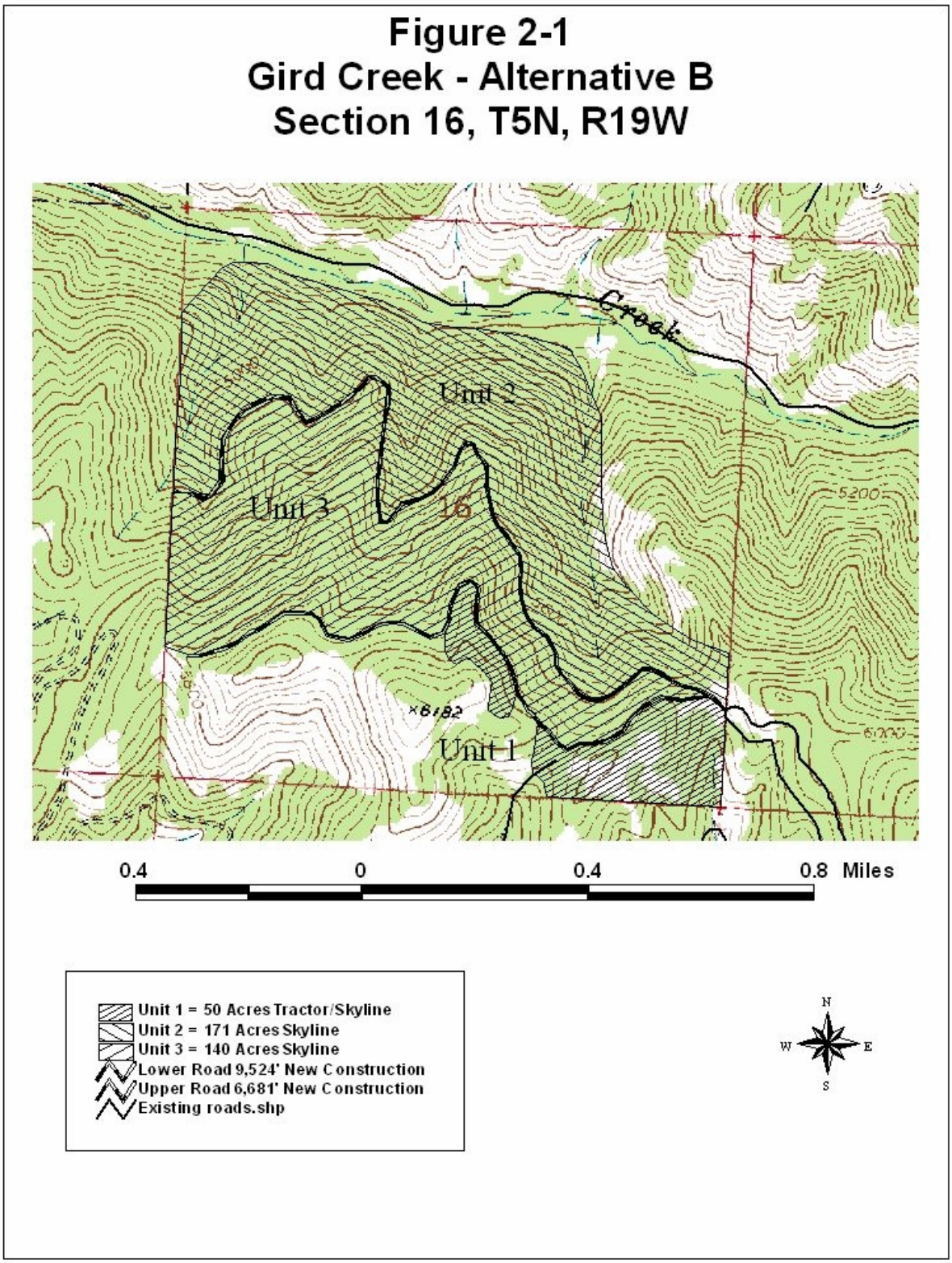
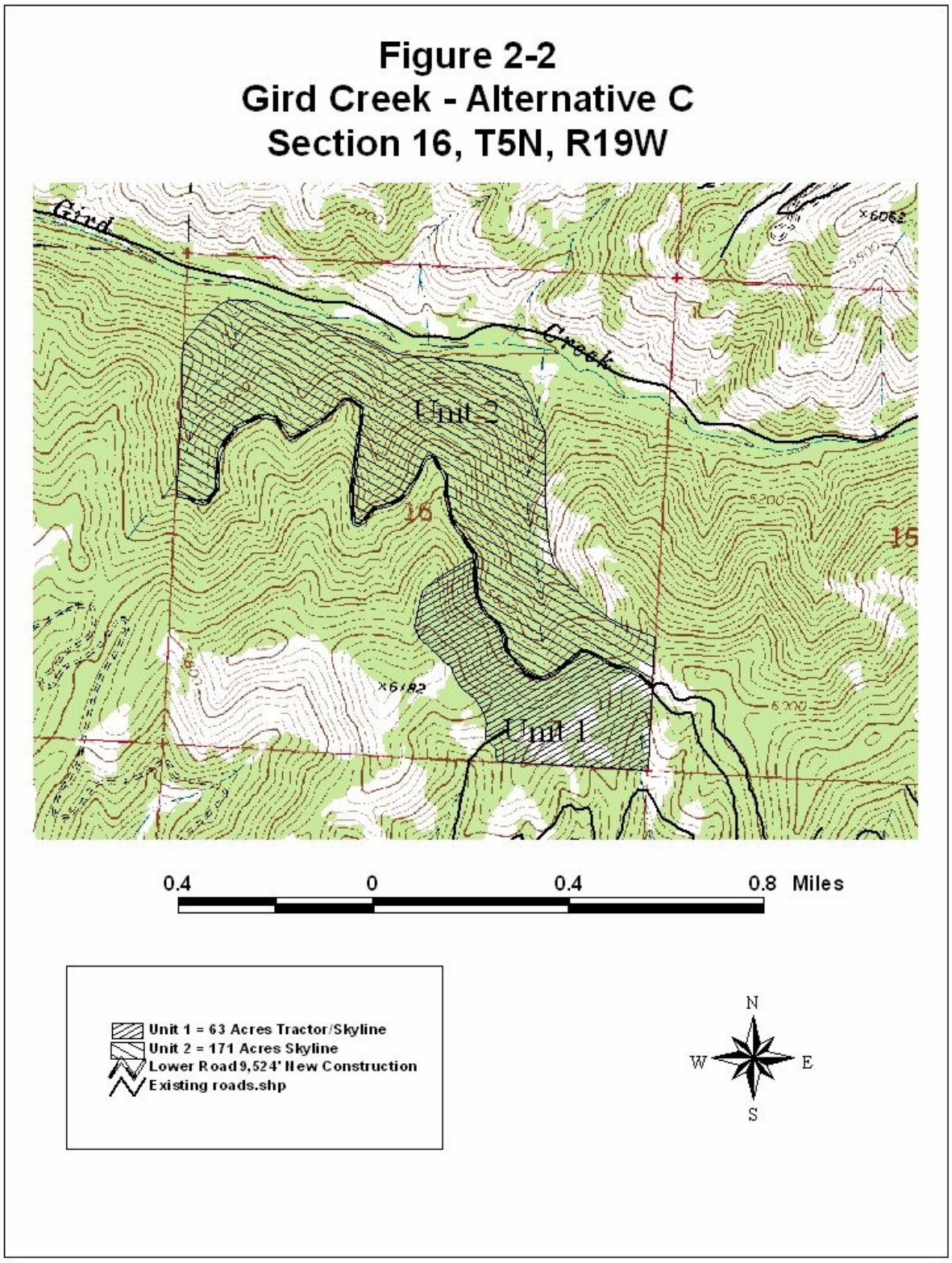


Figure 2-2 Gird Creek Alternative C



2.4 SUMMARY COMPARISON OF ALTERNATIVES

Each alternative is unique in terms of activities, achievement of project objectives, and effects that would occur. This section presents key characteristics of the alternatives, using tables to display differences and make comparisons. The following table provides a brief comparison of on-the-ground activities that would occur if Alternative A, B, or C were implemented.

Table 2-1: Summary Comparison of Project Activities for Each Alternative

Alternative	MMBF Harvest	Acres Treated	Acres by Harvest Method	Road Management
No Action Alternative A	0 MMBF	0	Regeneration Harvest: 0 acres Intermediate Harvest: 0 acres	Miles new road: 0 Miles of road abandonment: 0
Action Alternative B	~1.8 MMBF	~641	Regeneration Harvest: 322 acres Intermediate Harvest: 319 acres	Miles new road: ~2.9 Miles of road abandonment: ~1/2
Action Alternative C	~1.4 MMBF	~514	Regeneration Harvest: 238 acres Intermediate Harvest: 276 acres	Miles new road: ~1.85 Miles of road abandonment: ~1/2

Table 2-2 displays a comparison of how each alternative would meet the project objectives identified in Chapter 1. Those are:

1. Maximize revenue over the long-term for the School Trust accounts from the timber resources and provide a sufficient amount of sawlog volume to contribute to the DNRC's sustained yield as mandated by State Statute 77-5-222, MCA.

2. Manage the identified parcel intensively for healthy and biologically diverse forests to provide long-term income for the Trust.

3. Improve timber stand growth and vigor.

Table 2-2: Summary Comparison of Achievement of Project Objectives

Objective	Indicators	No Action Alternative A	Action Alternative B:	Action Alternative C:
Generate revenue for the School (CS) grants and contribute to sustained yield.	Stumpage receipts (dollars)	$0	$529,300	$406,100
	Grazing revenue (dollars)	$1,100	$1,100	$1,100
	Sawlog volume (MMBF)	0	~1.8 MMBF	~1.4MMBF
Manage intensively for healthy and biologically diverse forests to provide long-term income for the trust.	Acres proposed to regenerate	0	322	238
Improve timber stand growth and vigor.	Acres treated to improve health and vigor	0	319	276

The revenue information in Table 2-2 is an estimate. The No Action and Action Alternatives would all continue existing grazing licenses on each section. The total annual revenue from those licenses is approximately $1,100. Either action alternative was estimated to sell for $42.64 per ton. This value was based on comparable timber sales from the last ten months. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return. The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find a marked value for stumpage. The estimated volume, based on stand inventory data, was multiplied by the estimated stumpage to predict revenue values.

Costs related to the administration of the timber sale program are only tracked at the Land Office and Statewide level. DNRC doesn't track project-level costs for individual timber sales. An annual cash flow analysis is conducted on the DNRC forest product sales program. Revenue and costs are calculated by land office and statewide. These revenue-to-cost ratios are a measure of economic efficiency. The following table displays the revenue-to-cost ratio for the state and Southwestern Land Office:

Table 2-4: Revenue-to-Cost Ratios for the Southwestern Land Office and statewide.

	FY2001	FY2002	FY2003	FY2004	FY2005
SWLO	2.69	2.57	1.61	2.74	2.43
State	1.62	1.75	1.75	1.82	2.44

The table (2-3) summarizes the environmental effects of each alternative. Additional details of environmental effects can be found in Chapter 4.

Table 2-3: Summary Comparison of Predicted Environmental Effects

Resource Issue	**No Action Alternative A**	**Action Alternative B:**	**Action Alternative C:**
Illegal road use	No change*	Minor decrease	Minor decrease
Timber stand health	Poor	Improved on 641 acres	Improved on 514 acres
Risk of stand replacement fires	Gradual increase in risk	Short term increase and long term decrease on 641 acres	Short term increase and long term decrease on 514 acres
Water quality	No change	Minimal impact	Low impact
Soils	No change	Low to moderate impact	Low to moderate impact
Fisheries	No change	No measurable impact	No measurable impact
Weeds	No change	Increased risk	Increased risk
Grizzly Bear	No change	Minimal	Minimal
Gray Wolves	No change	Minimal	Minimal
Canada Lynx	No change	Potential impact	Temporary potential impact
Pileated Woodpecker	No change	Potential impact	Potential impact
Black Backed Woodpecker	No change	Low impact	Low impact
Flammulated Owl	No change	Potential impact	Potential impact
Fisher	No change	Low potential impact	Low potential impact
Ungulates (Deer and Elk)	No change	Low to moderate impact	Low to moderate impact
Aesthetics	No change	Visible roads and harvest units	Visible roads and harvest units

*"No change" means that compared to the existing conditions baseline (Chapter 3), the No Action alternative would create no additional impact to the resource.

CHAPTER 3: EXISTING ENVIRONMENT

INTRODUCTION

This chapter identifies and describes those resources that may be affected by the proposed action, and is organized by general resource categories and their associated issues introduced in Chapter 1. It does not describe any effects of the alternatives, as those will be covered in Chapter 4. The descriptions of the existing environment found in this chapter can be used, as a baseline for the comparisons in Chapter 4.

GENERAL DESCRIPTION OF THE AREA

The proposed Skalkaho Timber Sale is located in the Sapphire Mountains approximately 7 miles southeast of Hamilton, Montana. Elevations in the harvest area vary between 4600 and 6000 feet. These parcels are tributary to Sleeping Child, Skalkaho, and Gird creeks all of which drain to the Bitterroot River. The trust lands involved in the proposed project are forested and non-forested with grazing leases on all involved trust lands.

Adjacent landowners are primarily the US Forest Service as well as several large private ranches. Access varies from closed to motorized vehicles yearlong to open yearlong. The Gird Creek section currently has very few roads and the Sleeping Child Section is moderately roaded with mostly low standard 4-wheel drive roads.

3.1 EXISTING ROADS

Gird Creek Section

This section is mostly unroaded. The only maintained road lies adjacent to Gird Creek. This road originates west of state ownership, passes through the section and continues on to more private land to the east. The landowners limit access but do use the roads fairly continuously themselves (Lyn Neilson, pers. Comm. MTDFWP area biologist). The only other existing road goes up the end of Coffee Gulch in the southeast corner of the section and is closed to highway vehicles with a gate. Although off road vehicles (ORVs) and other motorized equipment use the road illegally, it is closed to all motorized vehicles. This road is in poor shape and has erosion problems. Additionally, the ridge that runs through the south part of the section receives illegal (ORV) use off the Brennan Gulch road #1362, which is open yearlong. In 2005 the Bitterroot National Forest installed segments of Jackleg fencing at illegal (ORV) access points that lead onto the section. This reduced illegal motorized use but has not eliminated it entirely. The current road density on this section is 1.2 miles.

Sleeping Child Section

This section is mostly roaded. Although all roads and trails are currently closed to motorized use, illegal use of motorized vehicles occurs. 3.7 miles of road currently exist on this section (see Figure 2-0 in Chapter 2). The majority of these roads were improved from a fire salvage timber sale in 2001. Access gained to this section is by a steep, rocky Forest Service road up Sawdust gulch #62786 to the south. Access is also possible via Forest Service road #718. Both roads are closed from October 15th to June 15th to all motorized vehicles. However, illegal ORV use is most prevalent during the summer months. Both roads intersect the section and create an illegal loop route around the state gates through the section (information provided by the Bitterroot National Forest ATV Ranger, 2005). Other possible locations of illegal access are a jeep trail in the southeast corner of the section through Forest Service and private land to the northwest.

Gates are closed year long however, vandalism of locks and damage to the gates have occurred since they were installed in 2002, though less frequent over time. The Forest Service ATV Ranger has contacted local ATV clubs, stores and individuals during the summer of 2005 to explain ATV regulations and laws on State Lands. A request to use the road through the Sleeping Child Section was made by a local ATV club in 2005; however, no formal application has been received.

Roads Relevant to Analysis Area and Cumulative Effects

Within that portion of the analysis area lying north of but not including the Skalkaho Road, the current road density is approximately 4 miles of road per section. Of these, approximately 1.1 miles of road per section is open to motorized use by the general public (Forest Service roads # 714, #1362, and #1365). These road densities were estimated by using Forest Service travel maps and topographic maps with the existing roads plotted on them. The #1362 road almost touches the southwest corner of state ownership and the #714 road crosses within ½ mile of the southeast corner. Both roads facilitate ORV trespass onto this section. There is an area closure on Forest Service lands that does not allow motorized use off these open roads yearlong. Many of the closed roads are still drivable and are likely to receive some illegal motorized use.

Within that portion of the analysis area lying south of and including the Skalkaho Road, the current road density is approximately 2.2 miles of road per section. Of these, approximately 0.7 miles of road per section is open to motorized use by the general public (road #372 and the Skalkaho Road – see FS travel map) with an additional 0.4 miles per section that is closed seasonally (road #718). No yearlong open roads pass within ½ mile of this section, but seasonally closed (Oct. 15th – June 15th) the #718 road does end at a gate on the section's east section line. Additionally, trails #510 and #521 are open to motorized vehicles under 40 inches in width yearlong. These trails touch state ownership on the east side and the southwest corner respectively in which trespass on to state land occurs. There is an area closure on Forest Service lands that does not allow motorized use of these open roads or trails from October 15th – June 15th. Many of these roads are still drivable and are also likely to receive illegal motorized use at times.

3.2 EXISTING CONDITIONS OF VEGETATION

The vegetation section describes present conditions or components of the forest in order to address the potential effects of proposed alternatives in Chapter 4. Issues expressed during initial scoping by the public and internally are:

- If the proposed action does not take place, timber stand health could continue to decline with increased severity and spread of mistletoe, increased risk of insect and disease outbreaks, and increased competition stress from overstocking.
- If the proposed action does not take place, risk of high intensity stand replacing fires would continue to increase.
- Slash from timber harvest activities could increase fire hazard and could make the site look displeasing.

Analysis Area

For the vegetative related resources the cumulative effects analysis area includes all state ownership in the Gird and Sleeping Child sections and includes all those lands within one mile of these two sections. This involves and includes both private and federal ownership in addition to state ownership (see vicinity map). In general, the area to the north, west, and south of the Gird Creek section has been more heavily harvested in the past 40 years than state ownership and the area lying to the east is similar to that of state ownership. On the Sleeping Child section all of the area immediately surrounding the section is similar in nature except to the west, which is dominated by grassland.

General Forest Structure and Historic Stand Conditions

The forested areas are comprised of primarily Douglas-fir and ponderosa pine with occurrences of spruce and a few lodgepole pine and alpine fir. The forested habitat types present are ponderosa pine/snowberry and ponderosa pine/bluebunch wheatgrass (PIPO/SYAL and PIPO/AGSP), Douglas-fir/snowberry, Doulas-fir/bluebunch wheatgrass, and Douglas-fir/ninebark (PSME/SYAL, PSME/AGSP, and PSME/PHMA), and subalpine fir/menziesia (ABLA/MEFE) in several microsites with various phases also present (Pfister et.al., 1977). The north aspects are primarily heavily stocked and are dominated by Douglas-fir with interspersions of ponderosa pine and are generally one-storied but are sometimes two and three-storied. The Gird Creek bottom is dominated by spruce and Douglas-fir as are several small

pockets in moist draw bottoms and wet microsites. The south aspects are generally more open and dominated by ponderosa pine with some Douglas-fir in the more moist sites. These stands are generally two and three-storied with a prevalence of young trees in most locations. Regeneration and sapling size trees are common in the two and three-storied stands on both parcels.

In many locations typical understory vegetation historically consisted of willow, rocky mountain maple, ninebark, grouse whortleberry, huckleberries, etc. and a variety of herbaceous species e.g., pinegrass, arnica, aster, etc. (Pfister et al., 1977; Fischer and Clayton, 1983). Fire suppression has allowed the stands to develop a more closed canopy condition and the spread of noxious weeds has caused a decline in many of these understory species. Ponderosa pine types in the project area are experiencing encroachment by Douglas-fir. This is likely due to the lack of frequent fires, which historically kept the south and west aspects clear of all but some scattered individual Douglas-fir (Gruell et al., 1982). Occasional grasslands are found interspersed within forested areas on drier sites where soils are shallow and make it difficult for regeneration to become established.

The trust lands involved in the proposed sale area total approximately 1280 acres with approximately 1240 acres of forested ground. General stand vigor ranges from very poor to moderate with the majority of the area being in the very poor to fair range. Douglas-fir mistletoe infects many of the trees on the north aspects and is causing very poor health, decreased growth rates, and some mortality of infected trees. Mountain pine beetle, Douglas-fir bark beetle, and root rot are all present but are currently at endemic levels across these parcels.

Both of the sections have had timber harvesting in the past. The Gird Creek section is quite steep and therefore past harvest activities have occurred primarily along the main ridge in the south half and along Gird Creek to the north. Harvesting primarily took place from 1951-53 removing approximately 2 MMBF of mostly ponderosa pine and some Douglas-fir. On the Sleeping Child section harvesting took place across most of the section with approximately 2 MMBF being removed from 1944-47 and 1.5 MMBF being removed around 1952. In 2000 a stand replacement fire occurred on the steeper north facing slopes that were heavily infested with mistletoe and approximately 0.6 MMBF were salvaged in 2002 over 161 acres.

At the broad scale, assessments prepared for the 1997 Interior Columbia River Basin (ICRB) Draft EIS are useful in examining how DNRC's ownership fits into the larger ecosystem. The information in the ICRB Draft EIS shows the general trend across the analysis area is a decrease of ponderosa pine, western larch, and western white pine across their ranges. The primary trend is from shade intolerant to more shade tolerant species (true firs, spruces, and western red cedar) with the shade intolerant species (ponderosa pine, lodgepole pine, and western larch) out competed and replaced by shade tolerant species. Fire regimes have changed from predominantly mixed and non-lethal severity to a large predominance of lethal severity fires. Acres of old forests of both multistory and single story structure have decreased.

The ICRB EIS grouped forests into three broad categories:

- ***Dry*** - includes ponderosa pine, dry Douglas-fir, and dry grand fir forests.
- ***Moist*** – includes cedar/hemlock, moist Douglas-fir, grand fir, and wet spruce/fir forests.
- ***Cold*** – includes the higher elevation forests not falling into 1 of the other 2 categories.

All three forest groups have experienced large increases in dominance by shade-tolerant species due to timber harvesting, fire suppression, insects, and diseases. All three groups are more likely to experience stand replacing fires than they did historically due to a large buildup of fuels and changes in stand structure and composition. The majority of the stands in the proposed project area would fall in the Dry forest category.

3.2.1 Existing Condition of Stand Health

Generally, the overall stand health across State ownership is moderate to very poor. Most of the Douglas-fir is infected with mistletoe while many of the other stands dominated by ponderosa pine are overstocked.

On the Gird Creek Section stand 10 (Figure 3-0) and most of the area to the northeast of stand 10 is primarily in very poor health. They are dominated by Douglas-fir which are heavily infected with Dwarf mistletoe, (A. Douglasii Engelm). Dwarf mistletoes are small, leafless, parasitic plants dependent on conifer hosts for growth and survival. These parasites are native to the western United States, but human influences such as partial cutting and fire exclusion have served to increase the intensification, spread, and severity of dwarf mistletoes to unnatural and unmanageable levels in many forest stands. Some of the trees are so heavily infected that mortality is occurring while others are misformed and rotting from the infections. Trees with lighter infections are suffering growth losses and beginning to show signs of physical deformities as a result of the mistletoe infections. The understory trees are also quickly becoming infected. When infected at a young age, most of these trees will never become large and provide the canopy cover or seed source that their parents did. Because of the growth inhibiting effects of mistletoe these young trees will likely remain small, bushy, and misformed. In the most heavily infected areas, total stand growth rates are likely near zero as the losses from mortality nears the slowed rates of growth of the other alive but heavily infected trees. Douglas-fir bark beetles are present in the stands and have killed several small pockets of trees and are beginning to cause substantial damage at this time. In units 6, 7, and the rest of the section, growth rates and stand health are primarily fair. Many of these stands are on the south and more east facing dryer slopes that are dominated by ponderosa pine and do not have the heavy amounts of mistletoe. They are generally more openly spaced although Douglas-fir is increasing in the understories and stocking rates have increased over time. Mountain pine beetle have killed scattered ponderosa pine but are not causing substantial damage at this time. Also included are several stands on the north aspect that are dominated by Douglas-fir but have not been heavily infected by mistletoe yet. These are primarily heavily stocked stands showing signs of slowed growth rates due to high levels of competition for nutrients, sunlight, and water.

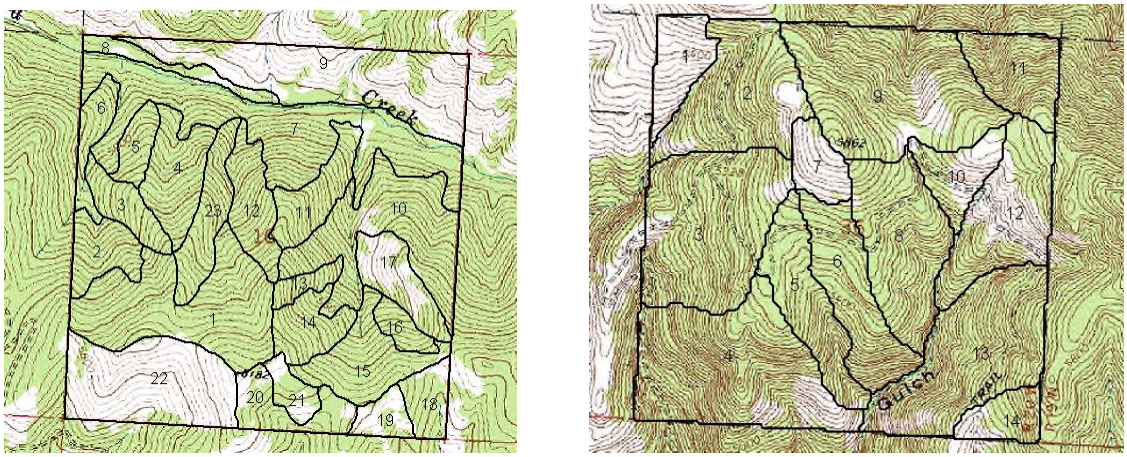
On the Sleeping Child Section growth rates and stand vigor and health are generally better than the Gird Creek Section. However, in 2000 a stand replacement fire burned 161 acres in mostly heavily infected Dwarf Mistletoe (Figure 3-0, stands 2&9). The rest of the section is primarily disease free with moderate rates of growth. It is mostly south facing aspects dominated by ponderosa pine that are less fertile but are still producing fair growth rates and have moderate stand vigor. Most of these stands are uneven-aged with two to three or more stories. However, increased stocking levels have begun to slow growth rates in all age classes as basal areas in these stands are exceeding the carrying capacity of the sites. As a result of this, the Mountain pine beetle is killing scattered trees with losses currently at high levels.

The two most significant factors affecting forest health and vigor on these sections is the extremely high levels of Douglas-fir mistletoe and the overstocking above the optimal levels in both even and uneven-aged stands.

The near exclusion of fire in the 20th century has likely affected many of the currently overstocked stands in the analysis area. The ponderosa pine stands would have been expected to receive frequent low intensity fires that would burn many of the understory Douglas-fir and pine and maintain these stands at lower stocking levels than exist today which would have resulted in a more healthy and vigorous stand. The Douglas-fir stands would have been expected to receive less frequent but moderate intensity fires that also would have had beneficial thinning effects that would improve forest health. These fires would have also been expected to keep the mistletoe at much lower levels as mistletoe is very susceptible to fire and tend to cleanse the stands of this disease.

Past harvest activities in the 40's, 50's, 60's that occurred on about half of the Gird Creek section and most of the Sleeping Child section likely provided some beneficial thinning and stocking reduction effects on forest health. However, in many of the stands now heavily infected with mistletoe, it is likely that many of the trees that were left were still infected with mistletoe. This incomplete sanitization likely resulted in the very poor stand conditions existing today as the disease was allowed to continue to spread to the rest of the stands and infect the understory trees as well. The heavy infection and spread of mistletoe is prevalent across the analysis area. The increase in stocking levels except in recently harvested or burned areas is prevalent across the analysis area as well.

Figure 3-0: Gird Creek (left map) & Sleeping Child Stand Maps



3.2.2 Existing Fire Hazard and History

The most predominant historic fire frequencies in the project area occur on the warm, dry Douglas-fir and warm, dry Ponderosa Pine habitat types, which had a mean fire interval of around 5-25 years in presettlement stands. Fire was an important agent in controlling density and species composition. Low to moderate severity fires converted dense stands of pole-sized or larger trees to a more open condition, and subsequent light burning maintained stands in a park-like state. Frequent low or moderate fires favored larch and ponderosa pine over Douglas-fir in stands where these species occurred. Severe fires probably occurred on dense, fuel-heavy sites and resulted in stand replacement. Stand replacement fires favored lodgepole pine on sites where this species was present (Fischer and Bradley, 1987). In the ponderosa pine dominated stands the fire frequency is expected to be on the shorter end of the range between fires and was typically a lower intensity event except in areas where fuels had built up or extreme weather conditions occurred.

Currently, the risk of a stand replacing fire or a fire that would burn more intensely than expected under natural conditions historically on these two sections is moderate to high. With the near exclusion of fire in the 20th century, stand dynamics, succession, and fuel loadings have all changed. With increased fuel accumulations on the forest floor, stand densities, and amounts of ladder fuels (especially Douglas-fir in the understory) in these stands, fires burning today are much more likely to be more intense. These more intense fires tend to replace entire stands that would not have typically been replaced historically often times with negative effects of soil damage, species composition changes, difficulty regenerating the site, and sometimes very unnatural conditions for entire drainages from those of historic conditions.

Should a fire start in the north facing Douglas-fir stands on the Gird Creek section, the risk of a stand replacing fire would be quite high due to the large increase in the coverage and abundance of mistletoe. Mistletoe brooms are highly flammable and act as ladder fuels, which would help a fire reach and carry through the crowns of the trees. Additionally, these stands are primarily on steep slopes, a factor that also helps to increase fire intensity. In the east, south, and west facing ponderosa pine stands the risk of a stand replacing fire has certainly increased to moderate to high due to the increase in stocking levels and ladder fuels. The large amounts of advanced regeneration provide fire with an avenue to reach the crowns of the otherwise fire adapted ponderosa pine and could cause substantial losses should the crown ignite.

Stand dynamics, succession, and fuel loadings have all changed over the past 100 years to create a situation that puts these forest stands at a much higher risk of high intensity and sometimes stand replacing fires. Past harvesting of trees has helped decrease fuel loadings and stand densities, but in many cases has removed the larger trees that are in most cases more fire resistant. Within the analysis area, fire hazard has generally increased over time in the ways described above with the exception of the more recently harvested areas around the

Gird Creek section. In these locations, the risk of high intensity fires is still low to moderate due to decreased stocking levels, reduced amounts of mistletoe, and ladder fuels. However, should a fire get started, many of the larger trees that are more fire resistant have been removed in which case a higher rate of death of the overstory trees could be expected than under historic conditions with the same intensity of fire.

3.3 EXISTING CONDITIONS OF WATER QUALITY

Analysis Methods

A watershed analysis was completed by a DNRC hydrologist for the proposed sale area to determine the existing conditions and direct, indirect and cumulative effects to water quality. These areas were evaluated using a course filter and fine filter approach. A fine filter approach, including a water yield analysis was conducted for this timber sale, because Sleeping Child Creek is listed as 303(d) listed waterbody. However, the potential for cumulative impacts is anticipated to be low; details of predicted effects are described in chapter 4.

In addition, reconnaissance level surveys were used to observe existing conditions water quality. DNRC has also completed a watershed analysis in 2001 for proposed fire salvage. All existing roads in the proposed project area were evaluated by a DNRC hydrologist for past and potential impacts.

Analysis Area

Refer to hydrology maps, Figures 3-1 and 3-2 for watershed boundaries and locations

The proposed harvest area is located on two different parcels of State School Trust Lands (Section 36, T5N, R20W and Section 16, T5N, R19W. The Sleeping Child Section (Section 36) is located on moderate to steep slopes, ranging from 25% to 80% slopes, on the ridge dividing Sleeping Child and Skalkaho Creek Watersheds in the Sapphire Mountains on the east side of the Bitterroot valley. The Gird Creek Section (Section 16) is located on steep slopes ranging from 45%-80%.

Sleeping Child Creek is a perennial Class 1 tributary to the Bitterroot River. The Sleeping Child Watershed drains approximately 46 square miles. A large majority of Sleeping Child Creek has characteristics of Rosgen B3 channel type. This Section is mostly drained by Falls Gulch and Sawdust Gulch. Falls Gulch is a Class 3, intermittent and discontinuous stream channel that normally has surface flow less than 6 months out of the year and rarely contributes surface flow to Sleeping Child Creek. Sawdust Gulch is an intermittent Class 2 stream channel that contributes surface flow to Sleeping Child Creek during spring runoff and other large runoff events. There are springs located in the upper portion of Sawdust Gulch that provide perennial flow for short reaches of Sawdust Gulch. The north end and remaining portion of the south end of the section are drained by unnamed ephemeral draws that drain into an unnamed tributary to Skalkaho Creek.

Ownership in this drainage is a mixture of State, Forest Service and private, with the majority being Forest Service.

Gird Creek is a Class 1 Perennial tributary to the Bitterroot River, located on moderate to steep slopes. The upper portion of the section located on the ridge ranges from 15 to 45% slopes. The middle and lower portions of the section are located on steep slopes ranging from 45-80%.

Gird Creek is drained by an unnamed Class 1 perennial stream channel an unnamed intermittent Class 2 Stream channel that delivers surface flow to Gird Creek, but most likely does not have surface more than 6 months out of the year. The remaining portion of the Section is drained by several unnamed ephemeral draws and springs which provide intermittent surface flow for short reaches but do not deliver surface flow to any other body of water.

The upper portion of the watershed is primarily Forest Service ownership. The middle and lower sections of the watershed are a combination of Forest Service State and private.

Figure 3-1: **Watershed Boundaries used for Sleeping Child Water Yield Analysis Area.**

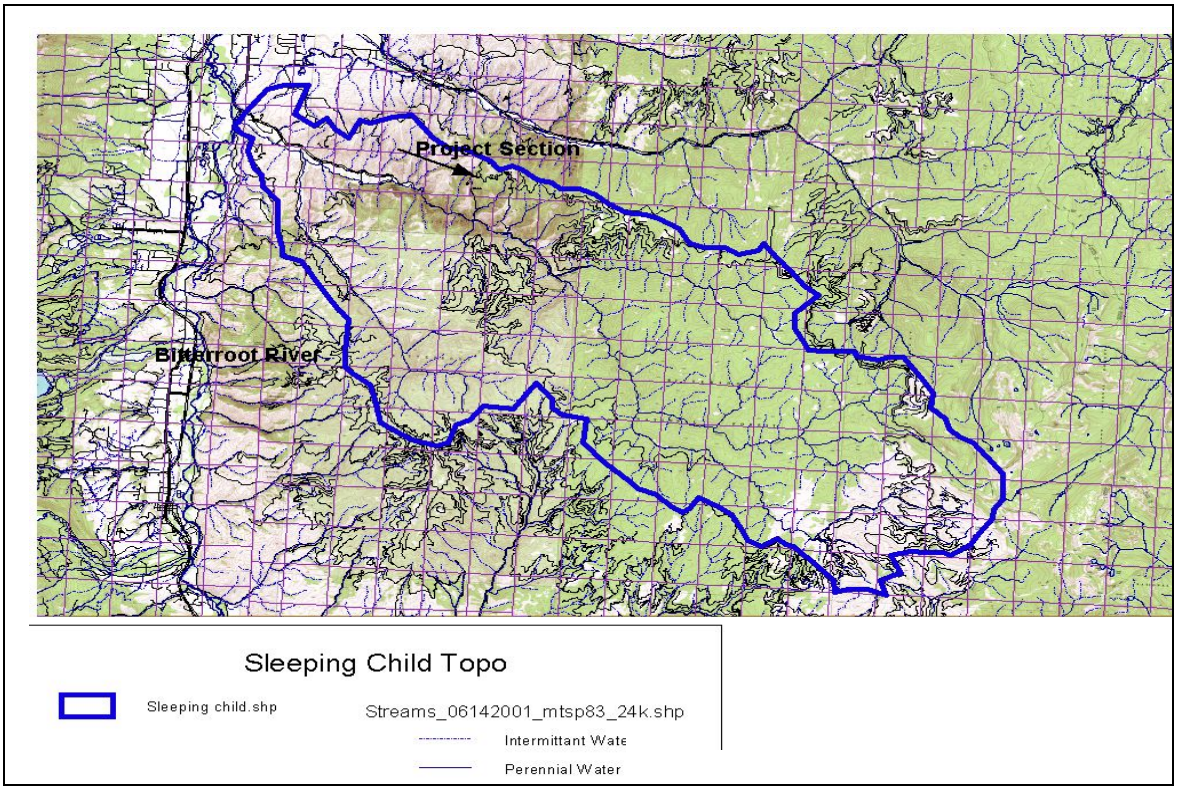
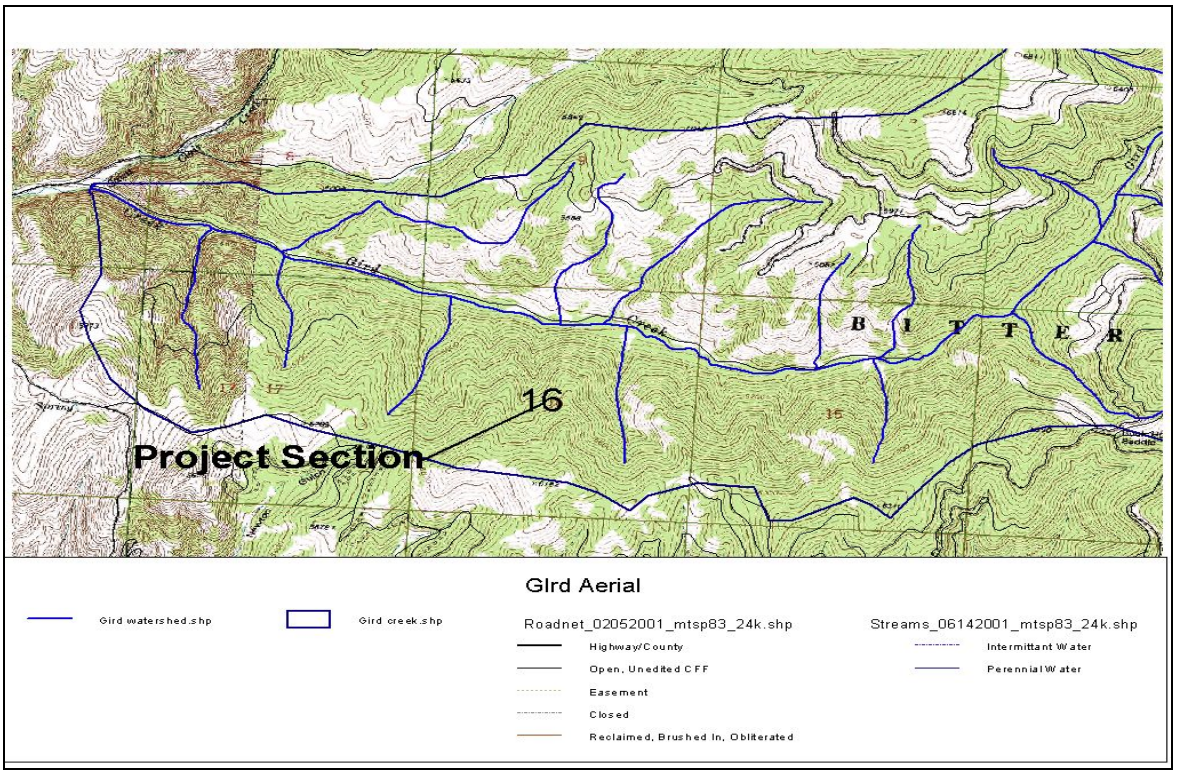


Figure 3-2: **Watershed Boundaries used for Gird Creek Water Yield Analysis Area.**



Regulatory Framework

The waters contained within the Sleeping Child and Gird Creek watersheds are classified as B-1 by the Montana Surface Water Quality Standards. The B-1 classification is for waters that are considered suitable for domestic use after conventional treatment, as well as recreation, swimming and bathing. They are also suitable for growth and propagation of salmonid fish and other associated aquatic life, waterfowl, furbearers, agricultural and industrial water supplies. Another criteria for a B-1 classification is; no increases are allowed above naturally occurring concentrations of sediment, settleable solids, oils or floating solids, which will or are likely to create a nuisance or render the waters harmful, detrimental or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish, or other wildlife. Naturally occurring includes conditions or materials present from runoff on developed where all reasonable land, soil and water conservation practices are applied. Reasonable practices include methods, measure and practices that protect and present and reasonably anticipated beneficial uses.

Sleeping Child is listed as a water quality limited waterbody on Montana's revised 303(d) list. The 303(d) list was compiled by the Department of Environmental Quality (DEQ) as required by Section 303(d) of the Federal Clean Water Act and the Environmental Protection Agency (EPA) Water Quality Planning and Regulation (CFR part 130) The waterbodies on this list have been characterizes as "water quality limited" and targeted for Total Maximum Daily Load (TMDL) development. Under Montana law, new or nonpoint source activities affecting a listed waterbody may commence and continue provided they are conducted in accordance with all reasonable land, soil, and water conservation practices (BMP's). Total Maximum Daily Loads have not yet been developed for Sleeping Child Creek.

Sleeping Child Creek was listed for only partially supporting aquatic life, cold water fisheries and swimming beneficial uses. Probable causes were identified as nutrients, siltation and thermal modification. Probable sources are listed as agriculture and highway/ road runoff.

3.3.1 Existing Conditions

The main potential for impacts to water quality is sediment. Effects to water quality can alter biological and physical characteristics of a stream channel by increasing sediment delivery and deposition. The existing potential of erosion in the project area is high due to the present existing geology of the area. Granitics and sandy loams, which dominate the area are erosive and naturally deliver high levels of sand and fines to the stream channel due to natural weathering processes.

Sleeping Child

Existing conditions in the Sleeping Child watershed, including wildfire, timber harvest activity and road construction, have resulted in increased sediment delivery and deposition beyond those of naturally occurring levels. Livestock grazing has also caused adverse impacts to site specific locations in the drainage.

The wildfires of 2000 did have a substantial impact on the Sleeping Child Creek drainage. During the 2000 wildfires, approximately 82% of the middle portion of Sleeping Child Creek was burned. Approximately 37% was low severity, 14% moderate severity and 32% high severity (USFS 2000). Post fire autumn rains did instigate minor landslides in Little Sleeping Child Creek, a tributary to Sleeping Child Creek. Considering that maximum daily temperatures in streams could increase between 3 and 10° C in intensively burned headwater streams (Helvey, 1972; Amaranthus et al., 1989) it is assumed that temporary increase in stream temperature did occur following the fires of 2000.

There are several USGS stations in Sleeping Child Creek near the National Forest Boundary and in the upper watershed above Sleeping Child Hot Springs that have monitored sediment and stream flow since 1976. There has also been monitoring in the middle portion of the watershed by the Bitterroot National Forest from 1986-1990. Results found that the middle and upper portions of the watershed produce about the same proportional amounts of sediment ranging from 2-8 tons per year (Environmental Analysis for the Spring-Child Fire Salvage Sale, June 2001).

In 2001 large debris flows did occur in the Sleeping Child drainage near Sleeping Child Hot Springs. This debris produced large amounts of sediment that did deposit in the stream channel.

Road densities in the drainage are high as well as the number of stream crossings. Following the fires of 2000, these areas most likely were a temporary source for increased sediment due to road surface runoff and lack of road stabilizing vegetation. The main access road paralleling the stream for many miles in the middle portion of the watershed has caused adverse impacts to the stream channel, including channel confinement and sediment delivery.

The DNRC project section contains approximately 3.73 miles of road. There is one stream crossing located within the State section. Not all road segments with the project area currently meet BMP standards. The road located in Sawdust Gulch is in poor condition and was observed as a direct sediment delivery source to Sawdust Gulch at one crossing site.

Both Sawdust Gulch and Falls Gulch have isolated segments of bank trampling caused by livestock. Segments of gully erosion were observed in both stream channels. Channel conditions were rated in 2001 using the Pfankuch method outlined in Forest Hydrology Part II (USFS 1974). Sawdust Gulch was rated as fair and Falls Gulch was rated as good. However, channel conditions vary throughout both Falls Gulch and Sawdust Gulch from fair to poor depending on reach location.

A water yield analysis was completed for the Sleeping Child Creek watershed. Management in the watershed, as well as wildfire occurrence has increased water yield from natural conditions. Existing water yield increases were calculated using the Equivalent Clearcut Area method (see Analysis Methods). Existing water yield increases for the entire Sleeping Child Creek watershed are approximately 5.3%.

Watershed	Existing %WYI
Sleeping Child	5.3%

Gird Creek

Management within the Gird Creek watershed has included timber harvest, road construction and grazing. The upper portion of the project area in Gird Creek, above DNRC section 16, has been impacted from a large trail system utilized by off road mechanized vehicles and pick-ups. Substantial erosion has occurred on some of the trails resulting in rilling and deep rutting on some sections of trail. Although this use is discouraged, erosion impacts are still occurring.

Most of the timber harvest in this watershed took place in the 1960's and 1970's. There is private ownership located in the lower portion of the drainage that was been heavily harvested and roaded in the late 1990's (USFS 1998). There are sections of the upper watershed that were burned during the 1991 Gird Point Fire and the 1994 Trail Fire. There is permitted livestock grazing mostly along FS# 1365 road corridor in the late summer, but access to the riparian area has been restricted to limited crossings in the lower 1000' of stream above the FS boundary (USFS 1998).

Most of the roads in the watershed are located in the middle portion of the drainage on Forest Service ownership. Increased sediment delivery has most likely increased from naturally occurring levels as a result of road construction and segments of poorly drained existing roads systems, including stream crossings. In 1998, the Forest Service measured sediment levels and found an 18-25% increase above reference conditions. Most of the increases probably stem from poorly drained road segments and the natural high erosion factor of the weathered granitic in the drainage following recent wildfires. Most of the mainstem of Gird Creek however, has a large buffer area that has been kept in tact, acting as a sediment filtration buffer. Adverse effects of erosion and sedimentation were observed to stem from timber harvest and road construction in the tributaries.

Road densities in the project are low. There is approximately 1 mile of road located in section 16 along the north end of Gird Creek. Not all sections of this road currently meet BMP standards, but it is grassed over and use is mostly restricted to livestock travel, along with occasional pick-up use by the grazing lessee. There was no direct sediment delivery to the stream channel observed as a result of the road.

There is approximately 1 mile of the main stem of Gird Creek that flows though the project area in section 16. This section of Gird Creek is in Good condition. The banks are stable and well vegetated. There are limited areas where bank trampling has occurred as a result of livestock use.

A water yield analysis was completed for the Gird Creek watershed. Management in the watershed, as well as wildfire occurrence has increased water yield from natural conditions. Existing water yield

increases were calculated using the Equivalent Clearcut Area method (see Analysis Methods). Existing water yield increases for Gird Creek are approximately 3.8%.

Watershed	Existing %WYI
Sleeping Child	3.8%

3.4 EXISTING CONDITIONS OF SOILS

Analysis Methods and Area

A watershed analysis was completed by a DNRC hydrologist for the proposed sale area to determine the existing conditions and direct, indirect and cumulative effects to soils. Reconnaissance level surveys also were used to observe existing conditions of soils. All existing roads in the proposed project area were evaluated by a DNRC hydrologist for past and potential impacts.

The analysis area for evaluating soil productivity will include both the Gird Creek and Sleeping Child sections.

3.4.1 Existing Conditions of Soils

The Skalkaho project area is located on moderate to steep slopes with soils weathering from mainly granitics, volcanics and metamorphozed quartzite. The Sleeping Child section has bedrock of granitics and calcasilicates. The granitics consist mainly of quartzite granodiorites, and micaceous granitics, which are weak and brittle when weathered and break down into coarse sands that are easily eroded. In the Gird creek section bedrock is volcanics and quartzite bedrock on the north 1/2 of the section and is generally more resilient to erosion than the granitics in the south ½ of the section

There are no especially unique or unusual geologic features in the sale area. A small slump area of less than 1 acre in size was noted in the Gird creek section. The old slump shows no current signs of movement and should not be affected by the planned harvest. Granite outcrops are common in the project area. Bedrock in the project area should be rippable where encountered at shallow depth, with the exception of some boulders exposed on ridges and midslopes which can hinder road and skid trail location. No suitable gravel sources were noted in the sale area.

Soils within the Sleeping Child project area are a combination of 31-B 70 McMeal Mowbray-Tolman complex on slopes of 30-60%, 31B15 Totelake-Macmeal-Sharrott soils on slopes of 30-60% and map units 61K 53 and 61B15, which are Mowbray-Totelake Sharrottt soils on steep 40-80% slopes with some bench relief.

31-B 70 McMeal Mowbray-Tolman complex on slopes of 30-60%- Soils in this map type are shallow very gravelly loams (Tollman) on the ridges and moderate to deep gravelly sandy loams (Mowbray) and some clayey subsoils (Macmeal) in the draws saddles and benches. Boulders and rock outcrops are common in these soil types. Tolman and Mowbray soils are excessively drained. On bare granitic soils, erosion potential is high and increases with slope steepness. The concave slope, where water is usually concentrated, is more susceptible to disturbance. The Macmeal soils are more sensitive to season of use and remain wet longer.

31B15 Totelake-Macmeal-Sharrott soils on slopes of 30-60%- These soils are found on mountain sideslopes and ridges predominantly on northern aspects. Macmeal soils are described as above. Totelake soils are deep gravelly and cobbly sandy loams that have low cohesion. The topsoil layer is approximately 4-6 inches deep sandy loams. Sharrott soils are also shallow and consist of gravelly loams 4-6 inches deep. On bare granitic soils, erosion potential is high and increases with slope steepness. Compaction hazard is low, but rutting potential can increase when the soils are wet. This soil type has a longer season of use.

61K 53 and 61B15, which are Mowbray-Totelake Sharrottt soils on steep 40-80% slopes- 61K soils have shallow soils that are mainly located on south aspect slopes. 61B soils are more productive deeper soils located mostly on north aspects. These soils have a surface layer of very gravelly sandy loams over

shallow to moderately deep cobbly loams. Both map units have a severe erosion risk and are very susceptible to disturbance.

Past harvest activity has occurred in this section. After the fires of 2000, the DNRC salvaged approximately 161 acres in this section. Some signs of past harvest were observed, but the trails were stable and most were well vegetated.

Soils in the Gird Creek section within the proposed harvest area are a combination of various soil types. Primary soils on the upper northernly aspects are Klootch-Helmville complex (soil unit 30D32). These soils are formed from colluvium from mixed igneous and meta- sedimentary bedrock. Slopes range from 40-60%. Kootch soils have about 5 inches of light brown cobbly loam over deep very gravelly sandy soils. Helmville soils have 4-12 inches of dark loam over deep cobbly clay loams. There is an intermittent layer of silt loam volcanic ash soils. Coarse woody debris levels are moderate to high.

Soils on the lower northerly aspects are Trapps (map unit 31B28) on dissected mountain sideslopes. These soils are formed from colluvium from mixed meta-sedimentary bedrock. Slopes are 40-60%. Topsoils are about 3-9 inches of light brown gravelly loam over deep very gravelly loams and clay loams. Coarse woody debris levels are moderate to high.

On the southern facing slopes, the most typical soils are Holter-Tolman complex (soil map unit 31K37). Soil parent materials are colluvium / residuum from igneous rocks. Slopes are 40-60%. Tolman soils are shallow very cobbly loams on small ridges. Holter soils are moderately deep gravelly loams that are more productive than Tolman and support mixed vegetation of ponderosa pine and pouglas-fir. Coarse woody debris levels are low. Limited areas of Winkler/Rock outcrop soils (Map unit 61B11) occur on southerly ridge noses and slope breaklands.

Soils along the Gird creek bottom are a complex of gravelly and cobbly alluvium that is to narrow to map at this scale. Slopes are 5-20%. The soil consists of a moderately thick (9 inches) of gravelly sandy loam over a thick (greater than 40 inches) very gravelly sandy loam. There is a narrow flat area of flood-prone soils directly adjacent to the creek. Just above the floodplain are moderate to deep, well drained, gravelly sandy loam soil that form the footslopes and small alluvial fan deposits. These sites are droughty and generally lower productivity supporting open spaced Pine and Douglas-fir.

Existing Cumulative Effects to Soils
Cumulative effects can occur from repeated disturbance in the harvest area as an additive process with each entry. Within the proposed project area, DNRC has conducted timber harvest operations since the 1950's with equipment. Most all of the proposed harvest areas were previously entered by skid trails and roads. Past harvest and mining are estimated to affect 10 to 20% of the land depending on location based on field review and aerial photo review of the proposed project area. These pre- Best Management Practice harvests resulted in substantial impacts to soils. Skid trails on steeper slopes resulted in rutting and soil displacement. Main skid trails are still evident from over 40 years ago, but most dispersed skid trails are barely evident. Field reconnaissance shows that the existing trails from past management are well vegetated, relatively stable and have continued to ameliorate over time from frost and revegetation.

3.5 EXISTING CONDITION OF FISHERIES

Sleeping Child Creek is a large eastside tributary to the Bitterroot River. Fish populations in Sleeping Child Creek have been sampled by FWP through methodologies including, electroshocking, snorkeling and mark/recapture. Both bull trout and westslope cutthroat populations are found in Sleeping Child Creek.

The Sleeping Child drainage is considered one of the most important drainages in the Bitterroot for migrating bull trout populations (USFS 1994). Bull trout are listed as a threatened species under the Federal Endangered Species Act (ESA). The U.S. Fish and Wildlife Service have not yet developed a bull trout recovery plan. However, the Montana bull trout restoration team has developed guidance that is contained in the State's Bull Trout Restoration Plan (DFWP 2000). Additional protection is addressed in the DNRC Forest Management Rules under Fisheries and Threatened and Endangered Species. One of the main objectives of the Restoration Plan was the protection of bull trout populations within core areas and maintaining the genetic diversity represented by these populations. Sleeping Child Creek is considered a core area watershed. A core area watershed is a watershed including its tributaries and

adjoining uplands, used by migratory bull trout for spawning and early raring and resident bull trout for all life stages.

Westslope cutthroat trout are recognized as Class A species by the State of Montana. Class A species are defined as having limited numbers and/or limited habitats both in Montana and elsewhere in North America: elimination from Montana would be a significant loss to the gene pool of the species or subspecies. DNRC has entered into statewide conservation agreement for westlsope cutthroat trout. Under this MOU, DNRC has agreed to protect genetically pure and slightly introgressed (less than 10%) westslope cutthroat populations.

Of the total trout biomass in Sleeping Child Creek, bull trout make up an average of 20% of the biomass and westslope cutthroat trout are the dominant species (USFS 1994). Sleeping Child Creek maintains a year-round marginal connectivity to the Bitterroot River. This is due to a concrete diversion on private land near the Bitterroot River. However, fish trapping data indicates there are some migratory bull trout and westslope cutthroat that migrate over the barrier and probably still spawn in the Sleeping Child Creek drainage (Nelson 1999).

During the fires of 2000, approximately 15.1 miles of fish bearing stream channel in Sleeping Child Creek was burned over by moderate to high severity fire (USFS 2000). Mortality of native fishes did occur in areas of high severity, most likely a result of increases in water temperatures, chemical toxicity from smoke or ash, large increases in ammonium and phosphorous or a combination of those factors (USFS 2000). Adverse impacts to fish habitat as a result of post fire conditions also included increases in sediment delivery to the steam channel.

According to samples taken by FWP, after the fire in 2000, populations of Cutthroat trout declined in age classes 4" and larger. Samples taken in 2003 found that populations have increased in class sizes 4, 5 and 8+ (inches), but have decreased in the 6" class and remained the same in the 7" class. Data collected by FWP indicates that most of the population decline was a result of debris flows that occurred in the middle drainage in 2001. After the debris flows, both bull trout and cutthroat populations declined significantly, but do appear to be coming back (correspondence with FWP).

In the upper drainage, about 4 miles above the Hot Springs, bull trout estimates have remained steady. Water temperatures have increased in the drainage as a result of the wildfires and will most likely remain elevated for a few years until adequate levels of riparian vegetation have recovered, to provide sufficient thermal regulation.

Gird Creek does contain a native assemblage of westslope cutthroat and bull trout for 1.1 miles between the National Forest boundary and the FS# 1365 road crossing. The FS#1365 crossing is a fish barrier and presently blocks westslope cutthroat and bull trout from accessing an additional 1-1.5 miles of potential suitable habitat (USFS 1998). Surveys conducted by the Forest Service found that cutthroat trout were common and bull trout were uncommon, with < 15 bull trout per 1000'. All of the bull trout found in the surveys were resident juveniles. There were no young of year or adult resident bull trout detected in any of the surveys. However, you cannot discount their presence (USFS 1998).

In the lower portion of the drainage on private land, brook trout are the dominant fish species, with westslope cutthroat uncommon and bull trout rare. On the National Forest portion of the drainage, suitable resident bull trout spawning and rearing habitat is low, but moderate levels of westslope cutthroat spawning habitat is supported. Abundance levels and size distribution of bull trout in Gird Creek are most likely well below reference conditions and westslope cutthroat levels are probably slightly below or near reference conditions (USFS 1998). The Forest Service did continuously monitor Gird Creek during the summer of 1998 for temperature readings and found that no maximum daily readings exceeded 10°C.

A riparian buffer has been maintained along most of the mainstem of Gird Creek, providing essential fish habitat for both westslope cutthroat and bull trout.

3.5 EXISTING CONDITIONS OF NOXIOUS WEEDS

Sleeping Child

Noxious weeds occurring in the Sleeping Child project area are mostly knapweed (Centaurea maculosa), thistle (Cirsium arvense), houndstongue (Cynoglossum officinale L) and spot infestations of sulpher

cinqefoil (Potentilla recta). Cattle grazing and off road vehicle are most likely the reason for the existing rate of spread of noxious weeds and the potential future spread and introduction of noxious weeds.

Gird Creek
Noxious weeds present in Gird Creek project area are knapweed (Centaurea maculosa), thistle (Cirsium arvense) and houndstongue (Cynoglossum officinale L). Most of the noxious weed infestations are located in areas where frequent cattle use is present along the road located in the bottom of Gird Creek, in draws and surrounding upland areas. There were not a lot of noxious weeds found within the forested section of the project area.

3.6 EXISTING CONDITIONS OF WILDLIFE

3.6.1 Existing Conditions of Grizzly Bear (Federally Threatened)

Grizzly bears are the largest terrestrial predators in North America, feasting upon deer, rodents, fish, roots and berries, as well as a wide assortment of vegetation (Hewitt and Robbins 1996). Depending upon climate, abundance of food, and cover distribution, home ranges for male grizzly bears in northwest Montana can range from 60 - 500 mi^2 (Waller and Mace 1997). The search for food drives grizzly bear movement, with bears moving from low elevations in spring to higher elevations in fall, as fruits ripen throughout the year. However, in their pursuit of food, grizzly bears can be negatively impacted through open roads (Kasworm and Manley 1990). Such impacts are manifested through habitat avoidance, poaching, and vehicle collisions.

The project area is located approximately 55 miles south of the Northern Continental Divide Ecosystem. The cumulative effects analysis area (hereafter, “analysis area”) is approximately 197 square miles, and incorporates forested land within the surrounding Sapphire Mountains. In September 2002, a grizzly bear was sighted in the Burnt Fork drainage near Stevensville. This bear has since taken up residence west of Phillipsburg, approximately 25 miles northeast of the project area (J. Jonkel, MT FWP, personal comm., July 2004). Within the project area, there are approximately 2.6 miles of open road per square mile (simple linear calculation), and approximately 2.6 total miles of road per square mile (simple linear calculation). Within the analysis area, there are approximately 415 miles of open and total road (2.11 miles of open and total road per square mile, i.e., all roads within the analysis area are open), and approximately 111 total miles of road (1.03 total miles of road per square mile, simple linear calculation). Within the analysis area, the U.S. Forest Service owns and manages 113,233 acres, private lands comprise 10,875 acres, and School Trust lands and Montana Fish, Wildlife, and Parks lands are each 1,453 acres and 728 acres, respectively.

3.6.2 Existing Conditions of Gray Wolves (Federally Endangered)

Wolves were recently re-classified as endangered under the Endangered Species Act. However, wolves located south of Interstate 90 and Highway 12 is part of an experimental population under which more relaxed rules apply (10J Rule). Cover, and road and prey densities likely have some influence on wolves (road densities reported under grizzly bear). For cumulative effects analysis, the analysis area will be the same as that of the grizzly bear. Wolf activity within the analysis area is restricted to the Lake Como, Sapphire, Sula and French Basin packs, located approximately 15 miles SW, 17 miles SE, 20 miles south, and 14 miles south of the project area, respectively (U. S. Fish and Wildlife Service 2005). Mule deer, white-tailed deer, elk, and moose are known to use the project and cumulative effects analysis area. Currently, no known wolf den or rendezvous site is located within 1 mile of the project area.

3.6.3 Existing Conditions of Canada Lynx (Federally Threatened)

Lynx are currently classified as threatened in Montana under the Endangered Species Act. In North America, lynx distribution and abundance is strongly correlated with snowshoe hares, their primary prey. Consequently, lynx foraging habitat follows the predominant snowshoe hare habitat, early- to mid-successional lodgepole pine, subalpine fir, and Engelmann spruce forest. However, lynx are thought to avoid big game winter ranges due to interspecific competition from other predators (e.g., coyotes, mountain lions, bobcats; R. Baty, DNRC, personal comm., May 2004). For denning sites, the primary component appears to be large woody debris, in the form of either down logs or root wads (Squires and

Laurion 2000, Mowat et al. 2000, Koehler 1990). These den sites may be located in regenerating stands that are >20 years post-disturbance, or in mature conifer stands (Ruediger et al. 2000, Koehler 1990).

Elevations in the project area range from 4,500 to 6,182 feet, and 88 acres of suitable habitat types (Pfister et al. 1977) for potential denning and foraging occur within section 16 of the project area. Snowshoe hares are important lynx prey and are associated with dense young lodgepole pine stands, as well as mature stands with subalpine fir understories.

Sensitive Species

3.6.4 Existing Conditions of Pileated Woodpecker

The pileated woodpecker is one of the largest woodpeckers in North America (15-19 inches in length), feeding primarily on carpenter ants (*Camponotus* spp.) and woodboring beetle larvae (Bull and Jackson 1995). The pileated woodpecker nests and roosts in larger diameter snags, typically in mature to old-growth forest stands (McClelland et al. 1979, Bull et al. 1992)(McClelland et al. 1979). Due primarily to its large size, pileated woodpeckers require nest snags averaging 29 inches dbh, but have been known to nest in snags as small as 15 inches dbh in Montana (McClelland 1979). Pairs of pileated woodpeckers excavate 2-3 snags for potential nesting sites each year (Bull and Jackson 1995). Snags used for roosting are slightly smaller, averaging 27 inches dbh (Bull et al. 1992). Overall, McClelland (1979) found pileated woodpeckers to nest and roost primarily in western larch, ponderosa pine, and black cottonwood. The primary prey of pileated woodpeckers, carpenter ants, tends to prefer western larch logs with a large end diameter greater than 20 inches (Torgersen and Bull 1995). Thus, pileated woodpeckers generally prefer western larch and ponderosa pine snags > 15 inches dbh for nesting and roosting, and would likely feed on downed larch logs with a large end diameter greater than 20 inches.

Within the project area, there are approximately 797 acres that are predominately ponderosa pine or Douglas-fir (approximately 509 acres in section 16 and 288 acres in section 36), with average stand diameter $\geq$ 15 inches dbh that would be considered suitable pileated woodpecker habitat (SLI database). Forested stands within section 16 are predominately of the Douglas-fir/snowberry and Douglas-fir/ ninebark habitat types (Pfister et al. 1977), in which the stands are >50% Douglas-fir with some large diameter ponderosa pine as the secondary tree species (Stand Level Inventory database). In general, these stands are heavily infested with Douglas-fir mistletoe in both the overstory and understory. The preponderance of ponderosa pine > 17 inches dbh would provide snags, snag recruits, and foraging substrate for pileated woodpeckers. On several field visits, pileated woodpeckers have been observed (both visually and aurally) within the eastern ½ of the parcel, along with several snags and logs exhibiting pileated woodpecker-excavated cavities and foraging holes. Forested stands within section 36 are also predominately Douglas-fir/snowberry and Douglas-fir/ninebark habitat types (Pfister et al. 1977), in which the stands are >50% bull pine, with a secondary component of Douglas-fir. However, much of section 36 was burned by stand replacing fire in the 42,300 acre Bear Fire of 2000. Approximately 161 acres in the NW ¼ of the section experienced stand replacement fire, and was subsequently salvage logged (under the Spring Child Fire Salvage Sale 2001), while the remainder of the parcel experienced low to moderate fire severity.

3.6.5 Existing Conditions of Black Backed Woodpecker

The black-backed woodpecker is an irruptive species that forages opportunistically on outbreaks of wood boring beetles primarily in recently burned habitats, and to a lesser degree in unburned habitats. It is also considered to be a sensitive species in Montana. Although the black-backed woodpecker's nesting and foraging requirements are thought to be tightly linked with burned areas, it does nest and forage in unburned forest in response to insect outbreaks (Hutto 1995, Bull et al. 1986). Burned forests tend to be used immediately after burns occur (approximately 1 - 5 years). Large, densely stocked non-salvaged stands with an abundance of trees greater than or equal to 12 inches dbh appear to provide the greatest benefit to black-backed woodpeckers for foraging and nesting. Black-backed woodpeckers are also found in green forests with high levels of insect activity.

The extensive and intense wildfires of western Montana in 2000 created large amounts of potentially suitable habitat that are currently available for black-backed woodpeckers at the landscape scale.

Because of the close relationship of black-backed woodpeckers and wildfire, the analysis area was defined as an area inclusive of several major fires near the project area: the Alder (6,234 ac.), Bear (187,536 ac.), Blodgett (11,448 ac.), Cougar (13,916 ac.), Coyote (21,972 ac.), Mussigbrod Complex (60,340 ac.), and Skalkaho Complex (7,475 ac.) fires. All totaled, these fires burned a combined 308,921 acres, at varying severities, in 2000. Following Hejl et al.'s (2000) guideline that burned areas provide the most benefit for black-backed woodpeckers from 2 to 5 years post-burn, these areas will likely start to decline in their usefulness to this species in 2005 or 2006.

Within the project area, as discussed previously under the pileated woodpecker, approximately 161 acres in the NW ¼ of the Sleeping Child section (section 36) experienced stand replacement fire, and was subsequently salvage logged (under the Spring Child Fire Salvage Sale 2001), while the remainder of the parcel experienced low to moderate fire severity.

3.6.6 Existing Conditions of Flammulated Owl

The flammulated owl is a tiny forest owl that inhabits warm-dry ponderosa pine and cool-dry Douglas-fir forests in the western United States and is a secondary cavity nester. Home ranges are typically > 20 acres in area (McCallum 1994). Nest trees in 2 Oregon studies were 22-28 inches dbh (McCallum 1994). Habitats used have open to moderate canopy closure (30 to 50%) with at least 2 canopy layers, and are often adjacent to small clearings. It subsists primarily on insects and is considered a sensitive species in Montana. Periodic under burns may contribute to increasing habitat suitability for flammulated owls because low intensity fires would reduce understory density of seedlings and saplings, while periodically stimulating shrub growth.

Within the project area there are approximately 1,177 acres of flammulated owl preferred habitat types (SLI data), with those acres being relatively evenly distributed throughout the project area. However, approximately 161 of these acres are currently unsuitable for flammulated owls because they experienced stand replacement fire during the 2000 fire season. Due to the size of both the project area and flammulated owl home range, the project area will also be the cumulative effects analysis area. Flammulated owls have been previously observed in two nearby sections: sections 20 and 21 of T5N R19W (Montana Natural Heritage Program Database 2004).

3.6.7 Existing Conditions of Fisher

The fisher is a medium-sized animal belonging to the weasel family. Fishers prefer dense, lowland spruce-fir forests with high canopy closure, and avoid forests with little overhead cover and open areas (Powell 1978, Powell 1978, Powell 1977, Kelly 1977, Powell 1977, Kelly 1977, Clem 1977, Coulter 1966, Coulter 1966). For resting and denning, fishers typically use hollow trees, logs and stumps, brush piles, and holes in the ground (Coulter 1966, Powell 1977). Because fishers prefer stands with dense canopy cover, areas that have experienced high intensity fires would not be suitable fisher habitat for several decades. However, newly created snags would provide needed coarse woody debris over time.

In 1960, 12 fisher were introduced in the Moose Lake area (approximately 23 miles east of the project area) from British Columbia (Vinkey 2003). Additionally, there is a well-established population of fishers across the valley in the Bitterroot Mountains (Vinkey 2003). Within the project area, there are approximately 571 acres of habitat types (i.e., Pfister et al. 1977) that fisher prefer to use, with 279 of those acres (49%) located in Section 16. Because these habitat types are present does not necessarily indicate that these acres are currently suitable for use by fisher (i.e., stand structure, canopy closure, etc.). For example, of the 270 acres of fisher preferred habitat types in section 36, approximately 138 acres experienced stand replacing fire in 2000, were subsequently salvage-logged (Spring Child Salvage Sale), and are no longer suitable. Additionally, the fisher preferred habitat types located in the Gird Creek parcel (section 16) are largely dry stands that may provide marginal habitat for fishers. However, probably the most suitable habitat for fishers within the project area occurs in the riparian area along Gird Creek; providing abundant coarse woody debris, diverse stand structure, and canopy closure > 60%. This area totals approximately 88 acres, and is not identified as a "preferred habitat type" for fisher (subalpine fir/menziesia). The cumulative effects analysis area is a rectangular 16 sq. mile area, with sections 36 and 16 as the SW and NE corners, respectively.

Ungulates

3.6.8 Existing Conditions of White-tailed and Mule Deer

Densely stocked thickets of conifer regeneration and overstocked mature stands provide thermal protection and hiding cover for deer in winter, which can reduce energy expenditures and stress associated with cold temperatures, wind, and human-caused disturbance. Areas with densely stocked mature trees are also important for snow interception, which makes travel and foraging less stressful for deer during periods when snow is deep. Dense stands that are well connected provide for animal movements across wintering areas during periods with deep snow, which improves their ability to find forage and shelter under varied environmental conditions. Thus, removing cover that is important for wintering deer through forest management activities can increase their energy expenditures and stress in winter. Reductions in cover could ultimately result in a reduction in winter range carrying capacity and subsequent increases in winter mortality within local deer herds.

Within the project area, there are approximately 515 acres of densely canopied forest (approximately 373 acres in the Gird Creek parcel and 142 acres on the Sleeping Child parcel) which could provide snow-intercept, and possibly thermal cover for deer. Within the larger cumulative effects analysis area, an approximately 35,352 acre area located from Willow Creek to Little Sleeping Child Creek (a distance of 14.5 miles), there are approximately 8,073 acres of snow intercept/thermal cover (determined using orthophotographs dated August to September 1995, and aerial photographs dated September 26, 2000). Due to the project area's proximity to the towns of Hamilton and Corvallis, this area likely receives ample hunting pressure. Additionally, grazing has historically occurred on these parcels, with 40 AUM on the Gird Creek parcel, 133 AUM on the Sleeping Child parcel.

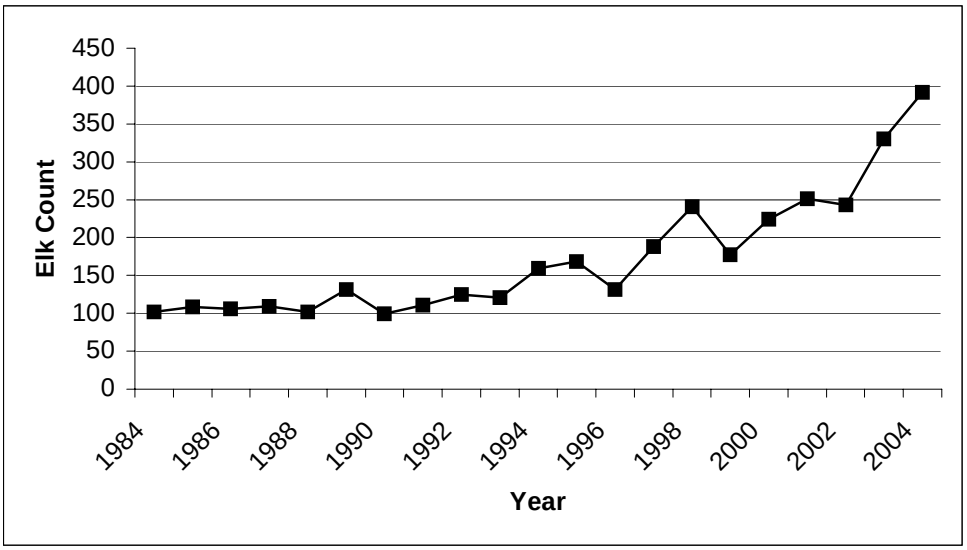
3.6.9 Existing Conditions of Elk

Elk generally avoid open roads; however, they become more tolerant of closed roads in the area over time (Lyon 1998). Densely stocked thickets of conifer regeneration and overstocked mature stands provide thermal protection and hiding cover for deer and elk in winter, which can reduce energy expenditures and stress associated with cold temperatures, wind, and human-caused disturbance. Additionally, extensive (e.g., $\geq$250 acres) areas of forest cover $\geq$0.5 miles from open roads serve as security for elk. Thus, removing cover that is important for wintering elk through forest management activities can increase their energy expenditures and stress in winter. Reductions in cover could ultimately result in a reduction in winter range carrying capacity and subsequent increases in winter mortality within local elk herds.

Following the concept of elk security cover (Hillis et al. 1991), there is no elk security habitat within the project or cumulative effects analysis areas due to the abundance of open roads and areas burned by the 2000 wildfires. The cumulative effects analysis area used for deer will also be used for the analysis of elk habitat. The project area is heavily hunted during the fall, and the ridge between Sleeping Child and Skalkaho Pass has recently had >300 head of elk overwintering, with a steadily increasing population (Fig. 3-3; J. Vore, MT FWP, personal comm., May 2004).

As discussed in the scoping comments from the Friends of the Bitterroot (Jim Miller, 30 January 2003), following the Spring-Child Salvage Timber Sale (which involved portions of the Sleeping Child parcel), roads constructed during that sale "would be closed and revegetated after use." The Friends of the Bitterroot found continued use of the Sleeping Child parcel by ATV's and 4WD pickup trucks during the 2003 hunting season. In fact, up until late July 2004, the gates controlling motorized access on Sleeping Child were unlocked and open (M. McGrath, SWLO Wildlife Biologist, personal obs.). Motorized activity on both the Sleeping Child and Gird Creek parcels has been documented throughout 2004 (M. McGrath, personal obs.) through ATV's and 4WD pickup trucks. ATV use is quite pervasive on the Gird Creek parcel, with well-established illegal trails. Hamilton Unit spent much of 2005 working with the Bitterroot National Forest to curtail illegal motor vehicle use behind the locked gates. As of 2005, the gates accessing the project area were closed and locked, jack-leg fences had been installed across some ATV trails, and dialog had been initiated with user groups. While ATV use had been reduced, some illegal use of the parcels still continues.

Figure 3-3. Elk trend counts by fixed-wing aircraft from Skalkaho to Sleeping Child, 1984-2004



3.7 EXISTING CONDITIONS OF AESTHETICS

It is primarily the north and northwest facing aspects on each section that can be seen from private ownerships or heavy use areas. These areas are primarily homes in the Skalkaho Creek drainage (several can see the north aspect of the Sleeping Child section), homes in the Bitterroot Valley primarily southeast of Hamilton, and heavily used county and private roads that leave Highway 93 and travel southeast from Hamilton. Although the Sleeping Child section can be seen from the city of Hamilton, it is such a distance away (approximately 7 miles) that it is a small spot on the landscape. The Gird Creek section is more east of Hamilton than the Sleeping Child section and is mostly obscured by closer ridgelines. From a distance the two sections and analysis area appear quite timbered with very few openings. The only evidence of past timber harvesting is several clearcuts within the last 25 years that can be seen nearby, but lie to the east of both sections. Very few roads exist on these north aspects and are difficult to see from most viewpoints.

From the stand level (on the site), most of the sections are completely timbered with very few high standard roads, which can be aesthetically pleasing to many. However, sight distances in most locations are less than 100-200 feet, which does not allow for visual pleasure of the landscape. Additionally, on the north aspects, the heavy mistletoe infestations and brooms causing physical deformities in the infected trees result in an unhealthy and dysfunctional appearance in the stands.

The analysis area likely appears more timbered or at least with more trees per acre than what would have been expected historically due to the exclusion of fire and resulting increase in stand densities and lack of moderate intensity fires. There has been little to no effect aesthetically from road construction in the analysis area as they are very hard to discern from the valley bottom. At the stand level, sight distances are shorter due to increased stocking levels and there has been an increase in physical deformity in most of the Douglas-fir from mistletoe, both from the exclusion of fire over time. Some of the higher standard roads that are maintained are quite evident on the site while many of the older roads that are not maintained are revegetating and becoming less evident.

CHAPTER 4: ENVIRONMENTAL EFFECTS

INTRODUCTION

Chapter 4 describes the environmental effects of each alternative on the resources described in Chapter 3. Cumulative effects from current management and foreseeable future State actions are discussed in this chapter. These include other active timber sales, those in the planning stage, ongoing maintenance, and other uses of the areas being analyzed. Direct, indirect and cumulative effects on the resources being analyzed were considered. Chapter 2 describes the details of each alternative and lists proposed mitigation measures specific to all action alternatives.

4.1 PREDICTED EFFECTS ON ROADS

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Roads
The No Action Alternative would cause no direct, indirect, or cumulative effects to road use. Segments of road in the project area that do not meet BMP standards would continue to erode.

Alternatives B –Direct, Indirect, and Cumulative Effects to Roads
All existing roads would be repaired and maintained to meet BMP standards. All new roads would be constructed to meet BMP's and promptly revegetated and closed after project completion. Alternative B would include construction of 2.9 miles of road. Restoration activities would include abandonment of approximately .5 miles of road. Alternative B would require 1.05 miles more road construction than Alternative C. All new roads are located on moderate grades and stable terrain.

Alternatives C –Direct, Indirect, and Cumulative Effects to Roads
All existing roads would be repaired and maintained to meet BMP standards. All new roads would be constructed to meet BMP's and promptly revegetated and closed after project completion. Alternative B would include construction of 1.85 miles of new road.

4.2 PREDICTED EFFECTS ON VEGETATION

4.2.1 Stand Health

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Stand Health
Under this alternative, stand health would continue to decline as mistletoe continued to worsen and spread and as stand densities continue to increase above the currently overstocked levels. Increased tree mortality from mistletoe would be expected as the disease spreads and worsens as well as increased physical deformity and decay. Understory trees would continue to become infected and not be recruited into the overstory due to the growth inhibiting effects of the mistletoe, eventually resulting in very little overstory cover and very little chance for new growth to reach the overstory. Increased stand densities would result in a continued decline in stand vigor and growth and increased susceptibility to insects, disease, and/or fire.

Alternative B – Direct and Indirect Effects to Stand Health
Approximately 258 acres would be treated with a shelterwood or seedtree with reserves harvest and 64 acres would be treated with a sanitation harvest. These two treatments are designed to remove the Douglas-fir infected with mistletoe from the stands and reduce the elevated levels of mistletoe across the project area. This treatment, although it would not be successful at removing all the mistletoe, would greatly reduce the abundance of this disease in the harvest units and vastly improve the health and growth rates in the treated stands. Growth rates would improve dramatically across the sites as regeneration becomes established and the new healthier stands begin to mature. Growth rates would be expected to increase three or four-fold or more from poor or very poor to good or very good.

Approximately 103 acres would also receive treatment with an Improvement harvest and 216 acres with an individual tree selection harvest. These treatments would reduce stocking levels and leave the better healthier trees with the best potential for growth on these 319 acres. This would result in better growth

rates, more vigorous trees, and a reduced susceptibility to insect and disease outbreaks across these treatment areas. It would also bring these stands back toward more historic conditions that these stands have adapted to over long periods of time. Growth rates would be expected to increase from moderate to good. Forest health would be greatly improved on a total of approximately 641 acres. This would leave 397 acres of state ownership in its current state of health from poor to moderate.

Alternative C – Direct and Indirect Effects to Stand Health
Under this alternative, approximately 174 acres would be treated with a shelterwood or seedtree with reserves harvest and 64 acres with a sanitation harvest versus the 322 acres in Alternative B with the same treatments.

Forest health would be improved on a total of approximately 514 acres, which would leave 524 acres of state ownership in its current state of health. This Alternative would do less to improve and repair the current state of poor health on these parcels than Alternative B.

Alternative B and C – Common Cumulative Effects to Stand Health
Both Alternatives B and C would cumulatively improve the health and growth rates across the analysis area. Very little has been done in the analysis area to address the problems of elevated levels of mistletoe and overstocking (overstocking has been addressed and reduced more around the Gird Creek section). These treatments provide a cumulative benefit across the analysis area from the standpoint of forest health and should help to allow these treated stands to persist in a healthy state into the future.

4.2.2 Fire Hazard
All of the proposed treatments are designed to emulate the effects of fire or bring the stands back toward a state that would have been expected had fires not been excluded from these ecosystems.

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Fire Hazard
Under this alternative, no treatments would occur and therefore the stands would continue to increase in densities and abundance and coverage of mistletoe. The stands would remain at high fuel loadings and ladder fuels would continue to increase at levels well above those expected without the exclusion of fire. There would continue to be a high risk of a high intensity, stand replacing fire occurring across either of the parcels and therefore the fire hazard would remain high. This condition would be expected to increase over time until the fuels are modified by an ecological disturbance or by management activities.

Alternative B – Direct and Indirect Effects to Fire Hazard
Under Alternative B, fuels and stand densities would be reduced on approximately 641 acres. These treatments would thin the stands thereby reducing canopy coverage and the chance of a crown fire. They would also reduce ladder fuels by removing and thinning smaller trees, which would reduce the chance of fire reaching and carrying in the crowns of the stands. It would reduce standing fuel loadings by removing forest products from the site. All of these factors would contribute to smaller more controllable and lower intensity fires that would more closely resemble those that might have been expected to occur naturally before the exclusion of fire.

A majority of the tops, limbs, and unusable pieces of the trees would be left out in the forest to recycle nutrients to the soils and to provide coarse woody debris for microorganisms and small mammals as well as their benefits to the residual stand. This slash would increase fire hazard on the site for up to 2 years as it cures and decomposes. Any slash left in the harvest units would meet the State Hazard Reduction Law. So the effects of reducing standing fuels, canopies, and ladder fuels may be offset for the first two years by the effects of increased ground fuels from slash. There would also be slash piles at the landings, which would be burned within 18 months of their creation. Additionally, up to 100 acres may be broadcast or jackpot burned on the Gird Creek section depending on the final fuel loadings, weather, and funding to reduce slash loads, create planting spots, reduce brush, and return fire to the landscape. A high risk of high intensity fires occurring would still exist on much of the untreated acreage, but access to these sections would be greatly improved for fire control purposes with the new road construction and road improvements.

Alternative C – Direct and Indirect Effects to Fire Hazard
Under Alternative C, fuels and stand densities would be reduced on 514 acres instead of the 641 acres in Alternative B. The effects would be similar to Alternative B except in the long-term; risk of high intensity fires occurring on the additional 127 acres treated would not be decreased.

Alternative B and C – Common Cumulative Effects to Fire Hazard
For the first two years fire hazard would not likely change considerably due to the offsetting effects of decreased stand densities but increased slash loadings. In the long-term however, the decreased risk of high intensity and stand replacing fires on up to 514 to 641 acres would provide a net benefit to the project area. Should a fire start in the overstocked or heavily diseased stands and build to high intensities, it puts most of the nearby stands at increased risk regardless of their fuel loads or stocking levels due to the fire intensity that was allowed to build. By removing 514 to 641 acres from this heavily stocked and diseased state, the surrounding landscape would benefit through reduced risk of higher intensity fires and through areas where fire might be more controllable because of the proposed treatments. Improved access would also benefit the analysis area and reduce fire hazards for initial and extended attack firefighting.

4.3 PREDICTED EFFECTS ON WATER QUALITY

4.3.1 Water Quality in Sleeping Child Analysis Area

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Sleeping Child Water Quality
Under the No Action Alternative there would be no potential for increases in water yield or sediment delivery. Segments of roads in the project area that do not meet BMP standards would continue to erode and sediment delivery at one location on the existing road would continue to occur at an intermittent draw. Existing roads and trails utilized by off road vehicles would continue to be used and the potential for erosion would increase.

Alternative B and C – Common Direct and Indirect Effects to Sleeping Child Water Quality
A watershed effects analysis was completed for the proposed sale area to determine the potential direct, indirect and cumulative impacts to water quality. Because Sleeping Child Creek was listed on the 1996, 2000, 2002, and 2004 303 (d) listed of impaired waterbodies, all recommended mitigation would be implemented to protect water quality. Pursuant to Montana Annotated Code section 75-5-70310C, pending completion of a TMDL on a water body listed pursuant to 75-5-702: new or expanded non-point source activities affecting a listed water body may commence and continue provided those activities are conducted in accordance with the reasonable land, soil and water conservation practices.

Under the action alternative minimal direct, indirect and cumulative effects are expected as a result of the proposed action. Mitigation measures implemented during the proposed activities are expected to minimize the potential impacts to water quality. There are two stream channels in the project area, including; Falls Gulch which is a intermittent and discontinuous class 3 stream channel and Sawdust Gulch which is an intermittent class 2 stream channel. There are no harvest boundaries adjacent to Falls Gulch. There are harvest boundaries adjacent to Sawdust Gulch for approximately .7 miles of steam. All SMZ Laws and Rules would be applied to this stream section. A 50 ft no cut buffer would be located on both sides of Sawdust Gulch to maintain an adequate buffer and limit the potential for sediment delivery to the stream channel.

There is approximately 800 ft of new road construction proposed, but none adjacent to stream channels. Approximately 1208 ft of road would be abandoned. There is an existing road crossing on Sawdust Gulch that produces direct sediment delivery to the stream channel. The crossing was originally constructed as a rock armored dip, which is not functioning properly. A new 24” culvert would be installed to allow for adequate surface flow through the pipe and reduce the amount of sediment currently being delivered to the stream. Roads that do not currently meet BMP standards would be improved. All new road construction would be required to meet BMP standards.

Alternative B and C –Common Cumulative Effects to Sleeping Child Water Quality
Under either proposed alternative, cumulative effects are expected to be minimal with the implementation of the recommended mitigation measures. Implementation of the recommended mitigation measures would reduce the sediment delivery to the stream channel caused by the proposed activity. Consequently, water quality would be maintained and in some locations sediment delivery would be reduced as a result of implementing recommended mitigation measures to improve the existing conditions.

Detrimental increases in water yield are not expected as a result of the proposed activities. Water yield is only expected to increase approximately 0.1% as a result of the proposed activities. This very low increase is less than 1% WYI and not expected to have any effects on stream stability or magnitude and duration of runoff. See Chart below for specific details.

Watershed	Existing %WYI	%WYI for proposed action
Sleeping Child	5.3%	5.4%

Direct, indirect and cumulative effects are expected to be minimal as a result of low anticipated increases in water yield.

4.3.2 Water Quality in Gird Creek Analysis Area

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Gird Creek Water Quality
Under the No Action Alternative there would be no increase in water yield or sediment delivery to the stream channel. No new road construction would occur on the State section and the only existing roads in the section would be approximately 1 mile along Gird Creek in the north end of the section.

Alternative B – Direct and Indirect Effects to Gird Creek Water Quality
Direct and indirect effects of the proposed action are expected to be low to moderate. Under Action Alternative B, approximately 361 acres would be treated under the proposed action. Approximately 326 acres would be cable system and 35 acres ground harvest. Approximately 258 of the 361 acres would be a shelterwood/ seedtree harvest, which is expected to decrease canopy cover by 80%. There would also be approximately 14,676 ft of new road construction in the project area.

To protect water quality, all SMZ Laws and Rules would be implemented as well as additional mitigation measures for watershed management based on DNRC Forest Management Rule 36.11.425. A riparian management zone (RMZ) would be established to increase buffer distance above what is required by the SMZ Law. Due to the high erosive factor of the granitic soils and the increased potential for sediment delivery from forest management activities, a 200 ft RMZ and no-cut buffer would be established next to Gird Creek. Because the units above the buffer are cable units, ground disturbance would be minimized and a 200ft buffer is expected to be a very effective filtration buffer. Slash would be placed on the ground in bare portions of the cable corridors for additional filtration, if erosion were observed.

Under Alternative B, approximately 14,676 ft of new road would be constructed. All new road construction would be constructed across only dry draws. However, 18” culverts would be installed in each draw crossing to provide a safety measure for any seasonal run off or ephemeral flow that might occur. Culverts would be installed to meet BMP requirements and each inlet and outlet would be rock armored to provide additional stability and erosion protection.

Alternative B –Cumulative Effects to Gird Creek Water Quality
Cumulative impacts as a result of the proposed actions are expected to be low to moderate. Adequate filtration should be accomplished through recommended mitigation measures, which would minimize overall sediment delivery to Gird Creek as a result of forest management activities. Because new roads do not cross streams and would be constructed through dry draws, the potential for impacting water quality in Gird Creek is expected to be minimal and unlikely.

Alternative C – Direct and Indirect Effects to Gird Creek Water Quality
Under alternative C direct and indirect effects of the proposed action are expected to be low. Alternative C would treat 234 acres, with 60 acres being improvement harvest (40% canopy removal) and only 174 acres of shelterwood/seed tree harvest (80% canopy removal). The amount of total new road construction under alternative C would also be reduced to approximately 9,014 ft.

All mitigation measures implemented in alternative B would be implemented in alternative C. However, the risk of sediment delivery to the stream channel would be slightly reduced because of less total acres of shelterwood/seed tree harvest and approximately 5,662 ft of new road that would not be constructed.

Alternative C – Cumulative Effects to Gird Creek Water Quality
Implementation of mitigation measures discussed in Alternative B, along with an overall reduction in canopy removal and road construction, the risk of cumulative effects of the proposed action are expected to be low.

Detrimental increases in water yield are not expected as a result of the proposed activities. Water yield is only expected to increase approximately 0.6% as a result of the proposed activities. This increase is less than 1% WYI and not expected to have any effects on stream stability or magnitude and duration of runoff. See Chart below for specific details.

Watershed	Existing %WYI	%WYI for proposed action
Gird Creek	3.8%	4.4%

Direct, indirect and cumulative effects are expected to be minimal as a result of low anticipated increases in water yield.

4.4 PREDICTED EFFECTS ON SOILS

4.4.1 Soil Effects in the Analysis Area

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Soils
Under the No Action Alternative the risk of direct, indirect and cumulative effects would remain the same as described in Existing Conditions, Chapter 3. Under this alternative, there would be no risk of erosion, displacement or compaction.

Alternative B and C – Common Direct, Indirect, and Cumulative Effects to Soils
The primary risks to long-term soil productivity are soil displacement, compaction and erosion of surface soils. During timber harvest, equipment operation on wet sites and sensitive soils can potentially result in soil compaction, rutting, displacement and subsequent erosion. Potential effects are a reduction in long-term soil productivity, and regeneration potential as well as impacts to course woody debris distribution and nutrient cycling.

Cable harvest units would have minimal effects of 5% or less of soil disturbance within units and bared soils would be stabilized with slash where needed. Tractor units would require a skid trail plan and design approved by the forest officer to ensure soil impacts would not exceed more than 15% of the total unit area. Skid trail planning would focus on use of existing trails to further limit the area of disturbance. Because soil types in the harvest area have a high erosion risk and increases with slope steepness, skidding would be limited to slope less than 40% and adverse skidding would be limited to slopes less than 30%. Additional drainage features would be installed on trials where necessary and slashed following completion of harvest activities. Cable corridors would have slash placed on them as needed if concentrated flow occurs and in areas with extensive disturbance.

On the Sleeping Child section 36 the McMeal Mowbray-Tolman Complex soils (31B70) are more sensitive to season of use and remain wet longer. These soil types, which occur in harvest unit 1, would need to be monitored closely for operability. On the Gird Creek section 16, approximately 326 acres of the proposed harvest would be cable and approximately 35 acres would be ground harvest operations. Cable harvest operations greatly reduce the amount of ground disturbance, especially on granitic soil types.

Primary concerns in the Klootch- Helmville complex soils (soil map unit 30D32) are mechanical disturbance and erosion. Rock outcrops occur on convex slopes and ridges. Cable harvest on slopes

over 40% can limit soil impacts. Due to the high erosive nature of granitic soils, cable corridors would have slash placed on them as needed if concentrated flow occurs and in areas with extended disturbance.

Holter-Tolman complex soils (soil map unit 31K37) are droughty, subject to disturbance and very erosive. Primary limitations are soil displacement and compaction associated with ground based harvest operations. Mitigations would include minimizing soil disturbance by limiting equipment operations to slopes less than 40%, season of use restrictions, skid trail planning and retaining historic levels of litter and woody debris.

Tractor units would require a skid trail plan be approved by the forest officer to ensure soil impacts would not exceed more than 15% of the total unit area. To minimize compaction the combination of skid trail planning to limit area disturbed and limiting season of use to dry frozen or snow-covered conditions would be implemented consistent with BMP's. Soil moisture would be monitored and approved by the Forest Officer prior to harvest activities. Operations would cease if rain events occur that increases soil moisture above acceptable levels. Slash would be placed on trails to provide energy dissipation for surface runoff, increases sediment filtration and woody debris for nutrient decomposition for soils. Areas of past heavily impacted soils would be rehabilitated by installing drainage and stabilization as part of scarification, site preparation and slash disposal efforts as feasible. Five to 15 tons/acre of course woody debris would be maintained or return skidded as needed to benefit soil productivity, nutrient cycling and soil moisture storage.

Cumulative effects could occur from repeated entries into a harvest area. To compare effects, DNRC has completed soil monitoring throughout the state to extrapolate from similar parent materials and landscapes (DNRC 2004). As reference examples for projects where BMP's and mitigations were applied, ground based skidding on granitic slopes of 20-40% on the DNRC Toomey Creek project (1988) were an average of 12.6% detrimental soil impacts mainly as soil displacement. No erosion was noted and soil conditions important to growth were maintained and no cumulative effects occurred.
Ground based skidding on moderate slopes (15-30%) with clay rich soils from granitic parent materials on the DNRC Sweeney Creek project area (2004) had 2.1% soil impacts from harvest on snow. With the implementation of BMP's and the recommended mitigation measures soil impacts are expected to be less than 20% of area. We expect that by protecting 80 to 85% of harvest area in non-detrimental condition, we will maintain soil productivity (DNRC 1998, 2004). Sale administrators will monitor on-going harvest activities to meet; contract requirements, BMP'S for soil and water protection and silvicultural objectives. Under the action alternative, the proposed harvest operations are expected to maintain soil properties important to, plant growth and hydrologic function and present low to moderate risk of direct, indirect and cumulative impacts to soils.

Alternative C- Direct, Indirect, and Cumulative Effects Specific to Gird Creek Section Soils
Under alternative C, the Gird Creek Section would involve a modified harvest plan with approximately 190 acres that would be cable harvest (136 acres less than Alternative B) and 44 acres tractor harvest. There would be 9 more acres of tractor ground, yet the effects would be similar on a per acre basis as Alternative B. Based on implementation of recommended mitigation measures, the direct, indirect and cumulative effects of Alternative C, would be the same as Alternative B, which are low to moderate.

4.5 PREDICTED EFFECTS ON FISHERIES

4.5.1 Fisheries in Sleeping Child Analysis Area

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Sleeping Child Fisheries
Under the No Action Alternative there would be no risk of direct, indirect or cumulative effects to fisheries. The Sleeping Child watershed is currently in the process of recovery after the fires of 2000 and landslides of 2001, which happened as a result of the fire. Both populations of bull trout and westslope cutthroat declined, but the significant population declines were associated with westslope cutthroat trout. The significant decline was a result of fish kills in the high intensity burn areas, but mostly from the landslide

that occurred in 2001, which significantly effected fish habitat. These populations are currently in an upward trend according to data collected by FWP.

Approximately 15.1 miles of stream channel burned along Sleeping Child Creek, increasing stream temperatures due to loss of thermal protection and loss of large woody debris (LWD) for habitat complexity and hiding cover. Temperatures will most likely be elevated for a few years until riparian vegetation has recovered to adequate levels. Stream temperatures should continue to decrease and habitat complexity increase.

Alternatives B and C – Common Direct and Indirect Effects to Sleeping Child Fisheries
Under Alternative B or C, the direct and indirect effects of the proposed action are expected to be low. There is no harvest associated with the main stem of Sleeping Child Creek or any tributary that provides critical habitat for bull trout or westslope cutthroat trout. Substantial levels of sediment delivery to the stream channel are not expected to result from the proposed actions. Mitigation measures implemented during harvest operations would reduce potential sediment delivery and subsequent impacts on cold-water fish habitat. Mitigation would include a 50' no cut buffer on all class I streams and compliance with all SMZ Laws and Rules.

Proposed harvest actions are not expected to have a measurable effect on stream temperatures or large woody debris. There would be no harvest within the SMZ on Sawdust Gulch, providing sediment filtration and potential large woody debris recruitment.

New road construction in this project area is limited. Approximately 800ft of new road would be constructed and restricting access and slashing the road would abandon 1208 ft of existing road. A culvert would be installed on Sawdust Gulch to improve an existing drivable dip that is not functioning properly. This improvement would help reduce sediment delivery to the stream channel.

Alternatives B and C – Common Cumulative Effects to Sleeping Child Fisheries
No additional cumulative impacts to cold-water fisheries are anticipated as a result of the proposed harvest activities. There is no harvest proposed within the SMZ of any Fish bearing stream. Mitigation measures are expected to minimize sediment delivery during harvest operations. Road mitigation measures would provide long term reductions in sediment delivery by increasing surface drainage and improving stream crossings that are currently are a direct sediment source. There are no foreseeable future state actions in the Sleeping Child watershed. Other related actions include potential effects from recreational fishing and riparian grazing.

4.5.2 Fisheries in the Gird Creek Analysis Area

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Gird Creek Fisheries
Under the No Action Alternative there would be no risk of direct, indirect and cumulative impacts to cold-water fisheries.

Alternatives B and C - Common Direct and Indirect, Effects to Gird Creek Fisheries
Under alternatives B and C, impacts to cold-water fish habitat would be similar and will be combined for the effects analysis portion of this EA. Direct, indirect and cumulative impacts are anticipated to be low as a result of the proposed actions. There is no harvest associated with the main stem of Gird Creek. Substantial levels of sediment delivery to the stream channel are not expected to result from the proposed actions. Mitigation measures implemented during harvest operations would reduce potential sediment delivery and subsequent impacts on cold-water fish habitat. Mitigation would include a 200 ft no cut buffer as well as complying with all SMZ Laws and Rules.

Proposed harvest actions are not expected to have a measurable effect on stream temperatures or large woody debris. There would be no harvest within the SMZ on Gird Creek, providing sediment filtration and potential large woody debris recruitment. The 200 ft buffer is expected to be adequate to sediment filtration and maintain large wood debris recruitment.

There would be new road construction in the project area. Under alternative A, 14,676 ft of new road construction is proposed and under alternative B, 9,014 ft. There are no live stream crossings included in the proposed new road construction. Any dry draw crossings would have an 18" culvert installed to ensure adequate drainage for any seasonal or ephemeral flow that could occur. All new road construction and crossing installations would be required to meet BMP standards to minimize any potential sediment production.

Alternatives B and C - Common Cumulative, Effects to Gird Creek Fisheries
Cumulative Effects to fisheries are expected to be low. Implementation of recommended mitigation measures would reduce potential sediment delivery, which can adversely impact fish habitat. Adequate buffers are anticipated to maintain large woody debris recruitment and maintain regulation of stream temperatures. Cable corridors would be water bared if necessary to prevent erosion. There are no foreseeable future state actions in the Gird Creek watershed. Other related actions include potential effects from recreational fishing and riparian grazing.

4.6 PREDICTED EFFECTS ON NOXIOUS WEEDS

4.6.1 Noxious Weeds in the Sleeping Child Analysis Area

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Sleeping Child Noxious Weeds
Under Alternative A, direct, indirect and cumulative impacts are expected to remain the same. Noxious weed infestations are expected to increase if the existing level of off-road vehicle use remains the same. The potential for noxious weed spread will also increase as a result of the current grazing lease on that section of State land.

Alternatives B and C – Common Direct, Indirect, and Cumulative Effects to Sleeping Child Noxious Weeds
Under the proposed activities, an increase in ground disturbance could increase or introduce noxious weeds throughout roads and forested areas. With weed species such as thistle and to a lesser extent knapweed, weed seeds may already be scattered throughout the forested areas and the reduction of canopy cover or disturbance from the timber harvest activities could provide the catalyst for spread.

For this project an Integrated Weed Management (IWM) approach would be implemented that would include: prevention, revegetation and weed control measures for spot outbreaks, which are considered the most effective weed management treatments. Short-term goals would be to reduce existing noxious weed populations and increase native plants and seeded grasses. Where weeds are replaced with grasses, erosion would be reduced due to the improved plant cover. Localized herbicide applications would be used, primarily along disturbed roadside edges and spot treatments of small infestations. An herbicide treatment of most of the roadsides would be accomplished once prior to proposed activities and once following completion of activities. In addition, some heavy infestations of knapweed not along roadsides would also be treated. Components of this IWM are listed in Section 2.3.3, mitigation measures, of this EA.

To protect water quality, herbicide would not be applied where runoff could enter surface waters or riparian features. Re-entry could increase the risk of cumulative impacts, if necessary mitigation measures to control noxious weeds are not implemented for each individual re-entry. Existing biological control efforts for knapweed would be monitored and supplemented if necessary.

4.6.2 Noxious Weeds in the Gird Creek Analysis Area

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Gird Creek Noxious Weeds
Under the No Action Alternative the spread of noxious weeds throughout the section would increase as a result of the current grazing lease on the state section.

Alternatives B and C – Common Direct, Indirect, and Cumulative Effects to Gird Creek Noxious Weeds
Effects of Alternatives B and C for Gird Creek would be the same as listed above in the effects of Alternatives B and C for Sleeping Child Creek.

4.7 PREDICTED EFFECTS ON WILDLIFE

4.7.1 Grizzly Bears and Gray Wolves

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Grizzly Bears and Gray Wolves

No change from the current conditions is expected under the No Action alternative.

Alternative B – Direct and Indirect Effects to Grizzly Bears and Gray Wolves

Under this action alternative, approximately 2.93 miles of new road would be constructed in the project area, with plans to abandon approximately 0.44 miles. Once the project is complete, the new roads would be closed to motor vehicles through Kelly-humps and slash on the first segment of road. However, until yearlong (and effective) road closures are implemented (see road discussion in section 3.6.9), all existing roads would be considered open to motorized vehicles under this analysis. Only one grizzly bear is known to have ventured near the project area in the last 5 years, however, with recent sightings of grizzly bears along the Clark Fork face of the Garnet Range, it would be likely that grizzly bears may be more common near the project area in the near future. Additionally, wolves are becoming more common in the southern Bitterroot Valley. Thus, due to decreases in vegetative screening cover due to timber harvest, there may be minimal short-term (i.e., 5 years) risk of direct and indirect effects to grizzly bears or wolves as a result of this action alternative, but the level of risk would likely increase over time (until vegetation has re-established itself for visual screening cover along roads) as bear and wolf populations expand and ATV use increases.

Alternative B – Cumulative Effects to Grizzly Bears and Gray Wolves

Similar to the direct and indirect effects, the resulting decrease in visual screening cover, coupled with past salvage harvest on School Trust and private lands, and 52,883 acres (42% of the analysis area) burned by the fires of 2000 within the analysis area, the proposed action alternative would further reduce vegetative screening cover in the analysis area. However, the vegetative manipulation of the proposed action may further increase ungulate herds, due to increased forage, and make deer and elk carcasses available in springs following hard winters due to reduced snow intercept cover that may increase winter ungulate deaths. Given the potential grizzly bear and wolf population expansions discussed under direct and indirect effects, and the reduction in visual screening cover, there may be minimal short-term (i.e., 5 years) risk of cumulative effects to grizzly bears or wolves as a result of this action alternative, but the level of risk would likely increase over time (until vegetation has re-established itself for visual screening cover along roads) as bear and wolf populations increase and ATV use increases.

Alternative C – Direct and Indirect Effects to Grizzly Bears and Gray Wolves

Under this action alternative, only an additional 1.86 miles of new road would be constructed in the project area, with plans to abandon approximately 0.44 miles of road. Once the project is complete, the new roads would be closed to motor vehicles through Kelly-humps and slash on the first segment of road. However, until yearlong (and effective) road closures are implemented (see road discussion in section 3.6.9), all existing roads would be considered open to motorized vehicles under this analysis. Only one grizzly bear is known to have ventured near the project area in the last 5 years, however, with recent sightings of grizzly bears along the Clark Fork face of the Garnet Range, it would be likely that grizzly bears may be more common near the project area in the near future. Additionally, wolves are becoming more common in the southern Bitterroot Valley. Thus, due to decreases in vegetative screening cover due to timber harvest, there may be minimal short-term (i.e., 5 years) risk of direct and indirect effects to grizzly bears or wolves as a result of this action alternative, but the level of risk would likely increase over time (until vegetation has re-established itself for visual screening cover along roads) as bear and wolf populations expand and ATV use increases.

Alternative C – Cumulative Effects to Grizzly Bears and Gray Wolves

Effects to grizzly bears and wolves under this action alternative would be similar to those from Alternative B (page 42), only with 1.07 fewer miles of open road, and 127 fewer acres treated.

4.7.2 Canada Lynx

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Canada Lynx
No change from the current conditions is expected under the No Action alternative.

Alternative B and C – Common Direct and Indirect Effects to Canada Lynx
The proposed action would harvest approximately 75 of the 88 acres of lynx habitat within the Gird Creek parcel. The affected habitat is currently a riparian multi-storied stand of Douglas-fir, Engelmann Spruce, and abundant coarse woody debris. The proposed silvicultural prescription would convert portions of this stand into a shelterwood/seed tree with reserves, and other portions of the stand into a more open, multi-storied stand. These prescriptions would likely result in much more open stand conditions that would be temporary non-lynx habitat for ≥20 years until regeneration became sufficiently established as to provide early foraging habitat for lynx.

As a result, the amount of lynx foraging habitat within the project area may be reduced (Ausband 2004). As a result of the proposed action, a potentially valuable travel corridor along Gird Creek would become temporary non-lynx habitat for ≥20 years post-harvest. Thus, there would likely be direct and indirect effects to lynx as a result of both action alternatives.

Alternative B and C– Common Cumulative Effects to Canada Lynx
Within the cumulative effects analysis area (the same 197 sq. mi. area analyzed for grizzly bears and wolves), approximately 42% of the area was burned by the 2000 fires, and several timber harvests and salvages have occurred on School Trust and private lands since the year 2000. As a result, the proposed action alternatives would temporarily remove additional lynx habitat from the analysis area. However, once the landscape begins its recovery from the fires, through the regeneration of Douglas-fir, spruce, and pine, and snags topple to form jackstraw piles, the analysis area will have abundant (possibly 42% of the analysis area acreage) early foraging habitat, and potential denning habitat from fallen snags. Thus, the proposed action alternatives would temporarily increase the cumulative effects to lynx within the analysis area, however, in ≥20 years, there should be abundant habitat for lynx.

Sensitive Species

4.7.3 Pileated Woodpecker

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Pileated Woodpecker
No change from the current conditions is expected under the No Action alternative

Alternative B – Direct, Indirect, and Cumulative Effects to Pileated Woodpecker
Alternative B would reduce the amount of pileated woodpecker habitat in the Sleeping Child parcel by approximately 182 acres through reduction in canopy closure and reduced availability of larger diameter trees (e.g., dbh ≥ 15 inches). Within the Gird Creek parcel, where pileated woodpeckers have repeatedly been observed, the habitat most suitable for this species occurs in the eastern-most draw and along Gird Creek (covered by Unit 2). The proposed harvest would likely eliminate habitat for this species within the eastern-most draw due to the level of mistletoe infestation and the forest health objectives of the proposed harvest. Along Gird Creek, this Alternative would likely reduce the suitability of the stand for pileated woodpeckers through reductions in canopy closure. Within the project area as a whole (which is also the cumulative effects analysis area), Alternative B would further reduce habitat for pileated woodpeckers previously lost to the Spring-Child Salvage Timber Sale and burned during the Bear Fire of 2000. Thus, there would likely be direct, indirect, and cumulative effects to pileated woodpeckers as a result of implementing the proposed Alternative B.

Alternative C – Direct, Indirect, and Cumulative Effects to Pileated Woodpecker
Effects on the Sleeping Child parcel would be identical to those put forth in Alternative B. However, on the Gird Creek parcel 127 fewer acres would be treated under this alternative, although the most suitable pileated woodpecker habitat would still be reduced to a shelterwood/seedtree with reserves harvest. Resulting canopy closure and stem densities would be too low for pileated woodpeckers. Thus, this alternative would further reduce habitat for pileated woodpeckers previously lost to the Spring-Child

Salvage Timber Sale and burned during the Bear Fire of 2000. Thus there would be direct, indirect, and cumulative effects to pileated woodpeckers as a result of implementing the proposed Alternative C.

4.7.4 Black-backed Woodpecker

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Black-backed Woodpecker
No change from the current conditions is expected under the No Action alternative.

Alternative B – Direct and Indirect Effects to Black-backed Woodpecker
The proposed alternative would not be harvesting fire-killed trees. Instead, it would largely be harvesting mistletoe-infested fir. As such, the proposed action would reduce the availability of suitable nest trees for black-backed woodpeckers should a future fire burn through the project area. Thus, there would likely low risk of direct and indirect effects to this species as a result of Alternative B.

Alternative B –Cumulative Effects to Black-backed Woodpecker
The proposed action would harvest green timber off of the Sleeping Child parcel, which was salvage logged (Spring Child Timber Sale) after the 2000 fires. Such action further reduces the availability of suitable nest trees for black-backed woodpeckers. However, because this species prefers burned areas (Hutto 1995), there area approximately 308,921 acres of suitable habitat in proximity to the project area that were burned in the year 2000. Thus, there would likely be low risk of cumulative effects to this species as a result of Alternative B.

Alternative C – Direct and Indirect Effects to Black-backed Woodpecker
The proposed alternative would not be harvesting fire-killed trees. Instead, it would largely be harvesting mistletoe-infested fir. As such, the proposed action would reduce the availability of suitable nest trees for black-backed woodpeckers should a future fire burn through the project area. Thus, there would likely be low risk of direct and indirect effects to this species as a result of Alternative C.

Alternative C –Cumulative Effects to Black-backed Woodpecker
The proposed action would harvest green timber off of the Sleeping Child parcel, which was salvage logged (Spring Child Timber Sale) after the 2000 fires. Such action further reduces the availability of suitable nest trees for black-backed woodpeckers. However, because this species prefers burned areas (Hutto 1995), there area approximately 308,921 acres of suitable habitat in proximity to the project area that were burned in the year 2000. Thus, there would likely be low risk of cumulative effects to this species as a result of Alternative C.

4.7.5 Flammulated Owl

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Flammulated Owl
No change from the current conditions is expected under the No Action alternative.

Alternative B – Direct, Indirect, and Cumulative Effects to Flammulated Owl
Alternative B would harvest approximately 641 acres within the project area, reducing stand densities and promoting ponderosa pine retention and regeneration. However, the proposed shelterwood/seed tree with reserves harvest (258 acres) in Gird Creek's units 2 and 3, and the proposed sanitation harvest (64 ac.) in unit 3 of the Sleeping Child parcel, would likely temporarily (30 to 30 years) reduce stand density and canopy closure below suitable standards for flammulated owls. However, when these stands regenerate, they would likely temporarily (possibly 20 years) provide suitable habitat for flammulated owls. Nearly one-quarter of the Sleeping Child parcel experienced stand replacing fire in 2000 and was subsequently salvage logged shortly after the burn. Within areas that sustained low to moderate burn intensity, conditions for flammulated owls may have been improved. However, the proposed harvest would likely further reduce the quantity of suitable flammulated owl habitat, temporarily, on the Sleeping Child parcel. Thus, there would likely be direct, indirect, and cumulative effects to flammulated owls as a result of Alternative B.

Alternative C – Direct, Indirect, and Cumulative Effects to Flammulated Owl
Effects on the Sleeping Child parcel would be identical to those put forth in Alternative B. However, on the Gird Creek parcel 136 fewer acres would be treated under this alternative. Thus there would be

direct, indirect, and cumulative effects to flammulated owls as a result of implementing the proposed Alternative C.

4.7.6 Fisher

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Fisher
No change from the current conditions is expected under the No Action alternative

Alternatives B and C – Common Direct and Indirect Effects to Fisher
The proposed alternative would harvest timber within potential fisher habitat along the Sawdust Gulch, in the Sleeping Child parcel, and along Gird Creek. Recent research (Zielinski et al. 2004) has demonstrated that fishers require multiple large diameter trees/snags/downed logs within their home range, usually within 100 yards of water, and in stands that have higher canopy closure than the surrounding landscape for resting sites. The proposed harvest associated with this alternative would reduce canopy closure, as well as the availability of larger diameter trees and snags within potential fisher habitat in the project area. Thus, there would likely be risk of direct and indirect effects to fisher as a result of the action alternatives.

Alternatives B and C – Common Cumulative Effects to Fisher
Approximately half of the analysis area is densely forested, and the other half is rangeland or sparsely forested rangeland (ocular estimate using aerial photos dated 1995 and 2000 [post-fire]). Roughly 60% (ocular estimate of post-fire aerial photos) of the densely forested acres south of Highway 138 experienced stand replacing fire in 2000. Thus, a majority of the potential fisher habitat and connective corridors within the analysis area are currently non-habitat for fisher. In addition, the Sleeping Child parcel has since been partially salvage-logged since the 2000 fire, removing future potential resting and denning logs that may have been created from fallen snags over time. Thus there is low potential for cumulative effects to fisher as a result of the action alternatives because the analysis area has been degraded by recent fires and salvage operations to an extent whereby there is a low probability of fisher currently utilizing this area.

Ungulates

4.7.7 White-tailed and Mule Deer

No Action Alternative A – Direct, Indirect and Cumulative Effects to White-tailed and Mule Deer
No change from the current conditions is expected under the No Action alternative.

Alternatives B and C – Common Direct, Indirect and Cumulative Effects to White-tailed and Mule Deer
The proposed action alternatives would not affect security cover within the project or analysis areas due to the abundance of effectively open roads within each area. However, the proposed action alternatives would influence hunting vulnerability due to the removal of potential hiding cover, and reduce the amount of snow-intercept cover for overwintering deer and thereby increasing their winter energy expenditures. These reductions are in addition to losses in cover from the recent Spring-Child Salvage Timber Sale and the Bear Fire of 2000. Hiding cover would likely not be restored within the project area for 15 to 20 years post-harvest. Due to the wide-ranging nature of these species, and the abundance of better habitat north of Highway 138, there would be low to moderate risk of direct, indirect, and cumulative effects as a result of the action alternatives.

4.7.8 Elk

No Action Alternative A – Direct, Indirect and Cumulative Effects to Elk
No change from the current conditions is expected under the No Action alternative.

Alternatives B and C – Common Direct, Indirect and Cumulative Effects to Elk
The proposed action alternatives would not affect security cover within the project or analysis areas due to the abundance of effectively open roads within each area. However, the proposed action alternatives would influence hunting vulnerability due to the removal of potential hiding cover, and reduce the amount of snow-intercept cover for overwintering elk and thereby increasing their winter energy expenditures.

These reductions are in addition to losses in cover from the recent Spring-Child Salvage Timber Sale and the Bear Fire of 2000. Hiding cover would likely not be restored within the project area for 15 to 20 years post-harvest. Due to the elk's wide-ranging nature and the abundance of better habitat north of Highway 138, there would be low to moderate risk of direct, indirect, and cumulative effects as a result of the action alternatives.

4.8 PREDICTED EFFECTS ON AESTHETICS

As described in Chapter 3, it is primarily the north and northwest facing aspects on each section that can be seen from private ownerships or heavy use areas

No Action Alternative A – Direct, Indirect, and Cumulative Effects to Aesthetics

The aesthetics would remain much the same as they are now under this alternative. Over time these stands might begin to appear somewhat more open as the mistletoe increases and begins to reduce canopy coverage. There would also be an increased risk of insect or disease attack or high intensity fire in these stands as stand densities and mistletoe increase, which would open the stands considerably and change the aesthetics from their current state.

Alternative B – Direct and Indirect Effects to Aesthetics

Under this alternative, approximately 16 acres would be harvested with a shelterwood/seedtree treatment on the north aspects of the Sleeping Child section with approximately 100' of new road construction (existing roads should already be fairly well vegetated and are not likely to be easily seen). On the Gird Creek section approximately 110 acres would be harvested with a shelterwood/seedtree treatment and approximately 40 acres with an Improvement harvest on the north and northwest aspects with approximately 4500 feet of new road construction on those aspects. With 40% canopy removal in the Improvement harvest treatment areas, the effects to aesthetics are not likely to be noticeable nor would the new roads, so the analysis will focus on the shelterwood/seedtree harvesting and the associated road building where 80% canopy removal could be expected. Because of the 40% and greater canopy removals and broken topography, in those areas that would be harvested with a cable system, the straight skyline corridors are not expected to be noticeable from heavy use areas.

This leaves 16 acres that would be visible on the Sleeping Child section with approximately 100 feet of new road and 110 acres on the Gird Creek section with approximately 3600 feet of new road. The Sleeping Child treatment area (unit 4, see Figure 2-0 in Chapter 2) is located in a bowl-shaped drainage with several small ridges running through it. For this reason less than half of the treatment area would likely be seen from any one location at a time. The harvest should be quite irregular and clumpy in nature and would likely not be easily noticed or readily discerned as a man-made opening. It should blend nicely with the landscape to the west where a patchy mosaic of intermingled timbered hillsides and openings exists. A somewhat more open appearance from the existing condition would be expected. The new road would lie on a northeast facing aspect, which is the least easily seen and would take advantage of small benches and flatter topography. It is not likely it would be discernable from high use areas. For these reasons, the aesthetics of the treatment areas are not likely to change substantially or be displeasing in appearance.

The Gird Creek treatment area primarily involves stand 9 (see Figure 3-0 in Chapter 3) in the west half of the section. The rest of the shelterwood/seedtree units and road construction are not readily seen from heavily used areas because of aspect changes and ridges. Unit 9 has several deep draws with ridges in between that tend to obscure much of the acreage. Therefore, approximately ½ of the 110 acres would likely be visible from any one point of heavy use and would generally be the northwest facing aspects. As with the Sleeping Child section, the harvest areas would be quite irregular and patchy and should appear quite natural on the landscape. They would appear more open than they are currently but should also blend with the surrounding landscape and the patchy foothills and the past harvesting to the west. Of the 3600 feet of new road in the shelterwood/seedtree treatment areas only approximately 1400 feet lie on north and northwest aspects that might be seen from heavily used areas down in the Bitterroot Valley. These sections of road would utilize benches or flatter topography where possible, but some sections of this 1400 feet may be visible from the closer homes and roads. This road would be constructed at as low a standard as is necessary to safely implement the project to mitigate the visual effects from down in the valley. Also, harvesting would occur 100-300 feet above the road, which would alleviate the line of uncut timber often found above roads that cause discernable lines that do not appear natural on the landscape.

It is still not likely that the treatment areas will appear unnatural or displeasing visually from heavy use areas, although those portions of the harvest units that can be seen would appear more open than they are currently.

At the stand level (on the site), approximately 800' feet of new road would be constructed on the Sleeping Child section with 124' feet of road being abandoned and allowed to revegetate. On the Gird Creek section there would be approximately 1100 feet of road abandoned on the south boundary along the ridge and from an illegal 4x4 trail. Stands that are harvested with Individual Tree Selections, Sanitations, and Improvement harvests would appear more open than they are currently but would still be completely stocked with larger trees. In the shelterwood/seedtree with Reserves harvest areas, the stands would appear considerably more open than they are currently. On all of the harvested areas, site distances and views of the topography and surrounding landscape would be increased. In general, the character of the stands treated without the shelterwood/seedtree harvest would not be expected to change considerably. The character and aesthetics of those areas that are treated with the shelterwood/seedtree harvest would likely be changed considerably with the removal of 80% of the trees. The areas infected with mistletoe would be sanitized of the majority of those trees with the physical deformities and brooms caused from mistletoe leaving the residual stands with a more healthy and thrifty appearance. At the stand level, some straight openings in the canopy created by skyline corridors and some straight site distances may be evident. These would be expected to become less evident over time as canopies begin to close and the trees and brush continue to grow.

Alternative C – Direct and Indirect Effects to Aesthetics

This alternative would have the same effects aesthetically on the Sleeping Child section. On the Gird Creek section, the same amount of road construction would be involved, but an additional approximately 35 acres might be seen from heavy use areas down in the valley bottom. The effects would be similar to those described in Alternative B except 35 acres would appear more open than they currently are for a total of approximately 90 acres that might be seen from any one point. Again, the irregular nature of the harvesting and broken topography and ridges would allow the harvesting to blend with the surrounding landscape. The effects are not expected to be visually displeasing from the valley bottom, but a more open appearance on an additional 35 acres would be expected.

At the stand level, effects would be similar to those described in Alternative B except 80 more acres would be treated and appear more open than they are now. This would result in 80 more acres having increased site distances and decreased physical deformities and mistletoe.

Alternatives B and C – Common Cumulative Effects to Aesthetics

Within the analysis area, there is very little evidence of harvesting or roads viewed from heavily used areas in the valley bottom. The mostly heavily timbered north aspects with some natural grassy openings would likely receive some diversity from the proposed harvesting that would increase the patchy mosaic that currently exists. Across the landscape, the harvesting would tend to appear natural in size, complexity and shape, and would bring the aesthetics of the analysis area back toward a condition that might have been expected to exist historically. Some relatively short segments of the newly constructed roads may be visible from the valley bottoms, which would show evidence of man's presence on the landscape. These segments of road would vegetate over time and become less visible; however they may be discernable for some time from various locations. With very few existing roads currently visible, these newly constructed road segments could add to the visible presence of man's activities on the analysis area.

The harvesting would increase site distances across the treated areas and decrease the appearance of physical deformities and mistletoe. Both effects are likely to have a beneficial influence in bringing the analysis area back toward more open conditions that would have been expected historically without the exclusion of fire.

CHAPTER 5: FINDING SKALKAHO TIMBER SALE

An Environmental Analysis (EA) has been completed for the proposed Department of Natural Resources and Conservation (DNRC) Skalkaho Timber Sale. After a thorough review of the EA, project file, public correspondence, Department policies, rules, and the State Forest Land Management Plan (SFLMP), I have made the following 3 decisions:

1. ALTERNATIVE SELECTED

Three alternatives are presented and were fully analyzed in the EA: the No-Action Alternative A, which includes existing activities, but does not include a timber sale (EA, page 13); Alternative B which proposes harvesting approximately 1.8 million board feet of timber from 641 acres with the construction of 2.78 miles of new road (EA page 16); and Alternative C which proposes harvesting approximately 1.4 million board feet of timber from 514 acres with the construction of 1.7 miles of new road (EA page 16).

For the following reasons, I have selected Alternative B without additional modifications:

a In my opinion, Alternative B best meets the purpose and need for action and the specific project objectives listed in the EA on pages 6 & 8. Alternative B generates more return to the school trust than either Alternative A or C. The environmental effects of Alternative B are acceptable as compared with either Alternative A or C. No major losses in habitat, or unacceptable effects to water or soil would occur under Alternative B.

b The analysis of identified issues did not reveal information compelling the DNRC not to implement Alternative B.

c The proposed action includes activities to address environmental concerns expressed by DNRC staff and the public. For example, it includes improvements to the roads in the project area to meet Best Management Practices (BMPs) (EA, page 15); and improves timber stand health and productivity where harvesting is proposed (EA, pages 39 & 40).

2. SIGNIFICANCE OF IMPACTS

For the following reasons, I find that the proposed action would not have significant impacts on the human environment:

a. Wildlife

The project and analysis areas contain no key security cover for big game. Deer and elk herds likely use the project and analysis area year-round. With the mitigations in place, little direct, indirect or cumulative long-term effects to big game populations would be expected with the proposed action. Neither individual effects nor total effects to big game habitat are below accepted thresholds for this area. Elk trend counts by fixed-wing aircraft are up from 175 elk in 2000 to 390 elk in 2004. This alternative would retain existing snags unless they pose an unacceptable safety hazard during logging operations.

The project area is 55 miles south of the Northern Continental Divide Ecosystem Grizzly Bear Recovery Area (NCDE). Only one Grizzly bear is known to have ventured near the project area in the last 5 years. Gray wolves are becoming fairly common in the southern Bitterroot valley. Sensitive species such as the lynx and fisher have been detected or suspected to be in the general project area. Habitats would be improved for some species and reduced for others. However, none of the estimated changes are identified to be

extensive, severe, or of a duration that would cause unacceptable impacts to threatened, & endangered or sensitive species. Mitigations included in the EA would further reduce impacts.

b. Economics

This alterative would provide the largest measure of reasonable and legitimate return over the long run for the Common School (C.S.) Trust Grant on this entry, at approximately $529,300, (EA, page 20). In the long run, with a well-designed and maintained access/transportation route, this would provide for future entries at reduced development costs and thus higher stumpage values.

c. Water Quality, Fisheries, and Soils

No increases in sediment yields are expected to result from the proposed action. The existing road segments planned for use were evaluated and determined to be low risk to water quality and cumulative watershed impacts. BMPs would be fully implemented during new road construction and harvest operations. All stream channels are well buffered from the proposed harvest areas. No harvests are planned within the SMZ (EA, pages 41 & 42). No direct, indirect or cumulative impact to cold-water fish habitat is expected to result from the proposed action alternative. All SMZ widths would comply with or exceed the Montana Streamside Management Zone Law and Rules. All applicable Watershed and Fisheries Rules would also be followed (EA, pages 44-46).

There is low risk of substantial impacts to long-term soil productivity associated with the proposed action. With the implementation of recommended mitigations, such as cable harvest on slopes over 40% and tractor harvest operations on dry or frozen ground. Erosion at landings would be controlled by proper location, appropriate size and standard BMP's (EA, pages 43 & 44).

d. Timber and Site Productivity

Logging would be completed within a typical time frame of two to three years. The proposed silvicultural treatments (EA, pages 39 & 40) are conventional techniques that have been previously applied in other projects and have resulted in acceptable environmental changes. The increase in stand vigor, resistance to insects or diseases, establishment of new stands and retention of a good gene pool for a future seed source would not only maintain, but likely improve, options for future timber management and thus revenue. No unique features would be impacted by proposed activities.

e. Precedent Setting and Cumulative Impacts

The proposed timber sale is similar to past projects that have occurred in the area. Since the EA does not identify future actions that are new or unusual, the proposed timber sale is not setting a precedent for a future action with significant impacts.

Taken individually and cumulatively, the identified impacts of the proposed timber sale are within threshold limits. Proposed timber sale activities are common practices and none of the project activities would be conducted on important, fragile or unique sites.
The proposed timber sale conforms to the management philosophy adopted by the DNRC in the SFLMP and is in compliance with existing laws, policies, and rules applicable to this type of proposed action.

3. SHOULD DNRC PREPARE AN ENVIRONMENTAL IMPACT STATEMENT (EIS)?

Based on the following, I find that an EIS does not need to be prepared:

a. The EA adequately addressed the issues identified during project development and displayed the information needed to make the decisions.

b. Evaluation of the potential impacts of the proposed timber sale indicates that no significant impacts would occur.

c. Sufficient opportunities for DNRC staff and public review and comment during project development and analysis were provided. DNRC staff and public concerns were incorporated into project design and analysis of impacts.

Jon M. Hayes

Area Silviculturist
Southwestern Land Office
April 19, 2006

CHAPTER 6: REFERENCES

6.1 LIST OF PREPARERS AND PERSONS CONSULTED

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6.3 ABBREVIATIONS AND ACRONYMS

Ac.	Acres
ARM	Administrative Rules for Montana
BMP	Best Management Practices
CFR	Code of Federal Regulations
DBH	Diameter at Breast Height
DEQ	Department of Environmental Quality
DF	Douglas-fir
DFC	Desired Future Conditions
DNRC	Department of Natural Resources and Conservation
E	East
EA	Environmental Assessment
EBT	Eastern brook trout
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FWP	Montana Fish, Wildlife, and Parks
HRA	Hazard Reduction Agreement
HW	Hardwood
ID	Interdisciplinary
IWM	Integrated Weed Management
LP	Lodgepole pine
MBF	Thousand Board Feet
MC	Mixed conifer
MCA	Montana Code Annotated
MMBF	Million Board Feet
MEPA	Montana Environmental Policy Act
N	North
NW	Northwest
PP	Ponderosa pine
R	Range
RT	Rainbow trout
S	South
SAF	Subalpine fir
SE	Southeast
Rules	State Forest Land Management Rules
SMZ	Streamside Management Zone
T	Township
TMDL	Total Maximum Daily Load

USDA	United States Department of Agriculture
USFS	United States Forest Service
W	West
WCT	Westslope cutthroat trout
WL	Western larch
WWP	Western white pine

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