United States Department of Agriculture
Forest Service
Region 1

Little Blacktail

Ecosystem Restoration Project

Sandpoint Ranger District
Idaho Panhandle National Forests

January 2002

Idaho Panhandle National Forests
Sandpoint Ranger District
Bonner County, Idaho

Little Blacktail Ecosystem Restoration Project
Final Environmental Impact Statement
January 2002

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ABSTRACT

The Sandpoint Ranger District has proposed ecosystem restoration activities in the Little Blacktail Project Area. The purpose of the project is to improve the health and productivity of terrestrial and aquatic habitats. The project would accomplish vegetation restoration, aquatic restoration and fuels reduction activities.

The Final Environmental Impact Statement (FEIS) displays the actions proposed by the Sandpoint Ranger District and provides an analysis of potential treatment alternatives. It also addresses public concerns and recommendations, and the environmental effects that could occur under each alternative.

Three alternatives (Alternatives A through C) were developed in response to major issues identified during environmental analysis. **Alternative A** (No Action) would defer all activities that are not part of current management in the area. **Alternative B** (the Proposed Action) would begin vegetation restoration and reduce hazardous fuels in currently affected stands. This alternative would also repair associated roads that pose risks to the watershed and its aquatic habitat. **Alternative C** would treat the same areas as Alternative B, but would not construct new roads. **Alternative B is the Forest Service's selected alternative**.

Copies of this FEIS are available in paper format or on compact disc (CD) from the Sandpoint Ranger District, and on the Idaho Panhandle National Forests' internet site at the following URL: www.fs.fed.us/ipnf/eco/manage/nepa/index.html.

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Preface

Important Considerations About This Document

The purpose of this environmental impact statement is to disclose potential effects of our proposed activities on the environment so that the deciding officer can make an informed and reasoned decision. To analyze such effects, we use a variety of information including, but not limited to, field surveys, historical data, maps, models, research, and monitoring data.

When we gather information for a proposal, there is a limit to the amount of information we can gather, and therefore, we must make estimates based on the best available information we have. As an example, when a road is proposed, we draw on a map where we think that road should go. Then we have a road engineer go out on the ground to try to physically locate the position of that road. We do the same to lay out our vegetation treatment areas. However, investing too much time and resources in getting exact data is impractical because we are working with *proposals* that could be subject to change during analysis due to public comments or new information.

So it is important to note that our numbers, although often displayed to the nearest tenth of a percent (usually derived from databases and models), are our best estimates given the information we have and primarily used for comparative purposes. Because of this, we tend to inflate these numbers slightly so that we show greater effects than what would likely occur, yet we design our activities to err on the side of having the least amount of effects in order to protect the resource in question.

If during implementation of the project, it looks like any of our activities might be outside the scope of our analysis, we would conduct a review as required by Forest Service Manual direction (FSM 1909.15, Chapter 18) to determine whether supplemental analysis is needed.

Changes Between The Draft And Final EIS

Changes have been made to this EIS based on field verification activities and review of the Draft EIS by both the public and the Forest Service. Corrections of typographical or factual errors have been made as necessary. Editorial changes have been made for clarification and readability of the document. In addition, the following substantive changes have been made.

Chapter I

⇒ The purpose and need section has been expanded to further explain the need of this project.
⇒ A section entitled "Little Blacktail Project Area" has been added to the "Overview of Scientific Findings" section to provide better site-specific information at the project level scale.
⇒ The section on Policy Direction and Legal Guidance has added more information on Forest Plan Direction.

Chapter II

⇒ "Finances" was added as a new analysis issue. This change is highlighted in the Analysis Issues section and was a result of comments received.
⇒ The road definitions were changed to reflect the terminology used in new manual direction (FSM 7700) and the Roads Analysis Process.

⇒ The proposed action was modified reducing the amount of road construction by 0.2 mile and to change some of the road locations. In addition, all newly constructed roads (previously proposed for storage) would be temporary and decommissioned after use. This change was a result of new field information and comments received.

⇒ Due to new field information and the proposed changes in temporary road construction, logging systems acreages also changed. Compared to the Draft EIS, these changes resulted in more helicopter but less tractor and skyline logging under Alternative B. Under Alternative C it resulted in more tractor, but less helicopter and skyline logging.

⇒ In the section Features Designed to Protect Heritage Resources, text about protection measures for a historic trail (10-BR-328) was dropped because new information reported by the district archaeologist states that the trail cannot be located on the ground and therefore is ineligible for protection. In addition, text about the need to survey a 40-acre parcel prior to activities was also dropped because the parcel has since been surveyed and no heritage resources were found (see the Heritage Site Inventory in the project files).

The section “Alternatives Considered But Eliminated” was expanded to provide better rationale for the elimination of some alternatives. This change was a result of public comments received.

Chapter III

All Sections - All cumulative effects discussions were changed by better defining which reasonably foreseeable actions are applicable to each resource, and by including future salvage opportunities and project-related opportunities analysis in these sections.

TES Plants - In July of 2001, the US Fish and Wildlife Service (USFWS) completed a 12-month status review for linear-leaved moonwort (*Botrychium lineare*). The USFWS determined that the species was warranted for listing but precluded due to higher priority species. Discussion of that species reflects the change in status. On October 10, 2001, USFWS announced the listing of Spalding’s catchfly (*Silene spaldingii*) as threatened. Discussion of that species reflects the change in status from Proposed Threatened to Threatened.

Wildlife - Relevant changes include better explanations of the reasonably foreseeable activities applicable to the cumulative effects analysis, and Environmental Consequences discussions under Alternative A for several species that relate the continuing decline of vegetation conditions to its effect on habitat.

Watershed and Fisheries – The rationale for not using water yield has been added as a result of comments. The WEPP model was rerun to take into account new design features for temporary roads. This resulted in a change in sediment delivery. A discussion on the Governors Bull Trout Plan has been added.

Visuals – Field reviews allowed for a change in fuels prescription around the microwave towers on Little Blacktail Mountain. This change in fuels prescription resulted in a change in the determination of meeting Forest Plan visual quality objective from *may not meet* to *would meet*.

Other Sections

Appendices - Although soils remains an issue not analyzed in detail, an appendix on soils (Appendix F) was added to the document to help clarify concerns received during the comment period. A Finance appendix (Appendix G) was added, which includes the transactional evidence appraisal information. List of Preparers and Literature Cited are now in Appendices J and K respectively. The following appendices have been added to the document: H - Biological Assessment / Biological Evaluation, I - Response to Comments and Agency Letters Received, L - Glossary, and M - Color Maps.

CHAPTER I - Purpose And Need

1.1 Area Location

The Little Blacktail Project is located within Bonner County, Idaho, approximately 12 air miles south of Sandpoint, Idaho and three air miles east of Cocolalla Lake (figure 1). The area can be reached by Forest Roads 315 and 630. The project area consists of National Forest land in the following legal location: all or portions of Sections 14, 15, 21-23, 26 and 27 in Township 55 North, Range 2 West.

1.2 Purpose and Need

The purpose and need for the Little Blacktail project was derived from the scientific information assessments described in the section entitled "Overview of Scientific Findings From Broad Scale to Site Specific" located further in this chapter, and from field reviews and surveys of the resources in the Cocolalla Creek drainage. Based on this information we have developed a goal with five main objectives:

- *To improve the health and productivity of terrestrial and aquatic habitats by:*
- *Restoring desired forest cover, structure and pattern, and species composition across the landscape where they are outside natural or accepted ranges.*
- *Providing for wildlife habitat diversity.*
- *Restoring fire as an ecological process.*
- *Reducing the risk of destructive wildfire around the microwave sites at the top of Little Blacktail Mountain and the powerline corridor that serves the electronic equipment.*
- *Maintaining or improving Cocolalla Creek's aquatic habitat by reducing existing and potential sediment risks.*

Additional explanation of the need for each of these objectives follows. Also see Chapter III, Affected Environment Discussions for more details.

- **Restoring desired forest cover, structure and pattern, and species composition across the landscape where they are outside natural or accepted ranges.**
- **Providing for wildlife habitat diversity.**

For over 90 years, wildfires have been suppressed in the forests in the project area. Over time, this exclusion of fire and the introduction of white pine blister rust have profoundly changed the structure, composition, and function of these forests. In order to maintain healthy, sustainable ecosystems, it is imperative to have species and forest structures that are adapted to disturbances such as insect and disease, fire and climatic variability.

Ecological disturbances, resulting from either natural processes or human-caused events, are responsible for changing landscape patterns and influencing wildlife populations. By maintaining a complex pattern of forest types and age classes across the landscape we can enhance biodiversity and strive to replicate historic patterns.

Root disease and mistletoe, which have always been present in these forests at natural levels, now flourish beyond historical levels due to the increased presence of grand fir and Douglas-fir, trees that are susceptible to these diseases. These forest health problems will continue to spread as long as grand fir and Douglas-fir remain the dominant tree species. As a result, the stands in the project area are not expected to advance successionally to the desired forest structure, cover and species composition.

Today, the once dominant, mature ponderosa pine and Douglas-fir trees are surrounded by a forest of younger 70 to 80 year old Douglas-fir and grand fir trees. As these younger trees fill in open spaces in the forest, they compete with the mature trees for limited nutrients and water, and shade out grasses, shrubs and other trees that need a lot of sunlight to establish. These large, sun-loving mature trees are decreasing as the lower branches of their crown die from the shade of the encroaching younger trees. Only isolated patches of the older mature trees can be found.

- **Restoring fire as an ecological process.**
- **Reducing the risk of destructive wildfire around the microwave sites at the top of Little Blacktail Mountain and the powerline corridor that serves the electronic equipment.**

Prior to European settlement, wildfires were an influential disturbance process that shaped the forest ecosystem across large landscapes. These fires occurred at a variety of intensity levels, depending on the forest types and moisture conditions. At the turn of the century, settlement surrounding the project area led to logging for homesteads and railroad development, and eventually the establishment of fire suppression policies. Since then, the natural role of fire has ceased to be a dominant ecological force. This has allowed fire-sensitive, shade-tolerant tree species to increase in abundance, and biomass and debris to accumulate.

As insect and disease infested trees die in increasing numbers, they leave behind dead branches and other debris that could fuel a lethal, stand-replacing fire–one that could kill most of the trees. The greater probability of a stand-replacing fire today poses a risk to the human developments on Little Blacktail Mountain and the lower slopes next to National Forest lands, as well as to the natural resources that exist throughout the area.

- **Maintaining or improving Cocolalla Creek's aquatic habitat by reducing existing and potential sediment risks.**

Cocolalla Creek is a listed 303(d) water quality limited segment from the mouth of Cocolalla Lake to its headwaters (IDEQ 2000). The current status of this stream is that it has an approved Total Maximum Daily Load (TMDL) for sediment delivery but no developed implementation plan. Under this status, there cannot be a net increase in sediment within the watershed.

Some existing roads within the Cocolalla subwatershed have caused increased sediment delivery to stream channels. Observable effects within the project area and subwatershed include erosion from road surfaces and ditches and sediment delivery to Cocolalla Creek.

These purpose and need statements are consistent with direction in the Idaho Panhandle National Forests Plan as referenced on page I-10 of this chapter.

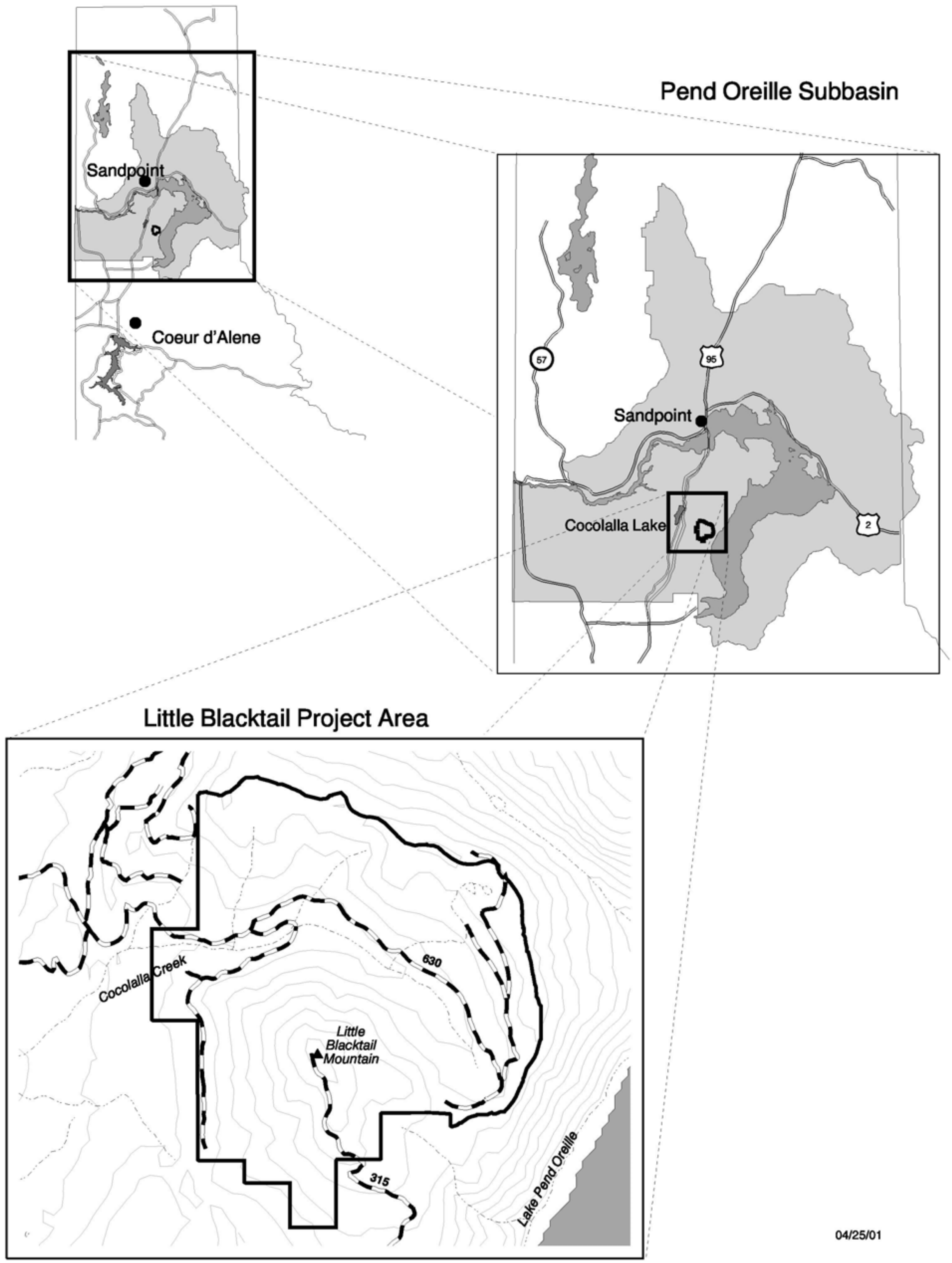

Figure 1. Vicinity Map

1.3 Overview of Scientific Findings From Broad Scale to Site Specific

1.31 Introduction

To arrive at our purpose and need for the project, the Interdisciplinary (ID) Team used information from a number of scientific assessments. Starting at the broad scale of the Columbia River Basin, the team derived general information about characteristics of the ecosystem in the basin. From there, the team "stepped down" their analysis to more specific levels of information--from the river basin level, to a sub-basin level, to a landscape area level, to a watershed area level, and finally to a project area level. General information from these assessments and how they relate to the Little Blacktail Project Area is briefly described below.

1.32 Interior Columbia Basin Ecosystem Management Project (ICBEMP)

The ICBEMP Scientific Assessment (Quigley and Arbelbide 1997) evaluates all National Forest and BLM-administered lands in a 63 million-acre area within eastern Oregon, eastern Washington, all of Idaho, and western Montana. According to the assessment, the Little Blacktail project area is located in Forest Cluster 4 (heavily roaded, moist forest types with moderate to high hydrologic integrity and low forest, aquatic, and composite integrity). The ICBEMP assessment findings show that the primary risks to ecological integrity in Forest Cluster 4 are:

- risks to late and old forest structures in managed areas,
- forest compositions susceptible to insects, disease and fire,
- risks to hydrologic and aquatic systems from fire potential, and
- declines in early and late stages of forest development.

In the assessment, the level below the Columbia River Basin scale was defined as "sub-basin." The Little Blacktail project is located in the Pend Oreille Lake sub-basin, one of 164 sub-basins in the Columbia River Basin.

1.33 Northern Region Overview

The Northern Region Overview (USDA 1998) focused on priorities for restoring ecosystem health and availability of recreation opportunities. The overview considered and incorporates findings from the Interior Columbia River Basin Assessment and Northern Great Plains assessments. The Northern Region Overview Summary explores this Region's situation with regard to ecosystem health and recreation.

The Overview findings conclude that there are multiple areas of concern in the Northwest Zone of the Region (which includes the Idaho Panhandle National Forests), but that "this subregion holds the greatest opportunity for vegetation treatments and restoration with timber sales…Aquatic restoration should be focused on specific needs based on the zone aquatic restoration strategy" (Northern Region Overview Summary, USDA October 1998, p. 9).

The Overview goes on to state, "The timber management (timber harvest) tool best fits with the forest types in northern Idaho and is essential, for example, to achieve the openings needed to restore white pine and larch, and maintain upland grass/shrub communities. It can enhance terrestrial/watershed objectives where timber funds are used to close and improve roads. Aquatic restoration could tie with assessing road access needs and obliteration of nonessential [roads]" (Northern Region Overview Summary, USDA October 1998, p. 33).

1.34 Pend Oreille Geographic Assessment

The Idaho Panhandle National Forests (IPNF) has been assessing ecological conditions in the Pend Oreille Lake area, which includes the Pend Oreille Lake sub-basin. The assessment (currently in progress) has identified ecosystem trends and changes over the last 100 to 200 years. The Pend Oreille Geographic Area is divided into Landscape Analysis Areas (LAAs). The Little Blacktail Project and the Cocolalla Creek watershed are located in the "Purcell Trench LAA". Several Pend Oreille Geographic Assessment findings relate to the Little Blacktail project area:

- There is a shift in forest structure from early and late forest development to immature size class stands.
- There is a loss of long-lived tree species such as western larch, western white pine, and ponderosa pine, and an increase in Douglas-fir and grand fir.
- There is a lack of wildfire as a natural disturbance factor.
- There is an increased risk of severe stand-replacing fire on dry habitats due to fuel accumulations from the exclusion of fire.

1.35 Little Blacktail Project Area

In addition to the previous mentioned assessments other documents were used to obtain information pertaining to the project area. The Lake Pend Oreille Bull Trout Watershed Advisory Group (1999) looked at the watersheds within the Lake Pend Oreille Basin and ranked them in order of restoration priority. Cocolalla watershed was ranked as a low priority watershed for bull trout restoration, primarily because of the impacts private land activities have had on the watershed and because the dam at Cocolalla Lake creates a barrier to bull trout migration into the watershed.

Field reconnaissance has been conducted within the Little Blacktail project area since 1998. Information obtained during this time has revealed that:

- There are sediment risks from some roads in the area.
- There has been a reduction in long-lived tree species (white pine, larch and ponderosa pine) and old forest structure due to fire suppression, white pine blister rust, and increases in species such as Douglas-fir and grand fir. These latter species are more susceptible to insect attacks and root disease, and therefore more trees are dying throughout the watershed. These vegetation conditions have created a very homogeneous forest that lacks structural and tree species diversity. There is a direct correlation between this lack of vegetation diversity and a lack of wildlife habitat and species diversity.
- Lack of natural fires (from fire suppression) and an increase in dying trees has allowed forest fuels to increase. This increase in fuels has increased the risk of a destructive fire around the microwave sties and powerline that serves these sites.

1.4 Proposed Action

A "proposed action" was defined early in the project planning process. This proposal serves as a starting point for the interdisciplinary team and gives the public and other agencies specific information on which to focus comments. Using these comments and information from preliminary analysis, the interdisciplinary team then develops alternatives to the proposal. These are discussed in detail in Chapter II.

The Proposed Action would be the first step in a long-term management strategy to meet the purpose and need goal of improving terrestrial and aquatic ecosystems within the Little Blacktail area.

To accomplish the purpose and need, activities in the Little Blacktail Project would include:

1. Vegetation restoration, which would include selective and regeneration cutting methods followed by planting of desired long-lived species such as white pine, larch and ponderosa pine.
2. Prescribed burning to reduce fuels, reduce the risk of destructive wildfire around the microwave sites and powerline, and to improve growing conditions.
3. Improving the design and drainage of existing roads to reduce the risk of sediment delivery to Cocolalla Creek.

An additional opportunity of this project is to initiate visual rehabilitation of an existing plantation on the northwest side of Little Blacktail Mountain. This plantation currently does not meet Forest Plan Visual Quality Objectives (VQOs). Initiating visual rehabilitation would help move the VQO toward Forest Plan objectives.

1.41a Details Of Our Proposed Activities

The proposed action is designed to improve the health and productivity of terrestrial and aquatic habitats through vegetation restoration and road reconstruction. By restoring forest structures and species compositions through timber harvest, fuels treatment and reforestation, the Little Blacktail landscape would trend toward maintaining forest health and encourage biodiversity. These changes in forested conditions would provide more diverse habitat for wildlife species inhabiting the area. The proposed reconstruction of existing roads would help reduce the amount of sediment entering the Cocolalla Creek watershed. See Chapter II, Alternative B for more details than what are described here.

Vegetation Restoration- Treatment of vegetation would occur on about 1,231 acres of a 2,139-acre project area using helicopter, skyline and tractor logging methods (see figure 3, Chapter II). Vegetation prescriptions are designed to trend the vegetation toward conditions created by low-intensity and mixed severity fires rather than stand replacement fires. Techniques would include two general types of treatment: selective harvest and regeneration harvest. Regeneration cutting would result in 11 stands with openings greater than 40 acres in size. The list of stands with openings over 40 acres can be found in the project file. See “Vegetation Treatment Definitions” in Chapter II for specific details.

Fuels Treatment - Most of the acres treated would be prescribed burned; other methods of fuel treatment would include limbing and lopping, grapple piling and yarding tops.

Aquatic Habitat Improvement - Drainage structures in roads that pose sediment risks would be repaired, replaced or removed, or additional drainage structures would be installed.

Road Reconstruction, Construction, and Obliteration – Approximately 5.4 miles of temporary roads would be constructed and approximately 13.5 miles of road work would occur on existing roads to bring them up to useable standards. This road work would help reduce sediment, improve surface material, and prevent roadbed damage during wet periods. All temporary roads would be decommissioned at the end of project activities.

1.5 Scope Of Our Analysis

In accordance with NEPA, it is the responsibility of the agency to assess direct and indirect environmental effects resulting from an agency action as well as the cumulative effects of all past, present and reasonably foreseeable actions. Connected actions associated with this project consist of the project-related and future salvage opportunities listed in the Reasonably Foreseeable Actions section and described in Chapter II. There are no similar actions related to this project.

The following past, present and reasonably foreseeable actions are relevant to the Little Blacktail project analysis. Each resource in Chapter III analyzes only those actions that fall within the cumulative effects analysis area described for that resource.

1.51a Past Activities

Past activities that may be considered in cumulative effects analysis include:

- Timber harvest (see Chapter III Vegetation section for a list of past timber sales)
- Planting
- Road construction
- Clearing of vegetation for the microwave sites and powerline right-of-way

1.51b Past, Present and Ongoing Activities

Activities that have occurred in the past, are still occurring, and may continue for an undetermined amount of time into the future include:

- Firewood gathering by individuals
- Hunting
- Agricultural burning, other forest residue burning, residential wood stove use
- Motor vehicle use on roads and trails
- Road maintenance activities on Federal and private land
- Brushing and hazard tree removal along powerline right-of-way and around microwave sites
- Urban development within rural areas

1.51c Reasonably Foreseeable Actions

The following reasonably foreseeable actions are considered in cumulative effects analyses in Chapter III where appropriate to the analysis of each resource considered and the cumulative effects area defined for it. The first three are described in greater detail in the following sections.

- Urban and residential land use
- Agricultural uses on privately owned land
- Activities on forested private land
- Noxious weeds monitoring and treatment on Federal and private lands

- Other Restoration Projects described in Chapter II (includes riparian road obliteration, wildlife habitat burning, inventory and treatment of noxious weeds, and timber stand improvement).
- Future salvage opportunities described in Chapter II.

1. Urban and Residential Land Use
There are an estimated 27,320 acres in the upper Cocolalla Creek Subwatershed. The vast majority of these lands are privately owned, and information concerning individual activities within this watershed area is limited.

There are approximately 989 acres of urban and residential land use in the watershed including roads used for transportation and access. The Cocolalla Lake watershed is experiencing tremendous development. An estimated 300 acres per year are subdivided, with the majority of the development occurring on 20-acres parcels following forest land harvest activities (Gilmore 1996). The effects of this activity have been considered in appropriate analyses.

2. Agricultural Uses on Privately Owned Lands
There are approximately 5,142 acres of pasture and hay land in the Cocolalla Lake watershed. Pasturelands are used primarily for livestock grazing. Of the area being utilized for agricultural purposes, approximately 45 percent occur on bottomland soils subject to flooding. The majority of the pasture acres are located along the lower Cocolalla Creek watershed and within the Westmond Creek watershed (Gilmore 1996). The effect of these activities has been considered in appropriate analyses.

3. Activities on Forested Private Lands
There are approximately 30,184 acres of forest land within the Cocolalla Lake watershed. About 60 percent of the watershed is covered with dense coniferous forest. Nearly 20 percent of the watershed is covered with open forest land that has been selectively logged. Most of the land in the watershed is under private ownership (Gilmore 1996). Some information on past and planned harvest and road building has been gathered from industrial landowners and the Idaho Department of Lands, but no specific information is available for non-industrial private landowners. Harvest activity has occurred throughout the watershed. The Idaho Department of Lands office in Sandpoint, Idaho has issued Forest Practices Act (FPA) permits within the Cocolalla watershed for tree harvest, road construction and slash management (project file). Forest Practices Act permit requests will continue as private land continues to be developed within the watershed on a regular basis. For any point in time we can assume that one or all of these activities are occurring on private land within the watershed. We can also assume that some of these requests will actually happen on the ground while others will never happen. The effect of these activities has been considered in appropriate analyses.

1.6 Policy Direction and Legal Guidance

1.61 Laws
Shown below is a partial list of federal laws and executive orders pertaining to project-specific planning and environmental analysis on federal lands. While most pertain to all federal lands, some of the laws are specific to Idaho. References to these laws and orders, as well as disclosures and findings required by them, can be found throughout this document and the project file.

Federal Laws

- The National Environmental Policy Act of 1969 (as amended)
- The Clean Water Act of 1977 (as amended)
- The Clean Air Act of 1970 (as amended)
- The National Forests Management Act (NFMA) of 1976 (as amended)
- The Forest and Rangeland Renewable Resource Act (RPA) of 1974 (as amended)
- The Archaeological Resources Protection Act (1979)
- The National Historic Preservation Act (1966)
- Idaho Forest Practices Act (1974) and amendments
- Multiple Use Sustained-Yield Act of 1960
- Endangered Species Act (ESA) of 1973 (as amended)
- American Indian Religious Freedom Act of 1980

Executive Orders

- Executive Order 11593 (protection and enhancement of the cultural environment)
- Executive Order 11988 (floodplains)
- Executive Order 11990 (wetlands)
- Executive Order 12898 (environmental justice)
- Executive Order 12962 (aquatic systems and recreational fisheries)

1.62 Natural Resource Agenda

On March 2, 1998, former Forest Service Chief Mike Dombeck announced the Forest Service Natural Resource Agenda. The Agenda provided a focus for the Forest Service, and identifies specific areas where there will be added emphasis. The four key areas identified are: 1) Watershed Health and Restoration; 2) Sustainable Forest Ecosystem Management; 3) Forest Roads; and 4) Recreation.

This proposal and the additional action alternatives are consistent with this Agenda. Watershed health and restoration would be addressed through road work and maintenance. Sustainable forest ecosystem management would be addressed by converting stands to desired, long-lived species less susceptible to disease, by improving growth and productivity of those species where they exist, and by reducing potential fire severity and the continuing mortality of insect and disease infested stands. Forest roads would be addressed by constructing temporary roads to accomplish proposed activities, by reducing sediment risks posed by existing roads, and by decommissioning unneeded roads or putting into storage roads intended for potential future management. Recreation would be addressed by managing existing recreation opportunities in a way that protects the natural resources in the Little Blacktail project area.

1.63 Forest Plan Direction

The IPNF Forest Plan provides direction for all resource management programs and resource activities on the IPNF. The Forest Plan consists of Forest-wide goals and standards as well as Management Area specific standards and guidelines that provide for land uses and resource outputs. The IPNF Forest Plan embodied the provisions of the National Forest Management Act (NFMA) of 1976 and its implementation regulations, as well as those of other guiding documents. (see “Laws” section).

Specific Forest Plan goals (USDA 1987, p. II-1 & II-2) that guided the development of the Purpose and Need are:

- Provide for a diversity of plant and animal communities.
- Begin harvest in stands created by the 1910 fire to better distribute the harvest and provide for future age class distribution.
- Maintain high quality water to protect fisheries habitat, water based recreation, public water supplies, and be within state water quality standards.
- Manage resource development to protect the integrity of the stream channel system.
- Provide opportunities for project development by public and private utilities for transmission facilities in compliance with laws and regulations commensurate with management area goals.
- Provide efficient fire protection and fire use to help accomplish land management objectives.
- Manage the forest resources to protect against insect and disease damage.

There are many Forest Plan Standards that are applicable to the general design of the proposed action. Specific Forest Plan Standards (USDA 1987, pp. II-32-34, II-38-39) that guided the development of the Purpose and Need are:

- Reforestation will normally feature seral tree species, with a mixture of species usually present. Silvicultural practices will promote stand structure and species mix that reduce susceptibility to insect and disease damage.
- Project design will provide for site preparation and slash hazard reduction practices that meet reforestation needs of the area.
- Maintain concentrations of total sediment or chemical constituents within State standards.
- Encourage utilization of Forest products to reduce biomass which must be disposed of otherwise.
- Activity fuels will be treated to reduce their potential rate of spread and fire intensity so the planned initial attack organization can meet initial attack objectives.
- Vegetation management will favor the use of fire, hand treatment, natural control, or mechanical methods whenever feasible and cost effective. Direct control methods, such as chemical or mechanical, may be used when other methods are inadequate to achieve control.

The IPNF Forest Plan designated Management Areas (MAs) to guide the management of National Forest lands within the IPNF. Each MA provides for a combination of activities, practices, and uses appropriate to the management goals and objectives of that specific management area.

The Little Blacktail project area is comprised of lands in three MAs. The locations of lands within each MA are displayed in figure 2. Management Areas are described in detail in the IPNF Forest Plan on pages III-1 through III-87. Summaries of the Management Area Goals specific to the project area are as follows:

Management Area 1 (approximately 1,058 acres) Provide for long-term growth and production of commercially valuable wood products on those lands that are suitable for timber production.

Management Area 4 (approximately 987 acres) Provide winter forage to support existing and projected big game populations through scheduled timber harvest and permanent forage areas.

Management Area 9 (approximately 94 acres) Manage to maintain and protect existing improvements and resource productive potential within minimum investments.

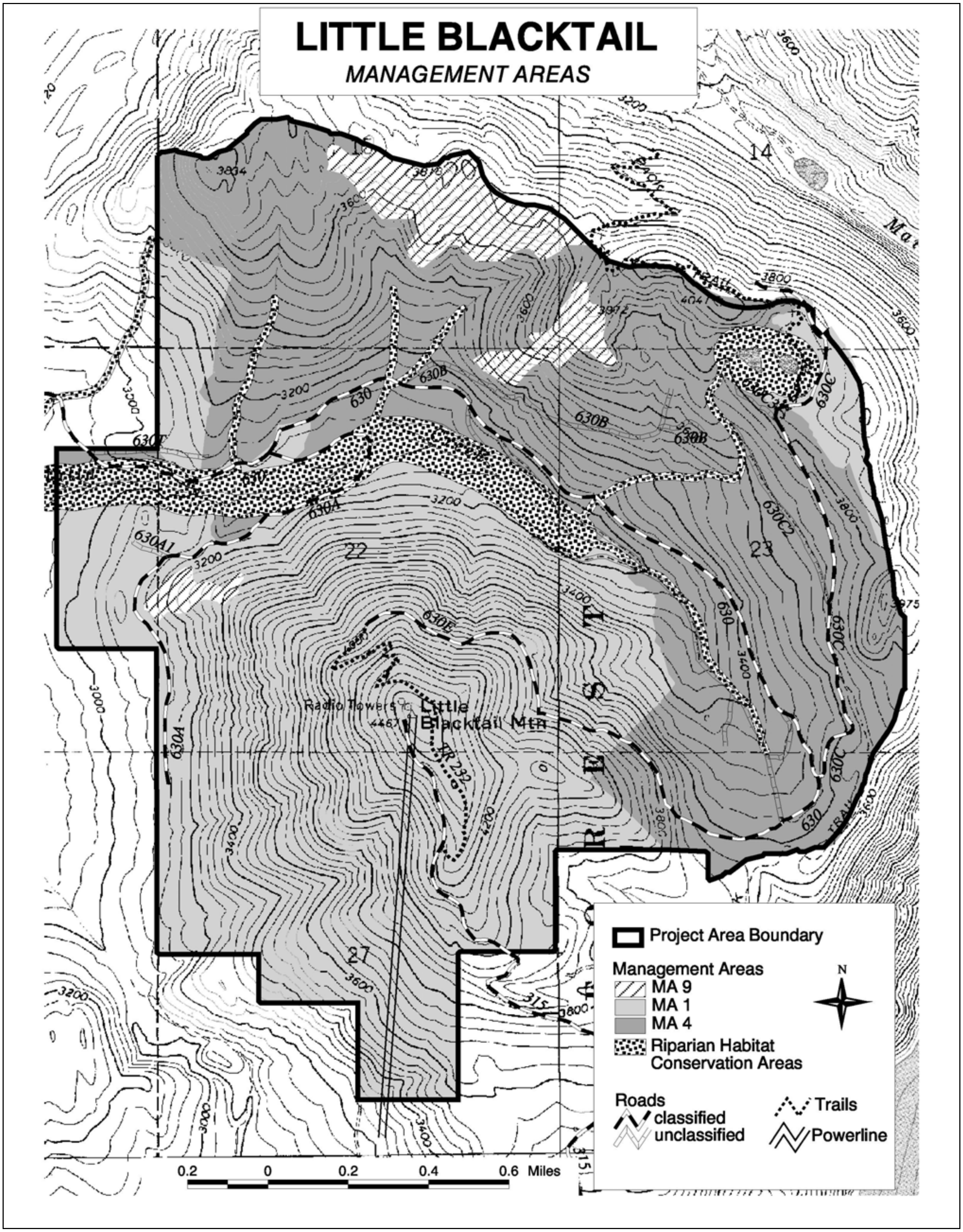

Figure 2. Map of Forest Plan Management Area designations.

Inland Native Fish Strategy (INFS) Riparian Habitat Conservation Areas (RHCA) – The standards and guidelines under INFS provide the management direction for RHCAs. In 1995 this direction replaced previous forest plan direction for managing riparian areas using standards and guidelines described for Management Area 16. See Appendix B for further details.

The Little Blacktail EIS is a project-level analysis. The scope of the analysis is confined to addressing the significant issues and potential environmental consequences of project implementation. It does not attempt to address decisions made at higher levels, but rather to implement direction provided at those higher levels. The Little Blacktail EIS tiers to the IPNF Forest Plan as recommended by 40 CFR1502.20.

1.63a Management Area Change Recommendation:

After conducting on-the-ground reviews of the project area, the Little Blacktail Interdisciplinary Team is recommending a minor amendment to the IPNF Forest Plan as a result of a mapping error due to elevational constraints of winter range for white-tailed deer. The Little Blacktail project area is located at elevations above 3,000 feet and outside recognized critical winter range boundaries. Critical winter range is generally found at lower slopes and on valley floors below 3,000 feet where snow accumulations are moderate enough to sustain white-tailed deer populations. Due to this minor error, the team is recommending that land designated as MA-4 in the project area (approximately 984 acres) be changed to MA-1. More specific conditions related to deer winter range can be found in Chapter III – Wildlife. The effects of this recommended change will be analyzed and disclosed during the Forest Plan revision process. The recommended change in land designation is not necessary for implementing the proposed action or any of the alternatives considered in this EIS.

1.64 New National Programs and Policies Not Applicable to This Project

The National Fire Plan (NFP) – Although the Little Blacktail Project proposes fuel reduction activities and would meet some of the objectives outlined for hazardous fuel reduction in the NFP, the project is not one of the priority projects identified in the NFP to receive special funding.

Roadless Conservation Interim Directive – There are no inventoried roadless or contiguous unroaded areas larger than 1,000 acres in the Little Blacktail project area, therefore, this interim directive does not apply to this project.

1.7 Decisions To Be Made

This Environmental Impact Statement is not a decision document. The EIS discloses the environmental consequences of proceeding with the proposed action or any of the alternatives. The deciding officer (IPNF Forest Supervisor) will select an alternative based on the information in this document, on public comments, financial considerations, and on how well the preferred alternative meets the purpose and need of the project and complies with applicable state and federal laws, agency policy and Forest Plan direction.

- Decisions to be made include whether to select an action alternative and, if so:
- When activities could begin and whether there are any time restrictions
- What type of vegetation prescriptions would occur and where
- Whether there is to be any road construction, road work or decommissioning and where
- How roads in the project area would be managed.

- What type of fuels treatment would occur and where
- What mitigation and monitoring requirements would take place
- Whether to recommend a minor Forest Plan amendment due to a mapping error in management area designation (changing 987 acres of MA-4 to MA-1).

CHAPTER II - Alternatives

2.1 Introduction

Alternatives to the Proposed Action were created after soliciting and receiving public comments on the proposal. The Interdisciplinary Team evaluated the issues raised in public comments and then developed alternatives based on these issues, Forest Service issues and the Purpose and Need for the project. The next two sections describe the Public Involvement methods used and the issues that were raised. Details of the Proposed Action and alternatives comprise the remainder of this chapter.

2.2 Public Involvement

In October of 1998, a proposal for the Little Blacktail project was mailed out to approximately 130 individuals, organizations, agencies, tribes and local media on the Sandpoint District mailing list to gather comments to be used in an Environmental Assessment (EA). The project was also listed on the Idaho Panhandle National Forests Quarterly Schedule of Proposed Activities in March of 1997 and has continued to be on the schedule ever since. From these efforts we received 27 comments from individuals, organizations and agencies.

Discussions with the U.S. Fish and Wildlife Service have been ongoing since scoping began in October of 1998. Agency discussions with Idaho Department of Environmental Quality have also occurred during this time frame.

In November of 1998 and January of 1999, key members of the interdisciplinary team met with the Little Blacktail Homeowners Association. Our first meeting was in the field and the second meeting was at a homeowner's residence. We answered questions and concerns related to the project proposal. Details of these meetings can be found in the public involvement section of the project file.

Other office and field meetings were held with two adjacent landowners between March of 1998 and July of 2000. We met with these people to discuss questions they had about the proposal and to look at areas on the ground that they had concerns with. Details of these meetings can be found in the public involvement section of the project file.

A Notice of Intent to prepare this EIS was published in the Federal Register on December 7, 1999. We received comments from two agencies.

In February of 2000 we sent an update letter on the project to 27 people who had previously indicated interest in receiving mailings. The intent of the update letter was to inform those people interested in the project that the project had been put on hold due to the Douglas-fir Beetle Project and we would now, for procedural purposes, be preparing an Environmental Impact Statement (EIS) for the Little Blacktail project instead of an EA. A total of four responses were received.

Tribal consultation with an archaeologist for the Kalispel Tribe occurred in March of 2000. The project was presented to the Tribe at that time and they had no concerns. Documentation of the consultation can be found in the project file.

The Draft Environmental Impact Statement (DEIS) was mailed on July 23 and 24, 2001 to 41 individuals, agencies and groups for review. The Draft EIS presented specific information on the proposal, the alternatives to the proposal, and the results of analysis of the information gathered. The Federal Register Notice of Availability of the DEIS was published on August 3, 2001. During the public comment period a total of 6 comment letters were received, two from local landowners, three from environmental groups, and one from the Environmental Protection Agency. The responses to public input can be found in Appendix I of the FEIS. The letter from the EPA is included in its entirety as required in Appendix I of the FEIS. Responses to comments from the EPA are included with the other comments.

Comments received after public review of the Draft EIS were used to further analyze the proposed action and alternatives, develop new mitigation measures and issues, and prepare the Final EIS. Key changes due to public comments resulted in the addition of Finances as an analysis issue, the addition of an appendix featuring the soils analysis (Appendix F), and new design measures for temporary roads to reduce potential sediment risks (which includes decommissioning of all temporary roads instead of putting some into storage).

2.3 Issues

Two levels of issues are used in this analysis.

- **Key issues** are those within the scope of the project and of sufficient concern to drive the development of alternatives to the Proposed Action. The issues are specific to this geographic area and proposal, and provide a good comparison between alternatives during analysis. Only one key issue was identified.
- **Analysis issues** were not key in developing alternatives but are important for their value to design specific protective measures and to measure the effects of the alternatives on different forest resources.

The Interdisciplinary Team identified "issue indicators" to measure how each issue would be affected by each alternative. Each issue may have more than one indicator, depending on its complexity. Issue indicators were selected for their ability to show the differences among alternatives.

2.31 Key Issue

***Issue:* The effects of road management, road construction, and reconstruction on sediment delivery to streams, aquatic habitat, wildlife habitat, and noxious weed spread**.

Some people objected to road construction because of potential effects on forest resources such as water quality and wildlife habitat. Similarly, some supported road closures and obliteration to protect resources such as water quality, fisheries, wildlife, and, for noxious weed prevention. Other people expressed concern about leaving roads open and not closing any additional roads within the project area. Some expressed support for additional access that might be provided by this project. **Alternative C was developed to specifically address the concerns related to new road construction.**

<u>Issue Indicators:</u>

1. Road Construction – Miles of road constructed.
2. Road Reconstruction[1] – Miles of road work done.
3. Road Access – Change in miles of open classified road after project completion.

2.32 Analysis Issues

A new issue has been added to this section – Finances. The issue statement and indicators can be found at the end of this section.

***Issue*: Effects of project activities on forest vegetation**

Issue Indicators:

1. Acres and percent change in vegetation structure and cover type.
2. Changes in patch size, weighted edge density, and mean core area (defined in Chapter III – Vegetation).

***Issue*: Effects of project activities on Threatened, Endangered and Sensitive plants**

Issue Indicators:

1. Relative amount of canopy opening and/or ground disturbance in and next to known plant populations or suitable habitat.

***Issue*: Effects of project activities on the risk of spread of existing noxious weed populations and introduction of new weed invaders**

Issue Indicators:

1. Relative amount of canopy opening and/or ground disturbance.

***Issue:* Effects of vegetation prescriptions on risk of a destructive fire around the microwave sites and powerline**

Issue Indicator:

1. Potential for destructive crown fire as measured by flame lengths and fire intensity.
2. Ability to suppress an unwanted fire as measured by flame length and fire intensity.
3. Acres of the project area where fuels have been treated and their proximity to the microwave site and the powerline.

***Issue*: Effects of prescribed burning on air quality**

Issue Indicators:

1. Production of particulate matter from smoke emissions.

[1] The term reconstruction is now referred to as "road work" to avoid confusion with the new definition for reconstruction in FSM 7705 (January 2001).

***Issue:* Effects of vegetation prescriptions on wildlife habitat as related to sensitive and management indicator species groups**

Issue Indicators:

Sensitive Species:

1. Goshawk – trend toward suitable nesting habitat conditions.
2. Flammulated owl – trend toward suitable habitat conditions.
3. Blackbacked woodpecker – changes in distribution and quality of snag habitat.

Management Indicator Species:

1. Pileated woodpecker – changes to suitable nesting habitat.

***Issue:* Effects of project activities on sediment delivery in Cocolalla Creek**

Issue Indicators:

1. Estimated sediment delivery to stream channels.

***Issue:* Effects of vegetation prescriptions on visual quality**

Issue Indicator:

1. Evaluation of alternatives to determine whether activities proposed under the action alternatives would achieve visual quality objectives.

***Issue:* Effects of project activities on Finances**

Issue Indicator:

1. Predicted high bid rate per hundred cubic feet
2. Total predicted high bid values.

2.33 Issues Eliminated From Detailed Analysis

The following issues have been eliminated from further analysis because they are either not relevant to the project or its resources, are beyond the scope of the project, or have been addressed by virtually eliminating any potential effects through project design.

Effects Of Herbicides On Ground Water Contamination – Herbicides would only be used for controlling noxious weeds. The decision to use herbicides is not to be made under this project. The Sandpoint Ranger District Noxious Weed EIS (USDA 1998a) provides guidelines for herbicide use to prevent groundwater contamination.

Impact of Clearcutting on Visuals, Hydrology and Wildlife Habitat – Clearcutting is not proposed for this project. Some people believe regeneration harvest methods can result in impacts similar to clearcutting. The effects of proposed regeneration harvest methods are fully analyzed in Chapter III.

Analysis Should Support Motorized Use Of Trails In Project Area – This is outside the scope of the project. The Little Blacktail project is not proposing to change the status of trails in the project area with regard to motorized use.

Impacts Of Log Hauling On County And Forest Service Roads– The Forest Service does not have jurisdiction over county roads. Monies are given to the county for maintenance of county roads and schools through the Secure Rural Schools and Community Self Determination Act (Public Law 106-393). Design Features to protect Forest Service roads are included in Chapter II and would be part of the timber sale contract. Due to public comment, a new design feature was added specifying that the Forest Service would contact the county prior to the commencement of activities in the Little Blacktail project area. See the Design Feature section for detailed language associated with this new design feature.

Impacts of project implementation on old growth – There was a concern about what the effects of this project might have on old growth forests. There is no identified old growth within the project area. See Vegetation - Chapter III for discussion on old growth. This project would not have an effect on old growth forests and therefore was eliminated from detailed study.

Impacts of project activities on soils and soil productivity – There was a concern about how the project might affect the soils and soil productivity in the project area. There are not any recognizable signs of detrimentally disturbed soils within the proposed cutting units. Two stands (658-01-006 and 658-01-034) proposed for treatment were considered marginal in the Draft EIS. These stands have since been field reviewed by the Forest Soils Scientist and were found to meet established Forest and Regional Soil Quality Standards. All action alternatives would comply with Forest Plan Standards and Regional Soil Quality Standards (FSH 2509.18) related to detrimentally disturbed soils. The project would use all of the recommendations of the Intermountain Forest Tree Nutrition Cooperative and is designed to meet the large woody debris guidelines. See Soils Appendix F for details of field review and specific information related to soils.

2.4 Alternatives Considered in Detail

2.41 Alternative A (No Action)

This is the No Action Alternative required by the National Environmental Policy Act (NEPA). Alternative A describes what environmental effects would result if none of the proposed activities occurred. This alternative provides a baseline comparison of predicted environmental consequences associated with taking no action versus implementing any of the action alternatives.

Under this alternative, no action would be taken to respond to the Purpose and Need identified in Chapter I. There would be no tree removal, no prescribed burning, no fuels reduction, and no road construction or decommissioning. Existing trends and uses, such as fire protection and recreation management, would continue.

2.42 Alternative B (Proposed Action and Preferred Alternative)

This alternative responds to the identified Purpose and Need. Details can be found in the Proposed Activities Table (table 1). The following describes the actions that would take place:

Vegetation Restoration - Treatment of vegetation would occur on about 1,231 acres of a 2,139-acre project area (see figure 3, Appendix M). Vegetation prescriptions are designed to trend the project area toward vegetation conditions created by low-intensity and mixed-severity fires, rather than stand replacement fires. Techniques would include selective and regeneration cutting. See "Vegetation Treatment Definitions" text box and Appendix C – Stand Treatments.

Selective cutting would occur on approximately 722 acres in the following cases:

- In stands where significant numbers of healthy desired species such as white pine, larch and ponderosa pine are present and are in need of thinning to retain this health,
- In stands estimated not to experience significant mortality within the next 10-20 years but are in need of thinning to retain healthy, wind firm trees of desired species for future seed and shelter,
- In stands where dead and dying trees need to be salvaged before loss of value and,
- In stands where the focus is to reduce the spread of disease.

Regeneration cutting and reforestation would occur on approximately 509 acres and would result in 11 stands with openings greater than 40 acres in size. The list of stands with openings over 40 acres can be found in the Forest Vegetation portion of the project file. The following cases describe where this type of cutting would occur:

VEGETATION TREATMENT DEFINITIONS

Regeneration Cutting and Reforestation: This technique involves removing most of the trees for the purpose of providing growing space for planted or natural seedlings. Both live and dead trees would be retained in an irregular spacing to provide wildlife habitat, maintain visual quality, provide shelter for seedlings, provide a seed source for natural regeneration, and provide woody debris for long-term site productivity. Generally, less than 30% of the trees would remain on these areas. The resulting view would be an open stand with scattered standing trees and patches of trees. Most of these trees would remain on site for a considerable time after seedlings have established. The size of open areas would range from approximately 2 acres to several hundred acres. Logging slash and other debris would be treated, where necessary, to reduce the fire hazard and to prepare the sites for reforestation. Prescribed fire or mechanical methods would be used. Most of the areas would be reforested with western larch, ponderosa pine and/or white pine. Silvicultural prescriptions may include irregular shelterwood with reserves, seed tree with reserves, and group selection.

Selective Cutting: This technique would remove trees in areas where there is the opportunity to maintain or enhance the health, growth, or wind firmness of desired existing trees. Trees removed would generally be smaller or less dominant trees in the stand, species not desired for future stand composition, or diseased or dead trees that are not needed to meet future stand objectives. Trees removed would provide growing space for the remaining trees. These stands would generally not be open enough to allow for successful establishment of desired tree species except where planted in small openings throughout the stand. The number of trees remaining in these areas would vary, but stands would generally have the appearance of being thinned. Fuel hazards may be reduced by use of fire or mechanical methods where appropriate. Silvicultural prescriptions may include treatments such as thinning, shelterwood preparatory cuttings, improvement cutting and sanitation salvage cutting.

- In stands where there is significant tree mortality occurring or risk of significant tree mortality is expected to occur within the next 10-20 years or,
- In stands where there is a need to modify visual impacts from past clearcutting, and/or, where regeneration harvests are needed to blend in with landscape pattern and characteristics.

Fuels Treatment – Regeneration cutting would include treating fuels to reduce risk of a severe fire and prepare the site for planting desired longer-lived species of ponderosa pine, larch, and white pine. The small diameter dense vegetation around the microwave sites would be thinned and grapple piled. To reduce existing fuels and those created by the vegetation treatment, the majority of acres (about 772 acres) would be prescribed burned, about 194 acres would be limb and lopped, about 256 acres would be grapple piled, and about 9 acres would be yarded with limbs and tops attached.

Temporary Road Construction - To accomplish vegetation restoration activities, there would be approximately 5.4 miles of temporary road construction (see figure 4, Appendix M). The temporary road construction is intended to reduce impacts to soils that could be caused by tractor logging and skid trails by increasing opportunities for the use of skyline logging systems in certain areas. The roads also help reduce the cost of logging systems such as helicopter yarding, and provide more access and control points for prescribed burning and fuels treatment. All temporary roads would be decommissioned after use for the project.

ROAD DEFINITIONS

Temporary Road – Road constructed but not intended to be used for long-term resource management.

Decommissioning – Activities that result in the stabilization and restoration of unneeded roads to a more natural state. Includes removal of all stream crossings and full recontour of the entire road prism, introduction of woody debris, and revegetation as needed.

Storage – includes removal and recontour of all stream crossings and, as needed, recontour of unstable fill slopes, cutslope stabilization, ripping the road tread, installation of no-maintenance cross ditches, and revegetation. Also includes some kind of road closure method such as with a guard rail barrier, gate, an earthen berm, or a short section of full recontour. Roads put into storage would remain as classified roads in the transportation system.

Road Work – The upkeep of a road necessary to retain or restore the road to the approved road management objective *(defined as "maintenance" in FSM 7705)*. Includes one or more of the following activities: brushing, blading, installation of rolling dips, installation of relief culverts, rolling the road grade for increased drainage, armoring of culvert catch basins and outlets, adding gravel surfacing, replacing stream crossings, stabilizing cut and fill slopes and removing encroaching road fills.

Classified Road – Roads wholly or partially within or next to National Forest lands determined to be needed for long-term motor vehicle access.

Unclassified Road – Roads on National Forest lands that are not managed in the forest transportation system. Examples include abandoned roads, unplanned roads, and roads constructed previously but not included in the system for maintenance and regular upkeep.

Road Work To Improve Aquatic Habitat- Road work would occur on approximately 13.5 miles of existing roads. Road work activities designed to reduce sediment would include spot surfacing at stream crossings, installing relief culverts, cleaning and improvement of ditches, cleaning inlet and outlets of culverts, and installing rolling dips and outlet ditches. These activities would help improve drainage and decrease sediment delivery to stream channels. Drainage structures that pose sediment risks would be repaired, replaced, removed or redesigned and additional drainage structures would be installed.

Additional road work to improve durability for project and public use and designed to reduce existing and potential sediment risks includes one or more of the following activities: brushing, blading, rolling the road grade for increased drainage, armoring of culvert catch basins and outlets, adding gravel surfacing, replacing stream crossings, stabilizing cut and fill slopes and removing encroaching road fills.

Approximately 0.7 mile of unclassified existing roads would be decommissioned to remove the roads from the landscape and reduce sediment risks over time. Of this total approximately 0.4 mile are currently drivable (two roads each 0.2 mile in length) and approximately 0.3 mile (one road segment) are not drivable. Approximately 0.8 mile of two existing road segments will be put into long-term storage. These segments are classified roads that are currently not drivable.

Following project activities all temporary roads will be decommissioned to avoid sediment risks. Decommissioning includes removal of all stream crossings and full recontour of the entire road prism, introduction of woody debris, and revegetation as needed (see table 2).

Logging Systems – Vegetation harvest systems would include approximately 386 acres of helicopter, 473 acres of skyline and 372 acres of tractor (figure 4, Appendix M).

2.43 Features Specific to Alternative B

2.43a Features Related to Temporary Roads

Road Design - To avoid potential resource damage from temporary roads that may remain on the landscape until post-sale activities are completed (possibly five to eight years), all temporary roads generally greater than 300 feet in length[2] would be designed by a Forest engineer and would be incorporated into a road package tied to the timber sale. There would be an engineering representative on site during all new temporary road construction to ensure design specifications are met.

The timber sale would be split into separate subdivisions. The intent of the subdivision is to focus activity within a specific area and limit the length of time a new road would remain on the landscape before all timber sale-related work (i.e. burning) is completed. At the end of all project activities, these roads would be decommissioned and removed from the forest transportation system.

Estimated Effectiveness: **High**; temporary roads that are specified are included in the road package with designs by forest service engineers. This ensures that the roads are adequately surveyed in advance of construction and are designed with features that minimize effects on resources over time. This feature would be implemented through contract provisions, administration of contract provisions and compliance monitoring by the sale administrator or engineering representative.

Sediment Reduction - All new temporary road construction would require slash filter windrows within RHCA boundaries.

[2] Exceptions to increasing this distance could occur if ground conditions are such that resource damage would be minimal.

Effectiveness Rating: **High**; this measure is 75-85% effective in trapping sediment (Cook and King 1983) and (Nieman 1989).

All new temporary road construction would require hydro-mulching on soil disturbance sites within critical areas such as stream crossings. Mulching would occur immediately after road construction is completed.

Effectiveness Rating: **Moderate to High;** this measure is 40-80% effective in reducing sediment (Burroughs and King 1989). **Moderate to High** for new weed invaders; this measure is expected to be somewhat to very effective at preventing establishment of new invaders.

Spot gravelling with approximately 6 inches of gravel would be required at all stream crossings, rolling dips, and in any wet areas.

Effectiveness Rating: **High;** this measure is 92% effective in reducing the amount of sediment delivered to streams (Foltz and Truebe 1995).

Table 1. Proposed activities by Alternative.

Activities	Alternative B (Proposed Action)	Alternative C (No new road construction)
Proposed Vegetative Treatments (Acres)		
Selective harvest	722	722
Regeneration harvest	509	509
Total Proposed Treatment Acres	1,231	1,231
Proposed Road Treatments (Miles)		
Temporary Road Construction	5.4	0
Temporary Road Decommissioned	-5.4	0
Existing Road Work	13.5	13.5
Existing Road Decommission	-0.7	-0.7
Existing Road Storage	0.8	0.8
Fuel Treatments (Acres)		
Underburn	772	777
Limb and Lop	194	223
Grapple Pile	256	222
Yard Tops	9	9
Total Fuels Treatment acres	1,231	1,231
Logging Systems (Acres)		
Helicopter	386	730
Skyline	473	135
Tractor	372	364
Total Harvested Acres	1,231	1,231

2.44 Alternative C (no new roads)

This alternative was developed in response to public comments that expressed objection to any new road construction because of potential effects on forest resources such as water quality and wildlife habitat. It also addresses concerns about potential watershed effects by eliminating new road construction as a potential source of sediment.

The proposed action was modified to produce Alternative C. Alternative C features are similar to Alternative B, with the exception that no new roads would be constructed. Although this change alters the proposed logging systems and fuel treatments in some units from those proposed in Alternative B, the harvest prescriptions stay the same. Details can be found in the Proposed activities table (table 1).

The following describes the actions that would take place with Alternative C:

Vegetation Restoration - Treatment of vegetation would occur on about 1,231 acres of a 2,139-acre project area. Vegetation prescriptions and intents are the same as Alternative B (see figure 3, Appendix M).

Fuels Treatment – To reduce existing fuels and those created by the vegetation treatment, there would be about 777 acres of prescribed burning, about 223 acres of limb and lop, about 222 acres of grapple piling, and about 9 acres of yarding with limbs and tops attached.

Road Work To Improve Aquatic Habitat- Road work would occur on approximately 13.5 miles of existing roads. Road work activities designed to reduce sediment would include spot surfacing at stream crossings, installing relief culverts, cleaning and improvement of ditches, cleaning inlet and outlets of culverts, and installing rolling dips and outlet ditches. These activities would help improve drainage and decrease sediment delivery to stream channels. Drainage structures that pose sediment risks would be repaired, replaced, removed or redesigned and additional drainage structures would be installed.

Additional road work to improve durability for project and public use and designed to reduce existing and potential sediment risks includes one or more of the following activities: brushing, blading, rolling the road grade for increased drainage, armoring of culvert catch basins and outlets, adding gravel surfacing, replacing stream crossings, stabilizing cut and fill slopes and removing encroaching road fills.

Approximately 0.7 mile of unclassified existing roads would be decommissioned to remove the roads from the landscape and reduce sediment risks over time. Of this total approximately 0.4 mile are currently drivable (two roads each 0.2 mile in length) and approximately 0.3 mile (one road segment) are not drivable. Approximately 0.8 mile of two existing road segments will be put into long-term storage. These segments are classified roads that are currently not drivable (see table 2).

Logging Systems – To avoid temporary road construction, helicopter logging would be the primary logging system used to treat the vegetation where feasible. Vegetation harvest systems would include approximately 730 acres of helicopter, 135 acres of skyline and 364 acres of tractor (see figure 5, Appendix M).

Table 2. Road information for all Alternatives.

	Road Number (parentheses are numbers shown in DEIS)	Current Access Management (Alternative A)	Alternatives B & C		Alternative B		Alternative C
			Miles of Road Work* on Classified Roads	Miles of Road Work* on Unclassified Roads	Miles of Temporary Road Construction	Change in Access Management	Change in Access Management
Existing Roads	**630**	Open road	3.9			None	None
Existing Roads	**630A**	Gated – seasonal closure	2.0			None	None
Existing Roads	**630B**	Currently brushed in	0.7			None - Put 0.7 mile into storage after use for project	None - Put 0.7 mile into storage after use for project
Existing Roads	**630B1**	Drivable unclassified road		0.2	1.6	Decommission 1.8 miles	Decommission 0.2 mile
Existing Roads	**630C**	Open road. Last 0.5 mile closed with earthen barrier	1.0			No change to open or closed portions	No change to open or closed portions
Existing Roads	**630C2**	Open road	0.3			None	None
Existing Roads	**630C3**	Closed to all motor vehicles with earthen barrier	0.1		0.1	Put 0.1 mile into storage after use for project, decommission 0.1 mile	Put 0.1 mile into storage after use for project
Existing Roads	**630E**	Closed with earthen barrier to vehicles over 50 "-- motorized trail	1.5			No change. Motorized trail maintained.	No change. Motorized trail maintained.
Existing Roads	**630A1** (630S)	Drivable unclassified road		0.2	0.2	Decommission 0.4 mile	Decommission 0.2 mile
Existing Roads	**630T** (630T1)	Currently brushed in unclassified road		0.3		Decommission 0.3 mile	Decommission 0.3 mile
Existing Roads	**315**	Open road	3.0			None	None
Existing Roads	**315A**	Open private road	0.3 mile all private road		0.7	No change on private section Decommission 0.7 mile on National Forest	None
Proposed Temporary Roads	**630A1A**	N/A			0.2	Decommission 0.2 mile	N/A
Proposed Temporary Roads	**630A2**	N/A			0.2	Decommission 0.2 mile	N/A
Proposed Temporary Roads	**630B1a**	N/A			0.4	Decommission 0.4 mile	N/A
Proposed Temporary Roads	**630B1b**	N/A			0.3	Decommission 0.3 mile	N/A
Proposed Temporary Roads	**630C1**	N/A			0.5	Decommission 0.5 mile	N/A
Proposed Temporary Roads	**315C**	N/A			0.2	Decommission 0.2 mile	N/A
Proposed Temporary Roads	**315D**	N/A			0.8	Decommission 0.8 mile	N/A
Proposed Temporary Roads	**315E**	N/A			0.2	Decommission 0.2 mile	N/A
	Total		**12.8**	**0.7**	**5.4**	**Decommission 5.4 miles temporary road and 0.7 mile existing unclassified road. Put 0.8 mile into storage.**	**Decommission 0.7mile existing unclassified road. Put 0.8 mile into storage.**
						Net road <u>access</u> reduction**:** 0.4 mile unclassified road	Net road <u>access</u> reduction**:** 0.4 mile unclassified road

N/A = not applicable
*Road Work is defined under "Road Definitions" in the Alternatives section.

2.45 Features Common to Alternatives B and C

The following features consist of project designs or mitigation measures that are applicable to both action alternatives. They are listed here to avoid repeating them in each alternative description. Mitigation measures are those actions taken to minimize, eliminate, avoid, rectify, or compensate for potential negative effects of proposed activities. Where mitigation measures are listed, the effectiveness of the measure is estimated as predicted by the resource specialists and interdisciplinary team. In general, effectiveness ratings are based on literature and research, administrative studies, professional experience, results of previous monitoring on other projects, and logic.

2.45a Features Related to Vegetation Restoration

Protection of Residual Stand – To protect the residual stand in selective cutting units, the size of logging equipment would be limited to meet the treatment objective. Skid trail width in these cutting units would not exceed 10 feet, unless otherwise agreed to by the sale administrator. Requirements to accomplish this objective may include one or more of the following: (1) limiting the size of logging equipment, (2) using rub trees, or (3) restricting the timing of logging. The use of skyline yarding where feasible protects residual trees as well.

Retention of Hardwood Trees - To maintain forest species diversity and wildlife habitat, aspen and birch trees would not be harvested for pulp. If for safety reasons these species need to be cut they would remain on site for long-term site productivity. Selected merchantable conifers in and around aspen patches would be removed to reduce competition for water, nutrients and sunlight.

Post-harvest Treatments - In regeneration units, site preparation, fuels treatment, and planting activities would occur within five years following timber harvest or the start of rehabilitation. Site preparation and/or fuels treatment may include a combination of prescribed burning, underburning, grapple piling and hand piling, depending on post-harvest conditions. .

Over 40 acre openings - Harvest unit size in 11 stands would be over 40 acres in size. The District requested and received Regional Forester approval to exceed the 40-acre size limit. The scoping letter dated October 27, 1998 and the Draft EIS detailed this request. See project file for specific information related to this request.

Regeneration Harvest – Regeneration harvest would not be proposed in areas that are unsuitable for reforestation in a timely manner as described in Forest Service Policy (NFMA).

<u>Estimated Effectiveness</u>: **High**; using specific silvicultural prescriptions and marking guides, the above features would be implemented and have a high likelihood of achieving the desired objectives.

2.45b Features Designed to Protect Water and Fish Habitat

Best Management Practices - All activities would be designed to protect water quality and fisheries habitat. Best Management Practices (BMPs) are the primary mechanism to enable the achievement of water quality standards. The Forest Service Handbook 2509.22 (Soil and Water Conservation Handbook) outlines BMPs that meet the intent of the water quality protection elements of the Idaho Forest Practices Act. Site-specific best management practices that have been specifically designed for these alternatives and are part of the design criteria are described more fully in Appendix A.

Estimated Effectiveness: **Moderate to high**; depending on the practice. A description of each practice and an estimate of its effectiveness are located in Appendix A. Research has evaluated the effectiveness of BMPs (Seyedbagheri 1996). These practices would be implemented since they are requirements tied to the timber sale contract. The Forest Service Timber Sale Administrator would frequently review the project for compliance with these and other timber sale requirements. The North Zone aquatics staff would also do periodic monitoring to assess the effectiveness of these practices.

Inland Native Fish Strategy - No-activity zones of protection for fish habitat would be established along stream channels using the guidelines established by the Inland Native Fish Strategy (INFS) unless, as the INFS directs, site-specific conditions warrant changing them (INFS Decision Notice 1995, p. A-5). These no-activity zones include 150-foot (slope distance) protection zones in streams with no fish, 300-foot protection zones in streams that have fish, and 60-foot protection zones in streams that do not have water in them year-round. Ephemeral draws would have a 50-foot protection zone if they either are directly tied to an intermittent channel, or lack large woody debris and vegetation that prevent scouring or head cutting.

In lieu of on-site delineation, standard widths defining Riparian Habitat Conservation Areas (RHCAs) would be used without modification. Streamside protection zones (RHCAs) were determined categorically for streams in the project area and are based on the INFS. The buffer widths used would be as described in the INFS.

Estimated Effectiveness: **Generally high**; a description of each applicable INFS standard and guideline and its estimated effectiveness may be found in Appendix B. These requirements would be implemented since they are incorporated into project design.

Protection of Wetlands, Seeps, and Springs - Wetlands and aquatic habitat in the northeastern portion of the project area would be buffered from all harvest activities by a minimum of 300 feet.

Estimated Effectiveness: **High**; this practice would be implemented because it would be incorporated in project design and unit layout.

Reduction of sediment delivery to channels - Cross drains and relief culverts would be installed to disperse water and reduce water concentrating below culverts on Roads 630, 630A, and 630C.

Road work (e.g. replacement of culverts, installation of rolling dips, armoring of culverts) and road decommissioning within any live crossing would take place after July 15th to reduce risk of effects from sediment during spring runoff and to avoid effects to westslope cutthroat trout redds.

Estimated Effectiveness: **High**; proposed road work would occur because it would be included in the road package as part of the Timber Sale Contract.

Protection of private water source - There is a water source on private land adjacent to the northwest corner of stand 658-01-006. No timber harvest or fuel treatment activities would occur within a 2 to 4 acre area around this source.

Estimated Effectiveness: **High**; the water source is high on the hillslope and the project would not affect slope hydrology uphill of this water source. The water source would be protected by unit layout.

2.45c Features Designed to Protect Wildlife Habitat

Wildlife Tree Retention – The following minimum amounts of standing trees would be retained within harvest areas:

- Dry Forest: 4 snags and 6 live tree replacements/acre from the largest trees.
- Moist Forest: 6 snags and 9 live tree replacements/acre from the largest trees.

Selection of snags and live tree replacements would emphasize practices that assure the highest probability for long-term retention (Bull et al. 1997). Practices would focus on retaining ponderosa pine, western larch, Douglas-fir and western red cedar trees, especially veteran or relic ponderosa pine and larch trees. Trees killed by root disease would not be used to meet retention objectives because of their short lifespan as snags. High hazard snags and snags in the advanced stages of decay would not be used to meet retention objectives (Intermountain Forest and Industry Association et al. 1995).

Large diameter snags (greater than 15 inches diameter) that are felled for safety reasons would remain on site to provide wildlife habitat and long-term site productivity.

To ensure adequate distribution of snags, snags should be represented on every 25 acres of treatment, in clusters or clumps where feasible. (For example if a treatment area is 100 acres in size, this measure would avoid a possible scenario of providing all the snags for the 100 acres within a 5 acre patch and no snags on the remaining 95 acres).

Where necessary, an unharvested perimeter would be left around large, relic, fire-burned trees and snags, and slash would be pulled back to protect these trees from timber harvesting and prescribed burning operations.

Estimated Effectiveness: **High to moderate**; this measure would be implemented (using unit layout, contract provisions, and compliance monitoring) and have a moderate chance of avoiding and/or reducing adverse effects on snag-dependent wildlife. It is not the intent of this project to willfully remove “soft” snags. Some of these “soft” snags would survive and remain standing during the life of the project. Consequently, this measure should provide more than the minimum number of snags prescribed.

Dry Forest Ecosystems - Due to the high incidence of insect and disease, some stands proposed for treatment are not able to maintain sufficient forest structure necessary for flammulated owls and other wildlife associated with dry forest ecosystems. However, some stands proposed for treatment would retain enough structure to promote or achieve suitable habitat conditions. For these stands, harvest designs that would help maintain habitat persistence on the landscape would include:

- Retaining a stand average of at least 40 percent overstory canopy closure.
- Designing for non-uniform spacing of trees (moderate within stand variability) within residual stands.
- Managing for mature ponderosa pine/Douglas-fir communities.

<u>Estimated Effectiveness</u>: **High**; using specific silvicultural prescriptions and marking guides, this feature would be implemented and have a high likelihood of avoiding or reducing adverse effects on flammulated owl habitat.

Vegetation Screen – In order to provide security screening for wildlife and minimize motorized access into cutting units next to open roads, vegetation buffers would be provided along open main roads and next to treatment areas where feasible. Buffers would transition from a no-harvest zone into the treatment prescription.

<u>Estimated Effectiveness</u>: **High**; using specific silvicultural prescriptions and marking guides, this feature would be implemented and the desired objectives would be achieved in the areas where creating buffers is feasible.

Threatened, Endangered, and Sensitive Wildlife Species Management - The Forest Service would conduct goshawk nest searches during project layout and design. Any suspected nest or other evidence of nesting (i.e. agitated birds defending territory) would be reported to a Forest Service Biologist for validation. If any active nest site were discovered, the legal and biological requirements for their conservation would be met.

If any threatened, endangered, or sensitive species were located during project implementation, management activities would be altered, if necessary, so that proper protection measures are taken. Timber sale contract clause C6.251, Protection of Threatened, Endangered And Sensitive Species, would be included in any timber sale contract.

<u>Estimated Effectiveness</u>: **High**; using specific silvicultural prescriptions and marking guides, this feature would be implemented and have a high likelihood of achieving the desired objectives.

2.45d Features Designed to Protect Air Quality

Smoke Management – All prescribed burning would be conducted following the Memorandum of Understanding established between the States of Idaho and Montana to comply with State and Federal air quality guidelines. Burning would only occur when weather and air conditions are favorable for smoke dispersal. No burning would be initiated during times when air quality restrictions are in place.

Landing slash and excavator piles would be burned in late fall when the risk of escape into adjoining stands and damage to residual timber are lessened.

<u>Estimated Effectiveness</u>: **High**; due to air quality requirements of State and Federal guidelines.

2.45e Features Designed to Protect Soil and Site Productivity

The following practices are designed to minimize the detrimental impacts of soil compaction, displacement, severe burning, and nutrient and organic matter depletion on long-term soil productivity. The use of these practices will insure that the soil quality standards listed in the Forest Plan and Regional Soil Quality Standards would be met. *Please refer to Appendix F for details related to changes from the Draft EIS to the Final EIS as related to soils.*

Protection During Tractor Yarding - The following tractor skid trail spacing would be used:

- Where feasible, existing skid trails would be used.

- All new skid trails would be designated.
- Where terrain is conducive, trails would be spaced at least 100 feet or more apart, except where converging.
- Skid trail spacing closer than listed above may be planned when winter logging could occur on at least two feet of packed snow or frozen ground, or where adequate slash matting exists.

Estimated Effectiveness: **High**; these guidelines meet Forest and Regional Soil Quality Standards by limiting disturbance to less than 15% of the activity area. Less ground would be impacted by heavy equipment operations.

Protection Using Skyline Yarding - Where feasible, skyline yarding would be the preferred logging system over tractor yarding. The intent is to reduce the potential detrimental soil impacts of displacement and compaction.

Estimated Effectiveness: **High;** past Forest Plan monitoring (USDA 1991) indicates low amounts of soil compaction and displacement with skyline yarding systems.

Protection During Prescribed Burning Activities – Prescribed burning would take place only when the surface inch of mineral soil has a soil moisture content of 25 percent by weight or 100 percent or greater duff moisture.

Estimated Effectiveness: **High**; this practice is effective in retaining the fine soil organic component (Niehoff 1985).

Nutrient Protection on machine or hand piled areas - Fine residue (foliage and branches) would be allowed to overwinter on site to allow potassium to leach out of these materials.

Estimated Effectiveness: **High;** based on IPNF soil scientist recommendations and Intermountain Forest Tree Nutrition Cooperative recommendations (Garrison, Moore 1998).

Protection of Large Woody Debris - Management of coarse woody debris and organic matter in cutting units would follow the research guidelines contained in Graham et al., 1994.

Estimated Effectiveness: **High;** based on Graham et al. 1994 research.

Protection during grapple piling activities – The grapple pile machine would travel on a slash mat during piling activities.

Estimated Effectiveness: **High;** past Forest Plan monitoring (USDA 1991 and 1993) indicates little to no detrimental soil compaction and displacement with these requirements.

2.45f Features Designed to Protect Heritage Resources

In the event that cultural resources are encountered during program activities, the Forest Service has the authority to modify or stop timber sale activities. The standard heritage resources protection provision C(T)6.24# - Protection of Cultural Resources (1/93), would be used in the sale and road construction contracts. The provision specifically requires the contractor to notify the Forest Service of discoveries of historic resources.

Mitigation of impacts to cultural resources can include, but is not limited to:

- Establishment of buffer zones

- Directional falling
- Alteration of harvest unit boundaries
- Changes in road locations
- Designation of skid trails away from historic properties
- Limiting the harvest methods in certain areas
- Seasonal operating limitations
- Limiting slash disposal and tree planting activities

Estimated Effectiveness: **High;** Idaho State Historical Preservation Office (SHIPO) has reviewed and agrees with the mitigation measures and Forest Service determination on this project. See project file for SHIPO approval letter. Special contract provisions are used in all timber sale and road construction contracts and have been effective in protecting heritage resources.

2.45g Features Designed to Protect Threatened, Endangered, Sensitive (TES) and Rare Plants

TES plant surveys would be conducted as needed prior to weed treatment activities. The biological control agent *Aplocera plagiata*, which attacks goatweed (*Hypericum perforatum*), would not be released in the analysis area due to the proximity of a population of the sensitive plant species large Canadian St. Johnswort (*Hypericum majus*) near Maiden Creek. *Aplocera plagiata* has been shown to attack large Canadian St. Johnswort in host specificity tests (Bergman 1996).

Site-specific TES plant surveys would be conducted as needed prior to in-stream watershed work in highly suitable riparian habitat.

If an action alternative is selected, any changes that may occur during layout would be reviewed and TES plant surveys conducted as necessary prior to project implementation. Newly documented occurrences would be evaluated, with specific protection measures implemented to protect population viability. Such measures could include the following:

- Dropping units from harvest activity
- Modifying unit boundaries to provide a minimum 100-foot slope distance around documented occurrences
- Modifying harvest methods, fuels treatment or logging systems to protect TES plants and their habitat
- Implementing, if necessary, Timber Sale Contract provisions C(T)6.251, Protection of Endangered Species, and C(T)9.52, Settlement for Environmental Cancellation.

Estimated Effectiveness: **High**; the measures would protect documented populations of triangle moonwort (*Botrychium lanceolatum*), Mingan moonwort (*B. minganense*) and western goblin (*B.montanum*) and contiguous highly suitable habitat. The above measures would also assure protection of any newly documented occurrences. Buffering of wetlands as proposed is consistent with INFS guidelines, and would provide protection from effects associated with harvest activities.

2.45h Features Designed to Prevent the Spread of Noxious Weeds

Noxious weed treatment would be conducted according to guidelines and priorities established in the Sandpoint Weed Control Project FEIS (April 1998). Methods of control may include biological, chemical, mechanical and cultural controls. The biological control agent *Aplocera plagiata,* which attacks goatweed (*Hypericum perforatum*), would not be released in the analysis area due to the proximity of a population of the sensitive plant species large Canadian St. Johnswort (*Hypericum majus*) near Maiden Creek. Herbicide treatment would not exceed the maximum treatable acres established under the Sandpoint Weed Control Project FEIS adaptive strategy. A table displaying maximum treatable acres in the Cocolalla drainage is included in the project file.

Weed treatment of all existing roads to be used for hauling, service landings and helicopter landings would occur prior to ground disturbing activities, when feasible. If the weed treatment does not occur prior to ground disturbing activities then treatment would occur the following weed season.

All timber sale contracts would require cleaning of off-road equipment prior to entry onto National Forest lands.

All skid trails, landings and other areas of substantial soil disturbance would be seeded with a weed-free native and desired non-native seed mix and fertilized. All newly constructed roads would require hydro-mulching as described under Features Specific to Alternative B, Features Related to Temporary Roads.

All straw or hay used for mulching or watershed restoration activities would be certified weed-free.

Road segments identified for obliteration would be treated prior to obliteration.

Gravel or borrow pits to be used during road construction or road work would be inventoried and treated (as needed) prior to use to insure they are free of new weed invader species (see project file for a list of these species).

Any priority weed species (see project file for a list of these species) identified during road maintenance would be reported to the District Weed Specialist.

<u>*Estimated Effectiveness*</u>: **Moderate to high**; for new weed invaders, the measures are expected to be somewhat to very effective at preventing establishment.

For existing infestations of spotted knapweed, common tansy and oxeye daisy, estimated effectiveness is moderate based on past treatment and monitoring. The measures are expected to be somewhat effective at reducing infestations of these species associated with existing and proposed roads.

For existing infestations of goatweed, estimated effectiveness is expected to be low in portions of the project area where this weed is already established in natural openings well above existing and proposed roads. The restriction on use of the agent *Aplocera plagiata* in existing populations of goatweed further hampers efforts to bring this weed species under control in those areas. The above measures would be expected to have moderate effectiveness at reducing goatweed infestations associated with existing and proposed roads.

2.45i Features Designed to Protect Scenery and Visual Quality

As needed to meet Visual Quality Objectives, the following specific mitigation measures would be used:

- Mitigate negative impacts in the middle ground by shaping units to imitate natural openings and landform configurations, including islands of untouched vegetation. Locate and construct roads and landings to minimize cuts and fills. Maintain hardwoods for diversity of color and texture.
- Mitigate negative impacts in the background by emulating natural forms. Created openings should be irregular in shape. Maintain hardwoods for diversity of color. Blend vegetation from treated to untreated areas.

Estimated Effectiveness: **Moderate**. The use of varied logging systems, natural features of the landscape, and limited construction of roads would generally aid in applying techniques that largely limit impacts of timber harvest on the scenic condition of the landscape.

2.45j Features Designed to Protect Trails

Trail #232 would be designated on the timber sale area map as a protected resource.

Where possible, the trail tread on Trail #232 would be protected from logging activities. Disturbed tread would be restored to pre-harvest condition under the timber sale contract.

In the interest of public safety, Trail #232 and Forest Road 630E would be closed to public access during active harvest operations within the following stands: 658-01-017, -021, -022, -023, -028, and -047. Public trail access to this area would be reopened from October 1 through November 15. No timber sale operations would occur during this time period. This scheduled closure and reopening of Trail #232 and Forest Road 630E would only be in effect during harvest operations within this specified area. In addition, the trail may be closed during the post-sale activity of prescribed burning.

During trail closure periods, signing of the closure would be posted at either end of the trail.

Currently there is no parking facility for the #232 trailhead. If a helicopter landing is constructed where the current trailhead exists on road 315 it would be converted to a parking area for the trailhead at the end of the project. If a landing were not created, the first 100 feet of road 315D would not be obliterated and would be maintained as trailhead parking after the timber sale contract is completed.

Estimated Effectiveness: **High**. Special contract provisions used to protect trail tread have been effective. Trail closures have been effective methods to eliminate conflict between logging and recreational use.

2.45k Features Related to Roads and Access Management

Log hauling would occur along Roads 630 and 315. No hauling would occur on weekends or holidays to reduce safety hazards during times of increased visitor use.

Dust abatement would be used as needed on National Forest roads to control dust and maintain driver safety.

Previously bermed and impassable classified roads would be managed with long-term intent for non-motorized use (winter snow machine use would still be accepted). See table 2 for a list of roads being used for the project and how they would be managed after all project activities are completed.

To prevent the establishment of motorized public use patterns on temporary roads (Alternative B) or on existing, undrivable roads that are opened for project activities:

- When roads are first constructed or reopened prior to use for the project they would be closed to public motorized vehicle use with an earthen barrier and/or gate.
- Once project activities start, the roads would remain closed with a gate to public use. Gates would be closed at the end of each day's use, during periods of inactivity, on weekends, and on holidays.
- After completion of sale activities, the roads would remain closed to public motorized use with a gate or barrier until the road could be decommissioned or put into storage.
- Decommissioning or storage activities would occur as soon as possible unless the roads are needed for post-sale activities such as planting or fuels treatment.

Road 630E would remain accessible to motorized vehicles less than 50 inches unless harvest activities are occurring in that area (see Features Designed to Protect Trails above).

All existing and created skid trails that might provide vehicle access from open roads would be closed with large mounds made up of a combination of slash and dirt. This would help reduce the attraction to use these trails.

Estimated Effectiveness: **High**; these measures would avoid and reduce adverse effects to wildlife by controlling motorized access on roads. Using contract provisions, administration of contract provisions, and compliance monitoring, these measures would be implemented

2.45l Features Related to County Roads

To reduce the impacts of log haul on county roads, the timber sale administrator would contact the Bonner County Roads Department to notify them when work (road work and log hauling) would begin on Little Blacktail and Cocolalla Creek roads. It would be the county's responsibility to dust abate their maintenance portions of these roads.

Estimated Effectiveness: **Moderate**; past experience working with Bonner County road department shows that they have assisted with dust abatement activities in the past. Whether they are able to provide this service is dependent on their annual funding, resources and workload.

2.45m Other Restoration Projects

The following projects are beyond the immediate restoration needs of this area but have been analyzed in the event that funding would become available to accomplish them. If sufficient revenues were generated from the sale of timber, those funds would be used. Other funding sources may be available and each project would be prioritized with other needs across the IPNF and accomplished with appropriated funding. The following projects are listed in order of priority. Figure 6 (Appendix M) identifies the location of all projects except noxious weed treatment and monitoring, and landing slash disposal.

Riparian Road Obliteration and Landing Slash Disposal

A non-system road located almost entirely within the riparian area of Cocolalla Creek is diverting water down the road surface in wheel ruts. This situation affects overland flows on much of the length of this road. Approximately 3,000 feet of this road would be deep ripped, seeded, and fertilized. Waterbars would be placed every 50-100 feet. Recontouring of the roadbed would occur on approximately 1,500 feet. The recontoured section would be revegetated with grass and seedlings. Two stream crossings would be removed and reshaped, and one culvert would be removed. Excess debris from landing slash along main travel routes would be buried after landings have been burned.

Wildlife Habitat Burning on High Ridge Ecosystems

Historically, some of the area's higher elevation, ridge ecosystems were maintained in a relatively open condition by natural fire patterns. These periodic fires interrupted the natural advances of plant succession, promoting the establishment of early successional species (i.e. shrubs, grasses, forbs) and providing important winter range for local mule deer populations.

With the elimination of fire on these sites, stand conditions have become markedly different. The natural advances of plant succession have changed these open stands to ones with denser trees making them unusable to big game. Consequently, mule deer populations have been virtually eliminated from some of these areas.

The high ridge ecosystem maintenance project proposes to slash and mechanically remove sub-merchantable conifers within stands 658-01-29 and 658-01-76 (93 acres) to help restore ridge system habitats and reduce encroachment of vegetation. Prescribed burning would follow this. Burning would encourage regeneration of early successional vegetation and increase the vigor and palatability of existing browse species.

Inventory and Treatment of New Noxious Weed Invaders

All areas of soil disturbance would be inventoried after harvest activities for new noxious weed infestations. New weed populations would be treated according to guidelines established in the Sandpoint Noxious Weed Control Project FEIS (USDA 1998a). Treatment of pre-existing weed infestations other than those treatments described under Features Common to All Action Alternatives (see above) would occur only if appropriated funding were available.

Timber Stand Improvement

Thinning young, small diameter trees (formerly known as precommercial thinning) and other work would redistribute growth and trend stand species composition to desired conditions. Thinning would favor healthy trees of desired species adapted to the various habitat types. Seral species such as ponderosa pine, western larch and white pine would be favored when present on the appropriate growing sites. Pruning white pine could improve the opportunity for this species to resist blister rust infection and reach maturity.

Thinning would leave roughly 400 trees per acre, in about 10x10 foot leave spacing. Thinning is necessary for density and species control and to prevent these stands from stagnating. Thinning is most effective if accomplished while the stands are still vigorously growing and while at least 30-40% of the crowns are still maintained in green healthy foliage. All slash from thinning would be removed from road ditch lines.

To control the density levels of the understory within most of the harvested units, either a weed and release or slashing treatment would be accomplished. In general, the regeneration cuts (irregular seed tree and irregular shelterwood cuts) and the group selection harvests would require slashing. The selective cut units (sanitation, salvage, improvement cut, shelterwood preparatory cut, and commercial thin prescriptions) would require some level of weed and release treatment. All slash would be removed from road ditch lines.

2.45n Future Salvage Opportunities

Future Salvage of Dead and Dying Trees – The effects analysis for this environmental impact statement includes potential salvage of up to one million board feet of dead and dying trees from proposed harvest units for approximately six years after the timber sale contract is completed. Salvage opportunities could take place within the harvest units as long as it meets the following criteria:

- Salvage activities must meet INFS guidelines.
- Salvage activities must protect all Native American religious or cultural sites, archaeological sites or historic properties or areas, and other improvements from disturbances.
- Salvage would take place when only existing skid trails would be used.
- Salvage would meet snag and coarse woody debris guidelines.
- Salvage would meet assigned Visual Quality Objectives.
- Salvage would not take place if the activity would have an adverse effect on threatened, endangered and sensitive plant, animal or fish species or their habitat.
- Salvage would not include any new road construction.
- Salvage would not occur on soils having a “high risk” rating in any category listed in the IPNF Erosion, Sediment Delivery and Mass Failure Hazard Ratings if the activity would have an adverse effect on the soil or water resources.
- Salvage would not take place if the activity would have an adverse effect to a flood plain, wetland or municipal watershed.
- Salvage activities would meet Assigned Visual Quality Objectives.

The Interdisciplinary Team would review any changes to the above criteria. A Supplemental Information Report would be written to determine if additional analysis is needed and a Supplemental Decision is necessary.

2.46 Monitoring

The Forest Plan documents a system to monitor and evaluate Forest activities. Monitoring and evaluation each have distinctly different purposes and scope. Monitoring is designed to gather the data necessary for project evaluation. During evaluation of project effectiveness, data gathered during monitoring are analyzed and interpreted. This process provides periodic data necessary to determine if implementation is within the bounds of the project design (Forest Plan, page IV-7).

For activities in the Little Blacktail area, all alternatives would comply with specific monitoring requirements identified by the Forest Plan (Forest Plan, Chapter IV). The length of time that monitoring is needed would be determined by the results and evaluation of what is being monitored. When it is certain that regulations and standards are being met, monitoring of a particular element will cease.

Not all monitoring is considered mandatory, and its implementation is not a consideration in the determination of environmental effects. The monitoring projects listed below are designed to be accomplished during project activities, but are dependent upon the availability of funds and other resources.

Forest Corporate Monitoring

In December 1999, the Ecosystem Team for the Idaho Panhandle National Forests developed a Corporate Monitoring System. The emphasis is on monitoring progress in restoring the ecosystems of the Idaho Panhandle, and on emphasizing consistency in the way effects to ecosystems are analyzed. Monitoring is tied closely to findings of the Interior Columbia Basin and Geographic Assessment. The types of data that will be tracked for long-term monitoring are provided in table 3.

Table 3. Long-term monitoring of ecosystem core data

Issues	Core Data	Unit of Measure
Wildlife security and Public Access	Miles of Open Road	miles
Changes in Forest Structure	Forest Structure by size/age class groups	percent/acres
Changes in Species Composition	Forest composition by Forest Cover Type Group	percent
Habitat Loss and Species Decline	TES Dry and Moist/Cold Site habitat Restoration	acres
Changes in Landscape Pattern	Landscape Pattern Measures	patch size/ edge/core area

Further information regarding corporate monitoring is provided in Appendix E - IPNF Forest Corporate Monitoring.

Project Monitoring (Implementation and Effectiveness)

Project implementation generally involves the efforts of a variety of individuals with both specialized and general skills and training. Employees are accustomed to working together to achieve the desired project objectives. For example, it is common for a sale preparation forester or sale administrator to discuss specific ground or project conditions with the wildlife biologist or hydrologist to apply the best practices on the ground. Joint field reviews are taken as needed. This steady informal communication allows for incremental adjustments throughout layout and project implementation to achieve the desired results. In addition to these less formal monitoring procedures, the following monitoring items would be conducted:

Noxious Weeds: Pretreatment of roads and equipment as proposed (Features Common to All Action Alternatives) would be documented on sale inspection reports. The effectiveness of seeding disturbed areas would be evaluated upon completion of the activity. Treated acres for weeds would be monitored according to treatment priorities established in the Sandpoint Noxious Weed Control Project FEIS. Decommissioned roads would be monitored for effectiveness of seeding and fertilizing and new weed invaders for a period of approximately three years.

TES Plants: Monitoring of sensitive plant populations where the proposed activity area was modified to avoid adverse effects would be conducted to validate the effectiveness of mitigation measures during and following the activity.

Vegetation: All regeneration units would be monitored for regeneration success (National Forest Management Act requirements). This is required by NFMA and would occur regardless of funding.

Each active harvest unit would be visited at a frequency necessary to assure compliance with the timber sale contract. Minor contract changes or contract modifications would be enacted, when necessary, to meet objectives and standards on the ground.

Best Management Practices: Best management practices would be incorporated into the design of all temporary road construction and road work. The Zone Hydrologist would review the planned design of all temporary roads to assure compliance with BMPs. The engineering representative and the Zone Hydrologist would monitor all temporary and reconditioned roads to ensure that they were built or restored to specifications.

Air Quality: During the burning of timber harvest residues (slash), smoke management guidelines would be followed as prescribed in the Idaho Smoke Management Memorandum of Agreement (1990), and the North Idaho Cooperative Smoke Management Plan (1990). Each airshed has a coordinator responsible for reporting all planned activity to a monitoring unit. The monitoring unit regulates the prescribed burning activities of all participants in the program. The Idaho Division of Environmental Quality recognizes this process as Best Available Control Technology for prescribed burning.

Air Quality is monitored by the North Idaho and Montana Airshed Groups during the fall burning season and yearlong by the Idaho Department of Environmental Quality.

Visuals: The project would be reviewed during and after harvest operations are complete to assess whether or not visual quality objectives (VQOs) were met.

2.5 Alternatives Considered But Eliminated

During public scoping and project development, several proposals were analyzed but dismissed. The following section describes the proposals and the reasons they were dismissed from further analysis.

2.51a Moist Site Stands South Of Cocolalla Creek

The Interdisciplinary Team considered including more moist sites for timber harvest located in T55N, R2W Section 22, adjacent to Cocolalla Creek. These stands were not high priority stands to enter for silvicultural reasons. Since this area was low priority for vegetation treatment, and it is an unroaded landscape providing a spectrum of wildlife habitat within the project area, the team decided to drop this area from the proposed action. In addition, after reviewing the IPNF Erosion, Sediment Delivery and Mass Failure Hazard Ratings it was recognized that this area has moderate mass failure potential, high sediment delivery potential and potential to affect slope hydrology.

2.51b Use Of Even-Aged Harvest Units Not Exceeding 40 Acres

An alternative was considered that would have limited new openings to 40 acres or less and would not make any existing openings greater than 40 acres. However, it was not carried into the detailed analysis for the following reasons:

- Smaller openings would not sufficiently address the current vegetation problems on a landscape level and adequately meet the Purpose and Need.
- Smaller openings spread across the landscape would fragment large blocks of interior forest habitat and would not help to promote historic patch sizes.
- Visual resource impacts of smaller openings over a more extensive area can be greater than large openings of similar structure.
- Smaller openings would not effectively reduce the fuel loading to a scale that could provide fuelbreaks at the landscape level.
- Many stands proposed for regeneration harvest are experiencing high mortality, and are expected to continue with this level of mortality in the future. From a hydrologic standpoint, many of the stands will be openings within the next 10 years.

For these reasons the alternative was eliminated from detail study.

2.51c Extensive Roading

The interdisciplinary team considered an alternative that would have extensively roaded the project area. This alternative was dropped from further consideration primarily due to the potential impacts to the visual resources of the project area, as there would be difficulty in roading sidehills while still meeting visual quality objectives. Other considerations included impacts to aquatics. A map displaying the proposed roading under this alternative can be found in the project file.

2.51d Rehabilitate the Ecosystem Without A Commercial Logging Operation

Comments were received requesting the team consider alternatives that would rehabilitate the ecosystem and implement restoration projects without commercial logging. The following are the suggested alternatives that were considered. Reasons for dismissal follow.

1. Treat The Vegetation Without Commercial Logging:

Prescribed Burning Only – This alternative was considered after receiving comments saying that the DEIS rejected burning as a way to deal with the problems created by continued fire suppression. Using prescribed burning as the primary tool would not be very effective at achieving the objectives of the purpose and need for most of the project area. Safe and controlled prescribed fires are planned in spring and fall when weather and moisture conditions help fire managers keep fire intensities and severities low. In stands where thinning is the objective, shady conditions and lack of continuous natural fuels would make burning in spring or fall difficult. Trees would not be thinned effectively with fire alone to achieve desired composition, cover, structure, and pattern. In order to get a fire to achieve the objectives of thinning in the shady stands, hotter and drier conditions would be necessary, and this would likely result in a lethal crown fire which would likely kill most of the trees.

In the areas where the objective is to regenerate the stand to desired species, using fire to accomplish objectives in those stands would require igniting the stands in hot and dry conditions to produce a lethal fire that would kill enough of the trees and brush and create the openings needed for regenerating desired species. Such conditions would cause too great a risk of consuming more than just the trees in the areas proposed for regeneration and risk loss of control so close to private lands (see fire effects discussion "How Easily An Unwanted Fire Could Be Suppressed").

Therefore, because of the risk to resources and adjacent private property, none of the stands would be treated if prescribed fire were the only tool to be used. In addition, funding to reduce existing and potential sediment risks could be difficult to obtain because this watershed is not considered high priority for watershed restoration work (see Chapter III, Watershed and Fisheries section). For these reasons, this alternative was dropped from further consideration and was eliminated from further study.

Use Of Stand-Replacing (Lethal) Fire To Achieve Objectives – This alternative was considered as a result of receiving comments asking why lethal fire couldn't be used to achieve the same objectives as regeneration harvest. Although a lethal fire would achieve some objectives for stands in which we wish to reestablish desired species, it would not be as effective an approach at meeting the objectives of the purpose and need for the following reasons:

⇒ Allowing a lethal fire to burn so close to private lands would be socially unacceptable to nearby landowners due to risk of escape.

⇒ The severity of the fire could potentially exacerbate sediment problems by removing vegetation in riparian areas, and removing duff and humus layers from the soil. It could also potentially contribute more sediment from existing roads. These conditions would likely violate INFS standards for fire/fuels management as stated in FM-1 (see Appendix B, p.4), and forest plan standards for meeting state and Federal water quality requirements (USDA 1987 p. II-33).

⇒ A lethal fire would not improve the species composition through natural reseeding due to a declining seed source from desired seral species. Planting would still be necessary to provide the mix of species desired. Without it, shade tolerant species such as Douglas-fir and grand fir would continue to dominate.

⇒ A lethal fire would likely kill most of the trees potentially including moist riparian stands. It would therefore not provide the structural diversity, mosaic patterns, and wildlife habitat diversity desired. It would also waste usable and highly demanded wood fiber that could be sold as a by-product of achieving our ecosystem objectives. The microwave sites and powerline corridor would also likely be damaged.

⇒ This alternative would not be consistent with Forest Plan goals 8, 18, 19, 22 and 23 (see Chapter I), nor would it meet Forest Plan standards for visual quality (FP, page II-25), soil productivity (FP, page II-32), water quality (FP, page II-33), air quality (FP, page II-34), or fire management (FP, page II-38).

For these reasons, this alternative was eliminated from further study.

Treat the Vegetation With Non-commercial Thinning – This alternative was considered as a result of receiving comments asking us if objectives could be achieved only by thinning. After reviewing the stands proposed for treatment it was determined that, thinning would not be very effective at achieving the objectives for the larger-diameter stands that are proposed for treatment (see Vegetation Treatment Definitions in Chapter II). Non-commercial thinning is typically used for small diameter trees, which do not have much value as wood products. If we were to use non-commercial thinning as a method to treat the vegetation we would only treat two stands (stands 29 and 76), achieving only some of the objectives for wildlife habitat and vegetation. Thinning in larger diameter stands (selective harvest, in this case) is a technique used to promote the healthy growth and productivity of existing desired species by reducing competition from other trees for light, water and nutrients. Thinning stands with regeneration objectives would not be an appropriate treatment method because these stands are declining in growth and productivity due to age, disease and insect attack. Thinning these trees would only exacerbate the poor health and growth of these stands, would not achieve our objectives, and would not comply with Forest Plan Goal 24 (see Chapter I).

Although thinning could be done in dense stands with larger diameter trees, leaving the cut trees on the ground would create an unacceptably high fuel loading over the long-run that would increase the risk of a severe and intense lethal fire. This would not meet the project's purpose and need to reduce the risk of destructive wildfire around the microwave sites. It would also not comply with Forest Plan standards to "protect property from wildfire" (USDA 1987, p. II-38) and "reduce impacts from burning to air quality by encouraging the use of forest products to reduce biomass" (USDA 1987 p. II-34). A commercial timber sale would provide a tool to safely and effectively reduce the biomass on site prior to treatment with prescribed fire, reduce the extra fuel loading, sell the commercially valuable wood, and recover monies to accomplish sediment risk reduction activities.

For these reasons, this alternative was eliminated from further study.

2. Accomplish Only Watershed Restoration Or Road Obliteration Work

This alternative was considered after receiving comments that we should consider accomplishing only the watershed restoration and road obliteration work. Such an alternative would only accomplish 1 out of the 5 objectives of our purpose and need (reducing existing and potential sediment risks to Cocolalla Creek). Without a timber sale it is uncertain whether we would receive funding for these activities based on budget projections, and because this watershed is not considered high priority for watershed restoration work (see Chapter III, Watershed and Fisheries section). For these reasons, this alternative was eliminated from further study.

2.6 Comparison of Alternatives

Table 4 presents a comparison of alternatives focusing on the key and analysis issues for this project. These issuesare compared between alternatives using quantitative or qualitative analysis indicators.

Table 4. Comparison of Alternatives by Issue Indicator

Issue Indicator - Vegetation	Alternative A		Alternative B		Alternative C
EFFECTS OF PROJECT ACTIVITIES ON FOREST VEGETATION **Vegetation Structure**	**Acres**	**Percent Change**	**Acres**	**Percent Change**	**Acres/Percent**
Early Succession	491	+13	718	+24	Values are the same as Alternative B
Immature Forest	1419	-12	1243	-21	
Mature Forest	229	-1	178	-3	
Old Growth	0	0	0	0	
Total	2139		2139		
Cover Type Douglas-fir	1596	0	1025	-27	Values are the same as Alternative B
Grand fir/Hemlock	135	0	135	0	
Western Larch	95	0	123	+2	
Cedar	190	0	190	0	
Ponderosa pine	0	0	291	+14	
No trees	0	0	0	0	
Lodgepole pine	25	0	25	0	
White pine	98	0	350	+11	
Total	2139		2139		
Changes in patch size, weighted edge density, and mean core area	Mean patch size, weighted edge density and mean core area of the early succession stage would increase, while those same features of immature and mature stages would decrease.		Mean patch size, weighted edge density and mean core areas of early succession stage would increase while reducing those related to immature and mature stages. The trend to larger mean patch size for the early succession stage is a trend toward the historic range.		Same as Alternative B

Issue Indicator – TES Plants	Alternative A	Alternative B	Alternative C
EFFECTS OF PROJECT ACTIVITIES ON THREATENED, ENDANGERED, SENSITIVE PLANTS Relative amount of canopy opening and ground disturbance in and next to known plant populations or suitable habitat.	No impacts to any TES or Forest species of concern or suitable habitat.	All highly suitable wet forest habitats would be buffered. Undetected individual moonwarts could be impacted; however, these impacts would not lead to the listing or loss of population or species viability.	Same as Alternative B with regards to canopy opening but slightly less risk of impacts with less ground disturbance due to lack of road construction.

Issue Indicator – Noxious Weeds	Alternative A	Alternative B	Alternative C
RISK OF PROJECT ACTIVITIES ON THE SPREAD OF EXISTING NOXIOUS WEED POPULATIONS AND INTRODUCTION OF NEW WEED INVADERS Relative amount of ground disturbance	No change in the risk or rate of weed spread.	There is a risk of weed spread from ground-disturbing activities. The risk of introduction and establishment of new weed invaders to the project area is expected to be low. Prescribed fire and road construction may increase the spread of goatweed and spotted knapweed (both considered naturalized in the watershed) following treatment activities.	Similar to Alternative B but slightly less risk of weed spread because no new roads would be constructed
Amount of canopy removal	No canopy removal.	Oxeye daisy has a low to moderate potential for spread.	Same as Alternative B

Issue Indicator – Fire and Fuels	Alternative A	Alternative B	Alternative C
EFFECTS OF VEGETATION PRESCRIPTIONS ON RISK OF A DESTRUCTIVE FIRE AROUND THE MICROWAVE SITES AND POWERLINES Reduce potential for destructive crown fire as measured by flame lengths and fire intensity	Fuel configurations would change over time, which would increase the amount of available fuel and lead to more destructive fires with higher intensities. This increase would put the microwave towers and powerlines at a higher risk of burning.	This alternative would reduce the ladder fuels, flame lengths, and fire intensities which would effectively reduce the potential for crown fires within treated areas.	Same as Alternative B
Ability to suppression an unwanted fire as measured by flame length and fire intensity	Flame length – over 8 feet Fire intensity – just under 600 BTUs/foot/second Given this situation fire activity is unpredictable and heavy equipment would be required to fight any fires ignited within the area.	Flame length – less than 2 feet Fire intensity - less than 20 BTUs/foot/second Given this situation hand crews can be effective on fires of this nature. The risk of a crown fire would be reduced.	Same as Alternative B
Acres of the project area where fuels have been treated and their proximity to the microwave site.	None	772 acres underburned 256 acres grapple piled 194 acres limb and lop tops 9 acres yard tops All treatments are to be accomplished over a large contiguous area around the microwave towers.	777 acres underburned 222 acres grapple piled 223 acres limb and lop tops 9 acres yard tops All treatments are to be accomplished over a large contiguous area around the microwave towers

Issue Indicator – Air Quality	Alternative A	Alternative B	Alternative C
Effects of prescribed burning on air quality Production of particulate matter from smoke emissions	In a simulated wildfire situation the total PM_{10} and $PM_{2.5}$ emissions would generate over 395 tons per year.	This alternative would generate roughly 200 tons of PM_{10} and $PM_{2.5}$ emissions per project. However, given the 3-5 year time frame for fuel activities the annual expected air emissions would be 40-70 tons per project per year.	Same as Alternative B

Issue Indicator - Wildlife	Alternative A	Alternative B	Alternative C
CHANGES IN WILDLIFE HABITAT <u>Goshawk</u> – trend toward suitable nesting habitat conditions	Would not trend toward suitable nesting habitat conditions.	Would begin trending toward suitable nesting habitat conditions.	Same as Alternative B
<u>Flammulated owl</u> – trend toward suitable habitat conditions	Would not trend toward suitable habitat conditions.	Would begin trending toward suitable habitat conditions.	Same as Alternative B
<u>Blackbacked woodpecker</u> – changes in distribution and quality of snag habitat	Increase long-term snag densities and provide nesting/foraging opportunities.	Would increase the occurrence of large snags to longer-lived tree species over the long-term. Short-term reduction in availability of snag habitat for both foraging and nesting.	Same as Alternative B
<u>Pileated woodpecker</u> – changes to suitable nesting habitat	Snag production would shift away from the larger, longer-lived species, affecting the long-term stability and persistence of large snag habitat.	Short-term reduction in habitat quantity, converting tree species composition to longer-lived species, which would encourage the persistence and sustainability of large snag habitat over the long-term.	Same as Alternative B

Issue Indicator - Aquatics	Alternative A	Alternative B	Alternative C
CHANGES IN SEDIMENT ENTERING COCOLALLA CREEK Total estimated sediment delivery	7.9 tons per year	3.3 tons per year initially (Road work and decommissioning would reduce this value over time to the same as Alternative C)	3.1 tons per year

Issue Indicator – Roads **EFFECTS OF ROAD MANAGEMENT, CONSTRUCTION AND ROAD WORK ON SEDIMENT DELIVERY TO STREAMS, AWUATIC HABITAT, WILDLIFE HABITAT, AND NOXIOUS WEED SPREAD**	**Alternative A - No Action**			**Alternative B - Proposed Action**			**Alternative C - No new roads**		
	Unclassified	**Classified**	**Total**	**Unclassified**	**Classified**	**Total**	**Unclassified**	**Classified**	**Total**
Miles of roadwork	0	0	**0**	0.7	12.8	**13.5**	0.7	12.8	**13.5**
Miles of temporary roads constructed and decommissioned	0	0	**0**		5.4	**5.4**	0	0	**0**
Miles of existing open (drivable) road*	0.4	8.0	**8.4**	0	8.0	**8.0**	0	8.0	**8.0**
Miles of existing non-drivable roads	0.3	4.8	**5.1**	0	4.8	**4.8**	0	4.8	**4.8**
Miles of existing road decommissioned	0	0	**0**	0.7		**0.7**	0.7		**0.7**
Miles of existing road put in storage	0	0	**0**		0.8	**0.8**		0.8	**0.8**
Net change in road access	0	0	**0**	-0.4	0	**-0.4**	-0.4	0	**-0.4**

*does not include roads open to ATVs

Issue Indicator – Visual Quality	Alternative A	Alternative B	Alternative C
EFFECTS OF VEGETATION PRESCRIPTIONS ON VISUAL QUALITY Evaluation of alternatives to determine whether activities proposed under the action alternatives would achieve visual quality objectives	No change to the existing condition	Assigned Visual Quality Objectives would be met. The visual quality objective of the existing clearcut on the northwest side of Little Blacktail Mountain would begin moving toward the assigned Forest Plan objective.	Same as Alternative B

Issue Indicator – Finances	Alternative A	Alternative B	Alternative C
EFFECTS OF PROJECT ACTIVITIES ON FINANCES Predicted high bid rate per hundred cubic feet	0	$70.81/ccf	$49.73/ccf
Predicted high bid values	0	$793,072	$556,976

CHAPTER III – Affected Environment and Environmental Consequences

3.1 Introduction

This chapter presents two levels of analysis for each resource issue described: the existing conditions within each resource's affected environment, and the potential effects of the alternatives on each resource. The Affected Environment section provides general information about the resource described and establishes a baseline against which effects of the alternatives may be compared. The Environmental Consequences section discloses the potential direct, indirect, and cumulative effects of the alternatives on each resource.

In this analysis, direct and indirect effects are described for those activities that are proposed to occur on National Forest lands. Cumulative effects consider the effects of past, present and reasonably foreseeable activities of both Federal and non-Federal, in addition to the direct and indirect effect of proposed project activities. Each resource analyzed has a defined cumulative effects analysis area, which may be different for each resource.

3.2 Forest Health and Productivity

3.21 Forest Vegetation - Affected Environment

3.21a Regulatory Framework

Regulatory constraints applying to the management of timber resources include the State Forest Practices Acts, Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), National Forest Management Act of 1976 (NFMA), Idaho Panhandle National Forests Forest Plan (USDA 1987) and Forest Service policy. More specific regulations and details from these are located in Appendix D.

3.21b Methodology

Existing and historic vegetation conditions for the project area were determined using aerial photos, stand exam data, field surveys, historic information, the Interior Columbia Basin Ecosystem Management Project (ICBEMP) Scientific Assessment (Quigley and Arbelbide 1997) and data from the Pend Oreille Geographic Assessment (USDA draft in progress). Vegetation conditions on private lands have been obtained from aerial photos, historical records, the Cocolalla Lake Watershed Management Plan (Gilmore 1996), and personal knowledge.

Vegetation components used in this analysis include forest structure, species composition, and vegetation pattern. The project area serves as the analysis area for all effects analyses disclosed in the Environmental Consequences section. See that section for further rationale on how the analysis area boundaries were defined.

3.21c Characterization of the Coniferous Vegetation

The following sections provide an ecological overview of forest conifer conditions at the very large landscape scale of the Interior Columbia Basin, and step down through several geographic levels to conditions at the scale of the Little Blacktail Project area. As the geographic areas get smaller, the ecological information gets more specific.

1. Columbia River Basin

Recent findings presented in the ICBEMP Scientific Assessment show that, throughout the Interior Columbia Basin, disturbances such as fire and insect mortality have played an important role in determining forest tree composition. Within northern Idaho and eastern Washington, the most significant historic natural disturbance was fire. In addition to natural disturbance, the Assessment found that land management activities and introduced pathogens have dramatically altered the species and age composition of trees in the overstory.

Historically, coniferous tree composition in the Interior Columbia Basin was dominated by ponderosa pine, western larch, and western white pine. These long-lived tree species were typically established after some form of disturbance and have the potential to occupy a site for 200-300 years. Many of the local disturbances not only initiated these long-lived species, but also maintained them in mature conditions. Stands of these trees were adapted to regenerate in and survive local fire regimes. Other disturbances such as historic levels of insect populations, along with wind and winter storm damage, contributed to stand mortality. As trees died they became fuel wood and over time created conditions for large stand-replacing fires.

Effective fire suppression, the loss of white pine due to the introduced blister rust pathogen, and land management activities such as logging, have caused the character of the forests to change. Forests across the Interior Columbia Basin are now dominated by shade-tolerant grand fir, western hemlock, and Douglas-fir. These species are more vulnerable to disturbances such as insects, diseases, and fires. They are less adapted to fire, drought, and natural climatic variability than the species they replaced. The results are more insect and disease activity and higher fire risk.

2. Northern Region Overview

The Northern Region Overview (USDA 1998) focused on priorities for restoring ecosystem health and availability of recreation opportunities. The assessment describes changes in coniferous vegetation:

> *"In northern Idaho and moist portions of western Montana, Douglas-fir was largely an early succession species that regenerated well after wildfire in various mixes with white pine and larch, but then was largely eliminated by root diseases and bark beetles after 100-140 years, giving way to pine and larch. In the absence of white pine and larch, we have experienced an increase in Douglas-fir during early succession, and an apparent increase in root disease inoculum levels as succession proceeds. This condition, with ladder fuels, promotes and increases risk of stand-replacement fire."*

The Northern Region Assessment further states:

> *"The most significant societal and ecological risk is associated with fire; particularly where ladder fuels exist or are developing near or adjacent to urban interface locations."*

The overview considered and incorporates findings from the Interior Columbia River Basin Assessment and Northern Great Plains assessments. The Northern Region Overview is also consistent with the findings of the Geographic Assessment in progress for the three northern subbasin ecosystems, as discussed below.

3. Pend Oreille Subbasin Geographic Assessment

Because of the local variation in landscape change throughout the Columbia Basin, the Idaho Panhandle National Forests are in the process of completing a Geographic Assessment for the three northern subbasin ecosystems. The data for this assessment compare historic and current ecological, social, and economic conditions of the Pend Oreille subbasin. The assessment also identifies ecosystem trends and changes in vegetation over the last 100-200 years. Findings of the geographic assessment are similar to those in the Northern Region and Interior Columbia Basin Assessments, but provide more specific information on lands within the Pend Oreille Subbasin Ecosystem. Although the geographic assessment is still in draft form, data that have been compiled for the assessment are used throughout this chapter to compare with the project area. Tables, graphs, and characterizations that have been assembled during that analysis are referenced as "USDA draft in progress."

Terrestrial analysis data for the North Zone Geographic Assessment indicate that the proposed treatment areas are considered to be a high priority for vegetation restoration of desired long-lived species. A copy of the "Pend Oreille Terrestrial Strategy Zones" map displaying the priority areas is included in the project file.

4. Little Blacktail Analysis

This analysis is a step down from the Geographic Assessment and provides a scientifically based understanding of the ecological processes and interactions occurring within the Little Blacktail area, which is part of the Cocolalla Creek watershed.

Regarding vegetation disturbance processes, findings of the Pend Oreille Subbasin Geographic Assessment and the Little Blacktail Analysis are similar to more broad-scale conclusions found at the Columbia Basin and Northern Region, scales with some exceptions. In summary, these findings are as follows:

For the past 90 years, the general landscape structure of vegetation in the Little Blacktail project area appears to have been in the early succession and immature forest stages of stand development, primarily due to repeated large-scale fires occurring in 1910 and logging of residual timber after this fire. The landscape was composed primarily of shrub/seedling/sapling (0-5 inch diameter) size timber from 1910 to the 1930s, and pole size (5-9 inch diameter) trees in the 1950s. Since the 1950s, the majority of the landscape has progressed toward the immature sizes of 9-21 inches in diameter.

In order to maintain healthy, sustainable ecosystems, it is imperative to have species and forest structures that are adapted to disturbances such as insect and disease, fire and climatic variability. This is consistent with the findings of the ICBEMP, Northern Region Assessment, and the Geographical Assessments recently conducted in northern Idaho. Findings in these assessments suggest converting species that are shade-tolerant, but drought-and fire-susceptible to species that require more sunlight and are more adapted to drought and fire. This species shift would better represent the historic species mix. This would be accomplished through regeneration harvests, harvest of overstocked stands, and making use of natural tree mortality. Major concentrations of natural disturbances (insects, pathogens, weather events, fire) are recommended to be used as opportunities for vegetation restoration.

Findings of the ICBEMP and the Geographic Assessment also indicate that there is an increased risk of stand-replacement fires on dry habitat type groups due to fuel accumulations from fire exclusion. Most of the fuels are in the form of green trees within overstocked stands, where undergrowth provides fuel ladders and increases crown density, both of which increase the risk of crown fire.

5. Disturbance Processes

Disturbance is a key process for change in vegetation on the landscape. Disturbance can be either natural (e.g. wind storms, wild fire, insect mortality, ice damage) or human caused (e.g. prescribed fire, timber harvest).

Fire

Fire is the major natural disturbance event that produces vegetation changes in north Idaho ecosystems. Fire has burned in every ecosystem and virtually every square meter of the coniferous forests of northern Idaho and eastern Washington. Fire was the principle agent for the widespread occurrence and even existence of western larch, lodgepole pine, western white pine, and whitebark pine. Fire maintains ponderosa pine throughout its range at the lower elevations and kills ever-invading Douglas-fir and grand fir (Smith and Fischer 1997, Spurr and Barnes 1980). More details on the effects of fire on forest vegetation are described in the Fire and Fuels section.

Insects And Disease

Many insects and diseases are found in the Little Blacktail project area and most exist at endemic (native) levels. White pine blister rust, an exotic pathogen introduced to North America around 1910, and several native root diseases are currently beyond their historic levels. These diseases have had a significant effect on the vegetation for the past 80 years.

Based on historic vegetation inventories around the turn of the century, many of our moist habitat types had a forest composition of nearly 40 percent white pine (Zack 1999). Today the landscape contains very little of this species due to mortality from blister rust. Douglas-fir has taken up much of the growing space originally occupied by white pine. The increase of Douglas-fir has caused an increase in root disease, with Douglas-fir being more susceptible than other tree species to mortality from root disease agents. The high rate of mortality in many Douglas-fir dominated stands has changed and is changing the structure of these stands rapidly from immature and mature trees to brush and Douglas-fir/grand fir seedling stands. Long-term monitoring in similar stands indicate a 4-5% annual rate of mortality from root disease (Hagle 2000). Douglas-fir beetle activity is also very high at the present time. All this mortality is creating stands with high amounts of dead wood, brush, and young Douglas-fir trees that are reinfected with root disease and die. These conditions historically were not known to occur over large landscapes in the Idaho Panhandle National Forests.

The high incidence of root disease and insect mortality is leading to a great loss of timber productivity in the Little Blacktail area. As trees succumb to root disease and beetle kills, the ability to salvage the trees for lumber is difficult because they rot fairly quickly. For the same reasons, snag habitat is also decreased, especially with the decline in longer-lived species that produce larger, longer-standing snags (see the Wildlife section).

Native American Influences

It is probable that Native Americans used fire in forested areas to clear camp and travel areas and to create better forage for horses and wildlife, but there are no historic data for the project area. These fires were frequently set and commonly resulted in low-intensity fires that covered large areas much like the Little Blacktail project area. At higher elevations, topography, fuel moisture and fuel types would influence mixed-severity fires with some creeping underburns and some crowning that would kill small groups of trees. In dry years, fires likely caused mortality over extensive areas.

Euro-Settlement Influence

Homesteading and Railroading - Early records show there were no homesteads within the Little Blacktail project area. Most homesteading outside the Little Blacktail project area (T55N, R2W) began with the development of the railroad and continued after the fires of 1910. By 1925, 25 homesteads were known to exist within this area.

In the early settlement times, a relatively high density of roading took place on the homesteaded and granted lands (a 1912 map shows approximately 24 miles of road in a roughly 16 square mile area). The construction of the Northern Pacific Railroad in 1881 resulted in the opening of "tie roads" for access to timber suitable for hand hewn railroad tie making. The present railroad gave rise to small communities (Granite, Careywood, and Cocolalla). The existence of early roads made it more attractive and easier for early homesteaders to locate potential homesteads. There is no evidence that tie cutting took place within the Little Blacktail project area.

Milling - An early sawmill connected to the Northern Pacific Railroad and located in the NE ¼ of Section 7 T54N, R2W, reportedly was harvesting timber prior to the 1910 fire season. The same source (Sandberg, personal communication) stated that the operation left the area because of the fires. The logging may have been strictly on private land.

Other Activities – A lookout tower was built on the top of Little Blacktail Mountain in 1935. A road to the lookout is very noticeable on the 1935 aerial photograph. This road still exists to the top of the mountain; however, the lookout tower is now gone. Presently, four microwave communication facilities occupy sites at the top of Little Blacktail Mountain. Forest Service trails were constructed in the project area to access the land for fire control. Today there is a north/south trail system that extends from Talache to Bayview.

National Forest Timber Harvest - In the early days of Forest Service management, timber sales in the Little Blacktail project area were few. Available timber sale records indicate that only three small timber sales were sold between 1922 and 1935. There was very little merchantable timber to sell due to the fire of 1910. Based on the remaining stands we see today, these sales were likely some type of selective harvest, probably logging only trees of high value. In the period of 1965 through 1971 a salvage sale took place over approximately 275 acres. During that same time a regeneration harvest was done on a piece of private land, which was later acquired by the Forest Service. Between 1989 and 1990, the Blacktail Timber Sale harvested timber primarily through regeneration harvest. Following timber harvest, site preparation and planting of white pine and western larch occurred. In 1992 the Blacktail Salvage Sale selectively cut dead and dying timber over approximately 300 acres (see Table 5 below and Figure 7 in Appendix M)

Unlike other areas in the Interior Columbia Basin and the Pend Oreille subbasin, logging of long-lived serals such as white pine and larch has not been a major contributing factor to the decline of these species in the Little Blacktail project area. The exclusion of fire, the introduction of blister rust, and the increase in shade- tolerant species are the primary contributing factors.

Table 5. National Forest timber sales in Little Blacktail project area.

Year(s)	Timber Sale Name	Type of Harvest	Acres	Current Stand Structure
1922	Tilton Bros.- purchaser	Probably Selective	<20	Mature
1924	Walter Phillips purchaser	Probably Selective	50	Mature
1935	R. E. DeMarce purchaser	Probably Selective	<20	Mature
1965-1971	Cocolalla Creek Salvage and acquired lands	Selective Regeneration	276 63	Immature with some mature Early succession with some Immature
1989-1990	Blacktail	Regeneration Selective	166 21	Early Succession Early Succession
1992	Blacktail Salvage	Selective	304	Immature

3.21d Reference and Current Conditions

1. Habitat Type Groups

Forest vegetation in northern Idaho and in the Little Blacktail area is shaped by several complex physical and environmental factors. To simplify the measurement of some of these physical and environmental factors, a classification system called habitat typing is used. Habitat types are based on natural relationships and reflect ecological patterns and the capability of vegetation on a site.

The designation of habitat types and the classification of forest stands were established to characterize vegetation based on potential climax conditions. Climax conditions represent the culmination of overstory and understory plant succession without disturbance. Because climax species, by definition, are those species that are self-perpetuating in the absence of disturbance, and because natural disturbances are relatively common on most sites, the occurrence of climax conditions is rare (Cooper et al. 1987).

Information on habitat groups is derived from Fire Ecology of the Forest Habitat Types of Northern Idaho (Smith and Fischer 1997) and Biophysical Classification – Habitat Groups and Descriptions (R-1 Landscape Ecology Peer Group, July 1997).

Although every habitat type is unique in some way, they can be grouped based on similarities in natural disturbance regimes, successional patterns, and structural characteristics of mature stands. In an effort to categorize vegetation responses to disturbance (primarily fires), and to describe potential forest cover types capable of dominating these sites, habitat types in the Pend Oreille Subbasin have been aggregated into four habitat type groups: dry, moist, cool/moist and cold/dry. Of the four habitat type groups, two are found in the project area: dry and moist.

Dry Habitat Type Group **–** These forest types account for 27% of the Little Blacktail project area. The dominant forest vegetation in this group consists primarily of Douglas-fir, ponderosa pine and western larch. Very dry sites are often dominated by large, old ponderosa pine or Douglas-fir, with canopy cover often less than 30 percent and seldom reaching 50 percent. Grasses and low shrubs dominate the understory and are maintained by low-severity fires at intervals of 15-20 years. Downed woody fuels consist of widely scattered, large trees, twigs, branches, and cones; often the most abundant surface fuel is cured grass. Before the 20th century, these sites were characterized by frequent underburns that eliminated most tree regeneration, thinned young stands, and perpetuated open stands dominated mainly by ponderosa pine. Occurrence of these stands in extreme north Idaho has been limited, due in large part to a moderate moisture regime atypical of most of the interior west.

The more common moderately dry forests are also often open-canopied, although canopy cover often exceeds 50 percent. Ponderosa pine and Douglas-fir dominate the overstory, with western larch as a co-dominant on moister sites. The species composition and structure of moderately dry forests is dependent largely on the frequency and severity of fires. Drier forests within this group typically experienced succession dominated by ponderosa pine and Douglas-fir. Historically, low-severity fires at intervals of less than 50 years maintained stands with high, open canopies dominated by ponderosa pine.

Very long fire-free intervals have produced mature stands with few ponderosa pines or western larch. While large Douglas-fir can survive low-intensity fires, the dense understory and ladder fuels resulting from absence of fire increase the potential for lethal, or stand-replacing, fires. Moister forests within this group historically burned frequently enough to maintain a structure dominated by ponderosa pine and larch. Where fire has been excluded for a very long time, ponderosa pine and larch have gradually declined, with Douglas-fir persisting in the overstory.

In the old growth stage of stand succession, ponderosa pine, Douglas-fir and western larch stands are usually single-storied and open-canopied and have a low to moderate likelihood of occurrence of large down wood (Green et al. 1992). Old growth of this type historically was maintained by frequent, low-intensity disturbance.

The Little Blacktail project area is located within the Purcell Trench of the Pend Oreille Subbasin. Of the five ecological zones in the subbasin, the Purcell Trench zone has a highest percentage of dry habitat type (36%). Comparatively, the Little Blacktail project area has a significantly higher percentage of dry habitats (27%) than the average of the Pend Oreille Subbasin at (16%), but a lower percentage compared to the Purcell Trench (table 6).

Moist Habitat Type Group **-** These forest types account for 73% of the Little Blacktail project area. They consist primarily of western red cedar, western hemlock, western larch, grand fir, western white pine, and lodgepole pine. These are the most common forest types found on mid-elevation sites in the mountains of north Idaho. Prior to the introduction of blister rust, when white pine was a dominant species, over 40% of these areas were dominated by white pine, and the area was known as the "white pine type." Today, only two percent of the entire Pend Oreille subbasin is classified as a western white pine forest type.

Large stand-replacement fire intervals range widely from 50 years on the drier types to over 200 years on the more moist types. Typically, lower-severity fires are minor ground fires that create a mosaic within a stand or mixed-severity fires that create a larger landscape mosaic. These often occur two to three times as often as large stand-replacement fires. Large stand-replacement fires are the dominant disturbance mechanism for these larger landscapes. The large lethal fires often provide fuel for a reburn a few decades later; double and triple burns were once common on these landscapes, and lack of a seed source after multiple burns may delay regeneration. In some landscape positions, large old larch may persist through multiple disturbances and an occasional other species may also survive multiple disturbances on sheltered and moist micro-sites.

Table 6. Comparison of habitat type groups between Little Blacktail Area, and the Pend Oreille Subbasin.

Area	Dry	Moist	Cool/Moist	Cold/Dry	Rock/Scree/ Grass
Pend Oreille Subbasin	16%	52%	15%	10%	7%
Purcell Trench	36%	56%	.4%	.2%	7.3%
Little Blacktail Area	27%	73%	0%	0%	0%

2. Forest Cover Type, Structure, and Pattern

Reference and current conditions in forest cover type (species composition) and structure were evaluated by comparing historic information from several historic inventories (IPNF 1998) and current information from the Idaho Panhandle National Forests Timber Stand Management Record System data base. Tables 7 and 8 and figure 8 below represent this comparison for the entire Pend Oreille subbasin and the Little Blacktail project area. Supporting data for the tables and graphs are provided in the project file.

Forest Cover Types (existing dominant trees)

Historically, coniferous vegetation composition in the Little Blacktail project area consisted of more of the ponderosa pine, western larch and western white pine cover types than exist today (figures 8 and 9, and table 7). Tables depicting cover types in dry and moist habitat types are shown in Appendix D.

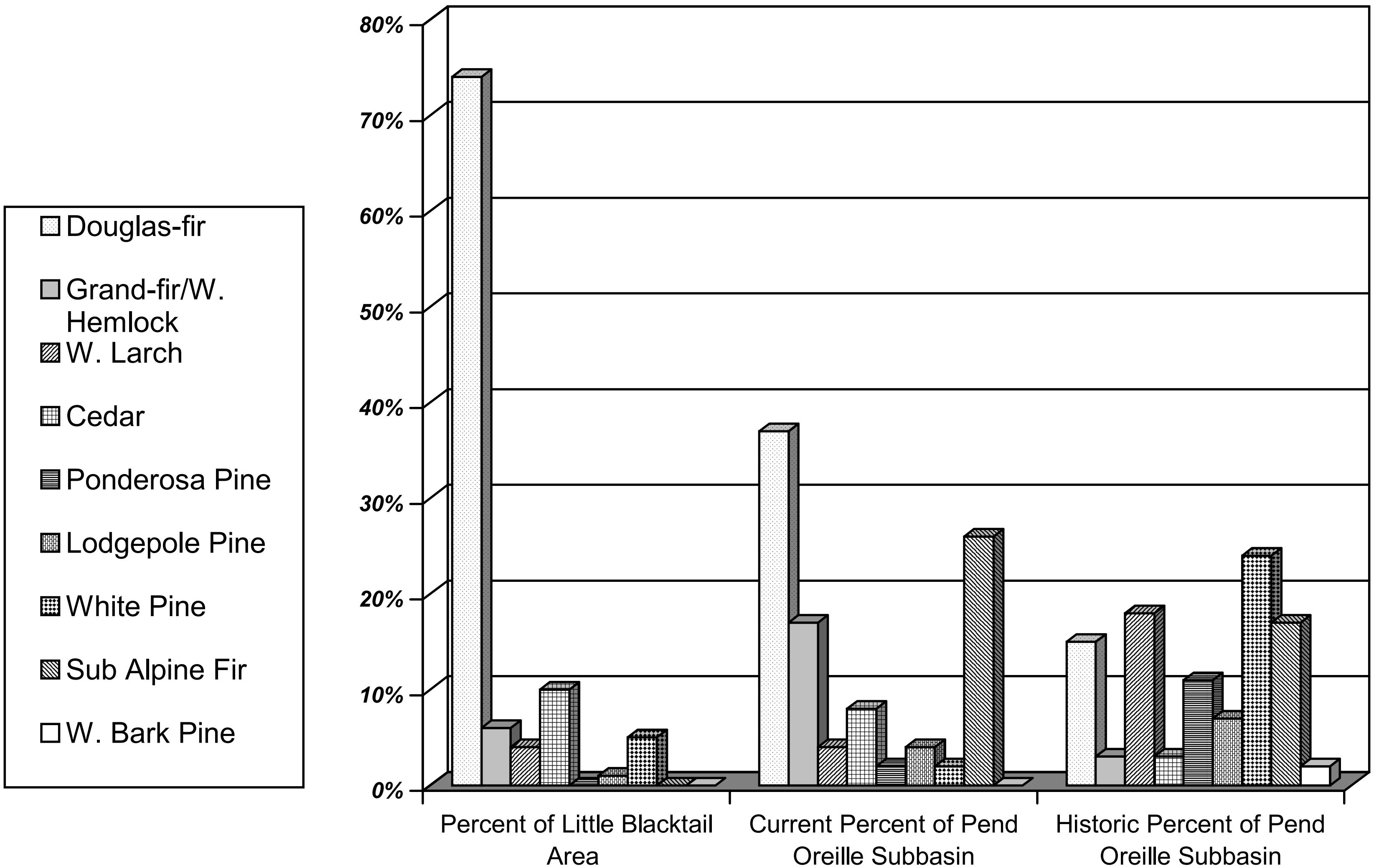

Figure 8. Percent of forest cover types in the Little Blacktail Project area as compared to current and historic cover types in the Pend Oreille Subbasin.

Table 7. Acres and percent of forest cover types in the Little Blacktail project area as compared to current and historic levels across the Pend Oreille Subbasin.

Conifer Species—Forest Cover Type	*Existing Acres Little Blacktail Area	*Percent of Little Blacktail Area	Current Percent of Pend Oreille Subbasin*	Historic Percent of Pend Oreille Subbasin*
Douglas-fir	1,596	75%	37%	15%
Grand-fir/W. Hemlock	135	6%	17%	3%
W. Larch	95	4%	4%	18%
Cedar	190	9%	8%	3%
Ponderosa Pine	0	0%	2%	11%
No Trees	0	<1%	No data	No data
Lodgepole Pine	25	1%	4%	7%
White Pine	98	5%	2%	24%
Sub Alpine Fir	0	0%	26%	17%
W. Bark Pine	0	0%	<.2%	2%
Total	2,139	100%	100%	100%

*Calculated on National Forest lands only

Aspen - Aspen communities tend to occur as scattered patches in an otherwise conifer-dominated landscape. Although widely distributed, aspen stands represent a very small percentage of forested areas. They are a valuable component of biodiversity, providing desirable habitat for a variety of wildlife species. In the Northern Region, about 50 to 70 percent of aspen has been lost as a result of fire suppression and grazing by ungulates (livestock and other hoofed mammals) (USDA 1998, pp. 14-15). Currently, aspen in the Little Blacktail project area are only found in small, scattered inclusions throughout the coniferous forest. Aspen historically have been an early species maintained and regenerated through periodic fires (USDA 1998, pp. 14-15). Aspen are declining in much of their historic range as fire regimes have been dramatically altered (Clark and Sampson 1995). Considering the history of large fires in the Little Blacktail area and the lack of fire over the last 90 years, it is likely that aspen used to be more abundant on the landscape.

Forest Structure

In drier habitat types, historic short-interval underburning fires maintained many of the stand structures as large, open-grown ponderosa pine, western larch, and Douglas-fir. It is estimated that over 40 percent of these habitats consisted of these open grown mature and old growth structures, with lesser amounts in the early succession and immature forest structures.

In the moister habitat types, both white pine and western larch made up a high percentage of the species composition. Over large landscapes, approximately one quarter was in the early successional stage and less than one quarter was in the old growth stage of stand development. The remaining acreage was in the immature and mature stand structures because lethal stand-replacing and mixed-severity fires were common in moister habitat types. In many cases, the old growth existing today in the Pend Oreille Subbasin is different from old growth stands of the past. Large old white pine is no longer present, and western larch has been reduced significantly. Today, old growth stands on moist habitats are primarily cedar, hemlock, and grand fir stands.

Currently, the Little Blacktail project area has a skewed distribution of stand structures, relative to the historic subbasin, with immature forest structure being the most common (table 8 and figure 8). The majority of this immature forest is nearing the mature forest structure, and there are no old growth stands. Due to the shift from long-lived species such as western larch, ponderosa pine, and white pine, to the generally shorter-lived Douglas-fir (Zack 2000 and Rockwell 1917 p.66 and p.142) and lodgepole pine, much of the immature and mature forest structures will not reach old growth conditions with these species. Tables depicting structure in dry and moist habitat types are shown in Appendix D.

Landscape Pattern

Natural disturbances such as fires and disease have historically fragmented landscapes of northwest forests. The variability of frequency and severity of fires produced conditions in which some forests were dominated by small habitat patches while others were characterized by larger forest patches (Rochelle 1998).

Table 8. Acres and percent of forest vegetation structure.

Size	Age in Years	Structure	Acres in Little Blacktail	Percent of acres in Little Blacktail	Current Percent of Pend Oreille Subbasin*	Historic Percent of Pend Oreille Subbasin
0-5"		*Early Succession	211	10%	33%	37%
5-21"	<100	Immature Forest	1,679	79%	39%	23%
9-21+"	>100	Mature	249	11%	21%	21%
> 21"	All >150	Old growth	0	0%	7%	19%
Totals			2,139	100%	100%	100%

*includes non-forested areas, shrubs, seedlings and saplings

Historic fire regimes (large stand-replacing fires at long intervals with smaller fires in the interim) tended to create large areas of similar stand structure. Immediately following disturbance, shrubs and seedlings would dominate these large areas. As trees in these areas grew through the various structural stages, minor disturbances would alter stand structure on a smaller scale. Some watersheds would be composed mainly of old forest structural stage with "islands" of younger age classes where small-scale disturbances occurred. Other watersheds would consist mainly of younger age classes with "islands" of mature and old structural stages that survived the large stand-replacing fires.

Since the late 1800s, timber harvesting and fire suppression have replaced natural disturbance as the primary forces shaping forest landscapes. Perhaps the most important consequence of timber harvesting in northwest forests has been the significant reduction in amounts of old growth on private land and its high degree of fragmentation on federal lands. Mature/old forests and stands dominated by large trees have been identified by the Columbia River Basin Assessment as elements that have declined significantly from historic levels throughout the entire basin and across most habitat types (Quigley and Arbelbide 1997). Fire suppression over the last several decades is also altering natural disturbance patterns and is generally recognized to be "defragmenting" some northwest forests (Rochelle 1998).

In the Pend Oreille subbasin, there is much less variability in patch size, more edge and less core area on the landscape than under natural disturbance. Large areas of mature and old growth timber are lacking, although the total amount of mature forest hasn't changed much from historic levels. Mature forest now tends to occur in long narrow stringers with more edge. There are large areas of immature/medium-sized timber that resulted from the high-intensity stand-replacing fires in the early 1900s and the effects of fire suppression. These areas are homogeneous, single-aged, single-storied stands. Patch sizes of shrubs and seedlings appear to have suffered the greatest decrease as these areas have advanced successionally to immature/medium size classes with fire suppression. There is now less variability and more edge effect than under natural disturbance processes. Regeneration harvesting that has been done has been in small patch sizes, typically less than 40 acres.

> ***Landscape Pattern Definitions***
>
> ***Mean Patch Size*** *refers to the average size of a patch of that structural stage.*
>
> ***Mean Core Area*** *refers to the amount of a patch that is more than 250 feet from the edge of the patch. This is an indicator of how disturbance on the edge of a patch would affect the core of the patch. A long, narrow patch has less core area than a wider patch of the same acreage.*
>
> ***Weighted Edge Density*** *measures the amount of "edge" between structural stages within the landscape. A value of "0" would indicate that the landscape consists of one patch of the same structural stage. An increase in this value indicates an increase in the number of edges or an increase in the contrast of existing edges. For example, if a stand in mature forest structure is regeneration harvested next to old growth, the amount of edge remains the same, but the contrast of that edge has increased dramatically.*

As mentioned previously, the Little Blacktail area experienced large stand replacement fires in the early part of the 20th century. These fires and subsequent fire suppression have led to large patches of homogeneous structures consisting primarily of immature and medium sized trees. Patch sizes in the mature, old growth and seedling structures are very small. Little remains of historic dry-site old growth, which is, in part due to the elimination of low-intensity wildfires.

3.21e Conclusions

Based on a comparison of current and reference conditions, the following conclusions were made:

- Disturbance and forest succession processes have been altered since European settlement in North Idaho.
- With the introduction of blister rust and the suppression of wildfires**,** the character of the forest has changed. Across the project area there has been a substantial reduction in the percent of the landscape composed of long-lived tree species such as western white pine, ponderosa pine, and western larch, and an increase in Douglas-fir and grand fir. These latter species are more vulnerable to disturbances such as insects, diseases, and fires. They are less adapted to disturbance such as fire and to natural climatic variability than the species they replaced. The results are more insect and disease activity and higher fire risk. This decline in white pine, western larch and ponderosa pine has resulted in a forest that lacks variety in tree

species. Because these species are present in small quantities, in some areas not at all, they are less likely to reseed themselves through natural regeneration.

- Across the project area there has been a major shift in forest structure from early succession and old growth to immature size-class stands. This is primarily the result of the large stand-replacing fire of 1910 and subsequent fire suppression activities. There is no anticipated large-scale increase in old growth on much of the landscape due to the shift from long-lived tree species to Douglas-fir, which is a short-lived species in this area. Currently, no old growth stands exist in the Little Blacktail project area. A few stands have old trees that survived fires, but not in large enough quantity for old growth. This does not meet the goal of five percent distribution by old growth management unit as stated in the Forest Plan.

- Across the project area, landscape patterns have been modified by large stand-replacing fires prior to 1910 and by subsequent fire suppression activities with some timber harvest since 1910. Early succession patches are smaller in size than are normally found on the habitat types of this area.

- Across the project area, there is a high level of root disease and Douglas-fir beetle activity due to the increase of Douglas-fir in the project area and the size, density, and age of the Douglas-fir present. The ability to effectively and economically begin restoring these stands will become more difficult as mortality increases and species diversity continues to decrease. Silvicultural practices recommended by the Forest Plan to reduce the development of insect and disease problems would be beneficial to restoring forest vegetation in the watershed.

- Across the project area there is a long-term loss of timber productivity as species composition has changed from white pine, western larch, and ponderosa pine to Douglas fir. The loss of timber productivity does not meet the intent of the current Forest Plan.

- Across the project area there is an increased risk of severe stand-replacing fire on dry habitat type groups due to fuel accumulations from the exclusion of fires. In small, localized areas of past timber harvest, the risk of fire spread and fire severity has decreased as fuel loading has been reduced and breaks in fuel continuity have been created. However, timber harvests in the last 20 years have not created large enough breaks in fuel continuity at the project area scale to reduce the severity of a stand-replacing fire.

1. Recommendations

- Stands that currently have potentially long-lived species such as western larch and ponderosa pine should be thinned to retain these species. The potential exists to move these stands towards old growth structures.

- Selective cutting (thinning, shelterwood preparatory cutting and improvement cutting) is recommended in stands to retain healthy, windfirm trees of desired species for future seed and shelter.

- In stands where there is high mortality or risk of high mortality in the next 10 to 20 years, regenerate these stands to desired species of western white pine, western larch and ponderosa pine. This would trend early successional patch size and pattern toward historic ranges.
- Selectively sanitize stands by removing heavily mistletoe infected western larch in or adjacent to plantations of young healthy western larch. In the long term this would allow for growth of large diameter western larch.
- Salvage dead and dying trees before loss of value in a few stands where the need for snags and coarse woody debris is adequate.

3.22 Forest Vegetation - Environmental Consequences

3.22a Methodology

Refer to Appendix C for unit-by-unit descriptions of harvest prescriptions, logging systems and fuels treatments proposed under each alternative.

1. Analysis Process

Existing conditions of forest vegetation in the Little Blacktail Project Area are described in the Affected Environment section and provide a baseline of vegetation conditions to compare differences in environmental effects between alternatives. Since there are no differences in the amount and type of vegetation treatment proposed in Alternatives B and C, effects of each alternative are the same and are discussed together.

Direct and indirect effects of harvest activities were measured by analyzing changes to species composition, stand structure, and pattern. In addition, the analysis of all alternatives includes discussion on estimated changes to vegetation in the entire project area due to mortality from insects and disease, in areas both proposed and not proposed for treatment. The information used for landscape pattern analysis was developed using the FRAGSTATS model (McGarigal and Marks 1995) and was used to compare the alternatives to existing conditions. FRAGSTATS is a spatial pattern analysis program for quantifying landscape structure.

The time frame for the estimated direct and indirect effects analysis of all alternatives is 10 years. Some discussion refers to the general progression of structural stages over time, which could occur over a span of 200 years or more.

3.22b Cumulative Effects Analysis

Cumulative effects analysis includes disclosure of the potential additive effects of past, present and reasonably foreseeable activities combined with the effects of the proposed action on Federal and non-Federal lands. These activities and natural processes span a range of time including from the 1800s to several hundred years into the future. The cumulative effects analysis area boundary is defined by where the effects are no longer apparent. For the reasons discussed below, the cumulative effects analysis boundary is the same as the project area boundary.

Little Blacktail Project Area

Past activities and natural processes, which have created the existing vegetation conditions, are described in the Affected Environment section. One past activity that is not described there is the clearing of vegetation for the powerline right-of-way and the microwave sites. These activities have only affected three to five acres, converting and maintaining the forest structure on these sites to an early successional stage. Overall, these acres are not significant to the general ecosystem function of the forest vegetation.

The following ongoing and reasonably foreseeable activities in the project area are relevant to the forest vegetation analysis: firewood gathering, brushing and hazard tree removal along the powerline right-of-way and around the microwave sites; and other restoration projects consisting of riparian road obliteration and landing slash disposal, wildlife habitat burning, treatment of noxious weeds and timber stand improvement activities. Natural processes such as insect-and disease-induced mortality are also discussed as reasonably foreseeable influences on vegetation change.

Firewood Gathering - This activity has the potential to reduce coarse down woody material, snags, and fuel along open roads, but effects at the project area scale would be negligible.

Riparian Road Obliteration and Landing Slash Disposal - Restoration opportunities that may be accomplished by road obliteration would begin converting several acres of non-forest land on a slow trend toward becoming reforested. Grasses, forbs and shrubs would most likely initially revegetate these sites, with most sites seeing an eventual recovery to trees of various species depending on site, seed or seedling availability and soil productivity. Long-term effects for vegetation would be an increase in acres of forest vegetation.

Wildlife Habitat Burning on High Ridge Ecosystems - The effect of these activities would be to help maintain existing ponderosa pine and trend away from Douglas-fir dominance. These activities would also trend the stands toward more early succession stand development and provide larger patch size, less edge and more core area in the early succession stage.

Treatment of New Noxious Weed Invaders - Noxious weed treatment, as conducted under the guidelines established under the Sandpoint Ranger District Noxious Weed Control Project EIS (USDA 1998a), would have little effect on forest tree vegetation. Under the guidelines of the EIS, chemical treatments are used with restrictive protective measures to minimize damage to native vegetation.

Timber Stand Improvement - Thinning small diameter trees (formerly known as precommercial thinning) would trend stands toward density levels that would improve continued tree growth by favoring the healthiest trees to remain on site and allowing nutrients critical to the trees' growth and defense mechanisms to be redistributed to uncut trees. Promoting healthy growing trees that are adaptable to disturbance on these sites would reduce the risk of epidemic levels of insect and disease infection while providing land managers a variety of options for future vegetation management. Pruning white pine could improve the opportunity for this species to resist blister rust infection and reach maturity.

1. National Forest Lands Outside the Project Area

In the contiguous portion of National Forest lands outside the project area boundary (approximately 6,500 acres) to the north and along the lake, there have been no significant past, current, or reasonably foreseeable activities that would lead to cumulative effects with the proposed action.

2. Private Lands Outside the Project Area

As described in Chapter I, private land activities in the Upper Cocolalla Subwatershed, such as urban development and agriculture, are continually modifying the landscape in private ownership. From a vegetation standpoint, only a small percentage of private lands are trending toward the desired forest cover types of larch, white pine, and ponderosa pine, as some landowners manage for these species. Most private landowners are not making the investments to manage in this direction. No significant increase in late mature structures or old growth is expected on private lands, and fragmentation is expected to continue with smaller patch sizes, more edge effect and less core area. It is predicted that historic ranges of variability in vegetation would not be restored on a landscape scale. For these reasons, effects of proposed vegetation treatments in Alternatives B and C are expected to be localized and therefore, would not have cumulative effects. For these reasons, the cumulative effects analysis boundary is the same as the project area boundary (see project file for further rationale and discussion regarding private land activities).

3.22c Direct and Indirect Effects

1. Effects Common To All Alternatives

In areas not proposed for treatment, there are a few seedling/sapling stands with forest cover types of western larch, white pine and ponderosa pine that will continue to grow and trend toward desired species compositions and structures. Other stands consisting of Douglas-fir, grand fir, hemlock and cedar, will remain as these forest cover types without treatment. Some of these stands are healthy, while others are not.

The success of fire control efforts over a number of years has contributed to the increase in insect and disease disturbances. Fire disturbance can be expected to eventually change stand structures in this area, but the timing of these events is not predictable.

2. Alternative A - No Action

Under this alternative there would be no harvest of trees, treatment of fuels or reforestation with desired species. There are expected to be no shifts in stand forest cover types that are presently dominated by Douglas-fir with lesser amounts of grand fir, lodgepole, and cedar. Mortality caused by agents such as root disease, insect attack, wind and other disturbance mechanisms would continue to “open up” many stands and change their structure from mature and immature to early succession seedling/sapling/shrub stands, with shade-tolerant tree species being most prevalent.

In stands where ponderosa pine or western larch are present and mortality occurs in the Douglas-fir and other species, there may be a temporary increase in the growing space available for the remaining trees over the short-term as competition is reduced.

However, in the absence of further disturbance, regeneration of shrubs or shade-tolerant Douglas-fir and grand fir is likely to proliferate. Douglas-fir trees, being highly susceptible to insects and disease, are likely to die before reaching old growth structural stages (Zack 2000 and Rockwell 1917 p.66 and p.142). This, in conjunction with high fuel accumulations that would result as the dead trees fall down, would lead to a higher risk of stand-replacing fire. In this type of fire most trees would be killed, including the normally fire-resistant pine and larch.

As shown in table 9 and figure 10, the ongoing and predicted mortality would result in more open areas and would lead to more early succession structure than under the existing condition (see project file Vegetation—Mortality Under the No Action Alternative). Within the Little Blacktail project area an estimated 280 acres, or 13 percent of the area, is expected to shift from immature and mature forest structure to early succession under the No Action Alternative. Mean patch size, weighted edge density and mean core area of the early succession stage would increase, while those same features of immature and mature stages would decrease.

3. Effects Common To Alternatives B and C

The proposed vegetation treatments of Alternative C are the same as those for Alternative B. The primary difference between the two alternatives is the absence of road construction under Alternative C. The difference in logging systems between the two alternatives would have no effect on forest structure and composition.

From a vegetation standpoint, the objective of both alternatives is to improve the health and productivity of terrestrial and aquatic habitats by trending toward restoration of desired species compositions, forest structures and patterns. To initiate this restoration objective, fire would be reintroduced as an ecological process. Its use and that of other fuels management tools would reduce the risk of destructive wildfire around the microwave sites on top of Little Blacktail Mountain and the powerline corridor that serves this electronic equipment.

As shown in table 9, Alternatives B and C would trend vegetation toward desired conditions with the use of regeneration and selective harvest. Approximately 509 acres would be treated with regeneration harvest under Alternatives B and C. This would include openings in excess of 40 acres (see project file Vegetation—Recommendation to Exceed 40-acre Harvest Openings). Approximately 722 acres would be treated by selective harvest under Alternatives B and C.

Alternatives B and C would trend approximately 571 acres, or 27 percent of the project area, from Douglas-fir forest cover type to western larch, western white pine and ponderosa pine cover types (table 9 and figure 13).

Alternatives B and C would trend more area from immature and mature forest structure to the early succession stage of stand development, converting approximately 507 acres, or 24 percent, of the existing immature and mature forest structures to early succession (table 9 below and figure 11 in Appendix M).

This would increase the mean patch size, the weighted edge density and mean core areas of the early succession stage, while reducing those related to immature and mature stages (see project file under Vegetation – FRAGSTAT analysis). These changes are greater than what would occur under the No Action alternative. The trend to larger mean patch size for the early succession stage is a trend toward the historic range. In areas of selective harvest, both alternatives would enhance the current characteristics of two dry site immature forest stands (totaling approximately 90 acres), which in time could become old growth ponderosa pine. This treatment would likely increase the acreage of future dry site old growth.

Tables Displaying Effects

Table 9 displays the existing and predicted forest cover type and structure changes of forest vegetation for the No Action Alternative and Alternatives B and C. These were calculated for

National Forest lands only. The Existing Condition columns represent the cumulative effects of past disturbances and present activities including past harvest, fire suppression, disease and insect attack, and vegetation growth to the present. Tables depicting changes in dry and moist habitat types are shown in Appendix D.

Table 9. Existing condition and predicted changes in vegetation structure and cover types in the project area. The difference between the existing condition and the No Action and Action alternatives reflects the change in the percentage of the project area occupied by the structural stage or cover type.

	Existing		Alternative A (No Action)				Alternatives B & C			
	Approx. Acres	%	Approx. Acres	%	Acres change	Change in % of project area	Approx. Acres	%	Acres change	Change in % of project area
Structural Stage										
Early Succession*	211	10	491	23	+280	**+13%**	718	34	+507	**+24%**
Immature Forest	1,679	79	1,419	66	-260	**-12%**	1,243	58	-436	**-21%**
Mature Forest	249	11	229	11	-20	**-1%**	178	8	-71	**-3%**
Old Growth	0	0	0	0	0	**0**	0	0	0	**0**
Totals	2,139	100	2,139	100			2,139	100		
Cover Type										
Douglas-fir	1,596	75	1,596	75	0	**0**	1,025	48	-571	**-27%**
Grand fir/ Hemlock	135	6	135	6	0	**0**	135	6	0	**0**
Western Larch	95	4	95	4	0	**0**	123	6	+28	**+2%**
Cedar	190	9	190	9	0	**0**	190	9	0	**0**
Ponderosa pine	0	0	0	0	0	**0**	291	14	+291	**+14%**
No Trees	0	0	0	0	0	**0**	0	0	0	**0**
Lodgepole pine	25	1	25	1	0	**0**	25	1	0	**0**
White Pine	98	5	98	5	0	**0**	350	16	+252	**+11%**
Totals	2,139	100	2,139	100			2,139	100		

*includes non-forested areas, shrubs, seedlings and saplings

Note that mature forest structure would decline under Alternatives B and C (table 9). This is because after field verification, a few mature forest stands were found to have extensive blowdown, beetle-killed trees and root disease activity. Even if left untreated, these stands would not reach old growth structure because of the predominance of Douglas-fir and the high mortality occurring and predicted to occur (Zack 2000 and Rockwell 1917 p.66 and p.142). Regeneration harvest would be used in these stands to reduce the fuel build-up, to allow for desired species to be introduced, and to help meet visual quality objectives.

4. Consistency With the Forest Plan and Other Applicable Regulatory Direction

All Alternatives are consistent with Idaho Panhandle National Forests Forest Plan direction. The specific Standards, with their location in the Forest Plan, are referenced below in parentheses.

Both even-aged and uneven-aged silvicultural systems were considered for areas proposed for harvest. On the Sandpoint Ranger District, it was determined that both systems were appropriate where regeneration harvests were proposed (Timber Standard 1, page II-31).

Regeneration harvests are proposed for stands in which mortality is either high or expected to be high in the near future, where species that are not desired are occupying the growing space or where this type of harvest is necessary to meet visual quality objectives. Site preparation and fuels reduction activities are proposed to provide appropriate sites for planting. Following site preparation, usually underburning, regenerated stands would be planted with seral species (white pine, larch and ponderosa pine) to promote stand structures and species composition that reduce susceptibility to insect and disease damage. This is consistent with Forest Plan direction that "reforestation would feature seral tree species." All stands proposed for regeneration harvest are on lands suitable for timber production and can be adequately restocked within five years of the final harvest. As directed by the Forest Plan, stands would be regenerated with trees from seed that is well adapted to the specific site condition, and would be regenerated with a variety of species (Timber Standard 4 and 5, page II-32).

Created openings would be blended to the form of the natural terrain as much as practicable. The Forest Plan states that creation of openings larger than 40 acres must conform to current Regional guidelines regarding public notification, environmental analysis, and approval. Scoping for the draft EIS informed the public that openings of greater than 40 acres would be considered to meet management objectives. Openings would no longer be considered openings when both vegetation and watershed conditions meet management objectives established for the management area (Timber Standards 7 and 8, page II-32).

Site-specific silvicultural prescriptions are compatible with management area goals, and preferred species management has considered both biological and economic criteria (Timber Standard 9, page II-32). Silvicultural practices including harvest, site preparation and planting with seral species are designed to reduce the perpetuation of pest problems (Forest Protection Standards 1 and 2, pages II-37 and II-38).

Management of competing understory vegetation would be accomplished, where necessary, as a consequence of fuels reduction/site preparation treatments (Forest Protection Standard 3, page II-38).

3.23 Threatened, Endangered and Sensitive (TES) Plants and Forest Species of Concern – Affected Environment

3.23a Regulatory Framework

Federal legislation, regulations, policy and direction require protection of species and population viability, evaluation and planning process consideration of Threatened, Endangered and other rare (Forest Service Sensitive) plant species. The regulatory framework for TES plants includes the Endangered Species Act (1973) as amended; the National Forest Management Act (1976); the National Environmental Policy Act (1969); Forest Service Manual (2672.1-2672.43); Idaho Panhandle National Forests (IPNF) Forest Plan (1987); and direction from the Regional Watershed, Wildlife, Fisheries and Rare Plants (WWFRP) program and Washington Office.

3.23b Introduction

There are no federally listed Endangered plant species suspected to occur in the Idaho Panhandle National Forests (IPNF) or in the project area.

A Threatened species, as determined by the US Fish and Wildlife Service, is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Currently, three Threatened species are suspected to occur in the IPNF. **Water howellia** (*Howellia aquatilis*) occurs in aquatic habitats that dry up for a portion of the year to allow for seed germination. Suitable habitat for water howellia occurs within the project area. **Ute ladies'-tresses** (*Spiranthes diluvialis*) is a Great Basin species; its habitat preferences include herbaceous wet meadows, irrigated pastures, riparian shrublands and riparian deciduous forests (Moseley 1999). It is not likely to occur in upland montane coniferous forests characteristic of the Little Blacktail project area.

Spalding's catchfly (*Silene spaldingii*) was determined to have low potential for occurrence in the project area. This species occurs in deeper soiled grasslands and grassland inclusions surrounded by ponderosa pine and Douglas-fir forest. While dry forest types occur in the project area, they are characterized by shallow to very shallow soils, and have low potential to support the species.

Sensitive species are determined by the Regional Forester as those species for which population viability is a concern, as indicated by a current or predicted downward trend in population numbers or habitat capability which would reduce the species' existing distribution. Several Forest species of concern are also considered; while they are generally not at risk on a rangewide, region-wide or state level, they may be imperiled at the Forest level. Seventy-six sensitive plant species and Forest species of concern are known or suspected to occur in the Kaniksu portion of the IPNF, which encompasses the Little Blacktail project area.

Sensitive species and Forest species of concern may be assigned to one or more habitat guilds. These guilds are artificial assemblages based on similar habitat requirements and are used to streamline analysis. A list of TES plant species by habitat guild and guild descriptions are included in the project file.

1. Methodology and Prefield Review

Assessment of TES plant habitat occurrence was accomplished through review of Idaho Department of Fish and Game Conservation Data Center (ICDC) Element Occurrence Records, National Wetlands Inventory maps, queries of the timber stand data base (TSMRS), aerial photographs and topographical maps, previous sensitive plant surveys, personal knowledge and professional judgment of the North Zone Botanist. Initial pre-field review was conducted in 1997.

Moist and wet forest habitat suitable for TES plants was determined to occur in several proposed harvest units and within the riparian influence of Cocollala Creek.

2. Field Survey Results and Post-Survey Review

Initial field surveys were accomplished in July of 1998. Populations of **Mingan moonwort** (*Botrychium minganense*) and **western goblin** (*B. montanum*) were identified in wet forest habitat along Cocolalla Creek. A population of western goblin was also identified adjacent to wetlands in the northeastern portion of the project area. No other TES species or Forest species of concern were identified, and most of the project area was confirmed as having low TES plant habitat suitability. Microsites of highly suitable moist forest habitat occur in some proposed harvest units.

Changes to the Regional Forester's Sensitive Species List were made in March of 1999. Field survey results were reviewed, and it was determined that no additional field surveys for TES plants were needed. Survey notes are included in the project file.

3. Species Screen

The Council on Environmental Quality (40 CFR 1502.2) directs that impacts be discussed in proportion to their significance. Generally, the following guidelines are used for determining the appropriate level of analysis:

No detailed analysis is necessary for species or habitat presumed not to be present within the affected area. Full disclosure of supporting rationale is included in the project file. No potential habitat for the Threatened species Ute ladies'-tresses or Spalding's catchfly occurs in the project area. Of sensitive species and Forest species of concern, no suitable habitat for deciduous riparian, peatland, dry forest, subalpine or cold forest guild species is present in the project area. These habitat guilds will not be discussed further.

Supporting rationale is presented for those species or habitat that are presumed to be present but not necessarily affected by the proposed actions. No detailed analysis is necessary. The Threatened species water howellia was not identified during field surveys. Potential habitat for water howellia in the project area would be buffered by a minimum of 300 feet from all project activities and would not be affected. No further discussion of this species is necessary.

Species or habitat considered present and potentially affected by the proposed actions are carried forward into a detailed discussion and analysis in the Environmental Consequences Section. Suitable habitat for sensitive moonworts and other moist forest and wet forest guild sensitive species and Forest species of concern has been documented in the project area, and may be impacted by project activities. These species will be analyzed in detail.

Rare Moonworts (*Botrychium* species)

Moonworts are seedless vascular plants that reproduce from spores and underground rhizomes. Mingan moonwort (*B. minganense*) and western goblin (*B. montanum*), both of which were identified in the project area, often occur with other rare moonworts, usually in wet or moist forest habitat and/or near streams and in soils with well-developed mycorrhizae[1]. Mingan moonwort may also occur with other rare moonworts in or adjacent to wet meadows, open disturbed areas, old roads and roadside ditches.

On May 10, 2001, the US Fish and Wildlife Service (USFWS) completed a 12-month status review of the Forest species of concern slender moonwort (*B. lineare*). The status review had been initiated after the species was petitioned for listing as Threatened or Endangered and it was determined that listing may be warranted. Following the review, USFWS determined that the

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[1] Mycorrhizae are symbiotic relationships between fungi and the roots of certain plant species. Although their ecology is poorly understood, it is apparent that mycorrhizal relationships enhance uptake of nutrients by the host plant (Allen 1991).

species was warranted for listing but precluded because of higher priority species (USDI 2001c). One historical occurrence of slender moonwort is documented from the IPNF approximately 60 mile northwest of the project area but has not been seen since 1925. Habitat for slender moonwort across its range varies from [open] meadows, limestone cliffs and moist, shady woods (Wagner and Wagner 1994). However, a specific habitat description for the species is problematic because of its formerly widespread distribution ranging from sea level to nearly 9,840 feet (Rey-Vizgirdas 2000).

No new occurrences of slender moonwort have been identified in the IPNF during numerous surveys in which other rare moonworts were documented. Highly suitable habitat for this species occurs in the riparian influence of Cocollala Creek and in microsites in some proposed harvest units.

3.24 Threatened, Endangered and Sensitive Plants – Environmental Consequences

1. Methodology

Analysis was conducted using results of TES plant surveys, current population distribution of TES species and Forest species of concern in the project area and professional judgment.

The cumulative effects area encompasses the upper Cocolalla Creek watershed, and is based on predicted seed dispersal distances (see TES plants report in the project file). For analyzing the effects to TES plants of biological control release for noxious weeds, the cumulative effects area also includes the adjacent Maiden Creek watershed. The Maiden Creek drainage supports sensitive plant species that could be attacked by some biological control agents for noxious weeds.

Cumulative effects analysis for rare plants considered the following activities:

Reasonably Foreseeable Actions - These include weed treatment and monitoring, urban and residential land use, agricultural uses on privately owned land, activities on forested private land and future salvage opportunities in the project area. Also included are other restoration projects: riparian road obliteration and landing slash disposal, wildlife burning on high ridge ecosystems, inventory and treatment of new noxious weed invaders, and timber stand improvement.

The time frame for measuring cumulative effects to rare plants and suitable habitat is ten years following completion of harvest and other restoration projects.

3.24b Direct and Indirect Effects

1. Alternative A

Under this No Action Alternative, there would be no direct or indirect effects to any TES or Forest species of concern or suitable habitat, since management activities would not change from current levels.

2. Alternatives B and C

The difference between the action alternatives with regard to effects to moist and wet forest habitat for TES plants is considered insignificant.

All known moonwort populations and highly suitable wet forest habitat would be buffered from harvest activities. The buffers would also preserve critical soil mycorrhizae. However, sensitive moonworts occupy a broader habitat range than most other sensitive species; several moonwort species have been found in disturbed meadows and on roadsides. They are often difficult to see because of their small stature, and aboveground stalks do not appear every year. Because individuals can go undetected during floristic surveys, they may be impacted by harvest activities. Undetected individuals of these species in marginal to moderately suitable habitat could be impacted under both action alternatives. Such impacts would not lead to a trend to federal listing or a loss of population or species viability.

Based on current knowledge of the species' distribution, impacts to slender moonwort would not be expected to occur from implementation of either action alternative. Highly suitable habitat for this species near Cocollala Creek would be buffered from all harvest activities. Furthermore, although occurrences of other rare moonworts have been identified in numerous surveys on Sandpoint Ranger District, slender moonwort has never been documented.

There would be no direct or indirect effects to any other moist forest or wet forest guild TES plants or Forest species of concern from implementation of any action alternative.

3.24c Cumulative Effects Common To Alternatives B and C

1. Reasonably Foreseeable Actions

Weed treatment and monitoring –weed treatment activities apart from those listed under "Other Restoration Projects" (Chapter II) would be subject to available funding. Any such activities would follow guidelines established in the Sandpoint Noxious Weeds Control Project FEIS (USDA 1998a). Biological control agents that may feed on sensitive plant species would not be released in the area (see TES plants report in the project file). Any herbicide use would follow label guidelines and would not exceed the maximum allowable acres to be treated established in the FEIS' adaptive strategy (USDA 1998a).

Impacts to TES plant species were analyzed in that document and its adaptive strategy. No impacts to TES plants beyond those described in the FEIS are expected to occur. Surveys would be conducted as necessary before implementation of this activity in highly suitable habitat; identified populations of TES plants would be protected.

Future salvage opportunities - There would be no impacts to documented occurrences of TES plants or Forest species of concern from implementation of future salvage in the project area. Incidental impacts to individuals of sensitive moonworts may occur; given the design criteria for future operations (see Chapter II); such impacts would not lead to a trend to federal listing or a loss of population or species viability. The provision for surveys of highly suitable habitat before implementation of salvage activities would reduce the risk of impacts to undetected individuals.

Riparian road obliteration and Landing Slash Disposal – this activity would occur where ground disturbance during initial road construction has already impacted TES plant habitat. Obliteration of stream crossings could impact a small amount of highly suitable habitat. Surveys would be conducted as necessary prior to implementation of this activity; identified TES plant populations would be protected. Other than incidental impacts to undetected sensitive moonworts, no impacts to TES plants or suitable habitat are expected to occur.

Wildlife burning on high ridge ecosystems – this activity would occur in areas with low potential to support TES plants or Forest species of concern. No impacts would be expected to occur.

Inventory and treatment of new noxious weed invaders - this activity would follow guidelines established in the Sandpoint Noxious Weeds Control Project EIS (USDA 1998a). Impacts to Threatened, Endangered and sensitive (TES) plant species were analyzed in that document and its adaptive strategy. No impacts to TES plants beyond those described in the EIS are expected to occur. Surveys would be conducted as necessary before implementation of this activity in highly suitable habitat; identified populations of sensitive plants would be protected.

Timber stand improvement – this activity would occur in areas with low potential to support TES plants or Forest species of concern. No ground disturbance would occur. No impacts would be expected to occur.

Based on the above analysis, cumulative impacts to sensitive moonworts under either action alternative would be low (individuals, populations and/or habitat not likely affected) to moderate (individuals and/or habitat may be affected, but populations would not be affected, and habitat capability would not over the long term be reduced below a level which could support sensitive plant species).

Cumulative impacts to moist forest and wet forest habitat for other rare plant species would be expected to be very low (no measurable effects).

3.24d Cumulative Effects Common to All Alternatives

Urban and residential land use is likely to impact suitable habitat for sensitive moonworts and other moist and wet forest guild species. Actions on private land have no restrictions with regard to protection of sensitive plants. Subdivision often involves permanent habitat conversion of at least some property from native to cultured plant communities.

Harvest activities on private forest lands will likely continue at the current rate. State requirements for riparian buffers would provide some protection for highly suitable habitat, but it is likely that individual moonworts outside those buffers would be impacted, and that habitat capability would be at least temporarily reduced.

3.24e Forest Plan Consistency

A Forest Plan management goal is to “manage habitat to maintain populations of identified sensitive species of animals and plants” (Forest Plan, II-1). A Forest Plan standard for sensitive species is to “manage the habitat of species listed in the Regional Sensitive Species List to prevent further declines in populations which could lead to Federal listing under the Endangered Species Act” (Forest Plan, II-28). The Forest Plan also identifies the need to “determine the status and distribution of Threatened, Endangered and Rare (sensitive) plants on the IPNF” (Forest Plan, II-18). All alternatives would meet Forest Plan direction.

3.25 Noxious Weeds – Affected Environment

3.25a Regulatory Framework

Federal legislation, regulations, policy and direction that require development and coordination of programs for the control of noxious weeds and evaluation of noxious weeds in the planning process include the following:

- National Forest Management Act (NFMA) (1976)
- National Environmental Policy Act (NEPA) (1969)
- Forest Service Manual (Chapter 2080, as amended) (2000)
- Executive Order #13112 (1999)
- IPNF Forest Plan (1987)
- IPNF Weed Pest Management EIS (USDA 1989)
- Sandpoint Ranger District Noxious Weed Control Project EIS (USDA 1998a)

The Forest Service Handbook (FSH 34409) defines a strategy for managing pests, including noxious weeds, as "a decision-making and action process incorporating biological, economic and environmental evaluation of pest-host systems to manage pest populations" (FSH 3409.11, 6/86). This strategy is termed Integrated Pest Management (IPM).

The overall IPNF strategy is to contain weeds in currently infested areas and to prevent the spread of weeds to susceptible but generally uninfested areas. The 1989 IPNF Weed Pest Management EIS describes the strategy.

Weed management activities in the District are guided by the Sandpoint Noxious Weed Control Project EIS. Copies of the EIS are available at the District office.

Noxious weeds are those plant species that have been officially designated as such by Federal, State or County officials. In *Weeds of the West* by Whitson et al. (1992), a weed is defined as "a plant that interferes with management objectives for a given area of land at a given point in time." The Federal Noxious Weed Act of 1974 defines a noxious weed as "a plant which is of foreign origin, is new to, or is not widely prevalent in the United States, and can directly or indirectly injure crops or other useful plants, livestock or the fish and wildlife resources of the United states or the public health" (P.L. 93-629).

The Idaho Noxious Weed Law defines a "noxious weed" as any exotic plant species established or that may be introduced in the State which may render land unsuitable for agriculture, forestry, livestock, wildlife or other beneficial uses and is further designated as either a state-wide or County-wide noxious weed (Idaho Code 24 Chapter 22).

Both Federal and State laws define weeds primarily in terms of interference with commodity uses of the land. However, the impacts of noxious weeds on non-commodity resources such as water quality, wildlife and natural diversity are of increasing concern.

3.25b Affected Environment

Information on current weed infestations and results of weed management in the project area is derived from observations during field surveys for Threatened, Endangered and sensitive plants.

Oxeye daisy (*Leucanthemum vulgare*) and goatweed (*Hypericum perforatum*) were found in heavy concentrations on Forest road 630. Spotted knapweed (*Centaurea biebersteinii*) and common tansy (*Tanacetum vulgare*) were noted in lesser concentrations. Infestations of these and other weeds occur in previously harvested units in the project area.

Similar infestations occur on Forest road 315.

Goatweed was observed well above Forest road 630 in dry, rocky to brushy openings within and adjacent to the proposed wildlife burn areas. It occurs in small, dense patches in grass- and forb-dominated openings and as scattered individuals in brushfields.

1. Recommendations

- Monitor the project area for new weed invaders with the goal of eradicating any new invaders identified before they become established.
- Treat weed infestations along haul routes to slow the spread of weeds established in the project area and to reduce the risk of their being transported out of the project area.
- As district funding and priorities allow, begin to treat off-road infestations of spotted knapweed and goatweed using biological control agents.
- Established weed species in the project area will be difficult to control, since adjacent private lands have similar infestations, and many landowners do not actively treat those infestations. As district funding and priorities allow, seek to establish cooperative weed treatment agreements with adjacent landowners.

3.26 Noxious Weeds – Environmental Consequences

3.26a Methodology

Effects of proposed actions on noxious weed spread are based on amount of new road construction and reconstruction, logging systems (ground-based or helicopter), fuels treatment, amount of canopy removal, and predicted amount of soil and/or understory vegetation disturbance.

Determination of the cumulative effects area for weeds considered likely seed dispersal distances and the extent of currently documented weed infestations. Transport of weed seeds out of the watershed is possible, with occasional transport over long distances (such as on vehicles). However, it would be difficult to predict the extent of such long-distance dispersal. It is likely that most seeds of noxious weeds would fall close to the parent plant.

In addition, adjacent other ownership lands have noxious weed infestations similar in composition and distribution to those on National Forest lands, so transport of weed seeds to these lands from the project area would have little additional impact. For these reasons, the cumulative effects area for noxious weeds is the project area.

3.26b Direct and Indirect Effects

1. Alternative A

Under the No Action alternative, there would be no change in the risk or rate of weed spread, since management practices would not change from current conditions. Treatment of existing weed infestations may occur, but would be dependent on District priorities and the availability of appropriated funding. No monitoring for new invaders would occur without appropriated funding. Without treatment, seeds from weeds on Forest roads would likely continue to be transported out of the area by vehicles, birds, and wildlife.

2. Alternative B

There would be a risk of weed spread associated with temporary road construction. Preventive seeding and monitoring as proposed would reduce, but not eliminate, the risk of weed spread. Preventive seeding and monitoring would greatly reduce the risk of new invaders becoming established. Following decommissioning of temporary roads and preventive seeding, the risk of weed spread would decrease over time to its present level.

3. Alternative C

Because there would be no new road construction under this alternative, there would be slightly less risk of weed spread than under Alternative B. There would be less ground-based harvest under this alternative, resulting in less soil and understory vegetation disturbance, and less risk of weed spread.

4. Effects Common to Alternatives B and C

There is a risk of weed spread from ground-disturbing harvest activities, particularly along skid trails and in regeneration harvest units. Preventive seeding of native and desired non-native species as specified in Chapter II - Features Common to All Action Alternatives would reduce, but not eliminate, the risk of weed spread. Treatment of weeds along haul routes would greatly reduce the risk of weed spread (see Chapter II, Features Common to All Action Alternatives). Contract requirements to wash off-road harvest equipment prior to entry into the sale area would further reduce the risk of weed spread (see Chapter II, Features Common to All Action Alternatives). The risk of introduction and establishment of new weed invaders to the project area is expected to be low with implementation of the above measures.

With regard to the predicted amount of canopy removal, there is no significant difference between the two action alternatives, thus no difference in its effect on the risk of weed spread. Oxeye daisy in particular tends to increase with expansion of canopy openings. Potential for spread of this species from project activities associated with canopy removal would be low to moderate under both action alternatives. Weed treatment would remove the majority of the seed source for weeds, which occurs in greater concentrations on roadsides, would slow their rate of spread within the project area.

Past timber harvest, prescribed and natural fire and road construction have been the major factors in the establishment and spread of goatweed and spotted knapweed in the watershed. These two species are considered naturalized in the watershed in both previously disturbed and undisturbed habitats. Both may increase, at least temporarily, in some areas following harvest and fuels treatment activities. While there are limited data addressing response of weeds to fire, initial studies of spotted knapweed indicate that both low and high intensity fires may increase its canopy cover by four to six times over preburn densities (Rice and Sacco 1995).

3.26c Cumulative Effects

1. Alternative A

Cumulative effects would be expected to be low with regard to existing weed infestations and low to moderate with regard to new invaders. Weeds could also infest National Forest lands in the project area from adjacent private lands.

2. Alternatives B and C

Under both action alternatives, cumulative effects with regard to new invaders are expected to be low; no new invaders are expected to become established. Cumulative effects with regard to existing weed infestations are expected to be low to moderate considering the following reasonably foreseeable actions:

Riparian Road Obliteration and Landing Slash Disposal- there would be a temporary increase in the risk of weed spread following these activities. Pre-treatment of existing infestations and preventive seeding would reduce the risk of spread over time to current levels.

Wildlife Habitat Burning On High Ridge Ecosystems - there would be an increase in the risk of spread of goatweed and spotted knapweed following burning to enhance wildlife forage. The actual incidence of weed spread would depend on many factors, including proximity of existing weed infestations, amount of weed seed in the soil, season of burning, shrub density and response of shrub species to burning. Following burning, resprouting of brush species in areas with a dense shrub component would be likelier to outcompete weeds than in areas with a sparse shrub cover. See the cumulative effects discussion above regarding the effects of fire on spotted knapweed.

Inventory And Treatment Of New Noxious Weed Invaders - this activity would follow guidelines established in the Sandpoint Noxious Weeds Control Project EIS (USDA 1998a). The risk of new invaders becoming established would be low.

Timber Stand Improvement - no increase in noxious weed spread is predicted from implementation of this activity, since no ground disturbance or significant canopy removal would occur.

Potential Future Salvage - the same preventive measures described in Chapter II - Features Common to All Action Alternatives would be implemented in any future salvage operations. The risk of new invaders becoming established would be low, and the risk of spread of existing infestations would be low.

3.26d Cumulative Effects Common to All Alternatives

1. Reasonably Foreseeable Actions

Private Land Activities - Urban and residential land use is likely to cause soil and canopy disturbance conducive to weed spread and infestation by new invaders. Subdivision often involves permanent habitat conversion of at least some property from native to cultured plant communities. Some landowners will aggressively treat weeds on portions of their property.

Harvest activities on private and other agency forest lands will likely continue at the current rate. Resulting soil and canopy disturbance may contribute to weed spread and infestation by new invaders. Spotted knapweed and goatweed are considered naturalized in the watershed, and some further expansion of these weeds on other ownership forest lands will likely occur, but the cumulative impact to the watershed would be negligible.

Noxious Weed Treatment – weed treatment activities apart from those listed in “Other Restoration Projects” (Chapter II) would be subject to available funding and District priorities. Any such activities would follow an Integrated Pest Management approach and may include biological, cultural, mechanical and chemical control methods. Preventive measures would also be used (see Features Common to All Action Alternatives). The impacts of noxious weed invasions on existing weed infestations and the effectiveness and impacts of different weed treatment methods are discussed in detail in the Sandpoint Noxious Weed Control Project Environmental Impact Statement (USDA 1998a), hereby incorporated by reference. A site-specific summary follows:

Weed treatment activities would be successful in controlling goatweed and spotted knapweed along road prisms, but in the short-term would not have a significant effect on these species where they occur in areas proposed for underburning. These two species are considered naturalized in the project area, and would not be eradicated by weed treatment efforts. The short-term management goal for goatweed and spotted knapweed is to reduce the risk of seed and plant parts being transported out of the project area. The long-term goal is to reduce the size of infestations and slow the rate of spread within the project area. Treatment of existing infestations on haul routes with approved herbicides, and preventive seeding and monitoring on skid trails, would greatly reduce the risk of transporting these species off-site.

Should funding allow, biological control agents for knapweed and goatweed may be released in off-road infestations. However, the biological control agent *Aplocera plagiata* would not be released in the project area due to the proximity of the sensitive plant species large Canadian St. John’s wort (*Hypericum majus*). Host specificity tests have indicated that this control agent for goatweed also attacks other members of the *Hypericum* genus. Efforts to reduce the incidence of goatweed would be hampered without use of this agent.

Treatment of other weed species, which are mostly confined to road prisms, would be moderately to highly effective.

3.26e Forest Plan Consistency

According to Forest Plan direction, infestations of many noxious weed species, including knapweed, goatweed and common tansy, are so widespread that eradication would require major programs that are not possible within expected budget levels (Forest Plan p. II-7). The No Action alternative meets Forest Plan direction by not creating disturbance conducive to new noxious weed invasions or spread of existing weed populations. Both action alternatives provide moderate control actions, as required by the Forest Plan, to prevent new weed species from becoming established, through project design.

3.3 Fire and Fuels

3.31 Regulatory Framework

The IPNF Forest Plan objective is to implement efficient fire protection and use programs based on management objectives, site-specific conditions, and expected fire occurrence and behavior. Fire management plans are to be guided by the following standards:

- Management area standards and goals provide direction for appropriate response.
- Human life and property will be protected.
- The appropriate suppression response for designated old-growth stands in all management areas except in wilderness will result in prevention of old growth loss.
- Activity fuels will be treated to reduce their potential rate of spread and fire intensity so the planned initial attack organization can meet initial attack objectives.

The primary Forest Plan Management Areas within the project area include goals to manage suitable lands for timber production for the long-term growth and production of commercially valuable wood products. The fire protection standard to achieve that goal is to use initial attack strategies (confine, contain, and control) appropriate to achieve the best benefit based on commercial timber values and where appropriate, big-game winter range values.

Forest Service Manual (FSM) 5105 defines fuels as combustible wildland vegetative materials, living or dead. Agency direction is to evaluate, plan and treat wildland fuel to control flammability and reduce resistance to control including mechanical, chemical, biological, or manual means (FSM 5150). This includes the use of prescribed fire to support land and resource management objectives.

The objectives of fuels management are to:

- Reduce fire hazard to a level where cost effective resource protection is possible should a wildfire ignition occur. Fire hazard is the potential fire behavior (intensity and rate of spread) of a fire burning in a given fuel profile and its ability to be suppressed by firefighting forces.
- Reduce potential fire severity.

Fire suppression policy from the early 1900s until the late 1970s has been that of total suppression. Only recently has fire policy been modified to recognize the importance of fire in balancing vegetation cycles within the temperate forest. The Federal Wildland Fire Management Policy and Program Review was chartered by the Secretaries of the Interior and Agriculture to examine the need for modification of and addition to Federal fire policy. The review recommended a set of consistent policies for all Federal wildland fire management agencies. In adopting the policy, the Federal Agencies recognize that wildfire has historically been a major force in the evolution of our wildlands, and it must be allowed to continue to play its natural role wherever possible. It was also recognized that all Agencies will not necessarily employ all identified procedures on all administrative units at all times (USDI and USDA 1995, USDI and USDA 1996). The severe wildfire seasons in northern California and Oregon in 1987, in Yellowstone Park and the Northern Rocky Mountains in 1988, throughout most of the West in 1994, Florida and Texas in 1998, and the Northern Rocky Mountains in 2000 have made it clear that fire cannot be excluded from fire-dependent ecosystems. On the other hand, because of developed areas, and commercial forests, fire cannot be fully restored to its historic character, except perhaps in a few of the largest wilderness areas (USDI and USDA 1996).

3.32 Affected Environment

3.32a Types of Fires

In the descriptions and discussions that follow, "severity" refers to the amount of damage a fire actually causes and "return interval" refers to how often a particular type of fire occurs.

Northern Idaho, northeastern Washington, and western Montana are an island of moisture in the dry interior west. These forests are very productive and produce high levels of organic material. Because these areas generally have more precipitation, wildfire return intervals are longer than in most of the interior west. A recent study describing fire history in the Coeur d'Alene Basin indicated that an average of once in every 19 years there was a fire season that burned five percent or more of the study area in a single summer (Zack and Morgan 1994). The study showed that historically, in an average summer, fires were patchy with variable intensity. During the periodic drought years, however, there were large stand-replacing crown fires that covered tens of thousands of acres. Lethal stand-replacing fires revisited individual forest stands on an average of once every 150 to 250 years.

Types of Fires in Forested Ecosystems

Nonlethal fires - fires that kill 10% or less of the dominant tree canopy. A much larger percentage of small understory trees, shrubs and forbs may be burned back to the ground line. These are commonly low severity surface and understory fires, often (but not always) with short return intervals (few decades).

Mixed severity fires - fires that kill more than 10%, but less than 90% of the dominant tree canopy. These fires are commonly patchy, irregular burns, producing a mosaic of different burn severities. Return intervals on mixed severity fires may be quite variable.

Lethal fires - fires that kill 90% or more of the dominant tree canopy. These are often called "stand replacing" fires and they often burn with high severity. They are commonly (but not always) crown fires. In general (but not always), lethal fires have long return intervals (150-250+ years apart), but affect large areas when they do occur. Local examples of these types of fires would be the Sundance and Trapper Peak fires of 1967 that burned over 80,000 acres in a relatively short time period during late summer drought conditions.

Fire was also the most significant historic natural disturbance in the Pend Oreille subbasin. Historically, one-third of the landscape in the subbasin would have experienced a stand-replacement fire over a 70-year period, and the majority of the landscape would have experienced a mixed-severity fire (personal communication, Art Zack 1999).

In the Little Blacktail project area, fire was also the major natural disturbance event. Figures 14 and 15 are historical pictures from 1916 that reveal the severity and expanse of the 1910 fire that occurred in the Cocolalla watershed. Following this fire, brush and small trees of seedling, sapling and pole sizes dominated the landscape for many years.

Approximately 73 percent of the project area consists of moist habitat types. Historic fire regimes in moist habitat types were variable, with long-interval, large, lethal fires mixed with shorter-return interval, nonlethal, and mixed-severity fires (Smith, Kapler and Fischer 1997). The remaining 27 percent of the project area consists of dry forest types scattered among larger areas of moist types. These types historically burned frequently with nonlethal and mixed-severity fire.

Figure 14. View from head of Cocolalla Creek looking west to Huckleberry Mountain in 1916.

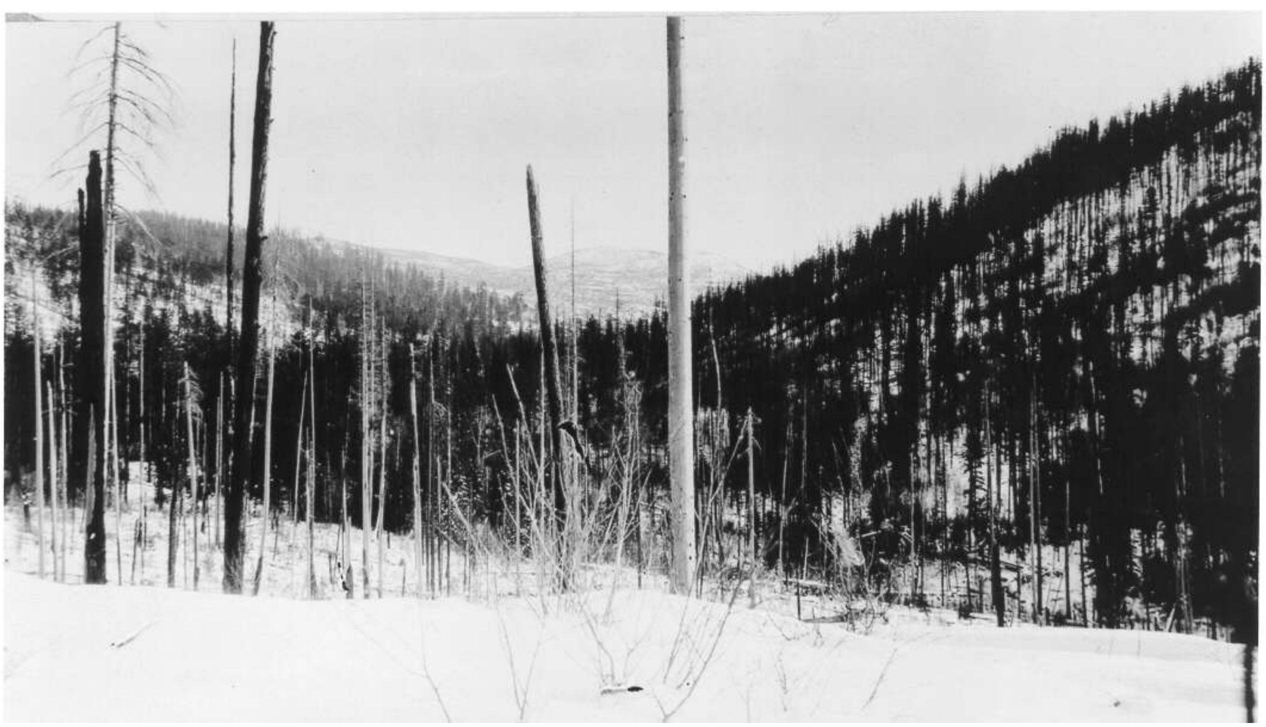

Figure 15. View from head of Cocolalla Creek looking east in 1916. Slope of Little Blacktail Mountain is on the right.

3.32b Fire Suppression

Fire suppression policy from the early 1900s until the late 1970s in this area was one of total suppression. Altering or removing the role of fire has produced significant changes in the ecosystem. On moist upland areas, the mosaics created by moderately frequent, variable-intensity burns with infrequent high-intensity fires have been altered across the Pend Oreille subbasin, including the Little Blacktail project area. Fire suppression efforts have largely eliminated the low-intensity and small, variable-intensity fires from the system. In the absence of low/mixed-severity wildfires that had a thinning effect, young stands of larch are being lost to competition. Drier south facing slopes that would have contained mixed, open stands of ponderosa pine, larch and Douglas-fir with little understory now have denser tree cover with a higher component of Douglas-fir and grand fir with understories of dense shrubs or shade-tolerant tree reproduction.

Since 1910, no major fire activity has taken place in the Little Blacktail project area. The historic disturbance mechanism of fire has been temporarily interrupted by fire suppression activities for the past 90 years. Partial records of the project area show that at least four fires have been suppressed from 1952 through 1986. Several other fires have been suppressed outside, but in close proximity to, the project area. The suppression of these fires and others, especially during times of large fire growth potential, has caused the majority of vegetation across the landscape to advance to the immature stage of stand development and older age classes. Some areas, which were severely burned and reburned early in the last century, have been slow to reforest and are still in the early succession stage of development.

3.32c Current Conditions of Fire Risk

Today the risk of lethal stand replacement fire in the Little Blacktail project area is increasing due to accumulating fuel loads. Both ground and ladder fuels are increasing for a variety of reasons, including normal tree mortality, excessive root disease, beetle-caused mortality, and absence of regular, nonlethal, and mixed-severity fires.

Because of the absence of these fires and the increase in shade-tolerant species, dry forest types in the Little Blacktail project area have become overstocked, creating fuel ladders for an eventual lethal fire. On moist and dry habitat types the same conditions, along with increasing numbers of dying trees, especially Douglas-fir, are causing increased fuel loadings and changes in fuel types.

Characteristic dry type, transition, and moist type fire is described and simulated in the Douglas-fir Beetle Project FEIS for the Idaho Panhandle National Forests and Colville National Forest (USDA 1999, pages III-542 through 546). This simulation and description reflects a similar situation to that in the Little Blacktail project area.

1. Recommendations

- Restore fire as an ecological process by prescribed burning activity-created and natural fuels as much as possible.
- Reduce the risk of a destructive wildfire around the microwave sites and the powerline corridor that serves the electronic equipment. The proposed silvicultural treatments followed by fuel treatments of cutting suppressed understory and underburning or grapple piling would reduce the potential for crown fire and increase the probability of success in fire suppression.

3.33 Environmental Consequences

3.33a Methodology

The primary concern to fuels management in the project area is the risk of a destructive wildfire that could destroy the microwave sites on top of Little Blacktail Mountain and the powerline that serves the sites. As fuel loads increase; as a result of normal tree mortality, root disease, bark beetle-caused mortality, and the ingrowth of seedlings and saplings; fire intensities and flame lengths would also increase. This in turn would increase the risk of crown fire, thus posing a greater risk to the microwave sites and powerline.

Fire behavior depends on forest density, composition, amount of surface fuel, its arrangement, moisture content, prevailing weather, and physical setting. To characterize surface fire behavior, 13 fire behavior fuel models are available that describe the fuel complex, fuel loading, fuel bed depth, and moisture of extinction (upper limits of fuel moisture beyond which a fire would no longer spread with a uniform burning front) in dead and live fuels for grass, shrub, timber, and logging slash groups. These models, in combination with dead and live fuel moisture content, slope angle, and wind speed, provide a basis for predicting both fire spread rate and intensity (Anderson 1982).

Fire spread rates and intensities can be predicted using the BEHAVE model (project file). BEHAVE is an interactive computer system designed to predict fire behavior characteristics for various fuel types. It is composed of simulation models developed for fire and associated fuel and environmental parameters. It has evolved over several years in conjunction with the material developed for training fire behavior officers at the National Advanced Resource Technology Center in Marana, Arizona.

3.33b Direct and Indirect Effects Common to All Alternatives

Drier sites have become more susceptible to stand-replacing fires because of multi-storied vegetation structures. In addition, the change in species composition to shade-tolerant species has made stands much more susceptible to root disease, dwarf mistletoe, defoliating insects, Douglas-fir beetles, and stand-replacing wildfires.

Within all of the alternatives, whether a federal action is chosen or not, the vegetation and fuel configuration throughout the project area would change. These changes can occur as a result of numerous outside forces, including wildfires, insects, diseases, humans, or routine stand dynamics. Regardless of the cause, they would change the density of the canopy; the type, amount, and arrangement of the fuels; and the species composition.

These changes in fuel configurations would affect the way a fire burns, thus the fuel models used to predict fire behavior. Changes in the fuel models would affect the rate of fire spread and predicted flame lengths, as well as fire intensity. Table 10, referenced from the Douglas-fir Beetle Environmental Impact Statement (USDA 1999), displays the different rates of fire spread and flame lengths that could be attained, depending on the fuel model, for a normal summer season and during drought conditions.

The values in the table were determined using the BEHAVE model. Constant weather and fuel moisture conditions were used to demonstrate the changes in fire behavior as fuel models change. Two sets of values were used for calculations. The first set represents fuel conditions commonly found during normal summers in the inland Northwest and the second set represents fuel conditions commonly found during drought conditions.

Table 10. Estimated Rate of Fire Spread.

Fuel Model	Rate of Spread (chains/hour) normal/drought	Flame Length (feet) Normal/drought
2	25/32	5.3/6.3
5	11/27	3.4/6.7
6	28/34	5.6/6.4
8	2/2	1.0/1.2
10	7/10	4.5/5.7
11	6/7	3.4/3.7
12	13/15	7.9/9.0

Rate of Spread. The forward rate of fire spread, expressed in chains per hour. One chain equal 66 feet.

Flame Length. The distance measured from the tip of the flame to the middle of the flaming zone at base of the fire.

It should be noted that, for a fire to burn, three essential components are required, including fuel, oxygen, and heat. With one component eliminated fire would not be sustained. Over an entire forest, the only one component that humans can control is the fuel. This includes the type, amount, and arrangement of the fuels. Adjusting one or all of these factors would not eliminate fire, but would help reduce negative impacts to the various resources from fire.

1. Cumulative Effects Common to All Alternatives on Private and Public Lands

The cumulative effects area for all fire-related effects analysis for the Little Blacktail Area encompasses all of the federal, private, and other lands that could burn into or out of the project area in any single fire event. This area is not definable on a map, because determining how large or how far a fire would travel is dependent on a number of variables including fuel conditions, temperature, relative humidity, wind, topography, and many others that cannot be determined until an ignition occurs. An example of this is the Sundance Fire of 1967, which traveled more than 16 miles and engulfed more than 50,000 acres, mostly within a nine-hour time frame (USDA 1968).

Past timber harvest can affect fire activity, thus fire risk. The effects of past harvest on Forest Service administered lands within the Little Blacktail project area are varied, depending on the type of harvest, the year of harvest, the acres harvested, and similar variables. This information is displayed in the Vegetation section in Chapter III of this document. As described, only minor timber harvest occurred in the early 1900s within the project area. This is primarily because of a large stand-replacing fire in 1910 that killed most of the trees. The effects of this harvest were insignificant and have no effect on fire risk today.

In the 1960s and early 1970s there was a salvage sale in the project area that covered over 275 acres. If this timber had not been removed the remaining fuels would most likely have been only the large diameter, rotten logs that absorb and lose moisture very slowly. None of the fine fuels would remain. This material would have added to the current down and dead fuel loadings, which would have increased fire duration (Smith and Fischer 1997) on the treated acres. The effect of this has no real measurable effect on the area as a whole today.

In the late 1980s and early 1990s two sales were prepared within the project area treating 166 acres in small regeneration cuts and 325 acres in selective cuts. Within the regeneration cuts the fuels were cleaned up and the sites were planted with white pine and western larch seedlings. The fire risk within these stands has been reduced, creating small, broken fuel breaks. Containment of ignitions within these stands would be very successful today, but since the units are fairly small and scattered the fire risk throughout the project remains high. Timber harvest in the selectively cut over areas focused on the removal of dead and dying timber. Again, this will reduce the fire risk within these stands, but will not do much for the area as a whole.

Current management practices on private lands are expected to continue. Timber harvest will most likely occur on portions of the forested lands. Typical treatments on these lands will usually include some form of partial cutting that focuses on removal of the trees with the highest economic value, which are often the largest trees. This practice typically removes the large fire-resistant seral species that require abundant sunlight to flourish. Natural regeneration usually fills in any created openings. This type of environment tends to favor the reproduction of shade-tolerant species like Douglas-fir and grand fir. With increased rural/urban development, it is probably safe to say that inherent disturbance regimes and historic vegetation patterns would never be reestablished on a landscape scale. Regionally, this pattern of vegetation change has led to increased fire intensities and severities and is expected to continue (Quigley and Arbelbide 1997).

Other land uses on private property, including residential, farming, and grazing will also continue. Most likely the number of residences will increase over time. They will be located within the forested areas while others will be constructed in areas currently used for agriculture purposes. Regardless, as the population increases in these rural areas, the probability of ignitions increase, as well as the values at risk and the difficulty of suppressing wildfire. Since private lands often include residences and other developments, fire would continue to be aggressively suppressed on the private lands. This is necessary, because reverting to the full range of historic disturbance patterns would generate significant threats to human life and property. Even smaller threats, as occurred in the firestorm of 1991, have not been acceptable to the public.

As stand conditions on Federal lands continue to deteriorate and fuel loads increase, the potential for fire risk also increases. This in turn increases the chances of a fire escaping onto adjacent private lands or from private lands onto federal lands.

The gathering of firewood within the project area will continue. This activity removes standing dead and down trees that contain little if any fine fuels, usually within 100-200 feet of open roads. As with the old salvage sales this material would have added to the current down and dead fuel loadings, which would have increased fire duration (Smith and Fischer 1997). With the minor amount of area impacted and the type of material removed, this activity would have very little effect on fire risk.

The clearing of vegetation and hazard trees from the powerline right-of-way and microwave sites has occurred in the past and will occur again in the future. As long as the fine fuels are disposed of this activity will reduce fire intensity and flame lengths, which will help to protect these structures in a wildfire situation.

3.33c Direct and Indirect Effects of Alternative A (No Action)

With the implementation of Alternative A, the No Action Alternative, there would be no change from current management direction or intensity. Timber harvest, reforestation, watershed rehabilitation, road obliteration activities, and fuels treatments would not be initiated at this time.

As mentioned earlier, fuel configurations change over time, even without human intervention. Those changes would continue with the implementation of this alternative. The mortality from insects and disease would continue, as well as fire suppression activities, which would increase the amount of available fuel. Historically, similar fuel conditions have likely occurred and have contributed to past wildfires that ranged from low-severity underburns to lethal stand-replacing wildfires. However, a continuation of the current management regime of fire suppression and no fuels reduction activities would eventually lead to more destructive fires with higher intensities (Stewart 1996), and would kill most of the trees (Arno 1996).

This alternative would not meet the stated purpose and need for this project.

3.33d Cumulative Effects of Alternative A

Since there are no fuels reduction activities planned with this alternative, it is reasonable to conclude that fire risk would increase over time. This increase in fire risk would put the microwave towers and powerlines at higher risk of burning. Within the project area, the probability of firefighter success with initial attacks begins to decrease as fuel loads increase. Firefighter access would remain the same as current levels, as long as funding for road maintenance is provided.

3.33e Direct and Indirect Effects of Alternatives B and C

Chapter I identified the purpose and need for this project. The two primary ones relating to fire and fuels are to restore fire as an ecological process and to reduce the risk of destructive wildfire around the microwave sites at the top of Little Blacktail Mountain and the powerline corridor that serves the electronic equipment. These are discussed separately below.

Restore Fire As An Ecological Process - Restoring fire to the ecosystem is a critical element in most ecosystem restoration projects. Many aspects of a wildfire can be imitated with alternative methods. For example, the chemical effects of a fire, such as nitrogen release, can be approximated by the application of fertilizers on the site. Physical effects of fire, such as biomass consumption, can also be replicated. Timber harvest is a method commonly used for such purposes. However, the thermal effects of a wildfire are impossible to imitate, except through the use of prescribed fire (Schmidt 1996). For these reasons the ID team chose underburning as the primary fuels reduction treatment method for both Alternatives B and C. For both of these alternatives, this treatment is planned for more than a third of the 2,100+-acre project area. Alternative B plans to underburn 772 acres, and Alternative C has identified 777 acres for underburning. Implementation of either Alternative B or C would be very effective at restoring fire as an ecological process.

Reduce The Risk Of A Destructive Wildfire Around The Microwave Sites And The Powerline Corridor That Serves The Electronic Equipment - Three items were considered for these two alternatives when determining how effective they would be at protecting the microwave sites and the powerline corridor. They are:

1. How effectively the treatments would reduce the potential for a destructive crown fire
2. How easily an unwanted fire could be suppressed
3. How much of the area would be effectively treated and where the treatment areas would be located in relation to the microwave sites and powerline

Reducing the Potential For Crown Fire - In a crown fire situation it would be difficult if not impossible to safely protect the structures and the powerline corridor. The effectiveness of both alternatives was determined with respect to the reduction of ladder fuels, estimated flame lengths, and fire intensity. Flame lengths and fire intensity were estimated through the use of the BEHAVE model.

Ladder fuels would be reduced through the use of commercial thinning, irregular shelterwood, irregular seed tree, and shelterwood preparatory cut silvicultural prescriptions. Post-timber harvest treatments would also be conducted. They would include cutting of the suppressed understory, followed by some form of fuels reduction (mostly underburning and grapple piling). All of these activities combined would be very effective at reducing ladder fuels.

BEHAVE was run for both pre-treatment and post-treatment conditions using typical summer-time conditions to estimate the probable flame lengths and fire intensities associated with the various proposed treatments. The estimated pre-treatment flame lengths were over eight feet, and the fire intensities were just under 600 BTUs/foot/second. The post-treatment flame lengths were less than two feet, and the fire intensities were less than 20 BTUs/foot/second. The same fuel moisture, wind speed, and terrain parameters were used for both runs. As can be seen from these results, the reduction of the fuel loading, with the implementation of these alternatives would have a direct effect on flame lengths and fire intensities.

As demonstrated above, both alternatives B and C would be very effective at reducing ladder fuels, flame lengths, and fire intensities, which would effectively reduce the potential for crown fires within the treated areas.

How Easily An Unwanted Fire Could Be Suppressed - The suppression of unwanted fires is dependent upon several factors. These factors include, but are not limited to, weather, accessibility, workforce availability, and stand conditions. Of them, only some can be managed to increase success in suppressing unwanted wildfires. For example, we cannot affect the weather and how it influences the forest fuels. Similarly, we cannot predict budgets, which dictate the number and kind of fire suppression resources. Also, when drought conditions occur throughout an entire region or regions, as in the 2000 fire season, firefighting resources can become limited in a very short time period. However, access and vegetation conditions are manageable.

As far as access is concerned, the project area has a good serviceable road system that would allow for quick initial attack. In general, under normal conditions, the quicker a fire is responded to the higher the probability of success in suppressing it.

Of all of the above-mentioned factors, the one that land managers can most easily manipulate to improve firefighter success is vegetation conditions. This includes the amount and arrangement of both live and dead vegetation to analyze the effects of the proposed vegetation treatments in relation to firefighter success. The BEHAVE model was used. The parameters used for comparison of the alternatives are the potential flame lengths and fire intensities that would be generated during a wildfire both before and after project implementation. The model showed pre-treatment flame lengths at over eight feet and fire intensities just under 600 BTU's/foot/second. The model predicted post-treatment flame lengths to be less than two feet in height and fireline intensities to be less than 20 BTU's/foot/second. According to the Fireline Handbook, hand crews can be effective on fires with flame lengths of 0-4 feet and fire intensities between 0-100 BTUs/foot/second. On fires with flame lengths of 4-8 feet and fire intensities between 100-500 BTUs/foot/second, heavy equipment would be required. In situations that have intensities in excess of 500 BTUs/foot/second and flame lengths in excess of eight feet, fire activity becomes very unpredictable and develops problems with spotting and crowning. By these standards, the implementation of Alternatives B and C would be very effective in allowing for containment of unwanted fires on the treated areas.

There is typically a time lag of one to two seasons from the completion of timber harvest activities and the follow-up underburning fuels reduction treatments. This is related primarily to the limited windows of opportunity for burning in the spring and fall of each year. During timber harvest, aerial fuels are converted into surface fuels. The risk of a crown fire would be reduced, but there would be a temporary increase in fire risk in the cured logging slash. This time of risk is much shorter and is more easily regulated by grapple piling, which can be accomplished throughout the spring, summer and fall seasons.

How Much and Where Treatments Would Occur - Both of these alternatives would treat more than 1,200 acres, or over half of the total project area (table 11). As described in Chapter II, the treatments involve a combination of timber harvest and post-sale fuels treatments that would greatly reduce fireline intensities and flame lengths as described earlier. Also, the treatments are to be accomplished over large contiguous areas, with all of the area around the microwave sites targeted. Refer to the treatment areas on the alternative maps in Chapter II.

Table 11. Fuel Treatment for Alternatives B and C.

Treatment	ALT. B Acres	ALT. C Acres
Underburn	772	777
Limb and Lop Tops	194	223
Yard Tops	9	9
Grapple Pile & Burn	256	222
TOTAL	1231	1231

When the three items discussed above are considered together, in relation to the protection of the structures, implementation of either Alternative B or C would be very successful. They provide a defensible perimeter to the microwave sites and the powerline corridor. This is based on the facts that the ground and aerial fuel loadings would be reduced, which would reduce fireline intensities and flame lengths. These reductions would allow for a very high probability for firefighter success and very low potential for the development of a crown fire.

3.33f Cumulative Effects of Alternatives B and C

Since this project proposes fuels reduction activities on over half of the project area, it is reasonable to conclude that the fire risk would be similarly reduced, as displayed earlier in the BEHAVE modeling outputs. Within the project area, the probability of firefighter success with initial attack is very high, especially if the ignition point is within an area that has been treated. Firefighter access into this area is good, and fuel loadings would be low to moderate. However, treatment of stands in the project area would not reduce the risk or intensity of a wildfire on adjoining lands.

Reasonably Foreseeable Actions – The following reasonably foreseeable actions could occur under alternatives Band C:

Riparian Road Obliteration and Landing Slash Disposal - Decreasing road densities may result in a small decrease in human-caused wildland fires, although the change may not be noticeable because there would not be a significant change in road densities or use patterns on the travel zones that have the highest ignition density.

Wildlife Habitat Burning on High Ridge Ecosystems - The 93-acre high ridge ecosystem maintenance project, designed to improve wildlife habitat, would reduce the risk of an escaped wildfire by reducing the fuel loads. Reducing the fuel loads would make containment of a wildfire easier. This project by itself would not protect the microwave towers, power lines, or adjacent private lands, but cumulatively with the other proposed treatments would be effective at reducing the risk of fire and make containment of unwanted wildfires much more successful, which would help protect these structures.

Inventory and Treatment of New Noxious Weed Invaders – Treatment of new noxious weed invaders would have no effect on wildland fire intensities in forest fuel types.

Timber Stand Improvement - In the long term, this action would move stands toward historic species composition and stand structures that would make them more resilient to disturbances such as wildfire. In the short term, there would be a temporary increase in dead fine fuels, which, should a wildfire occur, would increase wildfire intensity.

Future Salvage Opportunities - A portion of the proposed timber harvest includes salvage harvest opportunities throughout the project area. Typical salvage operations include the removal of scattered individuals or groups of dead and down trees. The merchantable portions are removed, which will reduce fire duration (Smith and Fischer 1997), but will not greatly affect fire intensity. The fine fuels, depending on the concentrations, will be either scattered or piled. Piling of the slash, followed by burning of the piles will reduce the fire intensity within the area salvaged, but will not have a real measurable effect on fire risk on the area as a whole. Likewise, if the slash is scattered and is allowed to abate naturally, the fire intensity would temporarily increase. However, due to the scattered nature of salvage harvesting, this practice would not have been a real measurable effect on fire risk on the area as a whole.

1. Cumulative Effects of Alternatives B and C on Private Lands

Treatment of over half of the project area acres would reduce the potential for fire risk within this area and would also allow for more timely containment of unwanted fires, which would reduce the chances of a fire escaping onto adjacent lands. Also, most large stand-replacing fires in the IPNF are wind driven or are the result of regional climate patterns, which historically are pushed to the north and east by prevailing wind patterns. Examples of this on the north zone of the IPNF include the Sundance and Trapper Peak Fires of 1967, the Ball Creek Fire of 1970, the Templeman Lake Fire of 1979, the Giles Connection Fire of 1988, and the Northwest Peaks Fire of 2000. This also coincides with weather data collected at the district level (refer to project file). As stated above, the area directly to the northeast of the project area is Federal land. The closest private land to the northeast is 2-3 miles away.

2. Consistency With the Forest Plan

The goal of the IPNF Forest Plan is to provide efficient fire protection and fire use to help accomplish land management objectives. The Forest Plan standards for fire management, 2a through 2g, are listed on page II-38 of the Forest Plan (USDA 1987).

Alternative A, the no action alternative, excludes fuels treatment. Forest Plan standards 2a, b, d, and e, which deal with fire suppression, would be adhered to. However, the continued succession of fuels and vegetation, mortality from insect disease, and the exclusion of fire would create areas where the trend in fire behavior characteristics would in time not meet the goals, objectives and standards established in the Forest Plan.

Alternatives B and C, the action alternatives would treat over half of the total acres in the project area through a combination of timber harvest, prescribed burning, grapple piling, and other fuels reduction methods. Through the implementation of those treatments, all of the standards listed above for fire suppression would be met, as well as standards 2c, f, and g, associated with fuels treatment.

3.4 Air Quality

3.41a Regulatory Framework

Current direction to protect and improve air quality on National Forests is provided by 1) the Forest and Rangeland Renewable Resources Act of 1974 (16 U.S.C. 1601), as amended by the National Forest Management Act (16 U.S.C. 1602); 2) the Federal Land Management Policy Act of 1976 (43 U.S.C. 1701); and 3) the Clean Air Act amendments of 1977, 1990, 1999 (42 U.S.C. 7401-7626). The Clean Air Act (Section 110) requires states to develop State Implementation Plans (SIPS), which identifies how the State will attain and maintain national air quality standards.

The Clean Air Act amendments of 1977 set up a process that included designation of Class I, II, and III areas for air quality management. (See project file for Idaho and Montana or Web page address for all states.)

The Clean Air Act of 1977 (as revised 1991) requires the Environmental Protection Agency (EPA) to identify pollutants that have adverse effects on public health and welfare and to establish air quality standards for each pollutant. Each state is also required to develop an implementation plan to maintain air quality.

The EPA has issued National Ambient Air Quality Standards (NAAQS) for sulfur dioxide, carbon monoxide, ozone, nitrogen dioxide, lead, and particulate matter less than or equal to 10 microns (PM 10) (see project file NAAQS standards). Idaho and Washington also have standards for these pollutants. Particulate standards were originally defined in terms of Total Suspended Particulate (TSP). In recent years, the Environmental Protection Agency (EPA) has changed the particulate standard to apply to small particulate less than 10 microns in diameter (PM10) and less than 2.5 microns in diameter (PM2.5). This change was made because PM10 and PM2.5 are too small to be effectively filtered by the human respiratory system and much of it penetrates deep into the lungs. When inhaled, these small particulates can cause respiratory problems, especially in smoke sensitive portions of the population such as the young, elderly or those predisposed to respiratory ailments. The Act defines NAAQS as levels of pollutant above which detrimental effects on human health and welfare could occur. An area that is found to be in violation of NAAQS is called a non-attainment area. Pollution sources in these areas are subject to tighter restrictions. Spokane, Washington; Libby; Montana; and Sandpoint, Idaho are Federally designated non-attainment areas, because of an excess of PM 10. A portion of Kootenai County, Idaho (Coeur d'Alene) is a proposed non-attainment area for PM10.

Airshed Classifications

Class I - These areas include all international and national parks greater than 6,000 acres, and national wildernesses greater than 5,000 acres, that existed on August 7, 1977. This class provides the most protection to pristine lands by severely limiting the amount of additional man-made air pollution, which can be added to these areas. The nearest federally designated Class I area is the Cabinet Wilderness, located approximately 45 air miles east to slightly northeast near the Idaho-Montana border. The intrusion of smoke into the Class I airsheds from prescribed burning operations in this project area would be minimal due to distance, the smoke dispersion and the prevailing southwest to north east air flow.

Class II - These areas include all other areas of the country. These areas may be upgraded to Class I. A greater amount of additional man-made air pollution may be added to these areas. All Forest Service lands which are not designated as Class I are Class II lands. All of the land in the Project Area is designated as Class II.

Class III - These areas have the least amount of regulatory protection from additional air pollution. To date, no Class III areas have been designated anywhere in the country.

Airshed Groups are assembled in North Idaho and Montana to work cooperatively to "minimize or prevent" accumulation of smoke in Idaho and Montana to such degree as necessary to meet State and Federal ambient air quality standards when prescribed burning is necessary for the conduction of accepted forest practices, i.e. hazard reduction, regeneration site preparation and wildlife improvement (MOA, 1990). The Sandpoint Ranger District is a member of this group and adheres to the group's restriction procedures. As monitoring units, the airshed groups may reduce burning, stop burning in specific areas, or cease burning entirely when meteorological or existing air quality conditions so warrant. Forest management burning is thereby regulated during the months of September through November (North Idaho Cooperative Smoke Management Plan).

3.42 Affected Environment

The Little Blacktail Project Area lies in a Class II airshed (see box for definitions of airshed classifications). The air quality in the Little Blacktail project area and the adjacent airshed is generally considered very good. An occasional negative impact has occurred due to smoke from wildfires, debris/waste burning, smoke and dust from agricultural activities, and vehicle exhaust and dust. The prevailing winds are from the west/southwest and normally push smoke from prescribed burning to the northeast and out of the area toward Montana Airshed 1, approximately 35 miles away, during the spring and fall burning seasons. Existing air quality has been determined by visual observations and annual North Idaho Smoke Management Committee reports which include air quality monitoring data compiled by the Idaho Department of Environmental Quality (DEQ) and Montana DEQ.

Historically, fire and smoke have always been part of the Northern Rockies ecosystem. Fire history indicates that impacts from smoke occurred infrequently. Fires occurring naturally in the project area and the general weather regimes of North Idaho would cause emissions to persist from a few hours to several days. These impacts would have occurred in the summer and early fall months.

The effect of Euro-American settlement and subsequent fire protection has reduced the historical amount and duration of smoke emissions from wildland fires. In the case of prescribed fire, the amount of smoke generated has been mitigated from earlier levels of post-settlement burning by forest managers scheduling burns during periods of good to excellent dispersion.

3.43 Environmental Consequences

3.43a Methodology

Emission production modeling was completed for each alternative using the First Order Fire Effects Model (FOFEM) (see project file). This model is a software program designed for resource managers to estimate woody fuel consumption and smoke production for forest stands (USDA 1997b). FOFEM models emission production, not visibility, or dispersion. It estimates the total pounds per acre of PM 2.5 (particulate matter less than 2.5 microns in diameter), PM10 (particulate matter less than 10 microns in diameter), and carbon monoxide that will be generated. Inputs for the program include fuel loading by size class, vegetation, density (herbaceous, shrub, and tree regeneration), anticipated fire intensity, fuel moisture, duff depth, and season of burning.

The Idaho Panhandle National Forests are a party to the North Idaho Smoke Management Memorandum of Agreement (MOA), which established procedures regulating the amount of smoke produced by prescribed fire. A principal objective of the MOA is to "minimize or prevent the accumulation of smoke in Idaho to such a degree as is necessary to protect State and Federal Ambient Air Quality Standards when prescribed burning is necessary for the conduct of accepted forest practices." The North Idaho group currently uses the services and procedures of the Idaho/Montana State Airshed Group. The procedures used by the Airshed Group are considered to be the Best Available Control Technology (BACT) by the Montana Air Quality Bureau for major open burning in Montana. A Missoula-based monitoring unit is responsible for coordinating prescribed burning in north Idaho year-round. This unit monitors meteorological data, air quality data, and planned prescribed burning and makes a decision daily on whether or not any restrictions on burning are necessary the following day.

In practice, a list of all prescribed burning planned for the year in the Sandpoint Ranger District is forwarded to the monitoring unit through the IPNF Dispatch Center before September 1. By 8:30 a.m., daily, the Sandpoint Ranger District informs the dispatch center of all burning planned for the next day. This information is forwarded to the monitoring unit. By 3:00 p.m. the same day the monitoring unit informs the Forest if any restrictions are to be in effect the following day, and the dispatch center informs the District. All of these precautions would limit smoke accumulations in the valley to legal, acceptable limits.

Historically, prescribed burning on the Sandpoint Ranger District occurs in the spring and fall seasons over a time span of 45 to 60 days during each season. All burning would comply with federal, state, and local regulations. Management practices include, but are not limited to, burning under spring-like conditions (high fuel, soil and duff moistures) to reduce emissions and provide for retention of large woody debris, evaluation of atmospheric stability to validate predictions of wind flow and smoke dispersal, and public contact and education. It should also be noted that control of the burning prescription during a spring or fall burn would generate less smoke than a much hotter stand-replacing summertime wildfire, as much of the fuel would have been removed by harvest operations.

The cumulative effects area of smoke, road dust, and other related effects is difficult to tie to a specific geographic area. The distance that smoke and dust will travel is dependent on numerous factors, including the prevailing winds, local winds, inversions, the amount of smoke generated from a burn, the amount of fuel to consume, the stability of the atmosphere, and others. However, since the project area is located in northern Idaho, only a short distance from Montana, it is reasonable to consider the cumulative effects area to be northeastern Idaho and northwestern Montana.

3.43b Alternative A (No Action)

1. Direct and Indirect Effects

In the project area, current management activities contribute only minimal pollutants to the local airsheds. Under the No Action Alternative the primary sources of pollution would be from vehicle exhaust, road dust, agricultural burning, other forest residue burning, and residential wood stove use.

This alternative would have no immediate adverse effect on air quality, except in the case of a wildfire. If a wildfire were to occur, the potential for air quality degradation and reduced visibility could increase with this alternative, depending on the size of the fire, since wildfires produce more smoke than prescribed fires (Arno 1996). Existing and increased mortality in the project area would contribute to increased fire intensities and severities. Consumption of the increased fuel loads and understory biomass would increase the amount of smoke emissions. These emissions may remain in the local and surrounding airsheds for a period of a few days to several weeks, depending on the fire's size and intensity.

A wildfire was modeled using FOFEM to estimate the potential effects of a wildfire on air quality within the project area. For comparison purposes, the acres of a potential wildfire are equal to the number of acres that require burning under Alternative B. The model showed that nearly twice as much PM10 and PM2.5 would be generated in a wildfire as would be generated by either Alternative B or C. This is because there would be more three-inch and larger material, branch wood, and foliage of the green timber that would be available to burn than under the action alternatives. This is displayed in table 12.

2. Cumulative Effects

Air resources are somewhat unique in that the past impacts to air quality are not usually evident. So, the effects from private land prescribed burning, residential wood combustion, traffic exhaust, road dust, and any escaped wildfires would be cumulative only with the local emission sources that would occur at the same time.

Table 12. Estimated PM10 and PM2.5 Emissions (total tons per project)

Type of Emission	ALT.A	ALT. B	ALT. C
Total tons of PM_{10}	214*	108	107
Total tons $PM_{2.5}$	181*	92	91
Total tons	395*	200	198

**In a simulated wildfire.*

3.43c Effects Common to Alternatives B and C

1. Direct and Indirect Effects

Disposal of slash from harvest through the use of prescribed fire would temporarily affect air quality. Slash and heavy fuel loadings also increase potential wildland fire intensities and severity. Prescribed fire is often used as a tool to reduce fuel loadings, thereby reducing potential intensities and severity.

Both of the action alternatives include underburning for fuel reduction, seedbed preparation, and nutrient recycling purposes. Additional burning would also be used to dispose of landing and excavator piles. The result of this burning would be increased smoke within the immediate vicinity of each burn on the day of the burn with the possibility of increased concentrations at the lower elevations in the event of a nighttime inversion. This would occur only on the day of the burns, with only scattered, minor drift smoke possible for two to three days after that. To limit the potential effects of inversions, the Montana/Idaho State Airshed Group will only allow burns to be conducted when good or excellent dispersion conditions are indicated. The risk of smoke intrusion into Class I airsheds (Cabinet Wilderness) and non-attainment areas (Libby, Sandpoint, Spokane, Coeur d'Alene) from any prescribed burning operations in the project area would be low due to distance and prevailing winds. Smoke created in the project area is normally carried to the northeast by prevailing southwest flows aloft and would not normally affect these areas. Dust generated from road construction, reconstruction, and increased vehicle traffic may also temporarily affect local air quality. Timber Sale contracts would require dust abatement during dry periods where dust from road travel becomes a problem.

According to the "Decision Analysis for Smoke Modeling," as outlined in the document Describing Air Resource Impacts From Prescribed Fire Projects In NEPA Documents For Montana and Idaho In Region 1 and Region 4, any project that generates more than 100 tons of PM2.5 and PM10 **per year** must be further analyzed using the NFSPUFF model: An Air Quality Model for Smoke Management in Complex Terrain (USDA 1997). Table 12 displays the total amount of PM2.5 and PM10 that could be generated by all of the prescribed underburning and pile burning combined. This figure is at or close to 200 tons of total emissions for the project that would be generated with either alternative B or C. However, to complete all post-harvest slash reduction activities for a project of this size, it would typically take three to five years. Given this three-to five-year time frame for fuel activities, the annual expected air emissions would be roughly 40-70 tons per project per year, which is well within the 100 tons mentioned above.

Table 13. Approximate Fuel Treatment Acres

Treatment	ALT.A	ALT. B	ALT. C
Underburn	0	772	777
Burn Landings	0	3	3
Limb and Lop	0	194	223
Yard Tops	0	9	9
Grapple Pile & Burn	0	256	222
Total Harvest Acres	0	1,231	1,231
Total Treatment Acres*	0	1,234	1,234
Opportunity underburning	0	94	94

** The number of total treatment acres exceeds harvested acres by the burn landings acreage.*

Effects of Fuel Treatment Methods

Prescribed Burning - Two types of prescribed burning would be used to treat both activity-created and natural fuels. They are defined as follows:

Underburning: This method is designed to meet various resource objectives where a tree canopy is present and is to be preserved. The treatment reduces woody debris, provides site preparation for natural or artificial regeneration and eliminates unwanted vegetation. Underburning can also improve wildlife habitat.

Underburning may have a significant short-term impact on air quality because of slow ignition, which causes lower fire intensity, and relatively high fuel moistures that often occur in spring and fall burns. However, most of our burns are conducted during periods in the spring and fall when atmospheric conditions promote ventilation.

Pile burning (machine or hand)*:* This treatment is used to dispose of woody debris. Pile burning is conducted in late fall during wet and often snowy conditions. The majority of piles are created using an excavator, which virtually eliminates dirt and other non-combustible debris from the piles, as was common with traditional dozer piling. The burning in excavator piles is extremely efficient and creates minimal smoke. Smoke emissions from pile burning are 25 to 50 percent less than that generated by underburning and increase combustion efficiency as much as 95 percent (D. Ward 1992).

Non-fire Treatments - In addition to fuel treatments using prescribed fire, other non-fire treatments would be used:

Limb and Lop: With this treatment, branches are cut from felled trees and lopped to a predetermined height, then scattered to reduce fuel concentrations. The objective is to rearrange the fuel to eliminate concentrations and break up vertical and horizontal continuity. Generally this treatment hastens natural decomposition and improves esthetic qualities of the treated area.

Yard Tops: Trees or logs are yarded out of the woods with the top attached to the top log. The top and limbs are severed from that part of the tree where there is no longer a commercial wood product at the log landing and placed in piles for burning. Burning can be done later or commensurate with logging.

2. Cumulative Effects

The Little Blacktail project emissions would be cumulative only with local emission sources occurring at the time of the burning. The operations of the Montana/Idaho State Airshed Group (described in Affected Environment section) are critical to minimizing cumulative air quality impacts in Idaho and Montana. The daily operations of the Airshed Group consider and try to minimize smoke impacts from prescribed fire and wildland fire use.

The monitoring of air pollutants during prescribed burning seasons is used to eliminate burning during times when such activities (including private land management activities) would result in violations of State standards, including unacceptable impacts to non-attainment areas. The Forest Service voluntarily ceases burning operations to avoid violations of State standards. Burning of activity-created fuels would occur primarily in early spring when demand for airspace has been historically low. Smoke and particulate matter flow to the northeast and dissipate rapidly during good to excellent dispersion days.

Reasonably Foreseeable Actions

Smoke produced from fuel treatments would compete with other activities within the airshed. Activities such as agricultural field burning, other forest residue burning, residential wood stove use, motor vehicle-produced exhaust and dust, and even dust from the Palouse and Columbia Basin produce pollutants that contribute to degradation of air quality. All of these activities occur annually and are monitored by the states. As mentioned above, the Forest Service voluntarily ceases burning operations to avoid violations of State standards.

Other Restoration Projects - As described in Chapter II, there is an opportunity to use prescribed burning to enhance wildlife habitat. This will have similar effects to those that are described under Effects Common to Alternatives B and C. These burns would also be monitored and coordinated with the Montana/Idaho State Airshed Group.

The implementation of the proposed riparian road obliteration and landing slash disposal, inventory of new noxious weed invaders, and timber stand improvement activities, in conjuction with the implementation of Alternative B or C, would have no effect on air quality.

Future Salvage Opportunities - A portion of the proposed timber harvest includes salvage harvest opportunities throughout the project area. With salvage operations the primary slash disposal method is lopping and scattering of the tree limbs with the possibility of spot grapple piling in heavier concentrations of dead and down timber. There may also be some slash accumulated at the landings, which would also be piled. The burning of these piles would be done in the late fall or early winter and would have a very limited impact on air quality.

3. Consistency With the Forest Plan and Other Applicable Regulatory Direction

The Forest-wide objectives for air quality include maintaining excellent air quality on the Forest and protecting local and regional air quality by cooperating with the Montana Air Quality Bureau in the Prevention of Significant Deterioration (PSD) Program and the State Implementation Plan (SIP). Requirements of PSD, SIP and the North Idaho/Montana Smoke Management Plan would be met.

As mentioned previously, smoke management for air quality is scheduled by the IPNF and is coordinated with and monitored by the North Idaho/ Montana Airshed Group. The project meets the Clean Air Act through coordination with this group prior to burning, and the use of burning techniques that minimize smoke emissions.

Prescribed burning is consistent with State laws requiring treatment of activity-created fuels to reduce the risk of catastrophic forest fires.

3.5 Wildlife

3.51 Affected Environment

3.51a Introduction

Ecological disturbances, resulting from either natural processes or human-caused events, are responsible for altering landscape patterns and influencing wildlife populations. Disturbances from natural processes (e.g. landslides, fire, and insect or disease outbreaks) direct landform and vegetation patterns, forming the foundation for wildlife habitat and influencing wildlife abundance and composition. Humans can alter landscape patterns and create features such as roads and trails, or they can alter the frequency, extent and magnitude of natural disturbances such as fire. Wildlife species will occupy their preferred niche in the landscape, and move from place to place as forest structures change and different habitat conditions develop (Clark and Sampson 1995).

In the absence of disturbance, vegetation grows through a gradual and more predictable sequence of change called succession. As vegetation moves through each stage of succession, the composition of wildlife species shifts accordingly. All wildlife possess a certain successional strategy. Some species are adapted to the early stages of forest development where grasses, forbs and shrubs dominate the site, while others are better suited for the later stages of forest development. Other species have adapted to a wide array of vegetation patterns. Because species and their environments are dynamic, it is highly questionable whether various wildlife species will persist indefinitely in some areas where they are found today.

3.51b Characterizations of Habitats

As discussed in the Vegetation Section (Affected Environment), the 1910 fires and tree harvesting have been the major disturbances shaping the forest vegetation in the Little Blacktail project area. Since the fires of 1910, a majority of the forested landscape has progressed into the pole and immature size classes. Past forest harvesting has altered the spatial pattern of the landscape, reverting some areas to the early succession (seedling/sapling) phase of forest development.

White pine blister rust and fire exclusion have changed the species composition of stands in the Little Blacktail area. Today's landscape contains only remnants of white pine, ponderosa pine and western larch. Douglas-fir and grand fir have replaced much of the growing space once occupied by these species, effectively crowding them out. This change in species composition has altered ecosystem biodiversity, increasing the risk to ecological stress and calamity. The dominance of Douglas-fir has increased the forest's vulnerability to drought stress and insect and disease infestations, resulting in higher levels of tree mortality.

Given the often-conflicting habitat requirements of many species, a sound strategy for management seems to be to try to maintain a complex pattern of forest types and age classes across the landscape that encourages biodiversity and tries to emulate historic patterns.

3.51c Species Screen

The combination of various vegetation types and other environmental components in and around the project area provides habitat for an assortment of wildlife species. To facilitate the management of all wildlife species associated with the project area and to help ensure population viability, the Idaho Panhandle National Forests selected a number of species to assess the impacts of land management decisions on the wildlife resource. Most of these species are referred to as Management Indicator Species (MIS) and include threatened and endangered species, sensitive species, and other species whose habitat is likely to be changed by Forest management activities. Sighting records, literature, previous planning records, and habitat characterizations were used to screen MIS for their relevancy to a detailed study.

The Council on Environmental Quality (40 CFR 1502.2) directs that effects be discussed in proportion to their significance. Some issues about wildlife and their habitat require a detailed analysis to determine effects on a particular species. Other issues may either not be affected by proposed activities, are affected at a level that does not increase risk to the species, or can be adequately mitigated by altering the design of the project. Generally, these issues do not require a detailed analysis.

Table 14 displays designated Forest MIS. Symbols denote the level of analysis for each species. USDA Forest Service policy (FSM 2670) requires a documented Biological Assessment of Forest Service programs and activities in sufficient detail to determine how an action may affect threatened, endangered, proposed, or sensitive species. The Biological Assessment for this project can be found in the project file. The documentation of effects and rationale for conclusions for Sensitive species are consolidated into the main text of this EIS and in the project file (USDA 1995). A summary of conclusion of effects for all MIS can be found in the project file.

3.51d Species Habitats and Requirements

This section includes a brief discussion of species' habitat preferences and requirements. It also describes the environmental baseline and relevant habitat components that may or may not be affected by the alternatives if they were implemented. The information in this section is based on scientific literature, district wildlife atlases, professional judgment, and findings of stand information collected in the field.

Table 14. Management Indicator Species analyzed in the project area.

	No detailed discussion and analysis is necessary for species or habitat presumed not to be present within the affected area. The rationale for no further analysis for these species can be found in the project file.	Supporting rationale is presented in this section for those species that are presumed to be present but not necessarily affected by the proposed actions. No detailed discussion and analysis is necessary.	Species considered present and potentially affected by the proposed actions are carried forward into a detailed discussion and analysis in Environmental Consequences Section.
Threatened and Endangered Species			
Bald eagle (*Haliaeetus leucocephalus*)	✓		
Northern gray wolf (*Canis lupus*)	✓		
Grizzly bear (*Ursus arctos horribilis*)	✓		
Woodland caribou (*Rangifer tarandus caribou*)	✓		
Canada lynx (*Lynx canadensis*)	✓		
Sensitive Species			
Flammulated Owl (*Otus flammeolus*)			✓
Black-backed Woodpecker (*Picoides arcticus*)			✓
Harlequin Duck (*Histrionicus histrionicus*)	✓		
Northern Goshawk (*Accipiter gentilis*)			✓
Peregrine falcon (*Falco peregrinus anatum*)	✓		
White-headed woodpecker (*Picoides Albolarvatus*)	✓		
Common Loon (*Gavia immer*)	✓		
Fisher (*Martes pennanti*)	✓		
Wolverine (*Gulo gulo*)	✓		
Northern Bog Lemming (*Synaptomys borealis*)	✓		
Townsend's Big-eared Bat (*Plecotus townsendi*)	✓		
Coeur d'Alene Salamander (*Plethodon vandykei idahoensis*)	✓		
Northern Leopard Frog (*Rana pipiens*)	✓		
Boreal Toad (*Bufo boreas*)	✓		
MIS and Others			
Pileated Woodpecker (*Dryocopus pileatus*)			✓
Rocky Mountain Elk (*Cervus elaphus nelsoni*)		✓	
White-tailed Deer (*Odocoileus virginianus*)		✓	
Forest land birds		✓	
Marten (*Martes americana*)	✓		

1. Northern Goshawk

Reference Condition

The northern goshawk is a forest habitat generalist that uses a wide variety of forest ages, structural conditions and successional stages, inhabiting mixed coniferous forests in much of the northern hemisphere (Reynolds et al 1991). Throughout North America, goshawk nest sites have consistently been associated with the later stages of succession (mature and old growth trees) in moderate to high tree densities (Warren 1990). Foraging habitat includes a wide range of forest age structures that provide a relatively open forest environment for unimpeded movement or flight through the understory.

The 1910 fires played an important role in shaping habitat for goshawks in the Little Blacktail area. The fire burned over much of the area, removing most of the suitable nesting habitat for goshawks and leaving the landscape in the early stages of successional development (young trees and shrubs).

Current Conditions

Due to fire exclusion since the early 1900s, today's landscape is dominated by an immature forest (80-90 year-old trees) that is on the threshold of developing the structural attributes necessary for goshawk nesting habitat. Nesting habitat is the most critical and limiting habitat feature for goshawks; however, suitable nesting habitat is lacking in the project area given the current species composition and forest structure. These stands of trees are moving toward suitable nesting habitat but they are not currently there. In the absence of a disturbance, healthy stands with relatively open understories are being replaced by dense Douglas-fir and grand fir regeneration.

In June 2000, surveys were conducted to validate whether any goshawks reside in the analysis area. A reasonable effort was made to achieve coverage of capable habitat in the project area. No goshawks were observed or heard during these surveys (see 2000 goshawk surveys- project file).

2. Flammulated Owl

Flammulated owls are seasonal migrants to northern latitudes during the spring and summer. They are attracted to relatively open grown, older forests of ponderosa pine and Douglas-fir that are associated with drier habitats. Reynolds and Linkhart (1992) reported that all published North American records of nesting, except one, came from forests in which ponderosa pine trees were at least present, if not dominant in the stand. The flammulated owl's preference for the ponderosa pine/Douglas-fir cover type can be linked to food availability. Reynolds and Linkhart noted a stronger correlation between prey availability and this cover type than with other common western conifer cover types.

Reference Condition

No population numbers exist for this species' historic presence. Inferences can be made when comparing the historical occurrence of ponderosa pine with current levels. Based on historic vegetation estimates, ponderosa pine comprised 11% of National Forest lands within the Pend Oreille subbasin. Today, only two percent of National Forest lands consist of sites that are predominately ponderosa pine (USDA draft in progress). This is 82 percent decrease from historic conditions. Therefore, suitable flammulated owl habitat is probably less prevalent today than in the past.

Current Conditions

The Little Blacktail project area is part of the Purcell Trench zone, one of five ecological zones that comprise the Pend Oreille subbasin. Of the five zones, the Purcell Trench has the highest percentage of dry habitats or sites capable of supporting ponderosa pine.

The primary factors that have contributed to the loss of flammulated owl habitat are those that have resulted in a loss of the ponderosa pine cover type. As mentioned previously, fire suppression has led to the advancing succession of species, such as Douglas-fir and grand fir, that crowd out ponderosa pine. Also, dry open grown forests of ponderosa pine and Douglas-fir were common at lower elevations, on areas suitable for human settlement and intense forest management. Currently, the project area has very little dry open grown ponderosa pine forest cover types (see Forest Vegetation – Affected Environment).

3. Black-backed woodpeckers

Snags (standing dead trees) are vital components of the forest ecosystem and are especially important to woodpeckers. Many forest-dwelling animals use these structures for nesting, foraging, denning, and roosting. Most notable of these are woodpeckers that excavate cavities in decayed wood of standing trees. Other animals subsequently use their vacated cavities (Bull et al. 1997). Several MIS, including black-backed woodpeckers, depend on snag habitat for their survival.

Black-backed woodpeckers tend to flourish in early post-fire habitat (Hutto 1995). Year-round, they are uncommon residents of coniferous forests and naturally occur at low population levels. Following fire or insect and disease outbreaks that increase populations of wood-boring insects, they experience local population increases and temporary range extensions. The availability of habitat for this species is negatively affected by the prevention of fires and post-fire salvage harvesting (Hutto 1995).

Reference Condition

Historically, ecosystems in north Idaho were shaped by disturbance patterns that altered the size and distribution of forest structures across the landscape. Forest succession, wind damage, fire, insects, and disease created snags in areas that ranged in size from individual trees or small patches to entire drainages. Consequently, snag densities would vary across the landscape.

Snag habitat associated with the Little Blacktail project area has been strongly influenced by fire and the subsequent changes in vegetation composition. As previously discussed, the fire of 1910 swept through the Little Blacktail area, leaving in its path a landscape dominated by fire-killed trees. This change in condition likely temporarily increased the breeding densities of black-backed woodpeckers.

Although this stand-replacing fire provided a pulse of hard snags, it disrupted the continuity and sustainability of snag production that would occur during the predicted sequence of vegetative change.

Because most snags generally do not persist long after a catastrophic fire, black-backed woodpecker populations likely dispersed from burned areas in the Little Blacktail area within several years following the fire. Morrison and Raphael (1993) found that snags created by fire fell sooner than snags not created by fire. Burning at the base of trees probably weakens snags created by fire. Also, snags in large burned areas are more directly exposed to wind, causing them to fall sooner than snags surrounded by live trees. In more recent times, timber harvest, road construction and firewood gathering from roadsides have contributed to the current distribution of snags.

Current Condition

While there have been no observations of black-backed woodpeckers in the project area, suitable habitat exists. Since 1910, fire exclusion and the introduction of white pine blister rust have laid the foundation for today's vegetation patterns and snag habitat. There are few large snags available in portions of the project area because of past logging and stand-replacing fires in the early 1900s. Remnant western larch and ponderosa pine snags occur infrequently throughout the project area due to the decline in those species. Small diameter snags (<10 inches) are much more abundant and are used more by black-backed woodpeckers than some other species dependent on larger snags (i.e. pileated woodpecker).

4. Pileated Woodpecker

Reference Condition

Pileated woodpeckers are relatively common in both cut and uncut mid-elevation forests. They appear to do well in a matrix of forest types (Hutto 1995). However, since foraging habitat occurs in a wider ecological range of forest age structures, nesting habitat is considered the most critical and limiting feature for pileated woodpeckers.

The pileated woodpecker was selected as a MIS because its highest densities occur in old-growth forests and because of its resultant need for large dead trees for nesting and dead woody material (standing and down) for foraging (Bull et al. 1990). Specific requirements for nesting include large trees in relatively uncut stands; with nest cavities usually located more than 30 feet above the ground--at a level with the canopy of the surrounding forest (Warren 1990).

Current Condition

As discussed in the black-backed woodpecker section, snag habitat in the project area has been strongly influenced by vegetation succession and natural fire events. Fires that swept through the Little Blacktail area burned with such intensity that most of the dominant tree canopy was killed, thereby, converting the sites to early stages of succession. Because snags do not persist long after lethal fires, large snags are generally absent from today's landscape.

The change in species composition, along with past harvest practices, has slowly and methodically replaced such species as ponderosa pine, white pine and western larch, further aggravating the production and sustainability of large snags. Consequently, snag production is shifting from larger, longer-lived species to smaller, shorter-lived species, which affects the long-term stability and persistence of snag habitat in the Little Blacktail area. As a result, snag habitat is in decline for species associated with large snags, such as the pileated woodpecker.

3.51e Species Not Analyzed Further

1. Rocky Mountain Elk

Elk are widely distributed within the Idaho Panhandle National Forests and, like deer; move seasonally in response to weather patterns and food availability. However, because of their greater foraging ability and mobility, elk will use higher elevations more than deer during the winter period. During the summer period there is a general relaxation of habitat requirements and a broader use of available habitats. Elk are regarded as focal species because of their high social, cultural, and economic importance in north Idaho.

Reference condition

The primary threat to elk is road access. Beginning in the 1960s, accelerated timber harvest and associated road building brought about mounting conflicts with elk populations. People using highly roaded areas are the single largest threat to big game populations, making them vulnerable to poaching, stress, hunting, accidents and displacement (Quigley and Arbelbide 1997). Other studies have clearly linked elk mortality rates with road access. Leptich and Zager (1991) found consistent patterns of increased bull mortality rates with increased open road densities.

Current Condition

The Little Blacktail project area lies within Idaho Department of Fish and Wildlife's Big Game Management Unit 2. Although population estimates are not available, a small band of elk is known to use this area. Because of low elk densities and limited public lands, this portion of Unit 2 is not considered an elk management priority.

Currently, there are 12.5 miles of system roads within the project area. Of these, 9.9 miles are open (roads without restrictions on motorized use); 2.0 miles are restricted (roads managed with gates and restricting motorized use during closure periods); and 0.6 miles that are barriered (roads with physical obstructions and managed with the intent for no motorized use). In addition, there are 1.6 miles of unclassified roads: 1.2 open miles and 0.4 barriered miles. (See access status by alternative—project file). It is important to note that these miles and descriptions do not match those listed in Chapter II. The difference is due to the fact that the roaded miles considered within this analysis include the entire 2,139-acre project area and the list in Chapter II includes only those roads intended for use with a timber sale.

Compared with the existing condition, Alternatives B and C would reduce the overall open road miles by 0.6 miles. This reduction in open road miles is due to decommissioning 0.2 miles of system roads and 0.4 miles of unclassified roads. All temporary roads (roads constructed for a short term purpose of the project) would be decommissioned (fully obliterated, recontoured with no intent for future use). Consequently, the results of these actions show a decrease in open road densities, thereby, reducing elk vulnerability. Therefore, no further analysis or discussion is warranted.

2. White-tailed Deer

Reference Condition

White-tailed deer are very adaptable and prolific and thrive in a variety of habitat types. They are tolerant of disturbances such as agriculture and forestry practices, and prefer areas modified by these activities if an adequate arrangement of cover and forage is available. Some of the largest white-tailed deer populations in Idaho occur in the northern panhandle. In 1985, the Idaho Department of Fish and Game estimated that 99% of the State's population was found in the Department's two northern regions.

Climatic factors affect the seasonal variation of forage quality and quantity, accessibility to foraging areas and the energetic requirements of the animal (Pfingsten 1984). Winter is the most limiting and stressful period for big game. It is during this period when forage is scarce and travel is energetically very expensive because of snow accumulations. Consequently, in an effort to ameliorate conditions, deer locate themselves on lower elevations, concentrating on smaller, more confined areas known as critical winter range.

Historically, white-tailed deer flourished in the 1800s, but by the early 1900s their populations were reduced to low numbers due to over exploitation by trappers, miners and settlers. White-tailed deer populations have since rebounded to being the most abundant big game species in northern Idaho. Idaho Fish and Game's 1986-1990 statewide goals for white-tailed deer were changed from emphasizing increases in populations to maintaining populations, harvest, and recreational opportunities.

Current Condition

The Little Blacktail project area is located at elevations above 3,000 feet and outside recognized critical winter range boundaries. Critical winter range is generally found at lower slopes and on valley floors below 3,000 feet where snow accumulations are moderate enough to sustain white-tailed deer populations.

Since white-tailed deer populations are prospering in north Idaho and the proposed actions would not impact critical winter range areas, no further discussion and analysis are necessary.

3. Forest Land Birds

Reference Condition

Hejl (1994) acknowledges that, while we do not know all of the specifics of bird-habitat relations, we do understand many principles of forest management that would help maintain a healthy forest for most bird species. These include practices such as encouraging old-growth characteristics, leaving snags and replacement trees, leaving or planting the natural diversity of trees found in the area, burning and allowing fires to happen in a manner similar to natural fire regimes, and mimicking natural landscape patterns. While no single forest condition or structural type will benefit all species simultaneously, providing a mosaic of habitat conditions and age classes can improve habitat values for forest birds.

Idaho has 243 species of birds that breed in the state (Idaho Partners in Flight 2000). A diversity of vegetation and topography results in a diversity of bird species. While all birds are important for their roles in the ecosystem, not all birds and habitats are equal when it comes to threats to their persistence. Idaho Partners in Flight (IPF) has identified and prioritized four habitats that represent species of moderate to high vulnerability and species with declining or uncertain population trends. These prioritized habitats include riparian habitat, non-riverine wetlands, sagebrush shrub, and dry ponderosa pine/Douglas-fir/grand fir forests (Idaho Partners in Flight 2000).

Current Condition

Three priority habitats occur in the Little Blacktail project area: riparian habitat, non-riverine wetlands and dry ponderosa pine/Douglas-fir/grand fir forests. However, these priority habitats would not be adversely affected by the proposed actions. Applying Best Management practices and the Inland Native Fish Strategy (INFS) would protect and maintain riparian habitat and non-riverine wetlands that occur in the project area (see Chapter II –Features Common to Alternatives B and C section). This project would promote the restoration and long-term stability of dry ponderosa pine/Douglas-fir/grand fir habitats by altering species composition, treating overcrowded conditions of shade tolerant trees, and restoring fire to mimic natural disturbances.

Because this project would not cause a loss of riparian habitat or non-riverine wetlands, and would help restore the original distribution of dry ponderosa pine/Douglas-fir/grand fir forests, no further discussion and analysis are necessary.

Recommendations

<u>Dry Ponderosa Pine/Douglas-Fir Habitat</u>

Maintain and restore the original distribution of dry forest (ponderosa pine/Douglas-fir) in the Little Blacktail area. Dry forests were historically characterized by stands of old growth ponderosa pine and are poorly represented on the landscape today.

- In areas where sufficient forest structure and tree composition exists, trend stand densities and patterns toward historic conditions.
- In areas where forest structure and tree composition have been compromised by insects and disease, convert/restore stands to historic vegetative patterns.

<u>High Ridge Ecosystems</u>

Historically, some of the area's higher elevation, ridge systems were maintained in a relatively open condition by natural fire. These periodic fires interrupted plant succession, promoting the establishment of early seral species (i.e. shrubs, grasses, forbs) and providing important winter range for local mule deer populations.

With the elimination of fire on these sites, stand conditions have become markedly different. The natural advances of plant succession have been allowed to proceed, invading these sites and replacing them with denser stands of trees. Consequently, mule deer populations have been virtually eliminated from some of these areas.

- Restore habitat conditions on high ridge ecosystems by mechanically removing encroaching vegetation, followed by prescribed burning.

Rocky Mountain Elk

The primary threat to healthy elk populations is road access by motorized vehicles. High open road densities increase elk vulnerability to poaching and hunting loss.

- Fully or partially obliterate roads that are not needed for long-term management and public use. Maintain or reduce open road densities.

Snag Dependent Wildlife

Large trees are lacking in many areas across the watershed. Large trees are necessary to provide for sustainable habitat for a variety of wildlife species. Severe fires of the early 1900s left much of the landscape lacking larger, longer-lived seral species such as ponderosa pine and larch. The change in dominance by species such as Douglas-fir and grand fir has increased the prevalence of insects and disease. This has resulted in higher levels of tree mortality in the smaller diameter, shorter-lived species.

- Increase the occurrence of longer lived large snags such as western white pine, western larch and ponderosa pine by converting those stands (Douglas-fir and grand fir) which are at high risk to insects and disease to longer-lived seral species such as ponderosa pine, white pine and larch.

3.52 Environmental Consequences

3.52a Introduction

This section displays and discusses the effects on those wildlife species identified in the preceding section that may be affected by the proposed actions. Effects discussions include direct, indirect and cumulative effects, all of which may have positive or negative consequences.

3.52b Cumulative Effects Analysis

A determination of the cumulative effects analysis area is based on each species' relative home range size in relation to its available habitat, topographic features that relate to how species move and utilize their home range (e.g. watershed boundaries), and boundaries that represent the point of diminishing potential effects.

The Little Blacktail project area lies on an isolated tract of National Forest lands, partially surrounded by Lake Pend Oreille and private ownerships. These other ownerships cannot be relied upon for long-term habitat contributions because they are highly susceptible to adverse modifications (e.g. rural developments, forest land conversions) and irretrievable alterations. Also, the general distributions of species do not rely on the Little Blacktail project area because it is removed from large tracts of Federal lands. This area is not considered a critical linkage between habitat areas.

Topographic features in the Little Blacktail project area influence how species move and use their home ranges. Situated in the upper reaches of the Cocolalla Creek watershed, the project area has hydrologic boundaries on the north and east and other ownership boundaries on the south and west. For these reasons, the boundaries of the Little Blacktail project area represent the cumulative effects analysis area for most of the species featured in this analysis.

The cumulative effects analysis for alternatives is an aggregate representation of past, present and reasonably foreseeable human-caused actions or natural events. Past disturbances used in this analysis are discussed in the Vegetation section of Affected Environment and are reflected in the current habitat conditions. The expected changes to habitat (i.e. stand structure) are from the proposed actions. Therefore, the cumulative effects analysis for featured species portrays past and present actions.

3.52c Analysis Indicators for Selected Species

Table 15 displays the indicators that will be used to measure effects on wildlife species. Indicators for each species vary and are based on those factors that could result in a measurable adverse or beneficial effect. For most species being analyzed, appropriate habitat parameters were measured to distinguish suitable habitat (specific parameters for individual species are located in the project file). A discussion of the changes in suitable habitat for each relevant species and the effects on species are disclosed in following discussions.

Table 15. Issue indicators used to measure effects

Species	Indicator
Northern goshawk	▪ Trend toward suitable nesting habitat conditions
Flammulated owl	▪ Trend toward suitable habitat conditions
Black-backed woodpecker	▪ Changes in distribution and quality of snag habitat.
Pileated woodpecker	▪ Changes to large snag habitat

An important concept in discussing changes in habitat conditions is the distinction between *capable habitat* and *suitable habitat*. Capable habitat refers to the inherent potential of a site to produce the necessary components to support a given species. Suitable habitat refers to habitat that is currently providing the necessary components to support a species. Therefore, habitat that is *unsuitable* has the potential to develop into a suitable condition, but currently does not meet the habitat requirements of a species. Habitat that is *not capable* has no potential to develop into a suitable condition.

3.52d Effects Common to Alternatives B and C: All Species Analyzed

Because Alternatives B and C differ by harvest system and amount of roads constructed rather than by amount of vegetation treatment (the factor most likely to affect species habitat), they are discussed together in the analysis of each species.

3.52e Cumulative Effects for All Alternatives

Reasonably foreseeable actions are listed in Chapter I that are relevant to a cumulative effects discussion for goshawks, black-backed woodpeckers and pileated woodpeckers include land uses on private ownerships and firewood gathering. There would be no anticipated effects on goshawks, flammulated owls, black-backed woodpeckers, or pileated woodpeckers from other actions listed because they would not alter habitat conditions.

Because the project area is too small, surrounding other ownerships and National Forest lands to the north would be necessary to accommodate a nesting home range area for goshawks. While other ownerships cannot be relied upon for long-term habitat contributions, the National Forest lands would complement this shortage. These lands are relatively intact and unaffected by past management activities. Consequently, nesting habitat within the project would contribute to the overall home range needs.

Firewood cutting, which has the potential to reduce snags within 50 meters of open and seasonal roads, is anticipated to continue in all alternatives. However, fewer snags would be vulnerable to firewood gathering in alternatives B and C because there would be a reduction in open road miles.

3.52f *Cumulative Effects Specific to Action Alternatives*

Those reasonably foreseeable actions are listed in Chapter I that are relevant to a cumulative effects discussion for goshawks, flammulated owls, black-backed woodpeckers and pileated woodpeckers include timber stand improvement and future salvage. Other foreseeable actions listed would not impact these species because they would not alter habitat conditions.

Thinning young, small diameter trees would be designed to increase the overall health and vigor of the stands. Additionally, the improved species composition would result in forest stands that are more ecologically stable in the face of potential disturbances. Consequently, thinning actions would provide long-term stability for habitat conditions.

Future salvage opportunities would not trigger incremental impacts as long as established criteria are followed (see Chapter II).

1. Northern Goshawk

Methodology

As mentioned previously, nesting habitat is considered the most critical and limiting habitat feature for goshawks. Nesting habitat was evaluated using a habitat suitability model derived from data in the Forest timber stand database (TSMRS). This database was updated to reflect any changes in condition identified by field walk-through exams (stand condition field notes, project file). Modeling rules and assumptions can be found in the project file.

At least three suitable nest areas should be provided per nesting home range (5,000-6,000 acres) to maintain population distribution. The minimum stand size for a nest site is 30 acres. In addition, at least three replacement nest areas should be provided per home range area. All nest areas are best located within 0.5 mile of each other (Reynolds, et al. 1991). The indicator used to measure effects is the trend toward suitable nesting habitat conditions.

Alternative A - Direct and Indirect Effects

Of the total 2,139 acres within the analysis area about 1,460 acres (68%) has been modeled as capable nesting habitat; the remaining 670 acres (32%) is not capable. Due to the stand-replacing fire of 1910, most of this is in the immature stage of forest development. Of capable habitat, there are 57 acres of suitable habitat, split between two stands (#658-01-012 and #658-01-028). However, only one of these stands (#658-01-028) currently meets the size requirements for nesting. Consequently, Alternative A would not provide the quantity, quality and spatial arrangement of habitat necessary to meet nesting requirements.

While Alternative A would not alter existing vegetation patterns through mechanical means, mortality caused by agents such as root disease and insect "outbreaks" would continue to exert change to habitat conditions. Areas of mortality would open the tree canopy and change the vegetative structure from mature and immature to earlier stages of succession (i.e. seedling/sapling). In the absence of disturbance, the cycle of Douglas-fir/grand fir regeneration would be repeated. The understory would continue to close in, further reducing habitat suitability. High fuel accumulations resulting from fallen trees would lead to a higher risk of fires and an increased chance of catastrophic losses to habitat.

The abnormally high densities of Douglas-fir on the landscape have given rise to a high incidence of insects and disease. Consequently, Alternative A would hasten deteriorating forest health conditions, leading to declining habitat conditions for goshawks. However, Alternative A should not change the general distribution of goshawks in the area. Alternative A would not impact goshawks beyond naturally occurring events.

Alternatives B and C - Direct and Indirect Effects

Of the 1,460 acres of capable goshawk nesting habitat, Alternatives B and C would affect 827 acres (57%) the remaining 632 acres (43%) of capable habitat would not be affected by the alternatives.

Of the affected areas, 227 acres are infected with insect and disease. Because of the high incidence of insect and disease, these areas are not currently trending toward suitable nesting habitat. These areas have lost sufficient forest structure, composition and/or density to trend toward suitable conditions for goshawks. Goshawks prefer a high level of canopy closure ($\geq$ 50%); a loss of canopy below this level would cause those stands to retreat from suitable conditions.

Following vegetation and fuel treatments, the remaining 600 acres affected by the action alternatives would retain enough canopy and structure to advance toward suitable habitat conditions. Even though these stands are proposed for harvest, mitigation measures would guide harvest treatments in a manner that would promote the persistence of habitat on the landscape. Some active management (e.g. thinning, prescribed fire) is necessary to produce and maintain the desired conditions for sustaining goshawks and their prey (Reynolds et al. 1991). Selective tree harvest in these stands would continue to trend habitat in a positive direction.

Active management through selective tree harvest and prescribed fire can help restore natural processes in an ecological system and promote goshawk-nesting habitat. Although some stands have lost sufficient forest structure to maintain habitat suitability, proposed actions (e.g. tree harvesting, planting, prescribed burning) would lead to long-term stability of habitat for goshawks.

In summary, Alternatives B and C may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species. These alternatives would allow goshawks to maintain their same general distribution, and thus maintain species viability.

Consistency with Forest Plan and Other Regulations

All action alternatives are consistent with the Forest Plan direction to manage the habitat of species listed in the Regional Sensitive Species List to prevent further declines in populations that could lead to federal listing under the Endangered Species Act (Forest Plan II-28). Alternative A would not impact the Northern goshawk because it does not propose any activities or actions that would alter habitat conditions. All other alternatives may impact individuals or habitat but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

2. Flammulated Owl

Methodology

Flammulated owl habitat was evaluated using a habitat suitability model derived from data in the Forest timber stand database (TSMRS). This database was updated to reflect any changes in condition resulting from field walk-through exams (stand condition field notes, project file). Modeling rules and assumptions can also be found in the project file. The indicator used to measure effects is the trend toward suitable habitat conditions.

Alternative A - Direct and Indirect Effects

Of the total 2,139 acres within the analysis area, about 568 acres (27%) have been identified as capable habitat for flammulated owls. The remaining 1,571 acres (73%) are not considered potential suitable habitat. Of capable habitat, only 25 acres are considered suitable habitat. The lack of suitable habitat is due mostly to the relatively young age of stands.

As discussed previously for Alternative A (e.g. goshawks) existing vegetation patterns would continue to shift toward more shade-tolerant species in the majority of the stands. The higher densities of Douglas-fir and grand fir would continue to displace ponderosa pine trees and eventually phase them out of the stands. This trend would postpone the development of flammulated owl habitat.

Insects and disease would continue to persist in those areas where they are currently active. In the absence of disturbance, the cycle of Douglas-fir and grand fir regeneration would be repeated. Fuel accumulations resulting from fallen trees would lead to a higher risk of stand-replacing fires and an increased chance of catastrophic losses to habitats.

The No Action alternative may affect certain individuals whose survival relies on periodic disturbances to maintain suitable habitat conditions. Alternative A, would allow flammulated owls to maintain their same general distribution, thus maintaining species viability.

Alternatives B and C - Direct and Indirect Effects

Of the 568 acres of capable flammulated owl habitat, Alternatives B and C would affect 382 acres (67%); the remaining 186 acres (33%) of capable habitat would not be affected by these action alternatives. The thinning prescription in stand 12 associated with the 25 acres of suitable habitat would preserve its suitability, trending it forward for flammulated owls.

Of the 382 affected acres, 193 acres are infected with insects and disease. Because of the incidence of insects and disease, these stands have lost sufficient forest structure, composition and/or density to trend toward suitable conditions for flammulated owls. Treating these high-risk stands through regeneration harvest methods would change species composition and favor the longer-lived, more disease-resistant species like ponderosa pine. Management of these stands would promote the restoration of more open grown, older forests of ponderosa pine/Douglas-fir and lead to long-term habitat stability for flammulated owls.

The remaining 189 acres would retain enough canopy and structure to achieve suitable habitat conditions. Although these stands are proposed for harvest, mitigation measures would guide harvest treatments in a manner that would promote the persistence of habitat on the landscape.

Active management through selective tree harvest and prescribed fire can help restore natural processes in an ecological system. Although some stands have lost or are losing sufficient forest structure to maintain habitat suitability, the action alternatives would lead to long-term stability of habitat for flammulated owls.

In summary, Alternatives B and C may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species. These alternatives would allow flammulated owls to maintain their same general distribution.

Consistency with Forest Plan and Other Regulations

All action alternatives are consistent with the Forest Plan direction to manage the habitat of species listed in the Regional Sensitive Species List to prevent further declines in populations, which could lead to federal listing under the Endangered Species Act (Forest Plan II-28). Alternative A would not impact the flammulated owl because it does not propose any activities or actions that would alter habitat conditions. All other alternatives may impact individuals or habitat but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

3. Black-backed woodpeckers

Methodology

The potential effects of management activities on black-backed woodpeckers were determined by the change in habitat conditions that would result from implementing the alternatives. Specific parameters analyzed for this assessment include the changes in distribution and quality of snag habitat.

Alternative A - Direct and Indirect Effects

As mentioned previously, the change in dominance of tree species to Douglas-fir and grand fir has increased the forest's vulnerability to insect and disease attacks. The prevalence of root disease and insect damage would be expected to spread under this alternative, resulting in higher levels of tree mortality. The dead trees in these stands would be replaced by more insect-and disease-susceptible species, thereby perpetuating the cycle and creating smaller and younger stands of trees. Therefore, Alternative A would increase long-term snag densities and provide nesting/foraging opportunities for the black-backed woodpecker and other species associated with small snags.

Mortality would continue to occur in those areas infected with insects and disease. This mortality would provide an abundance of nesting and foraging habitat. High fuel accumulations resulting from elevated tree densities would lead to a higher risk of fires, increasing the chance of stand-replacing fires. This scenario would create a temporary flush of habitat for black-backed woodpeckers.

Populations would remain at low endemic levels without a stand-replacing fire. Consequently, Alternative A would not impact black-backed woodpeckers. Firewood cutting is anticipated to continue along seasonal and yearlong open roads. This activity has the potential to reduce snags within 50 meters of open roads.

Alternatives B and C - Direct and Indirect Effects

In Alternatives B and C, tree harvest would affect approximately 1,231 acres that contain some form of snag habitat. Over the long-term, these alternatives would trend the occurrence of large snags to longer-lived tree species such as western white pine, western larch, and ponderosa pine through conversion from Douglas-fir and grand fir stands at high risk to insects and disease. However, during the short term, the availability of snag habitat for both foraging and nesting would be reduced.

Habitat loss due to tree removal would be partially compensated by snag and defective tree retention measures and prescribed burning. For these alternatives, black-backed woodpecker populations would remain at reduced densities and would maintain their current distribution.

Design features for the project were developed to ensure the retention and selection of snags at a level and distribution that has been shown to support viable populations of species that use snags and logs (see Features Common to All Action Alternatives, Chapter II). Snags and snag replacements would be retained in all treatment units at levels recommended by scientific literature based on recent studies. Snag retention objectives are consistent with recent published data suggesting that populations of cavity nesters were viable in stands of ponderosa pine and mixed conifer forests that contained about four snags per acre (Bull et al. 1997).

Alternatives B and C would reduce the quantity of available snag habitat. However, tree mortality would continue in untreated stands, producing snag habitat. Fewer snags associated with open road corridors would be vulnerable to firewood gathering because of a reduction in open roads.

In summary, Alternatives B and C may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species. Alternatives B and C would allow black-backed woodpeckers to maintain their same general distribution.

Consistency with Forest Plan and Other Regulations

All proposed alternatives would meet and exceed Forest Plan goals/objectives for managing snag habitat (Forest Plan Appendix X). Also, all action alternatives are consistent with the Forest Plan direction to manage the habitat of species listed in the Regional Sensitive Species List to prevent further declines in populations, which could lead to federal listing under the Endangered Species Act (Forest Plan II-28). Alternative A would not impact the black-backed woodpecker because it does not propose any activities or actions that would alter habitat conditions. All other alternatives may impact individuals or habitat but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

4. Pileated Woodpecker

Methodology

The analysis for pileated woodpecker was similar to that for black-backed woodpeckers. Direct and indirect effects reflect a change in habitat conditions that would result from implementation of the alternatives. As discussed in the Affected Environment section, snag habitat for nesting is considered more limiting than foraging habitat. Nesting habitat is dependent on the age and size of trees, which makes pileated woodpeckers a good indicator species for older, larger-diameter trees and late-successional forests. Specific parameters analyzed for this assessment include the changes in distribution and the quantity and quality of large snag habitat. Alternatives B and C are discussed together because of the similarity of effects.

Alternative A - Direct and Indirect Effects

As discussed for black-backed woodpecker, the continued shift in species composition toward more insects and disease-susceptible species would trend stands toward a smaller size class and younger age class of trees. Consequently, snag production would shift away from the larger, longer-lived species, affecting the long-term stability and persistence of large snag habitat in the Little Blacktail area. Habitat for species associated with large snags, such as the pileated woodpecker, would continue to decline.

Alternative B and C - Direct and Indirect Effects

Under Alternatives B and C, tree harvest would affect approximately 1,231 acres of habitat that contain some form of snag habitat. Although 509 acres of regeneration harvest would reduce habitat quantity, converting tree species composition to longer-lived species such as ponderosa pine, western larch and western white pine in higher risk stands would encourage the persistence and sustainability of large snag habitat over the long term. Selective tree harvest on 722 acres would trend these stands to an older size class and promote larger size snags. Tree mortality would continue on remaining untreated stands, producing foraging and possible nesting habitat for pileated woodpeckers.

Habitat loss due to tree removal would be partially compensated by snag and green tree retention measures and prescribed burning. Snags and snag replacements would be retained in all treatment units at levels recommended by scientific literature based on recent studies (Features Common to All Action Alternatives, Chapter II). Snag retention objectives are consistent with recent published data suggesting that populations of cavity nesters were viable in stands of ponderosa pine and mixed conifer forests that contained about four snags per acre (Bull et al. 1997).

Even though Alternatives B and C would reduce the quantity of large trees/snags, pileated woodpecker populations would maintain their current distribution, thus maintaining species viability.

Consistency with Forest Plan and Other Regulations

All proposed alternatives would meet and exceed Forest Plan goals/objectives for managing snag habitat (Forest Plan Appendix X). Alternative A would not impact the pileated woodpecker because it does not propose any activities or actions that would alter habitat conditions. All other alternatives may impact individuals or habitat but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

3.6 Watershed and Fisheries

3.61 Affected Environment

3.61a Regulatory Framework

1. Watershed

Regulatory framework governing management of watersheds includes the Clean Water Act (1948), Idaho State Water Quality Standards and Wastewater Treatment Requirements (IDAPA 16.01), Rules Pertaining to the Idaho Forest Practices Act (Title 38, Chapter 13, Idaho Code, 2000), the National Forest Management Act (1976), the National Environmental Policy Act (1969), Forest Service Manual (2500), IPNF Forest Plan (1987) as amended by INFS (1995), and direction from the Regional Watershed, Wildlife, Fisheries and Rare Plants program and Washington Office.

2. Fisheries

Federal legislation, regulations, policy, and direction require protection of species and population viability, evaluation and planning process consideration of federally listed threatened and endangered species, as well as sensitive species (Forest Service Regional list) and management indicator species (MIS; Forest Plan). In addition to the laws and regulations listed above, the regulatory framework for TES fishes includes the Endangered Species Act (1973) as amended, and section 2670 of the Forest Service Manual.

3.61b Methodology

1. Prefield Review

Information for the Little Blacktail watershed and fisheries analysis was compiled using data from the Pend Oreille Basin Geographic Assessment (USDA draft in progress), the general land uses and trends of the watershed as described in the Cocolalla Lake Watershed Management Plan (Gilmore 1996), and the Upper Cocolalla Creek Water Quality Assessment (unpublished paper, IDEQ 2000). In addition, prefield information was gathered from district fish/hydrology files, stream inventories, field reviews, historical records, aerial photographs, analysis of watershed conditions, published scientific literature, discussions with fisheries biologists and electrofishing/stocking data from the Idaho Department of Fish and Game (IDFG), the United States Fish and Wildlife Service (USFWS), electrofishing data from the Idaho Division of Environmental Quality (IDEQ) and comprehensive knowledge of the fisheries resources in the Pend Oreille River Basin.

2. Field Review

Several roads and streams were reviewed in the field during the 1999 and 2000 field seasons. A stream habitat inventory of Cocolalla Creek within the project area was completed during the 1999 field season.

3.61c Watershed Characterization

The Little Blacktail Project Area is located within the headwaters of the Upper Cocolalla Creek subwatershed (see figure 16). The upper subwatershed, which drains from the headwaters to Cocolalla Lake, is 42.7 square miles (27,320 acres) in size. The Little Blacktail project area encompasses approximately 8% of the entire subwatershed.

The average annual precipitation in the Upper Cocolalla Creek Subwatershed is approximately 38 inches. Base flows in the project area are dominated by ground water recharge through numerous small springs at the toe of Little Blacktail Mountain. Upper Cocolalla Creek is a snowmelt-dominated system where peak flows are generated during spring melt periods.

3.61d Watershed Processes

Changes in water yield through vegetative changes and rain-on-snow events are two physical processes that would most likely affect the watershed condition and its associated stream network.

Water yield changes through vegetative treatments: Changes in duration and intensity of peak flows is often used to measure changes in water yield from vegetative treatments. Patterns of regeneration harvest, large stand-consuming fires, and forest insects and diseases can alter snowmelt patterns because of vegetation changes on the slopes. These changes in snowmelt patterns can result in higher peak flows earlier in the spring. Changes in stream channel morphology and sediment loading is considered when peak flow changes occur.

Rain-on-snow events and watershed responses: Changes in forest vegetation resulting from management or natural events can affect the frequency and magnitude of rain-on-snow events (Harr 1986). About 28% of the Upper Cocolalla Creek subwatershed is susceptible to rain-on-snow events. These events occur within the 3,000 to 4,500-foot elevation range during the winter months. Rain-on-snow is a natural process that can generate a high to extreme peak flows, but not on an annual basis.

1. Beneficial Uses and Total Maximum Daily Loads

The IDEQ designates beneficial uses to be protected for each water body in the state. The beneficial uses for Upper Cocolalla Creek include salmonid spawning, irrigation, domestic water supply, secondary contact recreation, and cold-water biota. Salmonid spawning and cold-water biota are partially supported due to sediment and thermal modification (IDEQ 2000).

Upper Cocolalla Creek is a listed 303(d) water quality limited segment from the mouth of Cocolalla Lake to its headwaters (IDEQ 2000). The pollutants of concern are sediment and temperature modification. The current status of this stream is that it has an approved Total Maximum Daily Load (TMDL) but no implementation plan has been developed yet. Under this status, there cannot be a net increase in sediment within the watershed from any activities.

3.61e Stream Channel Characterization

In the project area, Rosgen stream type classifications vary from steep, highly confined A3 channels in tributaries, to a moderately confined, moderate gradient, predominantly gravel bed B4 channel in upper Cocolalla Creek, with a short section of sinuous, low gradient C channel in the wetland below the Road 630A crossing. Tributaries to Cocolalla Creek in the headwaters on National Forest lands have intermittent or ephemeral channels.

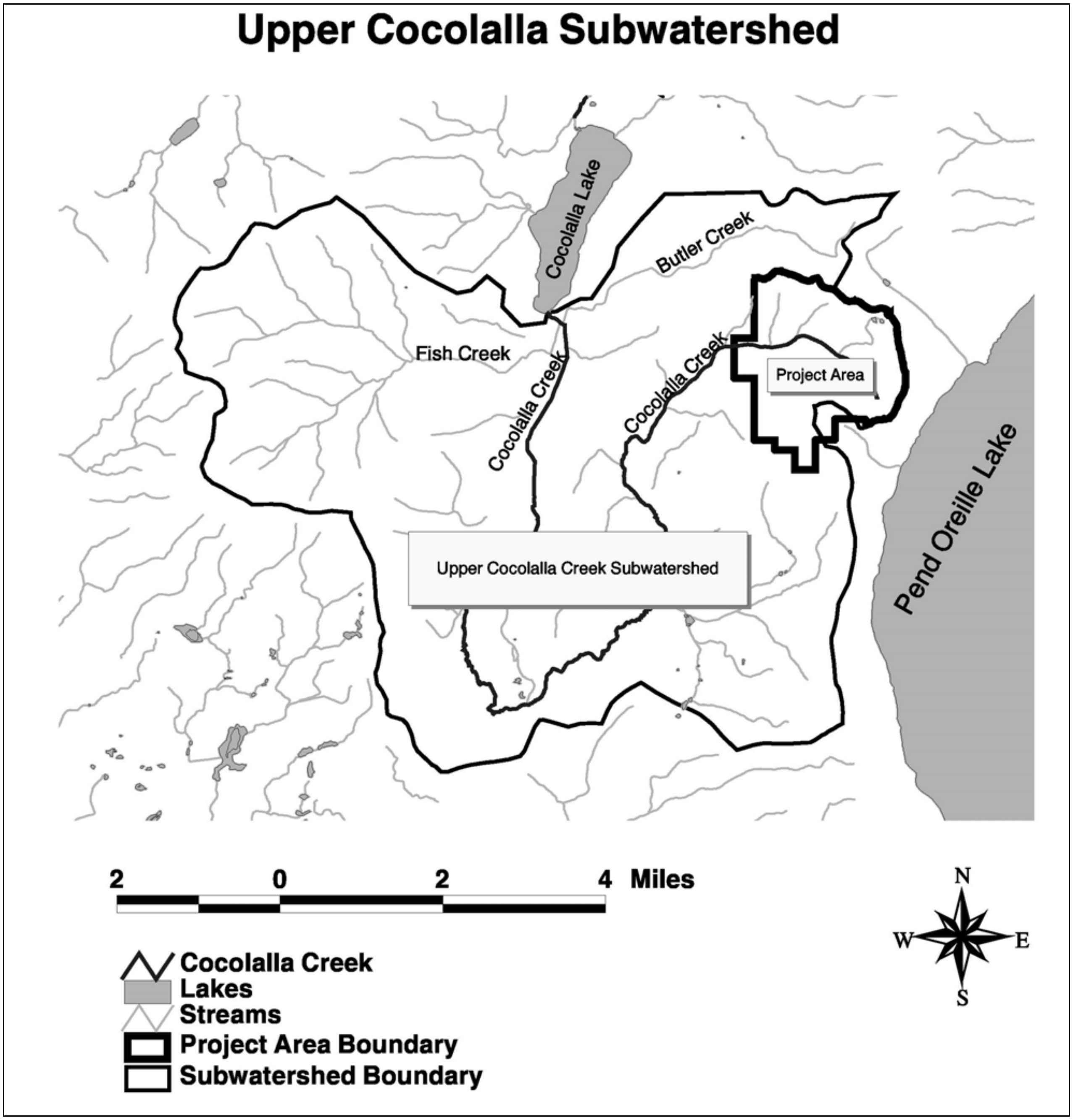

Figure 16. Cocolalla Subwatershed.

3.61f Fisheries Characterization

Historically, bull trout (*Salvelinus confluentus*) may have potentially inhabited the Cocolalla Creek watershed. Westslope cutthroat trout (*Oncorhynchus clarki lewisi*) potentially occurs here, however it is probable that there are resident hybrid cutthroat trout present in the drainage due to introductions (see Sensitive Species section below).

Other fish species identified in the Cocolalla Creek Watershed include minnow (*Notropis* spp.), sculpin (*Cottus* spp.), and dace (*Rhinichthys* spp.). Introduced fish species include populations of eastern brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*) and warm water lake species (IDEQ 2000).

1. Threatened and Endangered Species

Bull Trout

Bull trout, listed under the Endangered Species Act as a threatened species, are known to reside in the Pend Oreille Basin, which includes the Cocolalla Creek Watershed. No bull trout populations currently inhabit the Cocolalla Creek Watershed (PBTTAT 1998). Bull trout in the Lake Pend Oreille watershed appear to be entirely adfluvial[1] (PBTTAT 1998). There is a two-meter high dam that forms a migration barrier to bull trout at all flows approximately three miles upstream of the mouth of Cocolalla Creek at the Pend Oreille River. It is unknown whether bull trout existed in Cocolalla Creek in pre-European settlement times. Since the historic presence of bull trout is uncertain, a biological assessment matrix will be completed for Cocolalla Creek.

Habitat Requirements

Bull trout appear to have more specific habitat requirements than other salmonids.

(Rieman and McIntyre 1993). Habitat characteristics including: water temperature, stream size, substrate composition, cover and hydraulic complexity have been associated with distribution and abundance (Dambacher *et al*., in press; Jakober 1995; Rieman and McIntyre 1993).

Stream channel equilibrium (stability) is the balance between sediment yield, water yield, and channel morphology that exists within a stream system. Studies indicate that shifts away from channel equilibrium can result in negative changes in the structure and function of stream ecosystems (Bilby and Likens 1980, Schlosser 1982) and their dependent fish populations. Bisson and Sedell (1982) reported that where stream channels became destabilized, riffles elongated and in many cases extended through former pool locations resulting in loss of pool volume. They suggested that declines in older fish might be the result of their dependency upon deeper water habitats. Maintaining lateral and instream habitat complexity, in association with channel stability, can best provide persistence of bull trout over time (Karr and Freemark 1983, Karr and Dudley 1981, Gorman and Karr 1978).

[1] Adfluvial fish spawn in tributary streams before migrating to a lake or resevoir system to grow to maturity.

Stream temperature (below 15 degrees Celsius; Goetz 1989) and substrate composition are important characteristics of suitable bull trout habitats. Bull trout have repeatedly been associated with the coldest stream reaches within basins. The lower limits of many strong bull trout distributions mapped by Lee et al. (1997) correspond to a mean annual air temperature of about 4 degrees Centigrade (ranging from 3 to 6 degrees Centigrade) and should equate to ground water temperatures of about 5 to 10 degrees Centigrade (Meisner 1990). Water temperature can be strongly influenced by land management (Henjum et al. 1994).

Governor's Bull Trout Conservation Plan

The mission of the Governor's Bull Trout Plan is to "…maintain and or restore complex interacting groups of bull trout populations throughout their native range in Idaho" (State of Idaho 1996). Details about this Plan can be found in Appendix B. Through a process involving state and federal agencies, interested groups and individuals (i.e., Basin Advisory Groups, Watershed Advisory Groups, Technical Advisory Teams), a Problem Assessment was prepared and a conservation plan was developed for the Lake Pend Oreille key watershed.

The Lake Pend Oreille Key Watershed Problem Assessment (PBTTAT 1998) described the threats and limiting factors to restoration of bull trout in Cocolalla Creek, including loss of habitat due to channelization, loss of riparian communities, temperature (often exceeding 60 F in lower reaches of Cocolalla Creek and tributaries in mid-summer), and fine sediment. A migration barrier prevents bull trout from entering the system. The presence of exotic species (brook trout and brown trout) may pose a potential threat.

The final draft of the Lake Pend Oreille Bull Trout Conservation Plan (LPOWAG July 1999) lists Cocolalla Creek as a Low Priority for bull trout restoration. Low priority watersheds are those subwatershed streams that have no recent bull trout sightings documented, or streams that never produced bull trout as far as historical data shows. The list of low priority watersheds also contains streams that have limiting factors that can only be removed with significant investment. The conservation plan emphasizes restoration activities in High Priority watersheds only. Medium and Low Priority watersheds do not yet have associated restoration actions.

2. Sensitive Species

Westslope Cutthroat Trout

Cutthroat trout have been identified in Cocolalla Creek above Cocolalla Lake. Unknown variations of cutthroat trout were planted in Cocolalla Lake in the 1960s; however, the populations that lived there prior to the introductions were likely native westslope cutthroat trout. The cutthroat trout that currently inhabit Cocolalla Creek are probably a mix of native westslope and introduced strains (Jim Fredericks, Idaho Fish and Game, personal communication). It is unlikely that a pure native strain of westslope cutthroat trout remain in Cocolalla Creek.

Westslope cutthroat trout are listed as "sensitive" by Region 1 of the USDA Forest Service and are listed as "species of special concern" by the State of Idaho. In addition, the U.S. Fish and Wildlife Service (USFWS) lists westslope cutthroat trout as a "Species of Concern" with respect to section 7(c) of the 1973 Endangered Species Act (ESA) (01/17/01 letter, FWS 1-9-01-SP-252) and the species is under review for listing under the ESA.

Their preferred habitat is cold, clear streams with rocky, silt-free riffles for spawning and slow, deep pools for feeding, resting, and over-wintering (Reel 1989). Pools are a particularly important habitat component as cutthroat trout occupy pool habitat more than 70% of the time (Mesa 1991). Other key features of westslope cutthroat habitat are large woody debris (LWD) for persistent cover and habitat diversity as well as small headwater streams for spawning and early life-stage rearing.

A population status review of westslope cutthroat trout in Idaho has determined that populations in northern Idaho have declined over their historic distribution with viable populations existing in only 36% of the original Idaho range. The primary cause of the decline was found to be habitat degradation (Rieman and Apperson 1989).

Westslope cutthroat trout have been affected by the presence of introduced brook trout. Brook trout can out-compete westslope cutthroat trout in areas where habitat is degraded (Rieman and Apperson 1989). Brook trout are present in most of Cocolalla Creek. Habitat degradation may have accelerated the decline of potential westslope cutthroat populations in the watershed. In Cocolalla Creek, eastern brook and westslope cutthroat trout distributions overlap (IDEQ 2000).

Torrent Sculpin

Torrent Sculpin were added to the Idaho Panhandle National Forests' sensitive species list March 12, 1999. Though an electrofishing survey in Cocolalla Creek identified sculpin above Cocolalla Lake (IDEQ 2000), the species was not identified. The presence of torrent sculpin is probable in the Cocolalla Creek watershed due to the presence of suitable habitat. Torrent sculpin prefer riffle habitat in medium to wide streams and rivers (Markle et al. 1996). However, large adults (>150 mm) are found in pools. Spawning usually occurs in May and June and occurs in riffles with moderate to swift flows. Similar to westslope cutthroat and bull trout, the torrent sculpin is also a cold-water species and consequently its range overlaps with both these species. Because this species primarily inhabits large streams, it would only be affected by this project if the magnitude of the effects altered habitat conditions in the lower reaches of Cocolalla Creek. Analyzing effects on the westslope cutthroat trout will cover possible effects on this species.

3.61g Reference Condition

1. Watershed

In the early 1900s, the project area was far less heavily timbered than at present. This condition is due to a large fire that burned in 1910 over much of the watershed. Aerial photos from 1935 and photos from 1916 (figures 14 and 15) reveal large open areas in the vicinity of Little Blacktail Mountain. One effect of this open landscape was higher peak flows and greater fluctuations in flows than are present in Cocolalla Creek today.

Beavers were active in the Upper Cocolalla Creek subwatershed until about 30 or 40 years ago. Evidence of several old beaver ponds may be seen in the project area. The beaver activity created and preserved a number of wetlands and provided some fish habitat in the form of large pools. These pools also trapped sediment and helped to moderate flows.

Riparian forest was relatively continuous through most of the watershed. As a result, there was an abundance of large woody debris in Upper Cocolalla Creek and its tributaries. The large woody debris helped maintain stable stream channels, maintain pool habitat, increase stream and cover complexity, and reduce flow velocities (Bisson et al. 1987).

2. Fisheries and Habitat

Historically, habitat was probably higher quality than at present due to intact riparian vegetation, beaver activity, and the lack of migration barriers. Large woody debris would have created many high quality pools in the lower reaches of Cocolalla Creek that are presently dominated by pastureland. Continuous riparian forest in lower Cocolalla Creek helped moderate water temperatures. Cooler water temperatures provided improved habitat for species such as bull trout and cutthroat trout that need cool water for most of their life cycle. Beaver dams created large, high-quality pools. Adfluvial fish species, such as bull trout, had access to the Cocolalla system because there were no migration barriers to hinder their travel. Access to the Pend Oreille River provided connectivity with other fisheries streams.

3.61h Current Condition

1. Watershed

Despite past logging, the Upper Cocolalla Creek subwatershed is more heavily timbered presently compared to the turn of the century. As a result, peak flows are not as high and fluctuations of flows are more moderate. The absence of current beaver activity has led to a decrease in wetlands and large pools.

Roads within the subwatershed are the primary mechanism that has caused increased sediment delivery to channels. Observable effects within the project area and subwatershed primarily include erosion from road surfaces and ditches and sediment delivery to Cocolalla Creek. This is evident with Forest roads 630 and 630A. Relief culverts are too widely spaced, therefore adding sediment to the ditchline. Greater distances between relief culverts translate to greater potential for sediment delivery and (Megahan and Ketcheson 1996).

Roads within the project area are delivering an estimated 7.9 tons/year of sediment to Cocolalla Creek (project file). Sediment is both being stored in wetlands and abandoned beaver ponds within the floodplain or being routed through the creek. It is likely that the majority of sediment within Cocolalla Creek is from roads since 93.5% of the streambanks in the project area are stable (project file).

2. Fisheries and Habitat

Within Cocolalla Creek Watershed

Cocolalla Creek has been modified by human activities for the lower two-thirds of its length. These modifications occur downstream of the Little Blacktail project area. U.S. Highway 95 and the Burlington Northern-Santa Fe Railroad cross Cocolalla Creek three times. Approximately two miles of the stream channel were straightened to drain pastureland in 1970 (Gilmore 1996). These channel modifications resulted in increased riffle habitat as well as reduced pool frequency, complexity, and volume.

Habitat modifications on private land in the Cocolalla Creek watershed include riparian timber harvest, draining of wetlands, straightening stream channels, and riparian road construction.

These activities resulted in poorer pool quality and reduced pool volume, increased sediment delivery, and increased water temperatures. These are some of the primary contributors to Cocolalla Creek's designation as a 303(d) watershed.

A concrete dam approximately two meters high was constructed in the 1950s on Cocolalla Creek approximately one mile downstream of Round Lake. As a result of this barrier, adfluvial species (fish that migrate between larger rivers to smaller streams) no longer have access to Cocolalla Creek. Fish species upstream of the dam (*i.e.,* westslope cutthroat trout) are isolated from neighboring populations in the Pend Oreille Basin. When fish are isolated from nearby habitat and populations of the same species they are more susceptible to major disturbances. Fish cannot escape to other habitat if necessary and fish from other populations cannot move into available habitat. Also, the potential breeding population is reduced because the exchange of genetic material through interbreeding between populations is not possible.

Riparian vegetation (trees and high brush) has been removed at the stream crossings and riparian pasture, likely resulting in increased stream temperatures and reduced large woody debris in these areas.

A segment of Cocolalla Creek upstream of Cocolalla Lake was surveyed by IDEQ in 1991. This reach had unstable banks, high levels of sediment in pools and riffles, and substrate dominated by sand and silt. Overall, fish habitat in much of Cocolalla Creek below the project area is in poor condition (IDEQ 2000).

Within the Project Area

Large woody debris within the project area is somewhat low at 13.3 pieces per hundred meters (project file). Inadequate large woody debris equates to less hiding habitat, fewer pools, and less structure in existing pools for fish to hide (Bisson et al. 1987).

Pools make up 11% of the habitat of Cocolalla Creek within the project area. Pool quality is fair to good, based on depth and complex cover. Although surface fines are present, the pools are not filling with sediment and continue to provide adequate rearing habitat.

However, sediment is likely having a negative effect on spawning habitat. Mean surface fines were 29% in pool tailouts and riffles (areas commonly used as spawning habitat), indicating relatively high embeddedness. High embeddedness often impedes spawning because salmonids have a difficult time constructing redds (nests) in embedded substrate. High levels of fine sediment may also reduce fry emergence because less water comes in contact with eggs to provide oxygen and remove wastes. Fry may have a more difficult time emerging from the substrate if it has a large fine component (Fraley et al. 1989). Both bull trout and westslope cutthroat trout are particularly sensitive to fine sediment. Brook trout compete more successfully in degraded habitats, such as those with greater percent fine sediments (Rieman and Apperson 1989).

3.61i Recommendations

- *Road Reconstruction:* Activities should include spot surfacing at stream crossings, installing relief culverts, cleaning and improvement of ditches, cleaning inlet and outlets of culverts, and installing rolling dips and outlet ditches. These activities would help improve drainage and decrease sediment delivery to stream channels.

3.62 Environmental Consequences

3.62a Methodology

Ultimately, the effects of the project on stream channels are the main concern for watershed and fisheries resources. Hillslope conditions are reflected in stream channels, which in turn are the formative features of aquatic habitat. The analysis of direct and indirect effects is based on how the various components of the project (*e.g.,* location, size, and methods of harvest units, road construction and road work, and reasonably foreseeable actions) are expected to affect Cocolalla Creek and its tributaries. The estimated direct and indirect effects analysis timeframe for all alternatives is 30 years.

The cumulative effects analysis area is defined as the portion of the Upper Cocolalla Creek subwatershed above Cocolalla Lake. The lake would absorb any effects to this point; therefore habitat downstream of Cocolalla Lake would not be affected. The following ongoing and reasonably foreseeable activities are relevant to the aquatics analysis: activities on forested private land, weed treatment, road maintenance activities, riparian road obliteration, wildlife habitat burning, and future salvage opportunities.

3.62b Issue Indicators

Potential effects to stream channels from activities such as timber harvest and road construction could include increased water yield, changes in water temperature, loss of large woody debris recruitment, and increased sediment delivery (Chamberlain et al., 1991, Furniss et al., 1991).

1. Stream Temperature and Large Woody Debris Recruitment

The extensive removal of forest vegetation within a riparian zone can lead to increases in stream temperature and lost of large woody debris recruitment (Chamberlain et al., 1991). Since the project is implementing INFS standard Riparian Habitat Conservation Areas (RHCAs), no change would be expected in stream temperatures and large woody debris recruitment to Cocolalla Creek and its tributaries through vegetation treatments.

There would also be no change in stream temperature or loss of large woody debris recruitment from temporary road construction activities. When comparing the removal area of vegetation to the entire stream channel, this only equates to about 1%. Plus, these roads are temporary and will be rehabilitated with riparian vegetation and woody debris incorporated into the channel.

2. Sediment Delivery

Sediment delivery is the main effect to stream channels expected from this project. No change is expected from timber harvest activities because all units are outside of riparian habitat conservation areas; any sediment generated is expected to be filtered prior to reaching stream channels (USDA 1995b; USDA 1999; USDA 2000). Road-related activities could have both positive and negative effects on sediment delivery to stream channels. As stated previously no net increase in sediment is allowed to occur from this project because Cocolalla Creek is listed as a Water Quality Limited Segment. Based on this information, ***estimated sediment delivery to stream channels*** is the issue indicator for watershed and fisheries resources.

Changes in sediment delivery to stream channels were estimated using the Water Erosion Prediction Project (WEPP) Forest Road Model (Elliot and Hall 1997). The model uses measurements of road grade, road width, length between road drainage features, fill grade, fill width, buffer grade, and buffer width to determine the amount of erosion and resulting sediment delivery to stream channels over a thirty year period. The model has built in local climatological and soils data. The climatological information was derived from data collected at the Priest River Experimental Forest long-term meteorological station. The soil information was based on the IPNF Land Systems Inventory.

3. Issue Indicators Not Analyzed

Water Yield - Numerous studies have documented the varying effects of peak flow increases and how flows may alter stream channels and impair salmonid habitats through the removal of vegetation (Ziemer 1998; Keppeler 1998; Sierra Nevada Ecosystem Project 1996; Chamberlin et al 1991). To determine if the proposed alternatives would increase peak flows, the percent increase in water yield was calculated within the Upper Cocolalla Creek subwatershed (USDA 1974). The no-action alternative would yield a 4.6% increase in water yield over background (background assumes no past harvest acres). For both action alternatives, due to the design of the prescriptions, percent water yield would increase to 4.8%, or 0.2 above the existing condition. With this slight increase, there would be no measurable effect in the duration and intensity of peak flows, which would have no direct, indirect and cumulative effects from implementation of this project. Therefore, water yield was not used as an indicator to measure effects on aquatic resources.

Rain-on-Snow Events - Rain-on-snow events can cause fluctuations in water yield levels (see "Watershed Processes" in the Affected Environment section). The Little Blacktail project prescribes vegetation treatments that mimic historic fire disturbance conditions. The current condition of Upper Cocolalla Creek is very stable and resilient, since it has evolved with these disturbances occurring periodically with rain-on-snow events over time (see "Reference Condition" above). For these reasons, the natural range of variation for Cocolalla Creek is such that the impacts to Upper Cocolalla Creek from a rain-on-snow event following the proposed vegetation treatments would not be measurable. Therefore, rain-on-snow is not an issue indicator in this analysis.

3.62c Effects Common to Alternatives B and C

1. Effects of Sediment from Road Activities

Improvements to roads (spot surfacing, additional relief culverts, ditch cleaning/improvements, culvert cleaning, construction of rolling dips and associated outlet ditches) proposed under both action alternatives would reduce sediment delivery to stream channels (project file). There may be a short-term increase in sediment delivery during the installation of upgraded culverts. However, this will be minimal since all new pipes are proposed in intermittent or ephemeral draws and installation will occur during the summer when these draws are dry.

Over the long-term, there will be a net decrease in sediment delivery and associated risk of failure since the culverts will be designed to handle 100-year flow events and will have a minimum life expectancy of 20 years.

Indirect effects from sediment delivery reduction include improvements to spawning and rearing habitat for aquatic organisms (Furniss et. al. 1991).

2. Timber Harvesting and Sediment Delivery

There would be no direct and indirect effects from sediment delivery on aquatic resources from the logging activities. No sediment would be generated from logging activities since INFS buffers, design features discussed in Chapter II and Best Management Practices in Appendix A would be used. Yarding activities would be located beyond the riparian areas of streams. Undisturbed lands between all logging activities and INFS buffers would trap any sediment that may reach the margins of disturbed areas (Megahan and Ketcheson 1996, Belt et al 1992).

3.62d Direct, Indirect, and Cumulative Effects

1. Alternative A

Sediment delivery to stream channels in the Little Blacktail project area would persist or slightly increase under this alternative. Without proposed road improvements, sediment delivery from National Forest System roads would continue at the present rate of 7.9 tons per year.

Indirect effects to stream channels and fish habitat conditions would continue from road sediment delivery. Moderately high levels of surface fines and substrate embeddedness would continue to limit spawning and rearing habitat for salmonids in the headwater reaches in the project area. The intermittent channel that is diverted by an old road would also continue to deliver sediment to Upper Cocolalla Creek.

Cumulatively, fine sediment routed through Cocolalla Creek to Cocolalla Lake would not change with Alternative A. Only a small portion of the fine sediment delivered to Cocolalla Lake originates in the project area. The project area is only 8% of the Upper Cocolalla Creek subwatershed. There are many sources of fine sediment delivered to Cocolalla Creek downstream of the project area including timber harvest, roads, residential development, and agricultural use (IDEQ 2000).

2. Alternative B

The implementation of Alternative B would have a net decrease in sediment delivery from 7.9 to 3.3 tons per year in the short-term (table 16). By improving road drainage and performing road work on existing roads 630 and 630A, sediment from existing roads would decrease to 3.1 tons/year over the long-term. By implementing the design features discussed in Chapter II, the construction of 5.4 miles of temporary roads would result in an increase in 0.2 tons/year of sediment.

The 0.2 tons per year of increased sediment is associated with the construction of 630B1A and 630B1B. Since all new temporary roads would be engineered using the design features discussed in Chapter II and are located on landtypes that have low potential for mass erosion and surface erosion, the risk of these temporary roads failing is low.

There will be a short-term increase in sediment delivery during the decommissioning of the temporary roads. However, over the long-term, slope stability would be restored, surface erosion would be eliminated and all crossings and associated fill would be removed from the channel. The site should need no future maintenance after this restoration. It is expected that complete restoration of these sites would be reached within three to five years following decommissioning activities (Hickenbottom 2001 and Redente et al 1994).

3. Alternative C

The implementation of Alternative C would have a net decrease in sediment delivery from 7.9 to 3.1 tons per year (table 16) by improving road drainage and performing road work on existing roads 630, 630A and the 315. There would be no direct and indirect effects to aquatics with Alternative C.

Table 16. Estimated Sediment Deliver by Activity

Sediment Delivery by Activity	Alt A	Alt. B	Alt C
Sediment Delivery from existing roads (tons/yr):	7.9	7.9	7.9
Sediment Reduction off of existing roads (tons/yr)	0.0	- 4.8	- 4.8
Sediment input from new road construction (tons/yr):	0.0	0.2	0.0
Total Estimated Sediment (tons/yr)	7.9	3.3	3.1

3.62e Cumulative Effects Common to All Alternatives

1. Reasonably Foreseeable Actions

Private Land Activities: Urban and residential land use (residential development, agriculture and grazing uses and limited road maintenance) would continue to add sediment to the Upper Cocolalla Creek subwatershed. Sediment delivery to stream channels from private land would be expected to stay constant or possibly increase with additional activities on private residential or industrial timberlands.

Weed Treatment and Monitoring: Weed treatment activities follow guidelines established in the Sandpoint Noxious Weeds Control Project EIS (USDA 1998a). Effects to aquatic resources were analyzed in that document and its adaptive strategy. No additional effects to watershed or fisheries are expected to occur.

3.62f Cumulative Effects Common to Alternatives B and C

1. Effects of Reasonably Foreseeable Actions

Future Salvage Opportunities: Salvage opportunities, as described in Chapter II, are not expected to cause additional effects to watershed or fisheries resources. The criteria ensures that no additional disturbance will occur (e.g., salvage must meet INFS guidelines, will not take place on high risk soils or where it may adversely affect flood plains, wetlands, or municipal watersheds, or if it can adversely affect threatened, endangered, or sensitive fish species or their habitat; there will be no new road construction, and only existing skid trails will be used).

Riparian Road Obliteration and Landing Slash Disposal: This project would reduce sediment delivery, reduce the channel network extended by roads, and reduce riparian impacts to the Cocolalla Creek watershed. This project could lead to improved pool habitat over time as reduced sediment delivery leads to increased pool volume. Fine sediment delivered to Cocolalla Lake would be reduced by less than one percent.

Direct and indirect effects from watershed restoration activities include short-term increases in sediment delivery to streams during culvert and road removals, immediate reduction in risk of sediment delivery from crossing failures, as well as culvert upgrades. Over the long term it would reduce sediment delivery, reduce the extended channel network, and reduce riparian impacts to the Cocolalla Creek watershed.

Wildlife Habitat burning on High Ridge Ecosystems: Sediment delivery from prescribe burning activities are not anticipated since the proposed burns are located on slopes with a low potential for sediment production and delivery, and since riparian buffers (USDA 1995a) are applied.

Direct and indirect effects from prescribed burning activities include a low potential of sediment from fire lines, released nutrients, or water foaming agents would be delivered to streams and tributaries. There will also be an immediate reduction in risk of severe fire from this type of fuel reduction activity.

Inventory and Treatment of New Noxious Weed Invaders: This activity would follow guidelines established in the Sandpoint Noxious Weeds Control Project EIS (USDA 1998a). Effects to aquatic resources were analyzed in that document and its adaptive strategy. No additional effects to watershed or fisheries are expected to occur.

Timber Stand Improvement: This activity would occur outside riparian habitat conservation areas except potentially where it would improve riparian habitat. No ground disturbance would occur. No detrimental direct or indirect effects to fisheries or other cold-water biota are expected from this activity.

Cumulatively, actions on National Forest Lands within the Upper Cocolalla subwatershed (including the proposed project and reasonably foreseeable actions) do not increase sediment delivery to stream channels when combined with private land actions. There should be a net decrease in sediment to Upper Cocolalla Creek over the next thirty years since both action alternatives reduce sediment delivery by more than half of the existing condition; the Upper Cocolalla Creek subwatershed has an approved TMDL plan that will guide similar sediment reduction efforts on residential and agricultural lands use; and industrial timberlands are required to follow State of Idaho Forest Practices Act.

3.62g Consistency with the Forest Plan and Other Regulations

1. IPNF Forest Plan

All alternatives meet the requirements of the IPNF Forest Plan for water resources. Specific requirements and how this project meets them are listed in Appendix A.

Alternative A would not change riparian habitat conditions, except for a steady increase in the risk of a stand replacement fire over time.

The IPNF Forest Plan contains standards for fry emergence that are no longer valid since the Inland Native Fish Strategy was developed. Appendix B explains the rationale for using INFS rather than fry emergence.

Alternatives B and C would protect riparian management objectives by maintaining recommended INFS buffers along Cocolalla Creek and its tributaries (see Chapter II – Features Designed to Protect Water and Fish Habitat). Drainage improvements are included in Alternatives B and C for the portion of Forest Road 630 within the RHCA for Cocolalla Creek. These improvements would reduce sediment delivery to the stream channel, helping to achieve Riparian Management Objectives.

Appendix B lists specific INFS standards and guidelines and how the Little Blacktail project is designed to meet them.

2. Clean Water Act

All Alternatives would be consistent with the requirements of the Clean Water Act, 33 U.S.C. §1251. Sediment, the pollutant of concern, would not increase in the water quality limited segment on Cocolalla Creek. Risks to beneficial uses in Cocolalla Creek would not be changed by this project.

3. Idaho Water Quality Standards and Wastewater Treatment Requirements

The primary water quality concern in Cocolalla Lake is a high level of nutrients, particularly phosphorus. Fine sediment is a concern since phosphorus is adsorbed on particles of fine sediment and transported to the lake (Gilmore, 1996). Since The Little Blacktail project would reduce sediment delivery to stream channels, actual fine sediment in Upper Cocolalla Creek may be slightly reduced. The requirements of Idaho Water Quality Standards and Wastewater Treatment would be met by both action alternatives.

4. Endangered Species Act

No threatened or endangered aquatic species currently inhabit the fisheries analysis area. A historical population of bull trout, a threatened species, may have existed in Cocolalla Creek before European settlement. A Biological Assessment has been prepared for this project. It was determined that the project will have no effect on bull trout.

3.7 Visuals

3.71 Affected Environment

3.71a Regulatory Framework

Visual Resource management direction for the project area is contained in the IPNFs Forest Plan (1987) and is described in terms of Visual Quality Objectives (VQOs). VQOs were established during the Forest planning process and were mapped by computer. The mapping was based on the seen area from sensitive travel corridors and other features having a high visual sensitivity level. Visual Quality Objectives were assessed using guidelines contained in the Visual Management Handbook, Chapter I of the National Forest Landscape Management Series.

Visual Quality Objectives are based on (1) landscape variety class, (2) viewer sensitivity level, and (3) distance. Based on these factors, VQOs are defined as the acceptable degree of alteration of the natural landscape. The degree of alteration is measured in terms of visual contrast with the surrounding natural landscape.

The visual analysis for the project area will include only National Forest lands, and includes the following criteria:

Variety Classes represent the physical features of the landscape, such as landforms, vegetation patterns and unique features. A *distinctive variety class* refers to those areas where landform, vegetation patterns, water forms and rock formations are of unusual or outstanding visual quality. A *common variety class* refers to an area where features are common throughout the character type and are not outstanding in visual quality. A *minimal variety class* refers to those areas whose features have little change in form, line, color or texture.

Sensitivity Levels are a measure of the public's concern for scenic quality for areas viewed when traveling through the forest. The three sensitivity levels employed are:

- *Level 1* Highest Sensitivity. All areas seen from primary travel routes where at least one-fourth of all Forest visitors have a major concern for scenic qualities.
- *Level 2* Average Sensitivity. Secondary travel routes, use areas, and water bodies which have high use.
- *Level 3* Lowest Sensitivity. Areas seldom seen by the public.

Distance Zones are foreground, middle-ground, and background:

- *Foreground* is usually within one-half mile of the observer. It is defined as the distance from which detail, such as tree limbs, can be identified.
- *Middleground* extends from the foreground to about 3-5 miles from the observer; overall texture is emphasized; individual tree forms are only discernible in open or sparse areas.
- Everything beyond middle-ground is *background*. In background, colors and patterns dominate the visual impression. Texture in stands of uniform tree cover is generally very weak or nonexistent.

The Visual Quality Objectives, or the degrees of acceptable alteration of the natural landscape, within the project area are:

Partial Retention – management activities may be evident, but remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic landscape; but changes in their qualities of size, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape.

Modification – management activities may visually dominate the original characteristic landscape. However, activities of vegetation and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that their visual characteristics are those of natural occurrences within the surrounding area or character type.

3.71b Methodology

Timber harvest, road construction and fuels treatments can affect the appearance of a forested landscape due to contrasts created between natural appearing landforms and vegetation and those modified by management activities. These changes are often expressed in terms of form, color, line and texture.

The ability to control how management impacts will appear when viewed from certain viewpoints depends on the vegetation management prescriptions, logging techniques, terrain orientation to viewers, and logging slash disposal methods.

One objective of scenery management for the long-term would be to reintroduce a more representative mix of the long-lived trees and timber stands more "natural" to the region. Accomplishment of this goal tends to present unacceptable social effects. For instance, most people who live here now would not accept a policy of letting wildfires run their natural course with no attempt to suppress them. Nor would people accept widespread clearcut logging to artificially open the land. After clearcutting, as with fire aftermath, trees could be planted and tended so that, in a hundred years or so, things would more resemble historic conditions.

The goal, therefore, of scenery management is to generally maintain the views people now enjoy from the key points of high visual sensitivity identified in the existing condition portion of this document. Where opportunity exists, tree planting would introduce a tree species component that would help to diversify color and texture in the stand. Openings created on timbered slopes would be irregularly shaped.

Fire, and associated smoke, helicopters, and logging equipment are considered as short-term impacts to scenic integrity, and are not considered in the effects analysis.

3.71c Existing Condition

Overall, the scenic character of the project area through time has been a forested environment with a mixture of tree species. Large stand-replacing fires have been the primary agent of change to this forested landscape. The composition of the forest has been altered in more recent decades by the lack of fire resulting in a much higher percentage of Douglas-fir, grand fir and other shade tolerant species than under historic conditions.

Homesteading, development of transportation systems, logging, and other human activities has also altered the scenic character from historic conditions.

The project area is bordered by privately owned land on the southern and western boundaries, by Lake Pend Oreille to the east and by National Forest land to the north. Most of the privately owned land has been developed or harvested. Development is in the form of homesites, housing developments and agricultural land.

The project area is characterized as predominantly a common variety class. It can be seen from Sensitivity Level 1 and 2 viewpoints. Sensitivity Level 1 viewpoints are Highway 95 and Lake Pend Oreille. The top half of Little Blacktail Mountain, as viewed from the south, can be seen from Highway 95. The east face of Little Blacktail Mountain can be seen from Lake Pend Oreille.

Sensitivity level 2 viewpoints are the Dufort Road and Cocolalla Loop Road. The Cocolalla Loop Road was not identified as Sensitivity Level 2 in the IPNF Forest Plan. For this analysis, it is considered a Sensitivity Level 2 due to the number of houses along the west side of the lake that face the project area and the increase in housing developments within this area. The northwest and west faces of Little Blacktail Mountain can be seen from these viewpoints. An existing square clearcut can be seen from the northwest face.

The top of Little Blacktail Mountain was dedicated as a communication site in 1968. Portions of the towers can briefly be seen from Highway 95. Currently three of the four communication sites are occupied. These sites are surrounded by dense forested vegetation and are at risk of be damaged in the event of a wildfire.

1. Recommendations

- Regeneration cutting is recommend in stands adjacent to clearcuts where there is a need to modify visual impacts from past cutting and/or where regeneration harvests are needed to blend with landscape pattern and characteristics.
- Reduce the risk of a destructive wildfire to the microwave communicate site on the top of Little Blacktail Mountain by removing some of the dense vegetation surround this site.

3.72 Environmental Consequences

3.72a Introduction

Management activities are designed to meet, at a minimum, the VQOs assigned by the Forest Plan. The following discussion describes how disturbances such as timber harvest, road construction and fire affect the visual resource.

Disturbances caused by the construction of roads, fire and the cutting of trees can have an impact on visual quality. This impact is caused by contrasts between natural forest landscapes and managed landscapes. These contrasts consist of visual changes in form, line, color, and texture of the soil and vegetation. Visual effects generated by timber removal and associated activities vary in duration and intensity according to the vegetation cover left on the site after harvest and relative to the cover of the surrounding natural landscape.

The tree removal prescription for a particular area could influence the potential visual impact of that area on the landscape, but would not by itself determine the degree of contrast created. More important is how the tree removal fits with the natural landscape. The more varied the natural lines, color, texture and forms are, the easier it becomes to blend activities into the landscape.

3.72b Alternative A

1. Direct and Indirect Effects

Without timber harvest or road construction there would be no short-term effects to the scenic conditions of the area. Previous existing harvest units would continue to recover tree growth, muting the visual effects of tree lines and unnaturally shaped openings over time. Over the long-term, the increasing vulnerability to wildfire due to the changed conditions of the area may bring change to the scenic conditions.

2. Cumulative Effects

Fire can have a short-term or long-term effect on the visual landscape, generally depending on the intensity of the burn. If conifers dominate the landscape, a high-intensity, stand-replacing fire can completely change the visual character of that landscape. In summer the observer would see changes from textures and colors of dark green vegetation (conifers) to a period of black and gray, then to a lighter color and textured shrub and regeneration phase. In winter the landscape would change to a nearly all white snowfield. A high-intensity, stand-replacing fire tends to be very large, and could potentially affect the entire landscape.

3.72c Effects Common to Alternatives B and C

1. Direct and Indirect Effects

The features designed to protect Visual Quality described in Chapter II for each action alternative are intended to ensure that the assigned VQOs will be met.

A low- to moderate-intensity underburn would have a short-term effect by showing varying degrees of color change (from shades of dark green to reds and yellows) due to needle scorch. These color changes would usually last for a growing season after the burn. These fires generally leave a natural appearing landscape with a mosaic of vegetation patterns. This mosaic includes areas that do not burn at all, areas underburned but with no needle scorch, and areas where trees are killed. Open shrub fields would have a very short-term color change from light green to black, or grey. This would generally last until spring green-up. In winter the remaining mosaic of trees and shrubs would retain the texture and color of the original landscape, unlike that of a high-intensity fire. Low- to moderate-intensity fires tend to be smaller and generally affect only a portion of the landscape when viewed in the middle ground and background.

The highest VQO within the analysis area is partial retention (management activities remain visually subordinate to the characteristic landscape). In each alternative, the top of Little Blacktail Mountain as seen from Sensitivity Level 1 and 2 viewpoints, *would meet* the visual quality objective of partial retention. This is a change from the Draft EIS and is a result of changes made to fuel prescriptions around Little Blacktail Mountain. The original prescription was to prescribe burn below the microwave towers on Little Blacktail Mountain. After additional field review was conducted it was determined that a combination of hand piling and grappling could be done below these towers to meet fuel reduction needs. In doing so, a greater variety of vegetation could be left within this area. This would allow for vegetation patterns to remain natural appearing and thereby obscuring the towers from these viewpoints.

The existing square clearcut, as viewed from Sensitivity Level 2 viewpoints, currently does not meet the visual quality objective of partial retention. Because of this situation, it has temporarily been assigned a VQO of rehabilitation. Harvest within stands 658-01-020 and 021 would alter the shape of the clearcut on two sides and would begin moving it toward the assigned value of partial retention. It is not possible to immediately achieve the prescribed visual quality objective; however, the change would provide a more visually desirable landscape in the interim and achieve the VQO in the long-term.

Timber harvest would result in a discernable change in pattern, form and color. However these changes would blend with the natural landscape because unit design and layout would incorporate irregular boundaries and avoid straight lines and geometric unit shapes. Vegetation removal would repeat the form, line, color, and texture of the natural occurrences common to the surrounding areas. Prescribed burning activities would be expected to produce short-term effects. There would be a discernible change in color in spotty patterns where needle scorch occurred during underburning. This would be short-term and would appear somewhat like the dying clumps of Douglas-fir and grand fir in root rot pockets occurring on the natural landscape.

2. Cumulative Effects

The visual change of the landscape caused by private development cannot be predicted or designed. Therefore, there are no cumulative visual effects associated with any of the alternatives as proposed.

Reasonably Foreseeable Actions –

Wildlife habitat burning on high ridge ecosystems could result in a color and texture change, which would last until the following spring green up. This would be a very short-term effect. Future salvage of dead and dying trees would take place within any of the proposed harvest units. Vegetation removal would repeat the form, line, color, and texture of the existing landscape. These harvests would tend to be small in size and blend into the existing harvested areas.

No other reasonably foreseeable actions are expected to affect this resource.

3.72d Effects Specific to Alternative B

1. Direct and Indirect Effects

One of the longest lasting alterations is soil disturbance from road construction. On steep terrain, roads tend to leave long horizontal lines across the landscape. Exposed soil is rarely the color or texture of the surrounding landscape, and will contrast with the natural landscape until fully regenerated with shrubs and trees. On steep terrain, road location and design are critical to the maintenance of the natural appearing landscape.

Road construction, as proposed, may be evident but would have a short-term effect on visual quality, given the variety class and landforms on the landscape. Road cuts and fills could cause soil color contrast; however, decommissioning these roads after use would help reduce the amount of time the color contrast remained on the landscape. All roads would be fitted to the landform.

3.72e Consistency with the Forest Plan

Alternatives B and C meet the VQOs listed in the Forest Plan.

3.8 Road Management

3.81 Affected Environment

There are two distinct road categories within the project area – classified and unclassified roads. Definitions of these road categories can be found in Chapter II. Both of these road types are intermingled within the project area (figure 17). Unclassified roads (both drivable or undrivable) are roads that are on the landscape and are not part of the transportation system. Because of this .

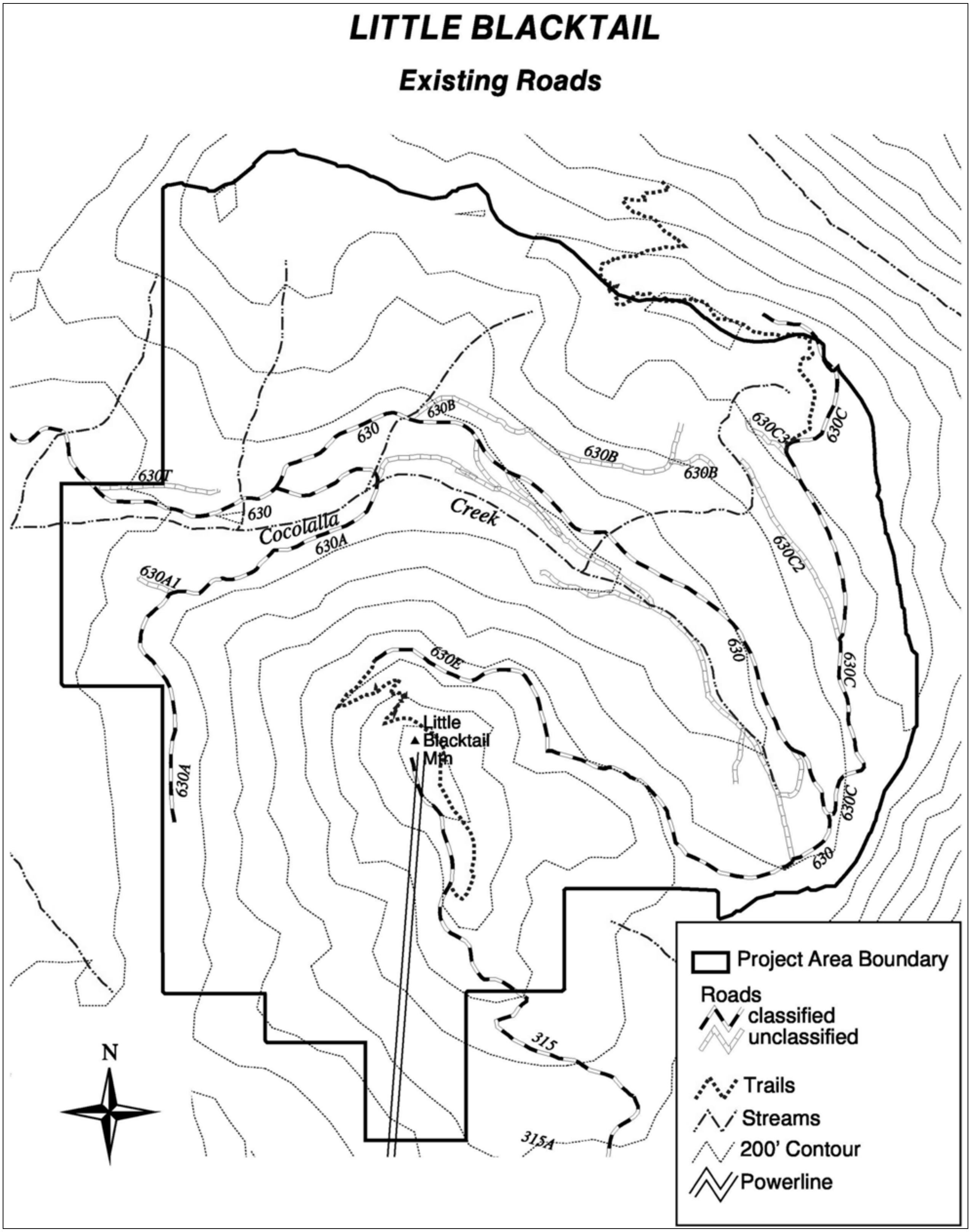

Figure 17. Existing Roads in the Little Blacktail project area.

they do not receive any maintenance or upkeep. These roads are targeted to be decommissioned since they are not maintained and could potentially create resource damage.

There were concerns from the public that either too many roads would be built and left open or too many existing roads would be closed as a result of this project. In order to address these concerns this section will focus on the effects of implementing the alternatives on road access. Road access in this case is defined as the ability to use those roads or trails within the Little Blacktail project area that are on the existing transportation or recreation plan. Other road-related concerns (e.g. effects of roads on water) are addressed in the appropriate resource effects sections.

Table 2 in Chapter II displays the proposed changes in road access (for both classified and unclassified roads) between the existing condition and the two action alternatives.

3.82 Environmental Consequences

3.82a Direct and Indirect Effects

1. Alternative A

There would be no change in access with this alternative; all existing roads and trails would remain on the landscape. All existing drivable unclassified roads (0.4 mile) would remain with no funding available for maintenance or upkeep.

2. Alternative B

Alternative B would provide better access for people and equipment during prescribed burning activities. Temporary roads would serve as fuel breaks used for prescribed fire, which reduces the cost of having to construct additional firelines.

3. Alternatives B and C

Alternatives B and C would reduce drivable unclassified road access by 0.4 miles. This reduction is a result of the decommissioning of roads 630B1 and 630A1.

3.82b Cumulative Effects

Under both Alternatives B and C, the roads that are proposed for closure are unclassified roads within the project area. Neither of these roads can be accessed from outside the project area or act as main access roads for areas within the project area. Given these conditions, there would not be any cumulative effects of additional access lost due to the reduction of roads (0.4 mile) with either Alternative B or C.

3.9 Finances

3.91a Regulatory Framework

The IPNF's Forest Plan EIS (page IV-47) indicated, "The level of timber harvest is important not only in providing jobs in the timber industry, but also through indirect and induced impacts on other business sectors as well." One of the seven major issues for the IPNF's Forest Plan EIS was community stability (Forest Plan FEIS, pp. 1-8).

1. Analysis Area

This analysis deals only with project level financial attributes of each alternative. The analysis was used to determine the economic feasibility of proposed timber sales. This analysis will essentially determine whether timber harvesting is a cost effective tool to achieve objectives of the purpose and need, considering the value of timber sold versus the cost of road work, fuel treatment, regeneration and other mitigation measures described in Chapter II.

2. Analysis Methods

Different revenues and costs are associated with the management activities under each action alternative. To arrive at the expected predicted high bid a Transactions Evidence (TE) appraisal was used to determine the potential stumpage of timber harvested. The TE appraisal method predicts the value of timber (referred to as "stumpage") through the use of several independent variable developed from recent similar sales within Region 1 of the Forest Service (Northern Idaho and western Montana). Since the information used is from actual bidding, current local market conditions, and production costs for logging and milling are reflected in the predicted rate. The market is not as robust as it has been; in some areas lumber prices have reached a low that hasn't been seen since 1992. Currently there is a 40% market adjustment and a rollback factor that is incorporated into the appraisal program to account for the existing market condition.

Cost averages were used for fuel reduction/site preparation and planting (including overhead), road construction, road reconstruction, road maintenance, and grass seeding.

Costs for road construction, road work[2], reforestation, mitigation and other direct costs are deducted from the expected stumpage value. The costs of upgrading existing arterial roads (main travel/haul routs) to further reduce long-term risks to the watersheds, are included in the road work costs.

Non-commodity values were not included in this analysis because these resources are evaluated under the specific resource section. Title 40, Code of Federal Regulations for NEPA (40 CFR 1502.23) indicated "For the purposes of complying with the Act, the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost benefit analysis and should not be when there are qualitative considerations." Qualitative effects on resources are documented in individual resource sections.

3.91b Existing Condition

Stumpage prices are noticeably down across the United States at present, largely due to present imports of inexpensive, often-subsidized timber from other countries.

1. Alternative A - Direct and Indirect Effects

Since no timber harvesting would occur under this alternative, there would be no effect on the efficiency of timber harvest proposals. Not managing the timber resource in this area as under the action alternatives may result in a loss of mature timber (of commercial size) to disease and

[2] In the TE Analysis, some road work is referred to as reconstruction.

insects, and would result in the loss of productivity over the long-term. This directly relates to expected future revenues.

2. Cumulative Effects

Past, present and reasonably foreseeable activities on National forest and other lands within the project re are not going to have an effect on the economic issues for these alternatives.

3.91c Alternatives B and C - Direct and Indirect Effects

The predicted high bid reflects the differences in road costs, environmental protection costs, and logging costs between alternatives. This figure uses the value of timber removed (based on size, species and volume), yarding method used and hauling distances. Logging, hauling, and contractual work (clean up, fire line construction, fuel treatment, grass-seeding and road obliteration) costs are deducted from the value of the timber.

Table 17 provides a summary of the financial appraisal of each alternative.

Table 17. Predicted high bids, values and timber volume by alternative.

	Alternative A	Alternative B	Alternative C
Predicted High Bid	0	$70.81/ccf	$49.73/ccf
Predicted High Bid Value	0	$793,072	$556,976
Total CCF/MBF	0	11,200 CCF/5,600 MBF	11,200 CCF/5,600 MBF

Both alternatives would be viable timber sales and would not be expected to be below cost. Alternative B would be the most economical since it has the least amount of helicopter logging. Alternative C would be more expensive to log with the increase in helicopter logging and would be less economical than Alternative B. Both Alternatives would provide additional revenues to fund Other Restoration Projects described in Chapter II; however, Alternative B would provide $236,096 more than C.

1. Cumulative Effects

This analysis determined the economical efficiency of the timber sales. Past, present and reasonably foreseeable activities would not affect the economical efficiency of the proposed timber harvests.

3.91d Consistency with the Forest Plan

All alternatives are consistent with the Forest Plan regarding finances.

3.10 Adverse Environmental Effects Which Cannot Be Avoided

Implementation of any action alternative would inevitably result in some adverse environmental effects. Many adverse effects can be reduced, mitigated or avoided by limiting the extent or duration of effects. The application of Forest Plan standards and guidelines, Best Management

Practices, project-specific mitigation measures, and monitoring are all intended to further limit the extent, severity and duration of potential effects. Such measures are discussed in Chapter II. Regardless of the use of these measures, some adverse effects will occur. This section focuses on unavoidable adverse effects from Alternative B or C. Effects relating to Alternative A (the No Action Alternative) are disclosed in each resource section.

3.101a Noxious Weeds

Any activity has a risk of introducing and spreading weeds. Vehicle use and travel associated with timber harvest, road construction and other activities will increase the risk of spread. Mitigation measures such as washing vehicles and closure of temporary roads would help reduce but would not eliminate the risk of weed spread from proposed activities.

3.101b Aquatics

Watershed restoration activities as well as road construction for timber harvest could create sediment that would reach some stream systems during the short term, but Best Management Practices, site-specific design criteria, and use of stream buffers would reduce the effects to a minimal level.

3.101c Soil Productivity

Compaction and displacement can affect soil physical, chemical and biological properties, which can indirectly affect growth and health of trees and other vegetation. Some soils will be compacted during timber harvest activities; however, FSM guidelines (R1 Regional Supplement to FSM 2500) specify that no more than 15 percent of an activity area will have detrimental impacts. Mitigation measures are designed so that activities meet these guidelines. None of the stands proposed for harvest activity would have existing compaction over Forest Plan standards.

3.101d Air Quality

Prescribed burning of slash and prescribed fires may cause a temporary reduction in air quality. No burning would be initiated during times when air quality restrictions are in place.

3.101e Wildlife

Removal of dead trees would reduce the amount of trees and snags available to some wildlife species, especially primary cavity excavators. However, the levels of snag and green replacement trees left would mitigate this adverse effect.

The harvest of trees would result in a direct loss of reproduction of some nesting birds. Other wildlife species may be displaced/disturbed during periods of human activity under the action alternatives.

3.101f Visuals

Road construction, road work and closure of roads would temporarily affect aesthetics and public use of the area.

3.101g Recreation

Where possible, trail tread on trail #232 would be protected from logging activities. However, under either action alternative some portions of the trail may be disturbed. Disturbed tread would be restored to pre-harvest condition under the timber sale contract. In the interest of public safety, trail #232 and Forest Road 630E would be closed to public access during active harvest operations within some stands.

3.11 Relationship Between Short-Term Uses and Long-Term Productivity

Short-term uses are generally those that determine the present quality of life for the public. Current activities must not impair long-term productivity. Long-term productivity of the land refers to its capability to provide resources such as forage, timber and high quality water.

3.111a Vegetation

The capability of the land to produce forage, timber and high quality water would not be impaired by the action alternatives. Silvicultural techniques that reduce competition and improve growth of individual trees, and other treatments to maintain the health and vigor of stands enhance the long-term productivity of the land to produce forest products. In the short-term, harvesting stands that are at high risk of mortality would use timber volume that would otherwise not be used for wood products. Timely reforestation would contribute to maintaining these lands in a productive state.

3.111b Aquatics

Under the action alternatives, road construction and decommissioning may temporarily increase a small amount of sediment to Cocolalla Creek. The long-term benefits of these activities would reduce the total potential volume of sediment entering the stream channel over time and would improve habitat conditions for fisheries.

Removal of roads in riparian areas has the short-term effect of removing streamside vegetation associated with the road fill, but the long-term benefit is to provide for a more natural channel condition. Habitat complexity and large wood recruitment into streams would improve over time as obliterated roads regenerate to riparian vegetation and forested cover.

3.111c Fuels and Fire Behavior

Timber harvest could significantly affect both short- and long-term fuel loading. Harvest moves unavailable canopy fuels (tops, stems, limbs, needles) into available surface fuels. The risk of a crown fire may be reduced, but the risk of surface fires could be increased. An increased fire hazard and risk of ignition from activities such as recreation camping, vehicles, recreational hiking and machinery used in timber harvest may result. Proposed fuel treatments would reduce some ignition risk over time and improve our ability to control fire.

3.111d Air Quality

Under both action alternatives, the Forest Service would voluntarily cease burning activities when necessary to avoid violation of State air quality standards. Prescribed burning of fuels would occur primarily in early spring when demand for airspace has been historically low. Activities such as agricultural field burning, other forest residue burning on private lands, residential wood stove use, motor vehicle exhaust and dust from the Palouse and Columbia Basin are competing uses of monitored airspace.

3.111e Wildlife

The need for large snags for cavity nesters and perches, as well as down logs for hiding, denning and forage for other wildlife species over the long term, has to be weighed against the increased fuel loading presented by leaving large amounts of dead standing material or down wood. The number of snags to be left under the action alternatives follows a protocol based on the best available information on the appropriate size, numbers and species of snags are needed for wildlife and that can be protected during harvest activities. The short-term need for protection from destructive wildfire and reduction of wildfire risk has been addressed by fuels treatment proposals in the action alternatives.

The disturbance to wildlife and loss of security would be minor and short-term due to roads that are currently closed being opened to implement the project. These roads would have restricted use.

3.12 Irreversible and Irretrievable Commitment of Resources

Irreversible effects describe the loss of future options; these apply primarily to effects of using nonrenewable resources such as minerals or cultural resources, or to factors such as soil productivity that are renewable only over long periods. Irretrievable effects apply to loss of production, harvest or use of natural resources. The production loss is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume production (from FSH 1909.15-92-1, Definitions section 05).

3.121a Vegetation

The loss of production, harvest or use of natural resources can be considered an irretrievable loss. A low level of harvest of dead and dying trees in an alternative could be increased under future decisions, but dead trees not harvested now would not be available in the future for harvest, and that output would be “lost”.

3.121b Soil Productivity

There would be minor nutrient displacement as a result of burning piles for fire hazard reduction and from wood removed from the site. Harvesting a tree bole as a log could remove about 14 percent of the potassium within the tree, which may have an indirect effect on some plants. Potassium is recycled from the soil through green vegetation and is not added to the ecosystem by rainfall, air or other inputs. Effects of removing Douglas-fir logs from low potassium soils are not entirely understood (see section entitled “Incomplete and Unavailable Information”). The loss could be termed an irreversible loss due to non-renewability of the resource. Mitigation measures that call for retaining much of the fines and small stem material to overwinter on site would limit potassium removal.

Road construction is an irreversible effect to soil productivity since roaded templates can only be restored to a non-roaded condition after a long period of time or after ripping and revegetation.

3.121c Wildlife

The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. This habitat will recover, but the timeframe for this to occur may be as long as several decades.

3.13 Possible Conflicts with Other Federal, State or Local Policies, Plans or Regulations

There would be no conflicts with any Federal, State or local policies, plans or regulations. Compliance with such laws and regulations are discussed in Chapter II and where appropriate in applicable resource effects discussions in this chapter.

3.14 Other Required Disclosures

3.141a Environmental Justice Act

In February 1994, President Clinton signed an Executive Order on Environmental Justice, requiring federal agencies to conduct activities related to human health and the environment in a manner that does not discriminate or have the effect of discriminating against low-income and minority populations.

Although low-income and minority populations may live in the vicinity, these groups would not be affected by any action alternative, and no groups would be disproportionately impacted. Effects of various levels of timber harvest activities and watershed restoration work are concentrated on National Forest System lands. All contracts offered by the Forest Service contain Equal Employment Opportunity requirements.

See the project file for a breakdown of minority groups in Bonner County provided by the most recent census.

3.141b American Indian Religious Freedom Act

No effects on American Indian social, economic or subsistence rights are anticipated.

3.141c Prime Farmland, Rangeland or Forestland

None of the proposed activities would adversely affect prime farmland or rangeland. National Forest System lands are not considered prime forestland.

3.141d Effects to Floodplains and Wetlands

The Inland Native Fish Strategy (INFS) standards and guidelines implemented with this project would protect floodplains and wetlands.

3.141e Incomplete or Unavailable Information

The effect of removing Douglas-fir logs off low potassium soils is not well addressed in the literature. A reasoned analysis of the of the soil types in the project area and the existing credible scientific evidence are disclosed in the Soils section of the project file. Adverse impacts have been evaluated and disclosed, in summary total tree yarding on 9 acres of the project area is expected to have a minor affect on the potassium content of the soils. In conjunction with the most recent research by the Intermountain Forest Tree Nutrition Cooperative, mitigation measures were developed (see Chapter II - Features Designed to Protect Soils and Site Productivity). The measures represent current state-of-the-art recommendations.