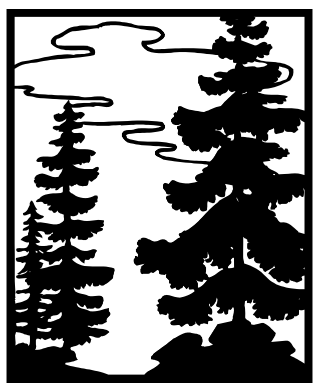
United States Department of Agriculture
Forest Service
Northern Region

# The West Gold Project



# Final Environmental Impact Statement

**November 2002**

Sandpoint Ranger District
Idaho Panhandle National Forests

Idaho Panhandle National Forests
Sandpoint Ranger District
Bonner County, Idaho

**West Gold Project**
**Final Environmental Impact Statement**
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## ABSTRACT

The Sandpoint Ranger District is proposing forest management activities in the West Gold Creek drainage in response to escalating root disease and insect mortality, declining biodiversity, threats to aquatic habitat, increasing forest fuels and increasing motorized recreational use. The project would include vegetation restoration, aquatic restoration and fuels reduction activities, as well as changing current management of two road segments to allow off-road vehicle use.

The Final Environmental Impact Statement (FEIS) displays the actions proposed by the Sandpoint Ranger District, provides an assessment of the scope and analysis of the project, discloses public issues related to the proposal, and discloses the environmental effects that could occur under each alternative.

Four alternatives were developed in response to the major issues identified during public scoping (Alternatives A through D). **Alternative A** (No Action) would defer all activities that are not part of current management in the area. **Alternative B** (the Proposed Action) would continue vegetation restoration, restore ecological benefits of fire, and reduce hazardous fuels in currently affected stands. This alternative would construct temporary roads and decommission most of them. This alternative would also repair or remove associated roads that pose risks to wildlife and aquatic habitats. **Alternative C** would treat the same areas as Alternative B, but would not construct any roads. **Alternative D** would use mostly selective harvest to achieve vegetation restoration goals and would construct very little road. **Alternative C is the preferred alternative.**

Copies of this FEIS and or Summary 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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* Note that some figures (color graphics) are located in Appendix I

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# *Preface*

## Tips for Reviewing This EIS

An Environmental Impact Statement (EIS) is a very complicated document. Below is a general description of what each chapter of the Final EIS contains. If at any time during your review you have any questions or would like more information, please don't hesitate to contact Judy York, the project team leader at the Sandpoint Ranger District Office (see first page inside the cover for contact information).

### Document Organization

**Chapter I – Purpose and Need:**
This chapter presents an **overview of what we are proposing and why**. It includes our objectives, a summary of the conditions in the project area, and all the current science, laws, policies, and other management direction that influence our proposal.

**Chapter II – Alternatives:**
This chapter presents information about the **public involvement activities** that have taken place, the **issues that have been raised** by the public and the project team, and the **alternatives being considered** for analysis. Key sections include:

- ***Issues*** - If you or anyone else had a concern (an issue) about the effects of our proposed action on some value (e.g. fish, public access, air quality), this is where we talk about **what the issue is and how we are analyzing potential effects** of the project on these issues. If an issue was found not to be relevant or we have designed protection measures to minimize or eliminate effects, it should be listed in "Issues Eliminated From Detailed Analysis."

- ***Alternatives*** - This is where we provide the **details of our proposal, along with alternatives to the proposal**. If you or anyone suggested an alternative that is not listed among the detailed alternatives, it should be listed in "Alternatives Considered But Eliminated From Detailed Analysis" with an explanation as to why it was not considered in detail.

- ***Features Common to Alternatives*** - This section describes all the various **measures we are taking to protect or manage resources** in the project area so that we will have minimal effects from our proposed activities on the environment. If you have a specific concern about a particular value, look in this section to find out what designs we are incorporating into our activities to protect various values or issues of concern.

- ***Alternative Comparison* -** This section compares both the positive and negative effects each alternative is anticipated to have on each issue of concern if that alternative is accomplished.

**Chapter III – Affected Environment and Environmental Consequences:**
This is the bulk of the document that provides the analysis of each resource value or issue of concern. By subject, each resource value is presented first with discussions about the **Affected Environment**. **Background and historic information** on the resource are presented in sections entitled "Characterization" or "Reference Conditions, and "Current Conditions" are described. The **Environmental Consequences** section presents the scientific analysis that was used to arrive at the **estimated effects of each alternative** on the resource value being considered. This section also describes whether each alternative is consistent with applicable laws, plans, and policies.

**Appendices:** These sections contain a variety of **supporting information** to the main chapters, as well as information about **who prepared** the document, **who the document was sent to**, **supporting literature** and a **glossary**.

# Important Considerations About Our Analysis

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 or worst-case scenarios than what would likely occur, while at the same time designing 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 or designs might need to be changed to better work with the actual ground conditions, we stop and check it with our analysis. If it appears that the change would 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 or a possible change in decision are needed.

# Changes Between the Draft and Final EIS

Changes have been made to this EIS based on field verification activities, review of the Draft EIS by both the public and the Forest Service, and public comments. Corrections of typographical or factual errors and editorial changes that have been made for clarification and readability of the document were made but are not noted here. Only substantive changes in content or analysis are noted in this section as follows:

**Chapter I**

⇒ **Maps** - A more detailed map of the project area (figure 1a) has been added. The Management Area map (figure 2) which was previously located in Appendix I, has been moved into Chapter I.

⇒ **Addition to Scope of Analysis** - Two items have been added to the List of Reasonably Foreseeable Activities in the section entitled “Scope of Our Analysis.”

**Chapter II**

⇒ **New Issue** - In response to public comments, a new issue has been added: "The effects of proposed road construction and existing road management on public road access" (see Analysis Issues).

⇒ **New Issue Eliminated** – An issue was raised regarding the effects of project activities on recreation, more specifically, the effect of new OHV use on non-motorized recreation. Reasons why this was eliminated as an analysis issue have been added to "Issues Eliminated From Detailed Analysis."

⇒ **Change in Design Feature** - In response to public comments, restrictions previously proposed on the OHV route have been changed from being open July 1 to three days prior to elk archery season, to being open any time the road is accessible to OHVs except during soft road bed conditions (see Alternative Descriptions).

⇒ **Addition of Design Feature** – In response to public comments, a design feature has been added specifying the retention of groups of large old trees.

⇒ **Change in Road Information** - Upon further field verification, the proposal to decommission 0.3 miles of unclassified Road 2707UF, was changed. The new proposal is to designate the 0.3-mile segment as a classified road in order to maintain a well-used dispersed campsite there. The remaining segment (0.7 mile) of road which narrows down into a trail and connects into Road 2707A, is proposed for decommissioning (see Chapter II, table 1).

⇒ **New Monitoring Item** – In response to public comments, a new monitoring item has been added regarding monitoring the new OHV route for illegal use or resource damage.

**Chapter III**

⇒ **Fire and Fuels** – In response to public comments, post-treatment runs for wind speed and fuel moisture in the BEHAVE model were changed to reflect the more open stand conditions that would result from logging. This resulted in a change in values in table 13.

⇒ **Air Quality Analysis** - In response to comments from the EPA, we have added information to the Air Quality section regarding the Interim Air Quality Policy on Wildland and Prescribed Fires.

⇒ **Wildlife Analysis** - The Wildlife Analysis has added information on the Gray Wolf, Northern Leopard Frog, Boreal Toad and Forest Landbirds. We also included a map of the Elk Analysis Areas, which was referenced yet missing in the DEIS.

⇒ **New Roads and Access Management Analysis** - In response to public comments requesting more information on the impacts of proposed activities on roads and access management, a section entitled "Roads and Access Management" was added.

⇒ **Watershed and Fisheries Analysis** - The Watershed and Fisheries section has clarified and expanded the analysis to better disclose estimated amounts of sediment produced by each alternative, as well as the amount of sediment that would be reduced by activities in the Gold Creek Watershed.

⇒ **Finances** – Due to changes in appraisal rates, the values in the Finances analysis have been updated.

**Appendices**

⇒ Two appendices have been added to the FEIS:

Appendix J – Response to Comments and Agency Letters
Appendix K – Biological Assessments and Evaluations

# CHAPTER I - Purpose And Need

## 1.1 Project Area Location

The West Gold Project is located about two miles southwest of Lakeview, Idaho (see figures 1 and 1a for the project area location). The area can be reached by Forest Roads 2707, 278 and 332. The project area consists of National Forest land in the following legal location: all or portions of sections 13, 14, 23, 24, 25, 26, 35 and 36 in Township 53 North, Range 2 West and sections 8, 9, 10, 16, 17, 20, 21, and 29 in Township 53 North, Range 1 West.

## 1.2 Purpose and Need

The purpose and need for the West Gold project was derived from the assessments described below in the "Overview of Scientific Findings", and from field reviews and surveys of the resources in the West Gold drainage. Based on this information we have developed five main objectives:

*To improve the health and productivity of terrestrial and aquatic habitats by:*

- *Restoring desired forest cover, structure, 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.*
- *Maintaining and improving West Gold Creek's aquatic habitat by reducing existing and potential sediment risks from roads.*
- *Managing current and additional motorized recreation opportunities while protecting resource values such as wildlife and water.*

## 1.3 Overview of Scientific Findings From Broad Scale to Site Specific

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 subbasin level, to a watershed area level, and finally to a subwatershed or project area level. General information from these assessments and how they relate to the West Gold Project Area is briefly described below.

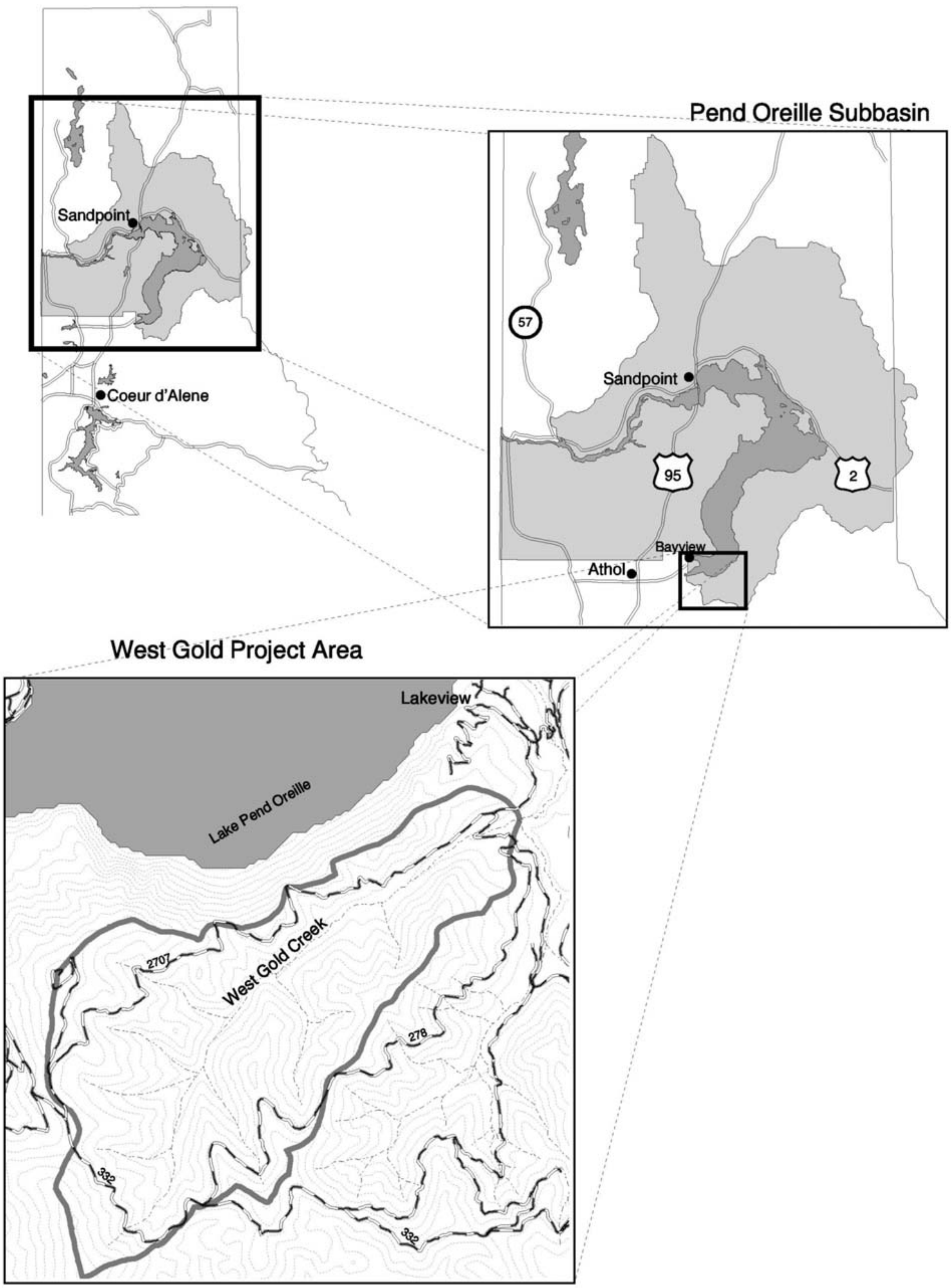


**Figure 1. Vicinity map of the West Gold project area.**

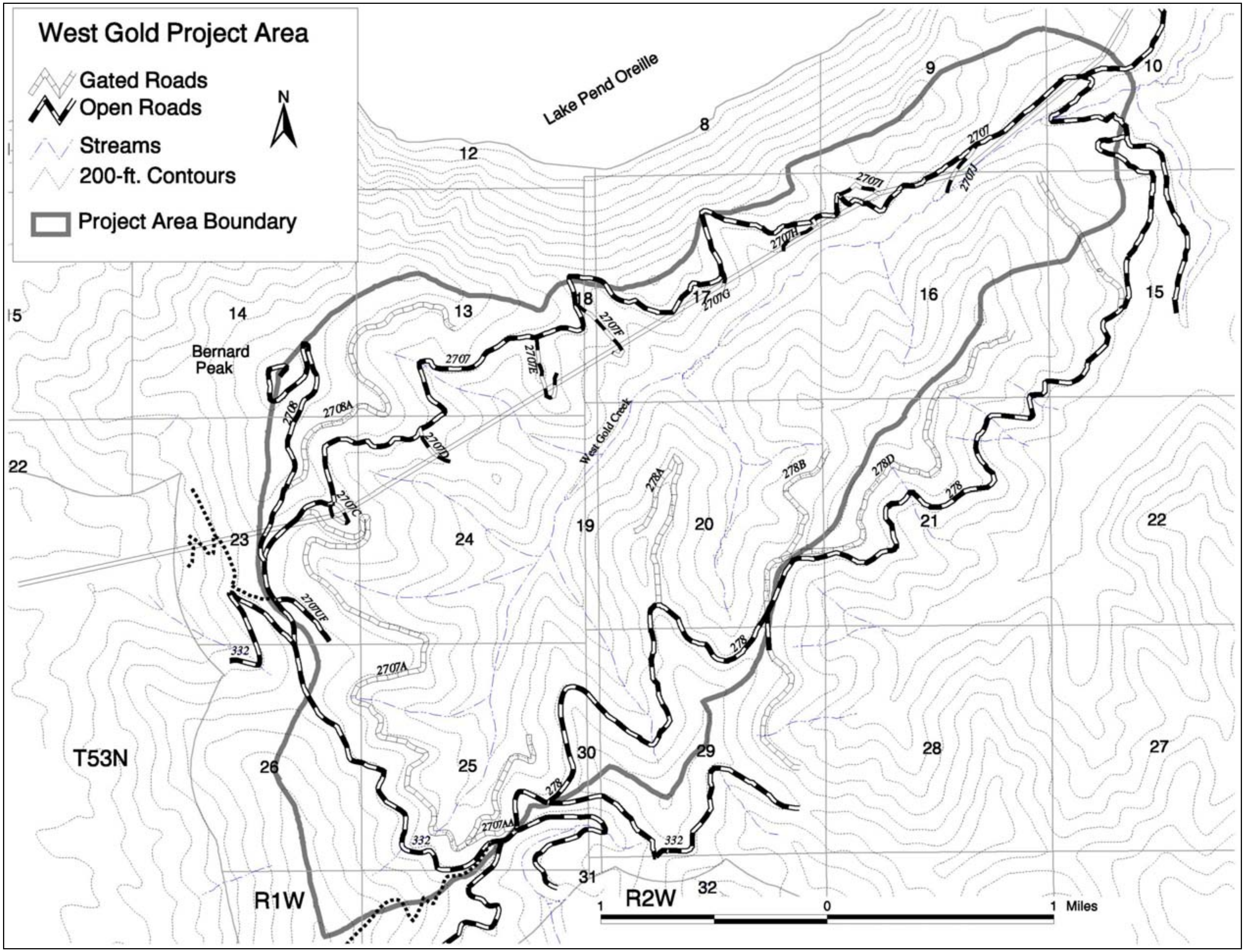


**Figure 1a. Project area map**

## 1.31 Interior Columbia Basin Ecosystem Management Project (ICBEMP)

The ICBEMP Scientific Assessment (Quigley and Arbelbide 1997) evaluates all the 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 Integrated Scientific Assessment (Quigley, Haynes and Graham 1996, pp. 115-116), the West Gold 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 are:

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

In the assessment, the level below the Columbia River Basin scale was defined as "subbasin." The West Gold project is located in the Pend Oreille Lake subbasin, one of 164 subbasins in the Columbia River Basin.

## 1.32 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).

## 1.33 Pend Oreille Geographic Assessment

The Idaho Panhandle National Forests (IPNF) has been assessing the ecological conditions in the Pend Oreille Lake area, which includes the Pend Oreille Lake subbasin (USDA draft in progress). The assessment has identified ecosystem trends and changes over the last 100 to 200 years. Within the Pend Oreille Lake subbasin lies the Gold Creek Watershed, which includes the West Gold Subwatershed. The Pend Oreille Geographic Assessment findings that relate to the West Gold project area are:

- There is a loss of widely spaced, large ponderosa pine, western larch and some Douglas-fir on dry sites.

- There is a loss of western larch and white pine on moist sites.
- There is a lack of large old trees in the forest structure.
- There is a lack of wildfire as a natural disturbance factor.
- Lack of large old trees in dry sites leads to a lack of habitat for wildlife species such as flammulated owls, black backed woodpeckers and pileated woodpeckers.
- The Gold Creek Watershed is one of two aquatic strongholds for bull trout in the Pend Oreille Subbasin.
- Gold Creek's Watershed status is "functioning-at-risk"[1].

## 1.34 Gold Creek Watershed Assessment

The Gold Creek Ecosystem Assessment at the Watershed Scale (EAWS) evaluated the resource conditions of the Gold Creek Watershed (USDA 2002). Combined with the findings of the broader scale assessments described above, the findings of the Gold Creek EAWS provided the basis for our Purpose And Need (See Gold Creek EAWS Recommendations section). Specific findings and recommendations from this assessment which relate to the West Gold project area are:

**Aquatic Ecosystems** – Historically, large fires burned across the entire Gold Creek Watershed. Between 1850 and 1896, two stand-replacing fires consumed most of the forest vegetation within the watershed. As a result of these fires, Gold and West Gold Creeks were shaped by high water yields, increases in sediment and debris flows. Hydrologically, West Gold Creek is currently within its natural range of variability (sediment and water yield levels are within historic ranges and the creek is in good condition). However, the West Gold Creek subwatershed is in a rain-on-snow zone, which, combined with sediment risks from roads, can put fish spawning habitat at risk. West Gold Creek provides important spawning habitat for Bull Trout, a threatened species. ***Reducing road densities and potential sediment risks from existing roads are recommended to maintain and improve the aquatic habitat in West Gold Creek.***

**Terrestrial Ecosystems –** The introduction of blister rust and almost 70 years of fire suppression have changed the character of the forest vegetation. There has been a substantial reduction in the percentage of landscape composed of long-lived tree species such as western white pine, ponderosa pine, and larch. Conversely there has been an increase in Douglas-fir and grand fir, species that 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. As a result, there has been a significant increase in insect and disease activity, which has led to substantial amounts of trees dying throughout the watershed and higher fuel accumulations.

The longer-lived species that do exist in the subwatershed are not regenerating naturally because there is a reduced seed source and lack of areas where these seedlings can germinate and grow. These vegetation conditions have created a homogeneous forest that lacks structural and tree species diversity. Old growth and early succession patch sizes are smaller than are normally found on habitat types of this area. There is a direct correlation between this lack of vegetation diversity and a lack of wildlife habitat and species diversity. ***Treatment of stands to maintain or restore***

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[1] A watershed that is essentially still functioning but may exhibit trends or has known risks that are likely to compromise its ability to fully support beneficial uses in the future.

***desired species, structures and patterns is recommended to increase terrestrial biodiversity and wildlife habitats.***

A lack of natural fires (from fire suppression) and an increase in dying trees has allowed forest fuels to increase beyond acceptable levels. Although large fires have been a natural part of ecosystem processes in this watershed, human developments within and just outside the subwatershed make the prospect of letting such a large fire burn today socially unacceptable. Suppressing such a fire is directed in the Forest Plan, and given the current fuel conditions would be very difficult. ***Treatment of fuels is recommended to improve our ability to suppress unwanted fire starts in the subwatershed, and use of prescribed fire is recommended to restore fire as a beneficial ecological process.***

**Human Uses** - There has been an increase in off-road vehicle and snowmobile use due to restrictions in other areas of the Pend Oreille Subbasin. Many OHV users are coming north from the roads and trails in the Coeur d'Alene River Ranger District, which has implemented a new travel management program in the last two years. Some illegal use has been occurring in the West Gold Subwatershed (see Chapter III, Roads and Access Management). ***Providing more motorized recreation opportunities is recommended to accommodate the increased use.***

For more details, see the Affected Environment sections of Chapter III.

# 1.4 Proposed Action

A "proposed action" was defined early in the project planning process and was shaped by information and recommendations from the Gold EAWS and our Purpose and Need. This proposal served as a starting point for the interdisciplinary team and gave the public and other agencies specific information on which to focus comments. Using these comments and information from preliminary analysis, the interdisciplinary team then developed alternatives to the proposal. These are discussed in detail in Chapter II.

The proposed action for the West Gold Project is designed to improve the health and productivity of terrestrial and aquatic habitats by restoring forest vegetation and reducing sediment risks. By restoring forest structures and species compositions through timber harvest, fuels treatment and reforestation, the West Gold landscape would continue on a path toward improved forest health and increased biodiversity. These changes in forested conditions would provide more diverse habitat for wildlife species in the area. Proposed road maintenance activities would help reduce the amount of sediment entering the West Gold watershed, and adding new off-road (ORV) vehicle access would accommodate increased ORV use.

Proposed activities for the West Gold Project would include:

- Selective cutting in overcrowded stands of trees to promote the growth and productivity of species such as larch and ponderosa pine
- Regeneration cutting in stands where there is high mortality, risk of high mortality, or undesirable species and replanting the stands with desired longer-lived species
- Burning to reduce fuels, improve growing conditions, and restore fire as an ecological process
- Improving the design, drainage and stream crossings of existing roads to reduce sediment risks to aquatic habitat

- Building temporary roads, decommissioning unneeded existing road segments; and putting some road segments into storage for future use
- Allowing limited, dry season, off-road vehicle use on Roads 2707A and 2707AA

More specific details of the proposed action can be found in Chapter II, under Alternative B.

# 1.5 Scope Of Our Analysis

In accordance with NEPA, it is our responsibility 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. Direct and indirect effects of the activities listed for each alternative in Chapter II will be analyzed. Connected actions related to this project are the Other Restoration Projects and Future Salvage Opportunities listed below under Reasonably Foreseeable Actions. There are no similar actions related to this project.

The following past, present, and reasonably foreseeable actions and events are relevant to the West Gold Project analysis. Each resource section in Chapter III analyzes only those actions and events that are relevant to the cumulative effects analysis area for that resource.

## *1.51a Past Activities and Events*

Past activities that have contributed to establishing the baseline conditions of the watershed today and may be considered in cumulative effects analyses include:

- Timber harvest – see Forest Vegetation section
- Wildfires – see Fire and Fuels section
- Planting – see Forest Vegetation section
- Mining in Gold Creek and Chloride Gulch – see the Watershed and Fisheries section
- Road Construction – see the Gold Creek Ecosystem Assessment (USDA 2002)
- Clearing of vegetation for the powerline right-of-way – see the Forest Vegetation section

## *1.51b Past, Present and Ongoing Activities*

Activities that have occurred in the past, and are still occurring, which may be considered in the cumulative effects analyses include:

- Firewood gathering – consists of the salvage of individual dead trees by members of the public for personal use.
- Hunting – consists of individuals primarily on foot using existing roads to access hunting areas.
- Fire suppression – consists of active suppression of wild or human caused fire starts.
- General motor vehicle, off-road vehicle and snowmobile use on roads – consists of public use of roads designated for specific types of motorized use. Occasional illegal use occurs on roads prohibiting motorized use.
- Activities on private lands in Gold Creek and Chloride Gulch – consist of residential development activities, forest management activities, and mining claim activities.
- Road maintenance activities – consist of activities described in Chapter II.
- Helispot maintenance – consists of clearing brush trees to create safe approach and departure paths for helicopters (see project file).
- Powerline right-of-way maintenance – consists of continual clearing of vegetation beneath the powerline structures for access and maintenance.

These activities are considered in analyses where appropriate.

### *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.

- **Other Restoration Projects** described in Chapter II
  - -Noxious weeds monitoring and treatment
  - -Timber stand improvement (thinning and pruning in plantations)
  - -Native Seeding
- **Future Salvage Opportunities** as described in Chapter II.
- **Lakeview Mine Clean-up** – consists of moving toxic mine waste materials out of the creeks and floodplains to a repository area, and restoring stream channels.
- **Kick Bush Slide Road Repair** – consists of repairing a chronically eroding, extremely steep, unvegetated road cut on Forest Service Road 278 by reducing the angle of the cut slope.

Although the following projects are considered reasonably foreseeable, they are not considered in the cumulative effects discussions in Chapter III due to a lack of detailed information:

- **Chloride Bush Project** – the Chloride Bush project is an ecosystem restoration project located in the Gold Creek Watershed that is in the early planning stages. This project would focus on terrestrial and aquatic habitat restoration based on broader scale data and recommendations of the Interior Columbia Basin Scientific Assessment (Quigley and Arbelbide 1997), the Pend Oreille Geographic Assessment (USDA draft in progress), and the Gold Creek Ecosystem Assessment (USDA 2002), but the potential treatment methods and scale of the project have not been defined yet. We anticipate a formal proposal to be released within the next year. There is not enough detailed information to be able to consider and analyze the cumulative effects of this potential project within the scope of this FEIS. However, once the Chloride Bush project is proposed for public review and environmental analysis is underway, the West Gold project will be considered in the cumulative effects analysis of the Chloride Bush project EIS.

- **Other Mine Site Cleanup and Rehabilitation –** There are three other mines in the Gold Creek Watershed that are targeted for cleanup and rehabilitation. Two of the sites are on private lands and the other site is on National Forest. These projects would be completed if and when environmental analysis under CERCLA regulations is complete and funding is available. Since there is not enough detailed information, we are unable to consider and analyze the cumulative effects of these projects within the scope of this FEIS.

# 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 in the project file.

**Federal Laws**

- The National Environmental Policy Act (NEPA) (1970)
- The Clean Water Act (1948) and amendments (1972)
- The Clean Air Act (1955)
- The National Forests Management Act (1976)
- The Forest and Rangeland Renewable Resource Act (1974)
- 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 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 the Agenda. Watershed health and restoration would be addressed through road 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 West Gold project area.

## 1.63 Final Rule – Administration of the Forest Development Transportation System

In January 2001, the Forest Service Manual, which governs regulations concerning the management, use and maintenance of the National Forest Transportation (Road) System, (Chapter 7700) was revised with a “Final Rule.” The Final Rule set forth that if a forest level roads analysis has not been completed, the Responsible Official (in this case, the Sandpoint District Ranger) determines whether a roads analysis is needed at the project scale, and if so, what level of analysis is necessary to support a project-level decision. On February 5, 2002 the Sandpoint District

Ranger established direction for a roads analysis for the West Gold project (project file). See Chapter III, Roads and Access Management for more information.

## 1.64 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.
- 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 [through fire] 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.

**Management Areas** - 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 West Gold project area is comprised of lands in four MAs and Riparian Habitat Conservation Areas (RHCAs). 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 (60%):** Consists of lands designed for timber production that are distributed throughout the Forests. The site-specific management goal for this MA is to provide cost-effective timber production while protecting soil productivity, adhering to State water quality standards, providing wildlife habitat, providing opportunities for dispersed recreation and meeting visual quality standards.

**Management Area 19 (5%):** Consists of lands designated to have high value for semi-primitive recreation as well as timber production.

**Management Area 9 (20%):** Consists of lands designated as non-forest lands, lands not capable of producing industrial products, lands physically unsuited for timber production, and lands capable of timber production but isolated by the above landtypes or nonpublic ownership. These areas are managed to maintain and protect existing improvements and resource productive potential with minimum investments.

There are two stands in the project area (stands 632-01-024 and –025 in Unit 35) currently designated as unsuitable for timber production. Based on recent field reconnaissance, these stands should be classified as suitable. Documentation of this recommended change in classification is located in the project file.

**Management Area 4 (1%):** Consists of lands designated for timber production within big game winter range. The management goal for this MA is to provide sufficient winter range requirements, through scheduled timber harvest and permanent forage areas.

**Inland Native Fish Strategy (INFS) Riparian Habitat Conservation Areas (14%):** 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 West Gold 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 West Gold EIS tiers to the IPNF Forest Plan as recommended by 40 CFR1502.20.

## 1.65 The National Fire Plan (NFP)

The West Gold Project proposes fuel reduction activities that would meet some of the objectives outlined for hazardous fuel reduction in the NFP. Some funding has been received for planning that relates to hazardous fuels reduction but the project is not one of the high priority projects identified in the NFP to receive implementation funding.

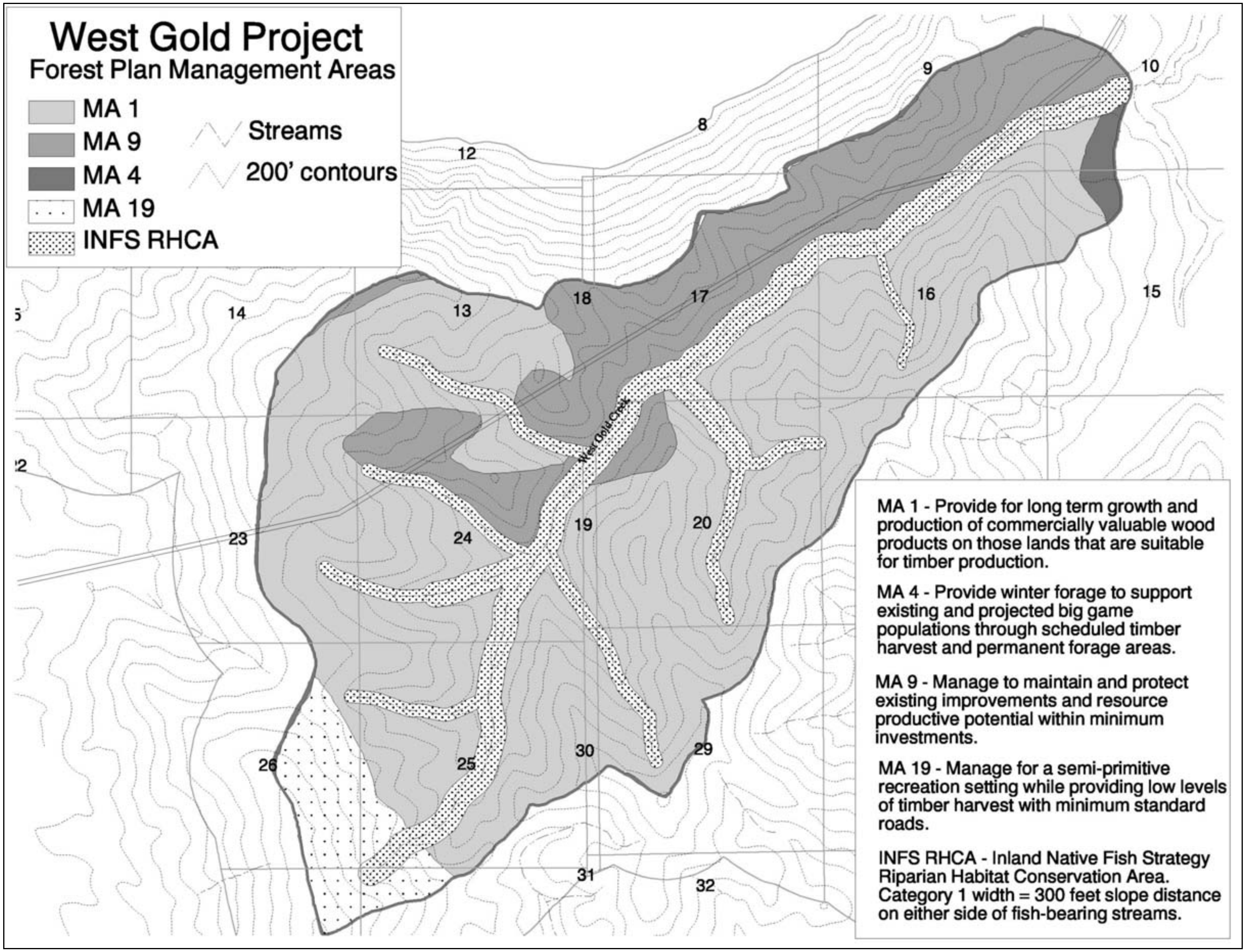


**Figure 2. Map of Forest Plan Management Areas.**

### 1.66 New National Programs and Policies Not Applicable to This Project

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

## 1.7 Decision 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, on 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 proposed 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, decommissioning, or storage 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

# 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 the alternatives to it comprise the remainder of this chapter.

## 2.2 Public Involvement

In June of 1997, a proposal for the West Gold project was mailed out to 96 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 that month and has continued to be on the schedule ever since. We received comments from 11 people, organizations, and agencies. In October of 1997 we held two field trips, one for an individual with questions about the project, and one for the Idaho Fish and Game.

In September of 1998 we sent out an update letter on the project to 29 people who had previously indicated interest in receiving mailings. That same month we held a field trip to the project area with representatives of the U.S. Fish and Wildlife Service. In October of 1998 we held a field trip for another individual interested in the project. The project was then put on hold for a year while district specialists worked on a different Forest-wide project.

In October of 1999, the West Gold interdisciplinary team decided to conduct an ecosystem assessment of the Gold Creek Watershed prior to resuming the West Gold project. In 2000, the team decided to prepare an Environmental Impact Statement (EIS) for the West Gold project instead of an EA because of the complexity of the issues. On July 14, 2000, a new proposal was sent out to 81[*] individuals, organizations, agencies, tribes, and local media on the Sandpoint District mailing list. A Notice of Intent was published in the Federal Register on July 17, 2000. We received comments from 16 people, organizations, and agencies. On October 18, 2000 we held a field trip with a new representative of the U.S. Fish and Wildlife Service. On November 15, 2000 we met with representatives of Idaho Fish and Game to discuss the proposal. On March 31, 2000 we met with the archaeologist from the Kalispel Tribe and he did not have any concerns about the project. On April 4, 2001 we sent a letter to residents of Lakeview who requested information on the Gold Creek Ecosystem Assessment and informed them of the West Gold EIS. On February 13, 2002, we sent out a letter to our mailing list of interested agencies, organizations and individuals notifying them that the Draft EIS was about to be released and to indicate in what format they would like to receive it (compact disc, paper summary or paper summary and Draft EIS). On March 27, 2002 we sent a letter to all property owners in the Gold Creek Watershed also

[*]Changed number on mailing list is due to a decrease in the number of people requesting to be informed of Sandpoint District projects and the West Gold project specifically.

notifying them of the upcoming release of the Draft EIS and to let us know if they wanted to receive it and in which format.

## 2.21 Public Review of the Draft EIS

The Draft Environmental Impact Statement (DEIS) presented specific information on the proposal, the alternatives to the proposal, and the results of analysis of the information gathered. The DEIS was mailed on May 2, 2002 to 58 individuals, agencies and groups that requested it for review. Three individuals requested and received notification when the DEIS was available to view on the Internet. On May 7 a news release was sent to the Spokesman Review and other local media. A legal ad was published in the Spokesman Review on May 9, 2002. The Federal Register Notice of Availability of the DEIS was published on May 10, 2002. A 45-day comment period occurred until June 24, 2002.

Several meetings and field trips occurred between the Draft and Final EISs. In the spring of 2002, we met with various representatives of OHV groups regarding OHV opportunities in the Sandpoint Ranger District, including the West Gold project. On June 19, road manager Larry Elliot met with members of the Backcountry ATV Association to look at Roads 2707A and AA. On July 25, we met with members of Idaho Fish and Game and Idaho Department of Environmental Quality at the project area. On September 25, we held a field trip in the project area for members of the Idaho Native Plant society.

During the public comment period a total of 120 comment letters were received, 4 from environmental groups, 4 from Federal and State agencies and 112 from OHV users. Of the 112 letters, 108 were identical form letters. Details of all public involvement planning and activities are located in the project file. The responses to public input can be found in Appendix I of the FEIS. Letters from State and Federal agencies are included in their entirety in Appendix I as required. Responses to comments from these letters are included with the other comments.

Comments received after public review of the Draft EIS were used to adjust and refine the analysis of the proposed action and alternatives, clarify and correct text, and prepare the Final EIS.

# 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.
- **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 between alternatives.

## 2.31 Key Issues

***Issue:*** **The effects of regeneration cutting and resulting canopy openings on water yield increases, sediment delivery to streams, and aquatic habitat in West Gold Creek and Gold Creek.**

Alternative D addresses this issue by using mostly selective cutting that treats fewer acres with smaller canopy openings.

Issue Indicators:

1. Percent change in the magnitude, intensity and duration of water yield from the existing condition.
2. Percent change in magnitude, intensity and duration of sediment delivery in West Gold.
3. Total estimated sediment delivered in tons over the duration of the project in West Gold and Gold Creek.
4. Overall sediment reduction in tons in West Gold and Gold Creek.

***Issue:*** **The effects of road construction, decommissioning, and maintenance activities on sediment delivery to streams and aquatic habitat in West Gold Creek and Gold Creek.**

Alternative C addresses this issue by featuring no new or temporary road construction.

Issue Indicators:

1. Net associated risk of sediment delivery (in tons) from road drainage crossings.
2. Percent change in the magnitude of sediment yields from the existing condition.

***Issue*: Risk of project activities on the spread of existing weed infestations and introduction of new weed invaders.**

Alternative C addresses this issue by featuring no new or temporary road construction. Alternative D addresses this issue by using mostly selective cutting that treats fewer acres with smaller canopy openings.

Issue Indicator:

1. Relative amount of canopy removal and ground or understory vegetation disturbance.

## 2.32 Analysis Issues

***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 sensitive and rare plants**
Issue Indicator:

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 and road management on wildlife habitat and security as related to sensitive and management indicator species groups**
Issue Indicators:

*Sensitive Species:*
1. Flammulated owl – trend toward suitable habitat conditions.
2. Black-backed woodpecker – changes in distribution and quality of snag habitat.

*Management Indicator and Other Species:*
1. Pileated woodpecker – changes to suitable nesting habitat.
2. Elk – changes to elk habitat effectiveness.
3. Forest Land Birds – changes to priority habitats and diversity

***Issue:*** **Effect of vegetation and fuels treatments on restoring fire as an ecological process, and on our ability to suppress unwanted fires**
Issue Indicators:

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

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

1. Estimated production of particulate matter from smoke emissions.

***Issue:*** **Effects of project activities on soils**
Issue Indicator:

1. Percent of detrimentally disturbed soils
2. Potential for loss of potassium and woody debris

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

1. Evaluation of whether activities proposed under the action alternatives would achieve IPNF Forest Plan visual quality objectives.

***Issue:*** **Effects of project activities on revenues generated from the sale of timber**
Issue Indicators:

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

***Issue:*** **Effects of proposed road construction and existing road management on public road access.**
Issue Indicator:

1. Net change in miles in types of motorized and non-motorized use

## 2.32a Issues Eliminated From Detailed Analysis

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

**Effects to Public Drinking Water** – There are no public water systems or private water use permits in the West Gold watershed. Therefore, this issue was eliminated from detailed analysis.

**Effects of New Road Construction On Increased Human Access** – All of the newly constructed roads would be decommissioned with the exception of one short segment, which would be put into storage at the end of project activities. These activities would make the all the new road segments impassable to motorized vehicles. All of these roads would be located behind existing gates restricting motorized vehicle access and these restrictions would remain in place during project activities (with the exception of vehicles used for project activities). For these reasons, this issue was eliminated from detailed analysis.

**Effects of Road Closures on Reducing Public Access** – Of the existing roads proposed for decommissioning, three consist of segments located at the ends of roads currently closed to motorized access. The non-motorized recreational value of these segments consists mostly of berry picking and hunting. The other existing road that is proposed for storage is also currently closed to motorized access. We are proposing to increase OHV access on one gated road in the drainage by about four miles during summer months. Out of about 30 miles of road in the watershed, we are reducing the amount of non-motorized road miles by 1.4 miles. Since the amount of public access permanently reduced on roads would be negligible (less than 1%), this issue was eliminated from detailed analysis.

**Effect Of Funding Certainty On Ability To Accomplish Restoration Objectives** – Although revenues generated from the sale of timber (Knutson-Vandenberg or (K-V) funds) are often used to fund some restoration activities associated with the project, they are not the only source of funding. Unless specifically stated otherwise, all activities proposed under the action alternatives would be accomplished regardless of whether K-V funds were available. For these reasons, this issue was eliminated from detailed analysis.

**Effects Of Vegetation Prescriptions On Old Growth** – Although treatment would occur in one old growth stand, the treatment would consist of underburning only to maintain the old growth ponderosa pine characteristics. Using controlled prescribed burning techniques, these treatments would not result in a loss of designated old growth acres. In addition, features outlined in Chapter II, Features Related to Vegetation Restoration are designed to protect the integrity of old growth stands next to proposed treatment areas. For these reasons, this issue was eliminated from detailed analysis. See Chapter III-- Forest Vegetation, Environmental Consequences for further discussions on old growth.

**Potential for Loss of Control During Prescribed Burning** – Prescribed burning is conducted only when weather and moisture conditions are favorable for control, and when adequate resources of personnel and equipment are available. Design features in this Chapter to address this issue would be highly effective at keeping a prescribed fire under control. For these reasons, this issue was eliminated from further analysis.

**Effects of Road Closures on Fire Suppression** – The location of existing roads not scheduled for closure, in addition to the use of resources such as smokejumpers and helicopters, provides ample opportunity for fire suppression access. All of the temporary roads that are proposed for decommissioning are located at the end of existing gated roads. Most will be created and used only for the life of the project. Existing road segments that are proposed for decommissioning are also located at the end of existing gated roads. Road segments proposed for storage could be easily reopened for suppression activities if needed. For these reasons, this issue was eliminated from further analysis.

**Effects of Project Activities on Heritage Resources** – The only documented heritage resources in the project area are old trails. Mitigation measures to protect these trails and any measures to protect heritage resources discovered during project activities are included in the section Features Designed to Protect Heritage Resources in this Chapter. For these reasons, this issue was eliminated from further analysis.

**Effects of Clearcutting on Visuals, Hydrology, and Wildlife Habitat** – Clearcutting is not a proposed prescription for this project. Some people believe regeneration cutting methods can result in impacts similar to clearcutting. The effects of regeneration cutting methods are fully analyzed in the Environmental Consequences sections of Chapter III. For these reasons, this issue was eliminated from further analysis.

**Effects of Project Activities on Threatened and Endangered Wildlife Species** – There are no known threatened or endangered wildlife species or recovery habitat in the project area. Sensitive species and management indicator species will be addressed in mitigation and analysis. For these reasons, this issue was eliminated from further analysis.

**Effects of Project Activities on Threatened and Endangered Plant Species** – There are no known threatened or endangered plant species or suitable habitat in the project area. Sensitive species and rare plant species will be addressed in mitigation and analysis. For these reasons, this issue was eliminated from further analysis.

**Economic Effects Of Logging On Public Land And The Resulting Damage To And Loss Of Ecosystem Values** – The potential loss of ecosystem service values as a result of logging on public land has been adequately addressed in the effects analysis of this document by assessing the effects of the proposed activities on the resources in the project area (please refer to Chapter III).

In addition, the Northern Region Forest Service publication <u>Economic Analysis for Forest Plan Implementation</u> (USDA 1989) provides guidance for determining the level of appropriate economic analysis for project-specific decisions. It states "[u]sually it is not appropriate to consider non-market effects in financial terms at the site-specific level. If the objective is to produce non-market outputs and market outputs are incidental, a cost effectiveness analysis determining least cost is usually sufficient".

**Effects Of Constructing And Decommissioning Roads On The Cost Of The Project** – Road construction is typically proposed in projects that have logging activities because they keep the cost of logging and other activities (i.e. planting and burning) down by providing easier access into treatment areas. So even though it may cost money to build and remove a road, not building roads typically increases the overall cost of accomplishing the project. A transactions evidence (TE) appraisal was conducted to determine the amount of revenues that would be available to fund post-sale activities to be completed by the Forest Service (see Chapter III - Finances). This analysis showed that all action alternatives would generate revenue, and that Alternative B, which constructs temporary roads would be more economical and generate more revenue than Alternative C which does not. For these reasons, this issue was eliminated from further analysis.

**Effects of Decommissioning All of Road 2707A** – In the winter of 1996/97, a portion of Road 2707A washed out when a culvert at the headwaters plugged causing the stream to flow over the road. Upon initial inspection, we discovered that the portion of road that was washed out was poorly built, with slash incorporated into the road fill. Fearing that the entire road was built that way, the team considered decommissioning the entire road segment after use for the project. The road serves as an important alternate snowmobile route when Road 332 is plowed, so the team investigated the possibility of finding a new route. The best place for a new route would have been on Chilco Mountain and would have resulted in clearing a route through trees and negotiating some steep topography. In addition, further inspection of Road 2707A revealed that only the washed out portion of the road had been built poorly, that the culvert at that crossing was undersized, and that there needed to be more drainage relief structures between some of the culverts. Given this information, the hydrologist felt confident that the headwaters crossings on Road 2707A could be redesigned to accommodate future peak flows as well as snowmobile and proposed off-highway vehicle use. In addition, the team has proposed decommissioning the last 0.7 mile of the road where one of the headwaters crossings is located. For these reasons, this issue was eliminated from further analysis. See the section Features Designed to Reduce Sediment and Protect Fish, later in this Chapter.

**Effects of Project Activities on Recreation/Effects Of Allowing New OHV Use On Non-Motorized Recreation** – These issues were brought up following review of the Draft EIS. Roads 2707A and AA are currently closed to dry season use by wheeled motorized vehicles. This route is currently open to snowmobile use. Other recreation uses are minor—the West Gold project area is not a major recreation destination. The primary uses are hunting, berry picking, and access to a trailhead outside of the project area. Most visitors to the project area are passing through to other destinations. There are no major trails within the project area, and many of the gated roads do not lead to commonly used areas. Logging and road work would likely be an inconvenience to those passing through, and may temporarily displace hunters and berry pickers that regularly use the area but not be a substantial impact. For these reasons, these issues were eliminated from further analysis.

# 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) and the National Forest Management Act (NFMA). Alternative A describes what environmental effects would result if no 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 reconstruction. Existing trends and uses, such as fire protection and recreation management, would continue.

## 2.42 Alternative B (Proposed Action)

This alternative is our proposed action and is designed to respond to the Purpose and Need identified in Chapter I. The following describes the details of actions proposed:

**Vegetation Restoration** - Treatment of vegetation would occur on about 29% or 1,338 acres of a 4,543-acre project area (see Figure 3, Appendix I). Vegetation prescriptions are designed to trend the project area forests toward conditions historically created by non-lethal (low-intensity) and mixed-severity fires, rather than lethal (stand-replacing) fires. Techniques would include selective and regeneration cutting, followed by fuels treatments and planting. Methods of removing cut trees would likely be by tractor, skyline or helicopter. See "Vegetation Treatment Definitions" text box and Appendix C for a table showing treatments in each unit. See table 1 below for acres of treatment.

- **Selective cutting** would occur on approximately 411 acres to reduce competition and increase tree growth within stands. These are 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. The silvicultural prescriptions may include treatments such as thinning, improvement cutting and thinning with group selection.
- **Regeneration cutting and reforestation** (see definitions) would occur on approximately 898 acres to remove undesirable trees, trees susceptible to or infested with root disease, or trees at risk of being killed by insects. Many of these are stands where there is significant tree mortality occurring or where there is *risk* of significant tree mortality within the next 10 to 20 years. Following cutting, these stands would be burned and reforested with desired longer-

**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 there would be less than 30% of the trees remaining 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 regeneration cut units would range from approximately 5 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 in a timely manner (within 5 years).

**Selective Cutting:** This technique would remove trees in areas where there is the opportunity to maintain or enhance the growth of western larch or ponderosa pine, or move the stand towards desired structural stages. Trees removed would generally be smaller or less dominant 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.

**See photos in the West Gold Project Summary for examples of what these treatments look like**

lived species less susceptible to root disease. This type of cutting would result in 16 stands with openings[1] 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 silvicultural prescriptions would include irregular shelterwood, seedtree with reserves, and final removal with reserves. Rehabilitation and reforestation would be used in areas where there are already large openings created by root disease and insect attack (see Glossary, Appendix G for prescription definitions).

**Fuels Treatment** – This alternative would include treating fuels to restore fire as an ecological process and to prepare the site for planting desired longer-lived species of ponderosa pine, larch and white pine. To reduce existing fuels and those created by the vegetation treatment, there would be about 919 acres of prescribed underburning, about 223 acres of limb and lop methods, about 10 acres of whole tree yarding and about 28 acres of grapple piling. About 29 acres of one old growth stand (unit 26) would be underburned (without any cutting) to provide ecological benefits of a low-intensity fire.

Within proposed units 16, 27, 31, 26, 39, and 24, there may be areas where root disease patches and brush fields extend into the Riparian Habitat Conservation Areas (RHCAs). Slashing and burning fuel treatments would occur in these areas to expedite trending the riparian area toward long-lived tree species, improved canopy cover and woody debris recruitment to West Gold Creek in the long term. No merchantable material would be removed. This is consistent with INFS direction (USDA 1995; Appendix A, TM-1(b)).

**Road Construction, Decommissioning and Storage** – To accomplish vegetation restoration activities there would be approximately 3 miles of road construction. About 2.7 miles of these would be temporary roads to 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. The remaining 0.3 mile constructed would become a classified road

ROAD DEFINITIONS

**Temporary Road** – Road constructed but not necessary 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 –** A method of retaining a permanent road for future use but removing features to eliminate hydrologic risks. 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.

**Road Maintenance** – The upkeep of a road necessary to retain or restore the road to the approved road management objective.

**Classified Road** – Road 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 or regular upkeep.

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[1]"Openings" in this case are not areas that are completely devoid of trees. Regeneration cutting units can be considered openings even though they have patches and clumps of trees left across the landscape. See Glossary in Appendix G.

and after use for the project, put into storage for potential future management (see tables 1 and 2 below and figure 3, Appendix I).

**New Off-highway Vehicle Route** - To provide more off road vehicle opportunities, the gates on Roads 2707A and 2707AA would be modified to allow use by wheeled motorized vehicles less than 50" in width except during soft roadbed conditions. When there are soft roadbeds, a closure order would be put into effect. All other roads currently gated would remain closed to all public motor vehicle access (except snowmobiles) to maintain wildlife security and reduce maintenance needs. See table 27 for details.

**Table 1. Activities proposed in each Alternative.**

| Activities | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **Vegetation Treatments (Acres)** | | | | |
| **Selective Cutting** | | | | |
| Thin | 0 | 411 | 411 | 406 |
| Improvement Cut | 0 | 0 | 0 | 38 |
| **Regeneration Cutting** | | | | |
| Irregular Shelterwood | 0 | 683 | 683 | 0 |
| Rehabilitation | 0 | 148 | 148 | 0 |
| Seedtree w/Reserves | 0 | 65 | 65 | 0 |
| Final Removal w/Reserves | 0 | 2 | 2 | 2 |
| **Underburn Only** | 0 | 29 | 29 | 29 |
| **Total Stand Treatment Acres** | **0** | **1,338** | **1,338** | **475** |
| **Logging Systems (Acres)** | | | | |
| Helicopter | 0 | 625 | 891 | 245 |
| Skyline | 0 | 638 | 405 | 186 |
| Tractor | 0 | 46 | 13 | 15 |
| **Road Work (Miles)** | | | | |
| Road Construction | 0 | 3.0 | 0 | 0.5 |
| New Road Storage | 0 | 0.3 | 0 | 0.3 |
| Temporary Road Decommissioning | 0 | 2.7 | 0 | 0.2 |
| Existing Classified Road Decommissioning | 0 | 1.4 | 1.4 | 1.4 |
| Existing Unclassified Road Decommissioning | 0 | 0.7 | 0.7 | 0.7 |
| Existing Unclassified Road to Permanent Road | 0 | 0.3 | 0.3 | 0.3 |
| Existing Road Storage | 0 | 1.7 | 1.7 | 1.7 |
| Road Maintenance | 0 | 25.5 | 25.5 | 25.5 |
| **Fuel Treatments (Acres)** | | | | |
| Underburn (includes 29 acre underburn shown above) | 0 | 1,077 | 1,077 | 225 |
| Limb and Lop | 0 | 223 | 223 | 223 |
| Grapple Pile | 0 | 28 | 28 | 27 |
| Whole Tree Yard | 0 | 10 | 10 | 0 |
| Burn landing debris | 0 | 9 | 9 | 5 |
| **Total Fuels Treatment*** | **0** | **1,347** | **1,347** | **480** |

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

**Road Work to Improve Aquatic and Wildlife Habitat** - To help reduce potential and existing sediment risks to the watershed, road maintenance activities would improve existing road drainage structures and surfaces on about 25.5 miles of road (see tables 1 and 27). Existing roads would be improved to meet standards suitable for use by large trucks and equipment. Drainage structures in roads that pose sediment risks would be repaired, replaced, removed, or redesigned.

To increase wildlife security and further reduce risks to the watershed, about 1.4 miles of existing gated roads would be decommissioned and about 1.7 miles of a currently gated road would be put into storage after use for the project (see tables 1 and 27). In addition, 0.7 mile of an existing unclassified road would be decommissioned (see Features Related to Roads and Access Management below). If these roads were used by the contractor to accomplish vegetation restoration activities, decommissioning would be included in the contract or accomplished using revenue generated by the sale of timber. If any of the existing roads proposed for decommissioning were not used for the project, they would be decommissioned using appropriated or other funding sources.

## 2.43 Alternative C

The intent of this alternative is to analyze the environmental effects of implementing the same proposal as Alternative B without constructing any new roads (see figure 4, Appendix I).

**Vegetation Restoration** – Vegetation treatments under Alternative C would be identical to Alternative B. Methods of removing logs would likely be mostly by helicopter with some skyline and tractor as there would be no new classified or temporary roads constructed.

**Fuels Treatment** – Fuels treatment would be identical to Alternative B.

**Road Construction** – No new or temporary road construction would take place.

**Table 2. Proposed road construction and resulting access management.**

| | Road Number | Alternative B | | Alternative C | | Alternative D | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | | Proposed Construction Miles | Access Management at end of Project | Proposed Construction Miles | Access Management at end of Project | Proposed Construction Miles | Access Management at end of Project |
| Temporary Roads | 2707AT | 0.8 | Decommission | 0 | N/A | 0 | N/A |
| | 278AT | 0.5 | Decommission | 0 | N/A | 0 | N/A |
| | 278D1T | 1.0 | Decommission | 0 | N/A | 0 | N/A |
| | 278D1T1 | 0.2 | Decommission | 0 | N/A | 0 | N/A |
| | 278D1T2 | 0.2 | Decommission | 0 | N/A | 0.2 | Decommission |
| New Road | 278D1 | 0.3 | Storage | 0 | N/A | 0.3 | Storage |
| | **Total** | **3.0** | **Decommission 2.7 miles Put 0.3 mile into storage** | **0** | **N/A** | **0.5** | **Decommission 0.2 mile Put 0.3 mile into storage** |

**New Off-highway Vehicle (OHV) Route** – As described in Alternative B, the gates on Roads 2707A and 2707AA would be modified to accommodate motorized wheeled vehicles less than 50 inches (see table 27).

**Road Work to Improve Aquatic and Wildlife Habitat** – To increase wildlife security and further reduce risks to the watershed, road maintenance and decommissioning of segments on existing roads under this alternative would be identical to Alternative B (see tables 1 and 27).

## 2.44 Alternative D

The intent of this alternative is to analyze the environmental effects of an alternative that uses mostly selective cutting techniques (see figure 5, Appendix I).

**Vegetation Restoration** – Treatment of vegetation would occur on about 10% or 475 acres of the project area. Prescriptions would consist of about 444 acres of selective cutting and about 2 acres of regeneration cutting (see table 1). On the two-acre unit, a portion of the overstory trees would be removed to allow the previously planted western larch and white pine seedlings room to grow.

**Road Construction and Management** – To accomplish vegetation restoration activities there would be approximately 0.3 mile of road construction. This road would be put into storage following project activities for potential future management use (see tables 1 and 2 and figure 5 in Appendix I).

**New Off-highway Vehicle Route** – As described in Alternative B, the gates on Roads 2707A and 2707AA would be modified to accommodate vehicles less than 50 inches (see table 27).

**Fuels Treatment** – To reduce existing fuels and those created by the vegetation treatment, there would be about 196 acres of underburning, about 225 acres of limb and lop methods, about 10 acres of whole tree yarding and about 30 acres of grapple piling. About 29 acres of one old growth stand (unit 26) would be underburned to provide ecological benefits of a low-intensity fire.

As described in Alternative B, Slashing and burning may occur in portions of the RHCA along Unit 39 only.

**Road Work to Improve Aquatic and Wildlife Habitat** – To increase wildlife security and further reduce risks to the watershed, road maintenance and decommissioning of segments on existing roads under this alternative would be identical to Alternative B (see tables 1 and 27).

## 2.45 Features Common to Alternatives B and D

The following features consist of project designs or mitigation measures that are applicable to Alternatives B and D. They are listed here separately only to avoid repeating them in each alternative description. Items described under "Features Related To…" are simply additional project designs common to the alternatives. Items described under "Features Designed to…" are protection or mitigation measures proposed 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.

### *2.45a Features Designed To Reduce Effects From 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), temporary roads generally greater than 300 feet in length[2] would be designed by a Forest Service Engineer and would be incorporated into a road package tied to the timber sale. An engineering representative would monitor new temporary road construction to ensure design specifications were met. At the end of all project activities, all temporary roads would be decommissioned and removed from the forest transportation system. See "Features Designed to Reduce Sediment" and "Features Designed to Protect Water and Fish Habitat" for specific mitigation measures.

Estimated Effectiveness: **High;** extensive research has demonstrated that improved design, building, and maintenance of roads can reduce road-related surface erosion at the scale of individual road segments. Key factors are road location, particularly layout relative to stream systems (USDA 1999c), road drainage (Haupt 1959, Copstead 1998), surfacing (Burroughs and King 1989, Kochenderfer and Helvey 1987, Swift 1984), and cut slope and fill slope treatments (Burroughs and King 1989, Cook and King 1983, Hungerford 1984). Many studies show that surfacing materials and vegetation measures can be used to reduce the yield of fine sediment from road surfaces (Beschta 1978, Burroughs et al 1983, Kochenderfer and Helvey 1987, Swift 1984, Foltz and Truebe 1995).

### *2.45b Features Designed to Reduce Sediment*

**Temporary and Classified Road Decommissioning to Improve Aquatic Habitat -** All temporary and classified roads identified for decommissioning or storage would be obliterated with appropriate techniques. These may include full and partial recontouring; removing all culverts; stabilizing fill slopes and restoring stream channel crossings back to natural grade. Seeding, fertilizing, and placement of woody debris would follow to establish desired vegetation and prevent noxious weed spread.

Estimated Effectiveness: **High;** road-decommissioning activities provide long-term improvements in reducing erosion and sediment delivery to stream channels. Removing culverts would prevent them from plugging and prevent the associated fill from failing and delivering large quantities of sediment (USDA 2000 and 1999).

**Hydro-mulching** - All road construction would require hydro-mulching on soil disturbance sites within critical areas such as wet areas. 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).

## 2.46 Features Common to Alternatives B, C and D

The following features consist of project designs or mitigation measures that are applicable to Alternatives B, C and D. They are listed here separately only to avoid repeating them in each alternative description. "Other Restoration Projects" are activities we would like to accomplish in addition to our proposed action. "Future Salvage Opportunities" provides information on the process we would follow to salvage future dead or dying trees within cutting units for up to six years after proposed project activities were completed. Other Restoration Projects and Future Salvage Opportunities are considered "connected actions" when analyzing cumulative effects.

[2] This distance could be increased if ground conditions are such that resource damage would be minimal.

## 2.46a Other Restoration Projects

The following projects would occur if Alternatives B, C or D were selected. These projects are beyond the immediate restoration needs of this area but have been proposed and analyzed in the event that funding would become available to accomplish them. If sufficient revenues were generated from the sale of timber (i.e. K-V funds), 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.

**Noxious Weed Treatment and Monitoring** – In addition to weed prevention measures described in "Features Designed to Prevent the Spread of Noxious Weeds" the project area would be monitored, and weed treatment would be accomplished as necessary. An Integrated Pest Management approach (including biological, mechanical, cultural and chemical control) would be used. This would decrease the chance of existing infestations becoming established in new areas, and would reduce the risk of new invaders becoming established. Weed treatment related to the project would complement weed treatment efforts recently completed along Forest Roads 2707 and 278. All weed management activities would be conducted in accordance with the guidelines in the Sandpoint Noxious Weed Control Project FEIS (USDA 1998c).

**Timber Stand Improvement** - Thinning young, small diameter trees (formerly known as precommercial thinning) and other work would occur in 382 acres of previously cut areas (see Appendix C-13). These activities 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 would 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 proposed cutting 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 cuts would require slashing. The selective cutting units would require some level of weed and release treatment. All slash would be removed from road ditch lines.

**Native Seeding** – Following prescribed burning of dry sites, recovery of native vegetation would be monitored. These areas would be seeded with native species appropriate to the site and fertilized if necessary to establish desired vegetation, enhance forage, and help prevent the spread of noxious weeds.

## 2.46b 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 cutting units for approximately six years after the timber sale contract is completed. Examples of situations in which salvage would be considered include (but are not limited to) groups of trees damaged by weather, fire, or insects. Salvage opportunities could take place within the cutting units subject to the following criteria:

- The Interdisciplinary Team must ensure the salvage activities are within the scope of effects analyzed in this EIS.
- 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 meet snag and coarse woody debris guidelines as outlined in Design Features. Salvage would avoid actions that would undermine or take away from wildlife habitat management objectives (e.g. removal of large diameter snags or trees that provide important nesting habitat for flammulated owls).
- 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 take place only when existing skid trails would be used.
- 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 activities would not cause detrimentally disturbed soils that exceed Forest Plan and Regional Soil Quality standards.
- Salvage would not take place if the activity would have an adverse effect to a flood plain or wetland.

The Interdisciplinary Team would review any proposed changes to the above criteria. If there were changes, a Supplemental Information Report would be written to determine if additional analysis would be needed and if a Supplemental Decision would be necessary.

### *2.46c Features Related to Vegetation Restoration*

**Post-cutting Treatments** - In regeneration units, site preparation, fuels treatment, and planting activities would occur within five years following timber cutting 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-cutting conditions.

**Openings Over 40 acres** - Cutting in 16 units as proposed would result in contiguous openings of greater than 40 acres in size. The update letter dated September 11, 1998 provided a 60-day public comment period on this issue as required by Regional Forest Service Guidelines (see Project File, Public Involvement Section). A request for approval by the Regional Forester to exceed the 40-acre openings limit has been submitted to the Regional Office and will be determined upon review of this Draft EIS.

**Retention of Large Old Trees in Stands Not Designated as Old Growth** – Within some units there are portions of small stands (<25 acres) with groups of large old trees that are not defined as old growth. Marking guidelines would specify that these groups of trees would be retained.

## 2.46d Features Related to Roads and Access Management

**Conversion of Unclassified Road Segment to Classified Road** – Approximately 0.3 mile of a one-mile unclassified road 2707UF would be converted to a classified road to maintain a dispersed recreation site. The remaining 0.7 mile of road would be decommissioned to stop existing motorized use through a plantation.

**Transportation, Maintenance and Safety on Roads** - Log hauling and some yarding and decking of logs would occur along Roads 2707 and 278. Haul would occur out Road 332 (the Bunco) Road to the west. Haul routes would be posted with signs indicating heavy truck traffic. No hauling would occur on weekends and holidays to reduce safety hazards during high use times by visitors. Dust abatement would be used as needed on National Forest roads to control dust and maintain driver safety.

**Management of Gated Roads During Project Activities** - During logging activities and during bow and firearm hunting seasons, existing gated roads in the project area would remain closed to all motorized vehicles not associated with the logging operation. While using these roads, the purchaser would not be allowed to use motorized vehicles to gather firewood, hunt or transport big game animals from behind the gates.

**Management of Motorized Access on Gated Roads After Project is Completed -** The following roads, which are currently gated and closed to all wheeled motorized vehicles would retain their current restricted access: Roads 2708A, 278A, 278B, and 278D. Restrictions on Roads 2707A and 2707AA, which are open to snowmobile use in the winter when Road 332 is plowed, would change to accommodate motorized vehicles less than 50" in width except during soft roadbed conditions. All other roads listed above would remain closed to all public wheeled motor vehicle access. See table 27 for details.

## 2.46e Features Related to Timing of Activities

**Timing of Contracted Activities** - The timber sale would be split into separate subdivisions. The intent of the subdivision is to limit the length of time most of the contracted activities take place within a specific area.

**Timing of Road Decommissioning** – Unless circumstances change during implementation that would extend the duration of time a road is needed, roads would be decommissioned within the following timeframes:

- Temporary roads or existing road segments proposed for decommissioning that are not needed for post-cutting activities (e.g. fuel treatment or planting) would be decommissioned the same season following cutting activities or no later than the following season.
- Other road segments proposed for decommissioning that are needed for post-cutting activities, such as prescribed burning or planting, would be decommissioned within two to five years of cutting activities.

**Timing of Logging Operations** – The purchaser would have the option of winter or summer logging with the following exceptions:

- No winter logging could occur in any units accessed by Roads 2707A or 2707AA when Road 332 is plowed or scheduled to be plowed. Roads 2707A and 2707AA are used as a snowmobile bypass when winter logging in other areas uses Road 332 for log haul.

- No winter logging could occur on Road 278 to allow snowmobile access for Lakeview residents unless other snowmobile or drivable road access were available.

(Also see Features Designed to Protect Wildlife Habitat regarding logging timing restrictions during Harlequin Duck breeding season.)

## *2.46f Features Designed to Keep Prescribed Burns Under Control*

Prescribed burning treatments would be conducted according to established standards in FSM 5142 – Prescribed Fire Management. A site-specific burn plan would be prepared for each area to be burned. Burning would only occur when weather, fuel conditions, and available resources are at the levels specified in the prescribed burn plan.

*Estimated Effectiveness*: **High**; burns conducted in compliance with an approved prescribed burn plan have a very high success rate (USDA 1996a).

**Slash and Pile Burning** - Landing slash and excavator piles would be burned in late fall after heavy rains and during cooler temperatures when the risk of escape into adjoining stands and damage to residual timber is lessened.

*Estimated Effectiveness*: **High**; Decades of burning piles in late fall has proven successful at ensuring there have been no escaped fires in the Sandpoint Ranger District (pers. comm. with Dave Lux, Fire Management Officer).

**Fuelbreaks** - If natural fuelbreaks are not present, fire lines and fuelbreaks would be constructed around the perimeters of all burn units. Where possible, fire lines and fuelbreaks would be constructed on ridges, benches, and the toe of slopes, using the advantage of the terrain to best control the fire.

*Estimated Effectiveness*: **High**; fuelbreaks that follow favorable terrain are more effective in reducing radiant heat and preventing burning debris from crossing fuelbreaks (USDA 1996a).

**Use of Water and Engines** - Fire hose would be installed along critical sections of fuelbreaks using water supplied from fire engines and/or pumped from nearby natural water sources (see Features Designed to Protect Water and Fish Habitat for "Protection of Fish When Using Streams For Prescribed Burning Control" below.

*Estimated Effectiveness*: **High**; fuelbreaks that are reinforced with water are more effective in keeping fire within the fuelbreak (USDA 1996a).

## *2.46g 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.

*Estimated Effectiveness*: **High**; due to air quality requirements of State and Federal guidelines, no air quality violations have occurred in the Sandpoint Ranger District.

## *2.46h Features Designed to Protect Soil, 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, USDA Forest Service Monitoring Reports 1995 - 2000). 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.

**Sediment Reduction** - 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).

**Inland Native Fish Strategy –** Commercial timber cutting would be prohibited in RHCAs for fish habitat protection using the guidelines established by the Inland Native Fish Strategy (INFS). These no-cut zones include 300-foot (slope distance) protection zones for streams that have fish, 150-foot protection zones for perennial streams with no fish, and 100-foot for intermittent streams and sensitive landtypes, since Gold Creek is a priority watershed. Ephemeral draws would have a 50-foot (slope distance) protection zone if they are either directly tied to an intermittent channel, or lack large woody debris and vegetation that prevent scouring or head cutting.

Except for units likely to have burning and reforestation activities within the RHCA, standard widths defining Riparian Habitat Conservation Areas (RHCAs) would be used without modification. INFS allows silviculture practices to be applied in RHCAs to acquire desired vegetation characteristics where needed to attain Riparian Management Objectives (see Appendix B, TM-1(b.)) and to design prescribed burn projects that contribute to the attainment of Riparian Management Objectives (see Appendix B, FM-4). No overstory canopy would be removed within the RHCAs. Some slashing[3] of shrubs and undesirable saplings and seedlings may occur in selected units to prepare sites for burning and reforestation activities. Planting within RHCAs would follow burning activities to promote long-lived species such as cedar, larch, and white pine. Streamside protection zones (RHCAs) were determined categorically for streams in the project area and are based on the INFS.

[3] Slashing is the use of chainsaws to treat sub-merchantable, undesirable tree species in order to prepare a site for burning and reforestation with desired species.

Eleven acres of thinning are proposed in unit 6, which is located within a landslide prone area. Skyline or helicopter logging would be necessary to minimize ground disturbance activities and harvesting can only occur during the summer months when the soils are not saturated.

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, Bogs, Wallows and Springs –** All known or discovered wetlands, seeps, bogs, elk wallows and springs less than one acre in size would be protected with a "no activity" buffer approximately 100 feet in diameter. There are no such areas larger than one acre.

Estimated Effectiveness: **High**; this practice would be implemented because it would be incorporated into project design and unit layout, and implemented by the sale administrator.

**Road Surface and Drainage Crossing Maintenance to Improve Aquatic Habitat -** The main source of erosion and sediment delivery from roads is usually from the road surface. Road maintenance activities that focus on reducing sediment delivery are blading along the road prism; spot surfacing at stream crossings; installing relief culverts where ditch lengths are too long; cleaning and improving ditches; cleaning the inlet and outlets of culverts; and installing rolling dips and outlet ditches. These activities would help improve road surface drainage and decrease sediment delivery to stream channels.

Road drainage crossings that pose a hazard and risk to aquatic species and their habitat from sediment delivery have been evaluated throughout the project area. Recommendations for each crossing may include replacing, redesigning or upgrading crossings as needed. Some specific road improvements to reduce sediment risks include:

> **Road 2707A and 278**– Road drainage crossings along these two roads would be redesigned to avoid stream diversion potential and culvert failure. On the 2707A, proposed treatments would maintain access for snowmobiles and a groomer. Increasing the culvert's flow capacity and constructing a rolling dip would reduce sediment risks.
>
> Road maintenance activities that repair or remove drainage structures in perennial streams would take place after July 15th and prior to September 15th. This is to reduce risk of effects from sediment during spring runoff and to avoid effects to westslope cutthroat trout redds and staging or spawning bull trout.

Estimated Effectiveness: **High**; proposed road surfacing and drainage crossing upgrades would occur because they would be included in the road package as part of the Timber Sale Contract or would be accomplished by the Forest Service using appropriated or other funding.

**Classified Road Decommissioning to Improve Aquatic and Wildlife Habitat -** All classified roads identified for decommissioning or storage would be decommissioned with appropriate techniques. These may include full and partial recontouring; removing all culverts; stabilizing fill slopes and restoring stream channel crossings back to natural grade. Seeding, fertilizing, and placement of woody debris would follow to establish vegetation and prevent noxious weed spread.

Estimated Effectiveness: **High;** road-decommissioning activities provide long-term improvements in reducing erosion and sediment delivery to stream channels. Removing culverts would prevent them from plugging and prevent the associated through-fill from failing and delivering large quantities of sediment. Removing drivable road surfaces increases big game security areas.

**Protection of Fish When Using Streams For Prescribed Burning Control** - To avoid adverse effects to fish and redds while using natural water sources, water removal may not exceed 90 gallons per minute and pumping sites would be located away from spawning gravels. The intake hose would be screened to prevent accidental intake of small fish. An emergency spill clean up kit would be on site in the unlikely event of a fuel spill outside the containment system. This is consistent with INFS direction (USDA 1995; Appendix A, RA-5).

Estimated Effectiveness: **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.

### *2.46i Features Designed to Protect Wildlife Habitat*

**Wildlife Tree Retention –** Design features for the project were developed to ensure the retention and selection of snags at a level and distribution that have been shown to support viable populations of species that use them.

Snags and live tree replacements would be retained where opportunities exist in treatment units at levels recommended by scientific literature based on recent studies (Bull et al. 1997). In high-risk stands proposed for regeneration cutting, desired snag habitat is generally lacking due to past large-scale lethal fires and the preponderance of short-lived tree species and root disease. Consequently, snag retention objectives would not be met in these areas.

Snag retention objectives are consistent with recent published data that suggests 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).

To compensate for the lack of snags in heavy root disease areas, the following minimum amounts of snags and live tree replacements are to be retained within applicable cutting areas:

- Dry forest habitats: 4 snags and 8 live tree replacements/acre from the largest trees.
- Moist forest habitats: 6 snags and 12 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). The 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). Retention practices would focus on ponderosa pine, western larch, Douglas-fir and western red cedar trees, especially veteran or relic ponderosa pine and western larch trees. Trees killed by root disease should be avoided, where possible, to meet retention objectives because of their rapid deteriorate/fall-down rate.

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

To promote good distribution of snags, some snags would be represented on every 10 acres of treatment, in clusters or clumps where feasible.

Slash would be pulled back from veteran or relic ponderosa pine and western larch live trees and snags to protect them from the adverse effects of prescribed burning. Grapple piling would be considered to treat fuels on moderate slopes where residual snags would be at risk from broadcast burning.

*Estimated Effectiveness*: **Moderate**; this measure would be implemented using project layout, contract provisions, compliance monitoring and fuels treatment, and would have a moderate chance of avoiding and/or reducing adverse effects on snag dependent wildlife. It would not be the intent of this project to willfully remove the high hazard snags and snags in the advanced stages of decay ("soft" snags). Some of these "soft" snags would survive and remain standing during the life of the project.

Past monitoring has demonstrated that tree harvesting and subsequent burning removes a large portion of existing snags, especially the "soft snags." However, through the strategic placement of leave patches or clumps, snags within these areas should be relatively protected. In addition, prescribed underburning will recruit "new" snags by fire-killing residual green trees. There would be no problem meeting and exceeding live tree replacement criteria in that vegetative prescriptions are designed to leave ample green trees scattered in patches and individually (regeneration cutting), and uniformly (selective cutting) across treatment areas. Consequently, this measure should provide more than the minimum number of snags and live tree replacements.

**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 coarse, woody debris and long-term site productivity. Selected merchantable conifers in and around aspen patches would be removed to reduce competition for water, nutrients and sunlight.

*Estimated Effectiveness*: **High**; this measure has a high potential for being implemented. These measures would be implemented through contract provisions and compliance monitoring. Effectiveness is high because regardless of whether hardwood trees remain standing or felled for safety reasons, they remain on site and provide benefits to various wildlife species. Hardwoods, such as aspen and birch, will re-sprout if felled or killed by burning.

**Dry Forest Ecosystems -** Due to the high incidence of insect and disease, some stands proposed for treatment are not able to sustain sufficient forest structure necessary for flammulated owls and other wildlife associated with dry forest ecosystems. However, some proposed stands retain enough structure to promote or achieve suitable habitat conditions for these species (see project file). For these stands, cutting treatments would be designed to maintain the persistence of habitat on the landscape by:

- Retaining a stand average of at least 40 percent overstory canopy closure.
- Designing for non-uniform spacing of trees (moderate within stand variability) or clumps.
- Managing for a mature ponderosa pine/Douglas-fir community.
- Designing fuel treatments to retain residual forest structure, including vertical structure that may occur in the patches or clumps of trees.

*Estimated Effectiveness:* **High**; using silvicultural prescriptions, marking guides, contract inspections and appropriate fuel treatment methods, this feature would have a high likelihood of avoiding or reducing adverse effects on flammulated owl habitat. This feature is intended for selective cutting treatments that are designed to advance current stands toward larger, more open forest structure. Estimated effectiveness is rated high because selective harvesting is a relatively light treatment, leaving a number of management options for the future.

**Vegetation Screen –** Vegetation buffers would be left along open roads and next to treatment areas where there is a realistic chance of protecting buffers from logging and fuel treatments. This measure is designed to provide security screening for wildlife and minimize unscheduled access. Buffers would transition from a no-cut zone into the treatment prescription.

*Estimated Effectiveness:* **Moderate to High**; using specific silvicultural prescriptions and marking guides, this feature would have a high likelihood of being implemented to achieve desired objectives where creating buffers is feasible. Screens below the road would probably lack some continuity due to openings needed for landings and/or skyline corridors.

**Harlequin Duck Habitat Protection** - Along West Gold Creek (from the confluence with Gold Creek, upstream, through Section 17) manage riparian habitat according to INFS guidelines (see Features Designed to Protect Water and Fish Habitat above). Ground-based, mechanized activities would be avoided within at least 300 feet of the stream during harlequin duck breeding season (April 15 – September 5) in or near proposed units 06 and 39. Helicopter logging activities would also be withdrawn from this area during the same season. Activity restrictions could be removed if on-site breeding surveys determine that habitat is not occupied.

*Estimated Effectiveness*: **High**; using INFS guidelines and contract provisions, this feature would have a high likelihood of being implemented and achieving the desired objectives. See Features Designed to Protect Soils, Water And Fish Habitat for estimated effectiveness of INFS.

**Threatened, Endangered, and Sensitive Wildlife Species Management** - If any threatened, endangered, or sensitive species were located during project layout or implementation, management activities would be altered, if necessary, so that proper protection measures are taken. Timber sale contract clause B(T)6.25, Protection Of Threatened, Endangered And Sensitive Species, would be included in any timber sale contract.

*Estimated Effectiveness*: **High**; using contract provisions, this feature would have a high likelihood of achieving the desired objectives.

**Protection of Elk Wallows** - See "Protection Of Wetlands, Seeps, Bogs, Wallows and Springs" above under Features Designed to Protect Water and Fish Habitat.

### *2.46j 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.

**Protection During Tractor Yarding -** The following tractor skid trail spacing 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. Forest plan monitoring reports have shown that by using these measures, less ground would be impacted by heavy equipment operations (Niehoff 2002).

**Protection During Prescribed Burning Activities –** Prescribed underburning and pile 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 and 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). These guidelines specify leaving 7 to 14 tons/acre of coarse woody debris on Douglas-fir/grand fir sites and 17 to 33 tons/acre on hemlock /cedar sites.

_Estimated Effectiveness_: **Moderate;** based on Graham et al (1994) research and IPNF Forest Plan Monitoring Reports (USDA 1998, 1999 and 2000). Effectiveness is high when guidelines are used; implementation has been moderately successful.

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

_Estimated Effectiveness_: **High;** past Forest Plan monitoring (Niehoff 2002) indicates little to no detrimental soil compaction and displacement with these requirements.

**Restoration of Landings** – All non-dedicated helicopter landings would be restored by decompacting the site using a winged subsoiler, seeding and planting the site to reestablish vegetation and leaving coarse woody debris for nutrient retention.

_Estimated Effectiveness_: **High**; this has been very effective at helping to restore soil productivity (Carr 1989)

### *2.46k Features Designed to Protect Heritage Resources*

During timber sale layout, an archeologist would identify and mark as much of the historic trails located within proposed units 20, 24, 28,40, 41 and 44 as possible to determine if protection measures are necessary. If the trail can be identified, blazed trees would be protected and the tread location cleared after logging activities.

In the event that heritage resources are encountered during program activities, the Forest has the authority to modify or stop timber sale activities. The standard heritage resources protection provision B(T)6.24 (Protection Of Cultural Resources), would be included in the timber sale contract. The provision specifically requires the contractor to notify the Forest of such discoveries. Mitigation of impacts for timber sales can include, but are not limited to:

- Establishment of buffer zones,
- Directional falling,

- Alteration of cutting unit boundaries,
- Changes in road locations,
- Designation of skid trails away from historic properties,
- Limiting the cutting methods in certain areas,
- Seasonal limitations, and
- 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). Special contract provisions are utilized in all contracts and have been effective in protecting heritage resources.

### *2.46l Features Designed to Protect Threatened, Endangered, Sensitive and Rare Plants*

TES plant surveys would be conducted as needed prior to weed treatment activities.

Should one of the action alternatives be selected for implementation, any change to unit boundaries or addition of new treatment areas that may occur during layout would be reviewed, and TES plant surveys would be conducted by a qualified botanist. Newly documented occurrences would be evaluated, with specific protection measures implemented to protect population viability. Such measures could include the following;

- Dropping units from cutting activity
- Modifying unit boundaries to provide a minimum 100-foot slope distance buffer around documented occurrences
- Modifying cutting methods, fuels treatment or logging systems to protect TES plants and their habitat
- Implementing, if necessary, Timber Sale Contract provisions B(T)6.25 (Protection of Endangered Species), and C(T)9.51 (Settlement for Endangered or Sensitive Species Termination).

Effectiveness: **High;** the measures would protect documented populations of Michigan moonwort (*Botrychium michiganense*), Mingan moonwort (*B. minganense*) and northwestern moonwort (*B. pinnatum*). The above measures would also assure protection of any newly documented occurrences. Protection of identified moonwort populations from ground or canopy disturbance would preserve critical soil mycorrhizae and overstory canopy cover. Such measures have been used in previous timber sale projects, including Ruened Salvage (USDA 1998b) and Skin Creek (USDA 1997b).

### *2.46m 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 (USDA 1998c). Methods of control may include biological, chemical, mechanical and cultural. 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 West Gold Creek drainage is included in the project file.

Gravel or borrow pits to be used during road construction or reconstruction would be free of new weed invader species (as defined by the IPNF Weed Specialist). A list of weed species considered to be potential new invaders is included in the project file. The Forest Service would inspect and treat gravel or borrow pits as needed prior to their use.

Any priority weed species (as defined by the IPNF Weed Specialist) identified during road maintenance would be reported to the District Weed Specialist. A list of priority weed species is included in the project file.

The purchaser would be responsible for weed treatment of existing haul routes. Treatment would occur prior to ground disturbing activities where feasible. If the timing of ground disturbing activities would not allow weed treatment to occur when it would be most effective, it would occur in the next treatment season following the disturbance. The Forest Service would be responsible for treating helicopter and service landings.

All timber sale contracts would require cleaning of off-road equipment by the purchaser prior to entry onto National Forest lands. If operations occur in areas infested with new invaders (as defined by the IPNF Weed Specialist), all equipment would be cleaned prior to leaving the site.

The purchaser would seed all newly constructed roads, skid trails, landings or other areas of disturbance (including maintenance on existing roads) with a weed-free native and desired non-native seed mix and fertilized as necessary.

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

Road segments identified for weed treatment and proposed for decommissioning would be treated prior to decommissioning.

*Effectiveness:* Based on weed inventories of recent timber sale areas, for new weed invaders, the estimated effectiveness of the above measures is **high** (see project file)**;** the measures are expected to be very effective at preventing establishment of new invaders.

For existing infestations of rush skeletonweed, common tansy and oxeye daisy, estimated effectiveness is **moderate to high** (see project file); the measures are expected to be somewhat to very effective at reducing the spread of these in the project area. However, any untreated infestations in the powerline rights-of-way would continue to be a source of spread of these species.

For existing infestations of goatweed and knapweed, estimated effectiveness is expected to be **low** in portions of the project area where these weeds are already established in natural openings away from existing and proposed roads. The above measures would be expected to have **moderate to high** effectiveness at reducing infestations of goatweed and knapweed associated with existing and proposed roads (see project file). However, any untreated infestations in the powerline rights-of-way would continue to be a source of spread of these species.

### *2.46n Features Designed to Protect Scenery and Visual Quality*

As needed to meet Visual Quality Objectives, the following specific design criteria would be used:

- Tree cutting activities would be designed to rehabilitate views that include the existing clearcuts and power line corridor by shaping units to imitate natural openings and landform configurations, including islands of untouched vegetation, openings, clumps of trees and open stands of trees with irregular spacing. Where treatment areas lie next to past clearcuts or the powerline corridor, straight lines would be modified by leaving trees in an open mosaic pattern. This technique borrows color and texture from the existing landscape, including the old cutting units. In thinning units, the spacing of leave trees would vary and some clumps of denser canopy would be retained to create a natural appearance. Roads and landings would be located and constructed to minimize cuts and fills. Hardwoods would be maintained for diversity of color and texture.

- In the background view areas, openings would be shaped to a size and form that appear as natural. Hardwoods would be maintained for diversity of color. Vegetation would be blended from treated to untreated areas.

*Estimated Effectiveness*: **Moderate to high**. The use of varied logging systems (i.e. helicopter) in more remote areas along with the opening of the canopy to create a natural appearing mosaic has proven to be effective on numerous projects in the Sandpoint Ranger District in the recent past (see project file for photos). The 1999 and 2000 IPNF Forest Plan Monitoring and Evaluation Reports showed that of the timber sale projects that were completed in those years, 95% of the 1999 projects were in compliance with VQOs and 100% of the 2000 projects were in compliance (USDA 1999, p. 12; USDA 2000 pp13-14).

## 2.47 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 West Gold 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.

### *2.47a 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 shown in table 3. More information regarding corporate monitoring is provided in Appendix D - IPNF Forest Corporate Monitoring.

**Table 3. Long-term monitoring of ecosystem core data**

| Issues | Core Data | Unit of Measure |
|---|---|---|
| Hydrologic Integrity | Road Density | miles/square mile |
| Water Yield | Hydrologic Openings | acres |
| 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 |

## *2.47b 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 Designed to Prevent the Spread of Noxious Weeds) would be documented on sale inspection reports. The effectiveness of seeding disturbed areas would be evaluated upon completion of the activity. Treated areas would be surveyed and monitored according to treatment priorities established in the Sandpoint Noxious Weed Control Project FEIS.

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

**Vegetation:** All regeneration-cutting units would be monitored for regeneration success the first, third and fifth year following planting if necessary. This is required by the National Forests Management Act.

**Best Management Practices:** Best Management Practices (BMPs) would be incorporated into many different phases of the project. The Zone Hydrologist would review the planned design of all temporary roads and all road maintenance 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.

A sale administrator would visit each active cutting unit at a frequency necessary to assure compliance with the BMPs and the timber sale contract. Minor contract changes or contract modifications would be agreed upon and enacted, when necessary, to meet objectives and standards on the ground.

**Air Quality**: During the burning of timber cutting 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 and spring burning seasons and yearlong by the Idaho Department of Environmental Quality.

**Visuals:** The project would be reviewed before, during and after cutting operations are complete to assess whether visual quality objectives (VQOs) were met.

**Decommissioned Roads**: Decommissioned roads would be checked periodically during the first year (and periodically thereafter if no problems are noted) to monitor effectiveness of erosion control, noxious weed control, and wildlife security.

**Permanent Stream Channel Cross-Sections**: Cross-sectional profiles and dominant substrate have been measured in West Gold and Gold Creeks. Measurements would continue to occur on an annual basis following post treatment activities to determine if any changes in stream channel morphology from water yield increases occur.

**OHV Use:** Roads 2707A and AA would be checked periodically by road management crews to monitor whether OHV use is causing any damage to the roadbed or off the designated route. If improper use occurs, law enforcement monitoring would be increased.

# 2.5 Alternatives Considered But Eliminated

## *2.51a Original Proposed Action*

The Current Proposed Action has evolved over several years and several different ID Team Members. Since the first ID team, we have added and dropped different areas proposed for treatment. The very first proposal looked at all "high-risk stands" (stands that were not trending toward desired species compositions and structures, or stands at high risk of mortality--see project file for map). Various stands were dropped for the following reasons: difficult access, need to maintain corridors and secure areas for wildlife, high social value (areas around Bernard Peak), and potential effects on water yield. Other stands were added or dropped or their prescriptions changed as ground verification revealed new information making them higher or lower priority than we originally thought. Also, additional temporary roads were proposed for construction but were dropped when proposed locations were determined to be too risky or unfeasible. For these reasons, this alternative was eliminated from further consideration.

## *2.51b Use Of Even-Aged Cutting 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. 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 subwatershed level.
- Many stands proposed for regeneration cutting 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, including those that are not proposed for treatment.

For these reasons the alternative was eliminated from detailed study.

### *2.51c Treat The Ecosystem Without Logging*

We received comments requesting that we consider alternatives that strive to achieve our ecosystem restoration objectives without using timber cutting. The alternatives were suggested several different ways:

**Prescribed Burning Only** – This alternative was considered after we received suggestions that we use prescribed fire to reduce stand density and not cut trees. Using prescribed burning as the primary tool would not be 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 could kill most of the trees.

In areas where the objective is to regenerate the stand, 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 (see fire effects discussion "How Easily An Unwanted Fire Could Be Suppressed").

Therefore, because of the risk to resources and adjacent private property, the only stand that would be treated under this alternative would be Unit 26, where fuels are relatively light and prescribed underburning is already planned as the only method of treatment.

Although the other objectives of our Purpose and Need (reducing sediment risks, managing motorized recreation) could still be accomplished without treating the forest vegetation, little would be achieved to begin restoring terrestrial habitats. This alternative would also not meet Forest Plan standards for reforestation, reduction of susceptibility to insect and disease damage, site preparation and reduction of fire intensity and spread (see Chapter I). For these reasons, this alternative was dropped from further consideration and was eliminated from further study.

**No Timber Cutting, Restoration Only -** This alternative would be similar to the Prescribed Burning Only Alternative and for the same reasons described above, was eliminated from further consideration.

**Accomplish Purpose and Need Without Using Commercial Logging** – This alternative suggested accomplishing all the elements of the proposed action, including cutting trees, without selling the trees in a commercial logging operation. To carry out this alternative would mean that either the cut trees would be left on site, or the Forest Service would have to pay someone to remove the trees. To leave the trees on site would add a large amount of fuel and increase breeding areas for insect infestations. It would make planting difficult and create areas inaccessible to some wildlife where logs were left. Prescribed burning would not be possible because of the large amount of fuels left on site. If a wildfire were to start in one of these areas, suppression would be extremely difficult as well. In addition, leaving merchantable trees on site would waste usable wood fiber that could just as easily be utilized as products. A timber sale provides us with a means of accomplishing our objectives at a reduced cost, to treat fuels more effectively, and results in a benefit of timber as a by-product.

This alternative would not meet Forest Plan standards for reforestation, reduction of susceptibility to insect and disease damage, site preparation, utilization of forest products, and reduction of fire intensity and spread (see Chapter I). For these reasons, this alternative was dropped from further consideration and was eliminated from further study.

### *2.51d Use of Horse Logging*

We received a suggestion that we use horse logging to remove trees in the project area. Horse logging requires more roads for yarding logs than conventional logging systems because horses cannot skid logs as far. Also, the vast majority of the project area is too steep for horse logging. For these reasons, an alternative using horse logging was eliminated from further consideration.

### *2.51e Use of Selective Cutting For All Vegetation Treatment*

We received two suggestions that we use selective cutting for all treatment areas including those that propose regeneration cutting. The project team reviewed every proposed regeneration unit to see if selective cutting was a feasible tool. After evaluating all the stands, the team concluded that selective cutting would not be effective to achieve the restoration objectives in most of the areas. This is because where regeneration cutting is proposed, not enough trees of desired species are available to maintain a stocked stand while removing undesirable and unhealthy trees.

The team considered whether we could strictly salvage log in the regeneration units and concluded that it would still not meet our vegetation restoration objectives. For these reasons, this alternative, which proposed using selective cutting for all proposed treatment areas, was eliminated from further consideration.

The team found one unit (08) that could be changed from an irregular shelterwood to an improvement cut, which would result in only portions of that unit meeting desired objectives. As a result of considering this alternative, the team decided to fully analyze Alternative D, which uses mostly selective cutting as the primary treatment method. In Alternative D, all but one of the regeneration units in the proposed action were dropped since they could not be treated effectively with selective cutting, and one other (unit 08) was converted to selective cutting. See Alternative D for more details.

# 2.6 Comparison of Alternatives

Table 4 presents a comparison of alternatives focusing on the key and analysis issues for this project. These issues are 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 | Alternative D | |
|---|---|---|---|---|---|---|---|
| **EFFECTS OF PROJECT ACTIVITIES ON FOREST VEGETATION** | **Acres** | **Change in Percent of Project Area** | **Acres** | **Change in Percent of Project Area** | | **Acres** | **Change in Percent of Project Area** |
| Early Succession | 1,532 | +18% | 1,871 | +25% | Values are the same as Alternative B | 1,532 | +18% |
| Immature Forest | 2,572 | -16% | 2,287 | -23% | | 2,572 | -16% |
| Mature Forest | 307 | -1% | 253 | -2% | | 307 | -1% |
| Old Growth | 110 | 0 | 110 | 0 | | 110 | 0 |
| Total | 4,543 | | 4,543 | | | 4,543 | |
| **Cover Type** | | | | | | | |
| Douglas-fir | 1,991 | 0 | 1,280 | -16% | Values are the same as Alternative B | 1,888 | -2% |
| Grand fir/Hemlock | 1,135 | 0 | 861 | -6% | | 1,003 | -3% |
| Western Larch | 594 | 0 | 767 | +4% | | 747 | +3% |
| Cedar | 308 | - < 1% | 288 | - < 1% | | 307 | - < 1% |
| Ponderosa pine | 253 | 0 | 952 | +15% | | 344 | +2% |
| No trees | 22 | 0 | 22 | 0 | | 22 | 0 |
| Lodgepole pine | 175 | 0 | 121 | -1% | | 167 | - < 1% |
| White pine | 65 | 0 | 252 | +4% | | 65 | 0 |
| Total | 4,543 | | 4,543 | | | 4,543 | |
| **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 | 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. These changes are the same as the No Action alternative, but less than Alternatives B and C. The trend toward larger mean patch size for early succession stage is a trend toward the historic range. | |

| Issue Indicator – TES Plants | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **EFFECTS OF PROJECT ACTIVITIES ON THREATENED, ENDANGERED, SENSITIVE PLANTS**<br>**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 known occurrences of sensitive moonworts would be buffered. Undetected individual moonworts could be impacted; however, these impacts would not lead to the listing or loss of population or species viability. | Same as Alternative B with regard to canopy opening but slightly less risk of impacts with less ground disturbance due to lack of road construction. | Less risk of impacts to undetected individual moonworts than Alternative B or C because fewer acres would be treated. |

| Issue Indicator – Noxious Weeds | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **RISK OF PROJECT ACTIVITIES ON THE SPREAD OF EXISTING NOXIOUS WEED POPULATIONS AND INTRODUCTION OF NEW WEED INVADERS**<br>**Relative amount of ground disturbance** | No change in the risk or rate of weed spread because no ground disturbance would occur. | 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 | Less risk of weed spread or introduction of new weed invaders than Alternative B or C because fewer acres would be treated. |
| **Relative amount of canopy removal** | No change in the risk of weed spread because there would be no canopy removal. | Oxeye daisy has a low to moderate potential for spread. | Same as Alternative B | Less risk of weed spread or introduction than Alternatives B or C because fewer acres would be treated and virtually no regeneration harvest would occur. |

| Issue Indicator – Fire and Fuels | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **EFFECTS OF VEGETATION AND FUELS TREATMENTS ON RESTORING FIRE AS AN ECOLOGICAL PROCESS**<br><br>**Acres of the project area where fuels have been treated** | Fuel configurations would change over time, increasing the amount of available fuel. Continuation of fire suppression and no fuels reduction activities would eventually lead to more destructive fires with higher intensities, which would kill most of the trees. This alternative would not restore fire as an ecological process or increase our ability to suppress unwanted fires in the West Gold drainage. | 1,077 acres underburned<br>28 acres grapple piled<br>223 acres limb and lop tops<br>10 acres yard tops<br><br>All treatments are to be accomplished over a large contiguous area. This alternative would help restore fire as an ecological process and would increase our ability to suppress unwanted fires in treated areas. | Same as Alternative B | 225 acres underburned<br>27 acres grapple piled<br>223 acres limb and lop tops<br>0 acres yard tops<br><br>To a lesser extent than B and C, this alternative would help restore fire as an ecological process and would increase our ability to suppress unwanted fires in treated areas. |
| **Potential for crown fire as measured by flame lengths and fire intensity** | Flame length – 8.5 feet<br>Fire intensity – 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. Our ability to suppress fires safely would be very difficult. | Flame length – 2 feet<br>Fire intensity - 25 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 in 29 percent of the project area. | Same as Alternative B | Same as Alternative B; however, potential for crown fire would be reduced in only 10 percent of the project area. |
| **Ability to suppress an unwanted fire as measured by flame length and intensity** | Flame length – 8.5 feet<br>Fire intensity – 600 BTUs /foot/ second. Given this situation, and with the expectation that fuel loads would increase over time, the probability of firefighter success with initial attack would also decrease over time. | Flame length –2 feet<br>Fire intensity - 25 BTUs /foot/ second. This alternative would reduce the ladder fuels, flame lengths, and fire intensities which would effectively reduce the potential for crown fires within treated areas. Initial attack success would be improved in 29 percent of the project area. | Same as Alternative B | Same as Alternative B in treated areas; however, initial attack success would be improved in only 10 percent of the project area. |

| Issue Indicator – Air Quality | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **EFFECTS OF PRESCRIBED BURNING ON AIR QUALITY**<br><br>**Estimated production of particulate matter from smoke emissions** | Without treatment as proposed, in a simulated wildfire situation the total $PM_{10}$ and $PM_{2.5}$ emissions would generate over 459 tons in the area proposed for burning under Alternative B and 96 tons in the area proposed for burning under Alternative D. | This alternative would generate roughly 333 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 70 -111 tons per project per year. | Same as Alternative B | This alternative would generate roughly 78 tons of $PM_{10}$ and $PM_{25}$ emissions per project. However, given the 3-5 year time frame for fuel activities, the annual expected air emissions would be 16-26 tons per project per year. |

| Issue Indicator - Wildlife | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **EFFECT OF PROJECT ACTIVITIES AND ROAD MANAGEMENT ON WILDLIFE HABITAT AND SECURITY AS RELATED TO SENSITIVE AND MANAGEMENT INDICATOR SPECIES**<br><br>**Flammulated owl – trend toward suitable habitat conditions** | Would not trend toward suitable habitat conditions. | Would trend 183 acres toward suitable habitat conditions, and begin trending 190 acres of capable habitat. | Same as Alternative B | Would trend 171 acres toward suitable habitat conditions including 7 acres of suitable habitat. |
| **Black-backed woodpecker – changes in distribution and quality of snag habitat** | Would increase small diameter snag densities and provide nesting/foraging opportunities to maintain the species at low endemic levels. In the event of a stand-replacing fire, a temporary flush of suitable habitat would occur. | 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 on 1,039 acres. | Same as Alternative B | Would increase the occurrence of large snags to longer-lived tree species over the long-term but to a lesser extent than B. Less risk of short-term reduction in availability of snag habitat for both foraging and nesting because all but two acres would be selectively harvested. |

| Issue Indicator - Wildlife | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **Pileated woodpecker – 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 would encourage the long-term persistence and sustainability of large snag habitat on 897 acres. Selective harvest would trend stands toward an older size class and promote larger size snags of desired species on 411 acres. | Same as Alternative B | Selective harvest would trend stands toward an older size class and promote larger size snags of desired species on 444 acres. Less risk of short-term reduction in habitat quantity because all but two acres would be selectively harvested. |
| **Elk – changes to elk habitat effectiveness (EHE)** | No change in EHE from its current condition of 55% | Short-term decrease in EHE from 55% to a worst-case scenario of 47%. Long-term EHE value would be 53%. | Short-term decrease in EHE from 55% to a worst-case scenario of 49%. Long-term EHE value would be 53%. | Short-term decrease in EHE from 55% to a worst-case scenario of 52%. Long-term EHE value would be 53%. |
| **Forest Land Birds – changes to priority habitats and diversity** | No Change | Alternative B would protect and restore dry site and riparian habitats and provide diversity for a variety of forest land birds. | Same as Alternative B | Similar to B and C but does not contribute as well to habitat diversity. |

| Issue Indicator – Aquatics | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **EFFECTS OF REGENERATION CUTTING AND RESULTING CANOPY OPENINGS ON WATER YIELD INCREASES AND EFFECTS ON AQUATIC HABITAT IN WEST GOLD CREEK AND GOLD CREEK**<br>**Percent change in magnitude, intensity and duration of water yield.** | Peak flows would increase 1-2% due to the loss of vegetation from dead and dying trees. Peak flow changes would be localized and would not affect habitat in fish bearing streams. | Peak flows would increase to 5% above Alternative A for the first two years and gradually decline to current levels in 30 years.<br>Peak flow changes would be localized and would not affect habitat in fish bearing streams. | Peak flows would increase to 4% above Alternative A for the first two years and gradually decline to current levels in 22 years.<br>Peak flow changes would be localized and would not affect habitat in fish bearing streams. | Peak flows would increase to 2% above Alternative A for the first two years and gradually decline to current levels in 22 years.<br>Peak flow changes would be localized and would not affect habitat in fish bearing streams. |
| **Changes in stream channel morphology.** | No change from existing condition. | No change from existing condition. | No change from existing condition. | No change from existing condition. |
| **EFFECTS OF REGENERATION CUTTING AND TEMPORARY ROAD CONSTRUCTION ON SEDIMENT YIELD INCREASES AND EFFECTS ON AQUATIC HABITAT IN WEST GOLD CREEK AND GOLD CREEK.**<br>**Percent change in magnitude and duration of sediment yield.**<br>**Total estimated sediment delivery in tons over the duration of the project.**<br>**Overall sediment reduction in tons.** | No change from existing condition. | An estimated 11% increase in sediment yield would occur the first two years, then decline to current levels in 8 years for a total of 137 tons over 10 years. Sediment input is not expected to negatively affect stream channel, fish habitat, or populations. Overall estimated net sediment reduction:<br>W. Gold Cr.=1,615 tons<br>Gold Creek = 1,809 tons | An estimated 9% increase in sediment yield would occur the first year of the project, then decline to current levels in 5 years for a total of 52 tons over 6 years.<br>Sediment input is not expected to negatively affect stream channel, fish habitat, or populations.<br>Overall estimated net sediment reduction:<br>W. Gold Cr.=1,700 tons<br>Gold Cr. = 1,894 tons. | An estimated 3.5% increase in sediment yield would occur for the first two years of the project, and then decline to current levels in 4 years for a total of 20 tons over 6 years. Sediment input is not expected to negatively affect stream channel, fish habitat, or populations. Overall estimated net sediment reduction:<br>W. Gold Cr.=1,722 tons<br>Gold Creek = 1,926 tons. |
| **EFFECTS OF EXISTING ROAD DECOMMISSIONING AND MAINTENANCE ACTIVITIES ON WATER YIELD INCREASES, SEDIMENT DELIVERY TO STREAMS AND AQUATIC HABITAT IN WEST GOLD CREEK AND GOLD CREEK**<br>**Net associated risk of sediment delivery in tons from road drainage crossings** | The net associated risk of sediment delivery from road drainage crossings if they fail would be 2,572 tons. | The risk of drainage crossing failure and sediment delivery would be reduced where culverts are replaced, and eliminated where culverts are removed. This would result in a long-term benefit to fish. | Same as Alternative B. | Same as Alternative B. |

| Issue Indicator - Soils | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **EFFECTS OF PROJECT ACTIVITIES ON SOILS**<br><br>**Percent of detrimentally disturbed soils** | No change in detrimentally disturbed soils beyond current conditions | Total Acres of Impacts = 33.4<br>Total Activity Acres = 1,347<br>Total % Impacts = 2.5%<br>No area exceeds 15% limit for detrimental impacts | Total Acres of Impacts = 24.9<br>Total Activity Acres = 1,347<br>Total % Impacts = 1.8%<br>No area exceeds 15% limit for detrimental impacts | Total Acres of Impacts = 10.6<br>Total Activity Acres = 480<br>Total % Impacts = 2.2%<br>No area exceeds 15% limit for detrimental impacts |
| **Potential for loss of potassium and coarse woody debris (CWD)** | No loss of potassium or woody debris unless there is a lethal stand-replacing fire | Some loss of potassium with removal of trees. Mitigation to leave branches and needles over winter and to leave CWD will reduce loss. | Same loss of potassium with removal of trees as Alt. B. Mitigation to leave branches and needles over winter and to leave CWD will reduce loss. | Less loss of potassium with removal of trees than Alts. B & C. Mitigation to leave branches and needles over winter and to leave CWD will reduce loss. |

| Issue Indicator – Visual Quality | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **EFFECTS OF VEGETATION PRESCRIPTIONS ON VISUAL QUALITY**<br><br>**Evaluation of 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. | Same as Alternative B | Same as Alternative B |

| Issue Indicator – Finances | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **EFFECTS OF PROJECT ACTIVITIES ON FINANCES**<br><br>**Predicted high bid rate per hundred cubic feet** | 0 | $89.56/ccf | $75.01/ccf | $46.65/ccf |
| **Total predicted high bid values** | 0 | $1,761,108 | $1,474,997 | $193,784 |

| Issue Indicator – Roads | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **EFFECTS OF PROPROSED ROAD CONSTRUCTION AND EXISTING ROAD MANAGEMENT ON PULIC ROAD ACCESS**<br><br>**Net change in miles in types of motorized and non-motorized access.** | 0 | + 3.5 miles available to OHV use<br>-1.4 miles non-motorized access<br>-0.7 mile open unclassified road/trail | Same as Alternative B | Same as Alternative B |

# 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 on both Federal and non-Federal lands, in addition to the direct and indirect effects 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 applicable to the management of forest vegetation include the State Forest Practices Act, 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 C.

#### *3.21b Methodology*

Existing and historic vegetation conditions for the project area were determined using aerial photos (1933 to present, located in the photo files at the Sandpoint District office), stand exam data (stand files and TSMRS data base at the Sandpoint District office), field surveys (District stand files and project file), historic information, the Interior Columbia Basin Ecosystem Management Project (ICBEMP) Scientific Assessment (Quigley and Arbelbide 1997), the Northern Region Overview (USDA 1998) 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 and personal knowledge.

#### *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 West Gold 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 (Quigley and Arbelbide 1997). 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 species such as 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 and 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 Overview 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 assessment 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 (IPNF) 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 of the Northern Region and Interior Columbia Basin Assessments, but provide more specific information on lands in 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 the subbasin analysis are referenced as "USDA draft in progress".

## 4. Gold Creek Ecosystem Assessment

The Gold Creek Ecosystem Assessment is a step down from the Geographic Assessment and provides a scientifically based understanding of the ecological processes and interactions occurring in the Gold Creek watershed.

Regarding vegetation disturbance processes, findings of the Pend Oreille Subbasin Geographic Assessment and the Gold Creek Ecosystem Assessment 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 150 years, the general landscape structure of vegetation in the Gold Analysis area appears to have been in the early succession and immature forest stages of stand development, primarily due to repeated large-scale fires in the mid- to late-1800s and early 1900s. In the 1880s, the landscape was composed primarily of pole size (5 to 9-inch) trees. In the 1930s, there were mostly shrubs, seedlings, and sapling (0 to 5-inch) size trees. Since the 1930s the majority of the landscape has progressed toward the immature (9 to 21-inch) sizes with minor components of old growth stands remaining.

Unlike other areas in the Interior Columbia Basin and the Pend Oreille subbasin, logging of long-lived species such as white pine, ponderosa pine and larch has not been a major contributing factor to the decline of these species in the Gold Creek Watershed. The large scale fires of the 1800s and reburns during the early part of the 1900s, in combination with fire suppression since the last major fire and the introduction of blister rust, have led to the condition of the vegetation in the watershed today.

In order to maintain healthy, sustainable ecosystems, it is imperative to have species and forest structures that are adapted to disturbances such as insects and disease, fire and climatic variability. This is consistent with the findings of the ICBEMP, Northern Region Overview, and the Geographical Assessments being conducted in northern Idaho. Findings in these assessments recommend 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. Such a species shift would better represent the historic species mix. This would be accomplished through regeneration cutting, cutting 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. Treatments in response to natural disturbances can trend the ecosystem toward desirable conditions, and will not accelerate undesirable trends.

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 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 (see the Fire and Fuels section).

### 5. The West Gold Analysis Area

Vegetation conditions at the West Gold drainage scale are very similar to those at the scale of the Gold Creek watershed. Most of the following information about historic and current conditions in the West Gold drainage was derived from the Gold Creek Watershed Assessment. Detailed information was compiled from stand data and field surveys. Conditions unique to the West Gold drainage are noted.

### 6. Disturbance Processes

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

#### a. 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 (Spurr and Barnes 1980). Fire was the principle agent for the widespread occurrence and even the existence of western larch, lodgepole pine, western white pine and whitebark pine. Fire maintains ponderosa pine throughout its range at lower elevations and kills ever-invading Douglas-fir and grand fir (Smith and Fischer 1997). More details on the effects of fire on forest vegetation are described in the Fire and Fuels section.

#### b. Insects and Disease

Many insects and diseases are found in the West Gold drainage 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 impact 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 (USDA draft in progress). The 1916 Pend Oreille National Forest Classification survey speaks regularly to white pine as a major component of many stands (USDA 1916). 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 (Byler and James 1997, Schwandt 1996, Lewis draft in progress). Long-term studies in similar stands indicate a 4 to 5 percent annual rate of mortality from root disease (Hagle 2000). Douglas-fir beetle activity has also recently been very high. All this mortality is creating stands with high amounts of dead wood, brush and young Douglas-fir trees, which are reinfected with root disease and die. These conditions historically have not been known to occur over large landscapes in the Idaho Panhandle National Forests (USDA draft in progress).

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

**c. 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 were low in intensity and covered large areas much like the Gold Creek watershed. 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, the fires likely caused mortality over extensive areas.

**d. Euro-Settlement Influence**

**Mining and Homesteading** - Although mining has been a significant activity in the Gold Creek watershed for over 100 years, no evident mining activity has been recorded or evident in the West Gold drainage. Undoubtedly, many snags and dead wood that remained after the large fires were used as a fuel supply during the mining booms. Some wood was probably used for structures. This wood probably came from the most accessible areas in the watershed at that time. If any timber was retrieved from the West Gold drainage, it was likely in the bottom reach.

Homesteading may have started around the turn of the century in the Gold Creek watershed, although records suggest the earliest entry may not have been until 1906. Most of the homesteads were located along creek bottoms and adjacent bench land. Homesteading removed timber in small portions of the watershed for a considerable time, although trees have become established on many of the original clearings. The 1916 Pend Oreille Forest Classification noted that there were settlers along West Gold Creek; they were likely located in the bottom reach of the drainage.

**Grazing** - Sheep and cattle grazing occurred in the early part of the century and may have delayed regeneration of conifer tree species in some areas for a short period of time. Although there are no records as to where in the Gold Watershed grazing occurred, historic trails in the West Gold Watershed were thought to have been used to move livestock to different areas of the watershed (Dahlgren and Kincaid 1991).

**National Forest Timber Harvest -** In the early days of Forest Service management, timber sales in the Gold Creek Watershed were few. Due to difficult access and the small size of the trees, there was no timber harvest in the West Gold drainage until the 1970s and early 1980s, when some small timber harvests and salvages occurred (see table 5 and figure 11 in Appendix I). Other timber sales of larger sizes were prepared and logged in the 1980s and 1990s. These timber sales have contributed to moving portions of the landscape back to early successional stages of stand development and regenerating longer lived seral species.

Unlike other areas in the Interior Columbia Basin and the Pend Oreille subbasin, logging of long-lived seral species such as white pine and larch has not been a major contributing factor to the decline of these species in the Gold Creek and West Gold Watersheds. 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 the West Gold Creek drainage.**

| Year(s) | Timber Sale Name | Type of Harvest | Acres | Current Stand Structure |
|---|---|---|---|---|
| 1933-1961 | Six Unnamed Sales | Selective (salv.) | 187 | Immature |
| 1976 | Lakeview South | Selective (salv.) | 8 | Immature |
| 1976 | Powerline Clearing | Regeneration | 52 | Early Succession |
| 1984 | West Gold Chloride | Regeneration | 21 | Early Succession |
| 1987 | Grand Gold | Regeneration | 52 | Early Succession |
| 1988-90 | Small Prospects | Regeneration | 75<br>130 | Early Succession<br>Early Succession w/overstory |
| 1990 | Prospect | Regeneration | 246 | Early Succession |
| 1991 | Snow Prospect | Selective (salv.) | 14 | Immature |
| 1993 | Gold Mistle | Salvage<br>Selective | 62<br>22 | Immature<br>Immature |
| 1997 | Gold Yeller | Regeneration<br>Commercial Thin<br>Improvement | 136<br>37<br>32 | Early Succession w/ overstory<br>Immature<br>Old Growth |
| Total | | | 1,074 (24% of the West Gold drainage) | |

## *3.21d Reference and Current Condition*

### 1. Habitat Type Groups

Forest vegetation in northern Idaho and in the Gold Watershed 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. 1991).

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 (USDA1997a).

Although every habitat type is unique in some way, habitat types can be grouped based on similarities in natural disturbance regimes, successional patterns and structural characteristics of mature stands (USDA 1997a). 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 West Gold watershed have been aggregated into four habitat type groups - dry, moist, cool/moist and cold/dry. Of the four-habitat type groups, three are found in the project area: dry, moist, and cold/dry (see table 6).

***Dry Habitat Type Group –*** These forest types account for 26 percent of the West Gold Watershed. 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. Historically, grasses and low shrubs dominated the understory and were maintained by low-severity fires at intervals of 15 to 20 years. Downed woody fuels consisted of widely scattered, large trees, twigs, branches, and cones; often the most abundant surface fuel was 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 the very northern parts of 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 a high, open canopy in these stands and perpetuated dominance by ponderosa pine.

Very long fire-free intervals have in many cases 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.

***Moist Habitat Type Group -*** These forest types account for 74 percent of the West Gold watershed and consist primarily of western redcedar, 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 percent of these areas were dominated by white pine, and the area was known as the "white pine type." Today, only 2 percent of the entire Pend Oreille subbasin (and only 1 percent of the West Gold watershed) is classified as a western white pine forest type.

Large stand-replacing fire intervals range widely from 50 years on the drier types to over 200 years on the moister 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-replacing fires. Large stand-replacing 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. The resulting lack of a seed source after multiple burns can delay regeneration. In some landscape positions, large old larch may persist through multiple disturbances and occasional other species may also survive multiple disturbances on sheltered and moist micro-sites.

***Cold/Dry Habitat Type Group-*** These forest types account for less than 1 percent of the West Gold Watershed. They consist of lodgepole pine, Douglas-fir, western larch, subalpine fir, Engelmann spruce and white bark pine and represent the cooler subalpine habitat types. The fire-free interval for stand-replacing fire on these types is 50 to 130 years (Smith and Fischer 1997). Periodic fire disturbances and high amounts of low to moderate fire intensities favor species such as lodgepole pine, Douglas-fir and western larch. Only one stand of approximately 12 acres in the West Gold Watershed consists of the Cold/Dry habitat type. This stand presently has a subalpine fir forest cover type and is not proposed for treatment.

The Gold Creek and West Gold Watersheds are located within the Lakeface Zone of the Pend Oreille subbasin. Of the five ecological zones in the subbasin, the Lakeface Zone has a high percentage (27 percent) of dry habitat types (USDA draft in progress). Comparatively, the Gold Creek Watershed consists of 31 percent dry habitats, and the West Gold portion consists of 26 percent dry habitat types (see table 6).

**Table 6. Comparison of habitat type groups between West Gold and Gold Creek Watersheds and the Pend Oreille subbasin.**

| Area | Dry | Moist | Cool/Moist | Cold/Dry | Rock/Scree/ Grass |
|---|---|---|---|---|---|
| Pend Oreille Subbasin | 16% | 52% | 15% | 10% | 7% |
| Lakeface Zone | 27% | 62% | 5% | 2% | 4% |
| Gold Creek Watershed | 31% | 68% | 0.3% | 0.1% | *** |
| West Gold Watershed | 26% | 74% | -- | <1% | *** |

***Data not separated for Gold Watershed and West Gold Creek

## 2. Forest Cover Type, Structure and Pattern

Reference and current conditions for forest cover types and structures were evaluated by comparing historic information from several historic inventories (Zack 1999) and current information from the Idaho Panhandle National Forests Timber Stand Management Record System (TSMRS) database. The following tables represent this comparison for the entire Pend

Oreille subbasin, the Gold Creek Watershed and the West Gold drainage. Supporting data for the tables and graphs are provided in the project files.

### a. Forest Cover Types (Existing Dominant Trees)

Historically, the coniferous vegetation composition in the West Gold drainage consisted of more of the ponderosa pine, western larch and western white pine cover types than exist today (figure 9). Table 7 shows the change in cover types that has occurred over time. Information pertaining to forest cover types in dry and moist habitat types can be found in the project files.

***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 most 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 livestock and other hoofed mammals (USDA 1998). Currently, aspen in the West Gold watershed are only found in small, scattered inclusions throughout the coniferous forest. Aspen historically have been maintained and regenerated through periodic fires (USDA 1998) and are declining in much of the species' historic range as fire regimes have been dramatically altered (Clark and Sampson 1995). Considering the history of large fires in the Gold Creek watershed and the lack of fire over the last 60 years, it is likely that aspen used to be more abundant on the landscape.

**Table 7. Acres and percent of forest cover types in the West Gold and Gold Creek Watersheds as compared to current and historic levels across the Pend Oreille Subbasin.**

| Conifer Species Forest Cover Type | Existing Acres West Gold Watershed | Percent of West Gold Watershed | Existing Acres Gold Watershed | Percent of Gold Watershed (includes private lands) | Current Percent of Pend Oreille Subbasin* | Historic Percent of Pend Oreille Subbasin* |
|---|---|---|---|---|---|---|
| Douglas-fir | 1,986 | 44% | 6,844 | 49% | 37% | 15% |
| Grand-fir/W.Hemlock | 1,135 | 25% | 3,218 | 23% | 17% | 3% |
| W. Larch | 594 | 13% | 1,223 | 9% | 4% | 18% |
| Cedar | 313 | 7% | 1,029 | 7% | 8% | 3% |
| Ponderosa Pine | 253 | 6% | 653 | 5% | 2% | 11% |
| No Trees | 22 | <1% | 507 | 4% | No data | No data |
| Lodgepole Pine | 175 | 4% | 284 | 2% | 4% | 7% |
| White Pine | 64 | 1% | 154 | 1% | 2% | 24% |
| Subalpine Fir | 0 | 0% | 50 | <1% | 26% | 17% |
| W.Bark Pine | 0 | 0% | 0% | 0% | <2% | 2% |
| Total | 4,543 | 100% | 13,961 | 100% | 100% | 100% |

*calculated on National Forest lands only

### b. Forest Structure

In drier habitat types of the Pend Oreille subbasin, 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 open grown mature

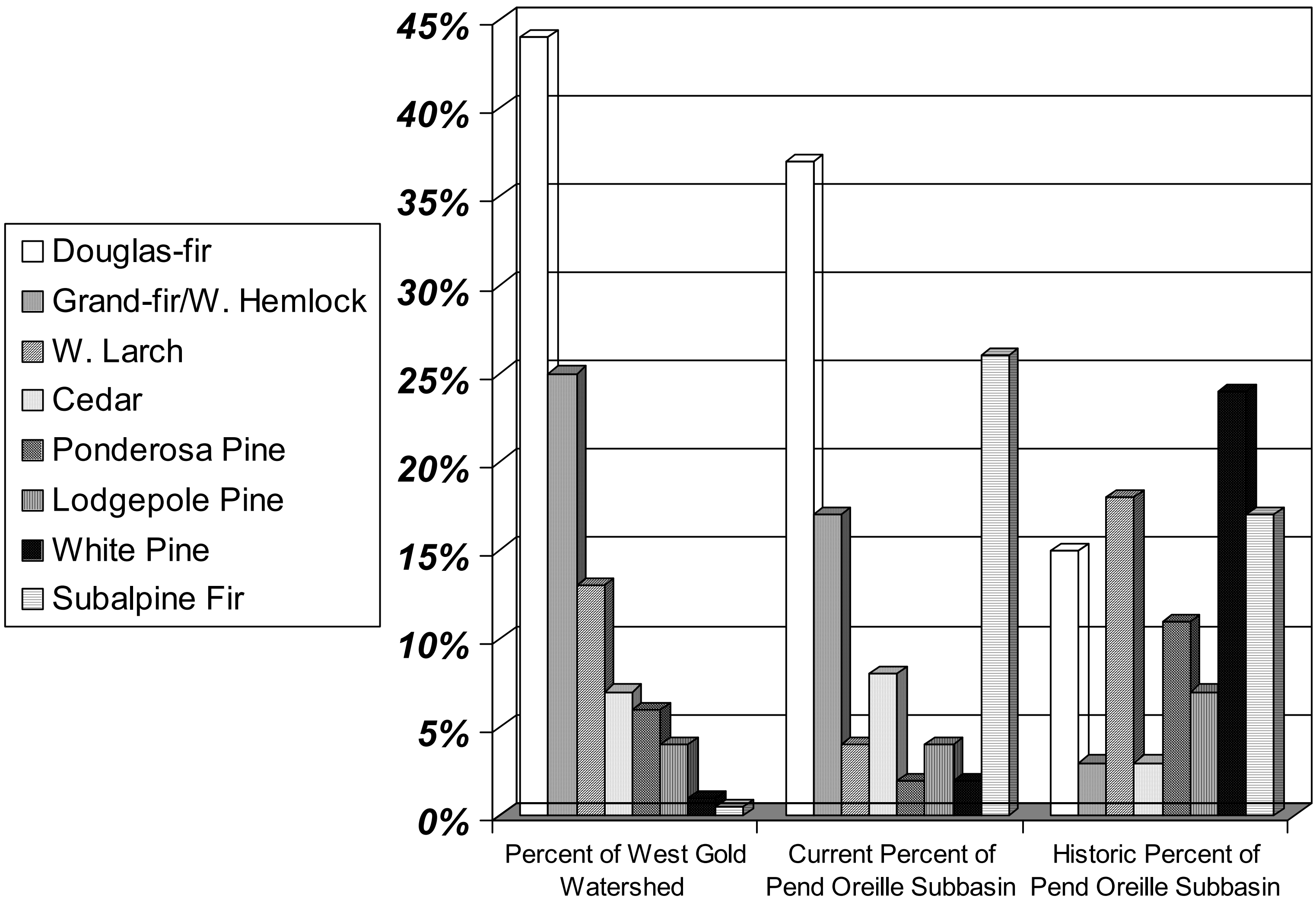


**Figure 9. Percent of forest cover types in West Gold Watershed as compared to current and historic cover types in the Pend Oreille Subbasin.**

and old growth structures, with lesser amounts in the early succession and immature forest structures.

In 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 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, the existing old growth stands in moist habitats are primarily cedar, hemlock, and grand fir stands.

Currently, the West Gold Watershed has a skewed distribution of stand structures relative to historic subbasin conditions, with immature forest structure being the most common (table 8 and figure 10 in Appendix I). The majority of this immature forest is nearing mature forest structure. Due to the shift from long-lived species such as western larch, ponderosa pine and white pine (Fins, Byler et al. 2001, USDA 1971, Fiedler and Lloyd 1992, Arno 1996) to the shorter-lived Douglas-fir (USDA draft in progress, Rockwell 1917), much of the immature and mature forest structures will not reach old growth conditions with these species. Information pertaining to acres and percent of forest vegetation structure in dry and moist habitat types can be found in the project files.

**Table 8. Acres and percent of forest vegetation structure in West Gold and Gold Creek watersheds and the Pend Oreille Subbasin.**

| Size | Age in Years | Structure | West Gold Subwater-shed acres | Percent of West Gold Subwatershed | Gold Watershed acres | Percent of Gold Watershed | Current Percent of Pend Oreille Subbasin* | Historic Percent of Pend Oreille Subbasin |
|---|---|---|---|---|---|---|---|---|
| 0-5" | | *Early Succession | 723 | 16% | 2,891 | 21% | 33% | 37% |
| 5-21" | <100 | Immature Forest | 3,308 | 74% | 10,161 | 73% | 39% | 23% |
| 9-21+" | >100 | Mature | 380 | 6% | 721 | 5% | 21% | 21% |
| > 21" | All >150 | Old growth | 110 | 3% | 188 | 1% | 7% | 19% |
| Totals | | | 4,543 | 100% | 13,961 | 100% | 100% | 100% |

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

## c. 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).

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 in northwest forests. Perhaps the most important consequence of timber harvesting has been the significant reduction in amounts of old growth on private land and its high degree of fragmentation on federal lands. Mature and old forests and stands dominated by large trees have been identified by the ICBEMP Scientific Assessment as elements that have declined significantly from historic levels throughout the entire basin and across most habitat types (Quigley, Haynes and Graham 1996). 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).

***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 cut next to old growth, the amount of edge remains the same, but the contrast of that edge has increased dramatically.

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 and medium size classes with fire suppression. There is now less variability and more edge effect than under natural disturbance processes. Regeneration cutting that has been done has been in small patch sizes, typically less than 40 acres.

As mentioned previously, the West Gold area experienced large stand-replacing fires in the late 1800s and early 1900s. 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, due to the large stand-replacing fires and the elimination of low-intensity wildfires.

### *3.21e Conclusions*

Based on a comparison of current and reference conditions across the West Gold watershed, 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 watershed, 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.

  The decline in white pine, western larch and ponderosa pine has led to a forest that lacks variety in tree species. Because some species are present in small quantities, and in some areas not at all, they are less likely to reseed themselves through natural regeneration. Aspen communities, as few as there are, will likely decline further or could eventually disappear from the watershed.

- 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 several consecutive, large stand-replacing fires 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 generally a shorter-lived species in this area. Currently, only three percent of the West Gold watershed contains old growth stands. This does not meet the five percent distribution goal stated in the Forest Plan.

- Across the project area, landscape patterns have been modified by large stand-replacing fires before 1935 and by subsequent fire suppression activities and some timber harvest since 1935. Old growth and early succession patches are smaller 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 within the watershed and the size, density, and age of the Douglas-fir present. The ability to effectively begin restoring these stands economically 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 the 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 on these areas 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 larger watershed scale to reduce the severity of a stand-replacing fire.

### *3.21f Recommendations*

The above conclusions support the following recommendations for the West Gold Creek project area, which were made in the Gold Creek Ecosystem Assessment. The recommendations are listed in order of priority; however, all recommendations are in need of immediate action.

1. On dry sites, maintain or restore open grown stands of ponderosa pine forest cover types through commercial thinning, precommercial thinning, improvement cutting and underburning.
2. In stands where they are adequately present, promote the maintenance of long-lived early seral trees species such as western larch and western white pine through commercial thinning, precommercial thinning, improvement cutting, and underburning where possible.
3. Promote the maintenance of aspen patches by managing conifer encroachment in and around them. Restore fire processes in these patches where possible.
4. Restore long-lived early seral tree species through regeneration cutting and planting in areas where shorter-lived early seral species (e.g., Douglas-fir and lodgepole) have high mortality or are at risk of high mortality.
5. Using methods such as cutting and prescribed fire, reduce fuel levels to decrease the risk of a large stand-replacing fire in the watershed and reduce the risk of destruction by fire to private property.
6. To enhance terrestrial riparian and aquatic habitat, promote desired riparian structure (e.g. large, long-lived species) through appropriate management activities such as thinning, planting, and fire management.
7. Restore and maintain old growth forest structure where possible through appropriate use of silvicultural methods and prescribed fire or protection from destructive fire.
8. Strive to increase stand patch sizes and variability in both old growth and early succession stages.

## 3.22 Forest Vegetation - Environmental Consequences

### *3.22a Methodology*

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

#### 1. Analysis Process

Existing conditions of forest vegetation in the West Gold Project Area are described in the Affected Environment section and provide a baseline of vegetation conditions to compare differences in environmental effects between alternatives.

Direct and indirect effects of cutting activities were measured by analyzing changes to species composition, stand structure, and pattern. In addition, the analysis of all alternatives includes 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.

Figures 12 and 13 in Appendix I and table 9 display the forest cover type and structure changes of forest vegetation for the No Action Alternative and Alternatives B, C and D. The changes were calculated for National Forest lands only. The Existing Condition information represents the cumulative effects of past disturbances and present activities including past harvest, fire suppression, disease and insect attack, and vegetation growth to the present.

## *3.22b 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 where previous cutting and planting occurred. These stands would continue to grow and produce desired species compositions and structures. Other stands consisting of Douglas-fir, grand fir, hemlock and cedar, would remain as these forest cover types without treatment. Some of these stands are healthy, while others are not. Old growth stands should maintain their old growth structure and characteristics through all alternatives unless severe natural disturbance occurs to change this.

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. Under all alternatives mature forest structure would decline (figure 12 and table 9). This is because these mature forest stands have considerable mortality occurring (project file). Even if left untreated, these stands would not reach old growth structure because of the predominance of Douglas-fir and the mortality occurring and predicted to occur (Zack 2000 and Rockwell 1917).

In some areas not proposed for treatment, insect and disease mortality would continue to expand. These changes are reflected in the analysis of each alternative as discussed below.

### 2. Alternative A - No Action

Under this alternative there would be no cutting of trees, treatment of fuels or reforestation with desired species. Stands that are presently dominated by Douglas-fir with lesser amounts of grand fir, lodgepole, and cedar would not be expected to change. 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 (Byler and James1997). Douglas-fir trees, being highly susceptible to insects and disease, are likely to die before reaching old growth structural stages (USDA draft in progress, Rockwell 1917). 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 (see Fire and Fuels section). In this type of fire most trees would be killed, including the normally fire-resistant pine and larch.

The ongoing and predicted mortality from insects and root disease would result in more areas that are open and would lead to more early succession structure than under the existing condition (see project file, Vegetation Mortality Under the No Action Alternative). Based on Hagle's research (2000) and the silviculturist's field review, within the West Gold project area an estimated 809 acres, or 18 percent of the area, is expected to shift from immature and mature forest structure to early succession under the No Action Alternative (see figures 9 and 11 in Appendix I and table 9). 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 and the types of logging systems that would be used to accomplish the vegetation prescriptions. Neither of these factors would have an effect on forest structure and composition (see table 1 in Chapter II for logging systems acreage and figures 6, 7, and 8 in Appendix I for maps).

From a vegetation standpoint, the objective of both alternatives is to improve the health and productivity of terrestrial and aquatic habitats by advancing species compositions, forest structures and patterns toward desired conditions. Approximately 898 acres would be treated with regeneration cutting, about 411 acres would be treated with selective cutting and about 1,077 acres would be underburned. About 29 acres of the underburning would occur in one old growth stand to maintain its old growth characteristics; no cutting would occur in this stand.

Both regeneration and selective cutting would convert approximately 1,059 acres, or 23 percent of the project area, from predominantly Douglas-fir forest cover type to western larch, western white pine and ponderosa pine cover types (see figure 13 in Appendix I and table 9). Regeneration cutting and mortality would advance the vegetation toward desired conditions by converting approximately 1,148 acres, or 25 percent of the project area from immature and mature forest structures to the early succession stage of stand development (see figure 12 in Appendix I and table 9). These treatments would result in openings greater than 40 acres, which would include 16 units consisting of 35 stands (see project file Vegetation – Recommendation to Exceed 40-acre openings).

**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 alternatives is reflected in the "Change in the percent of project area" columns.**

| | **Existing** | | **Alternative A (No Action)** | | | | **Alternatives B & C** | | | | **Alternative D** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Approx. Acres** | **% of project area** | **Approx. Acres** | **% of project area** | **Acres change** | **Change in % of project area** | **Approx. Acres** | **% of project area** | **Acres change** | **Change in % of project area** | **Approx. Acres** | **% of project area** | **Acres Change** | **Change in % of project area** |
| *Structural Stage* | | | | | | | | | | | | | | |
| Early Succession* | 723 | 16 | 1,532 | 34 | + 809 | **+18%** | 1,871 | 41 | + 1,148 | **+25%** | 1,532 | 34 | + 809 | **+18%** |
| Immature Forest | 3,308 | 73 | 2,572 | 57 | - 736 | **-16%** | 2,287 | 50 | - 1,021 | **-23%** | 2,572 | 57 | - 736 | **-16%** |
| Mature Forest | 380 | 8 | 307 | 7 | - 73 | **-1%** | 253 | 6 | - 127 | **-2%** | 307 | 7 | - 73 | **-1%** |
| Old Growth | 110 | 2 | 110 | 2 | 0 | **0** | 110 | 2 | 0 | **0** | 110 | 2 | 0 | **0** |
| Nonforest | 22 | < 1 | 22 | < 1 | 0 | **0** | 22 | < 1 | 0 | **0** | 22 | < 1 | 0 | **0** |
| *Totals* | 4,543 | 100 | 4,543 | | | | 4,543 | 100 | | | 4,543 | 100 | | |
| *Cover Type* | | | | | | | | | | | | | | |
| Douglas-fir | 1,986 | 44 | 1,991 | 44 | + 5 | **0** | 1,280 | 28 | - 706 | **-16%** | 1,888 | 42 | - 98 | **-2%** |
| Grand fir/ Hemlock | 1,135 | 25 | 1,135 | 25 | 0 | **0** | 861 | 19 | -274 | **- 6%** | 1,003 | 22 | - 132 | **-3%** |
| Western Larch | 594 | 13 | 594 | 13 | 0 | **0** | 767 | 17 | + 173 | **+4%** | 747 | 16 | + 153 | **+3%** |
| Cedar | 313 | 7 | 308 | 7 | - 5 | **- < 1%** | 288 | 6 | - 25 | **- <1%** | 307 | 7 | - 6 | **- < 1%** |
| Ponderosa pine | 253 | 6 | 253 | 6 | 0 | **0** | 952 | 21 | + 699 | **+15%** | 344 | 8 | + 91 | **+2%** |
| Nonforest | 22 | < 1 | 22 | < 1 | 0 | **0** | 22 | < 1 | 0 | **0** | 22 | <1 | 0 | **0** |
| Lodgepole pine | 175 | 4 | 175 | 4 | 0 | **0** | 121 | 3 | - 54 | **- 1%** | 167 | 4 | - 8 | **- <1%** |
| White Pine | 65 | 1 | 65 | 1 | 0 | **0** | 252 | 5 | + 187 | **+4%** | 65 | 1 | 0 | **0** |
| *Totals* | 4,543 | 100 | 4,543 | 100 | | | 4,543 | 100 | | | 4,543 | 100 | | |

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

Converting immature and mature forest structure to the early succession stage of stand development, would increase mean patch size, 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 many areas proposed for selective cutting, both alternatives would enhance the health and promote desired species on dry and moist site immature forest stands, which in time could become old growth. This treatment would likely increase the acreage of future long-lived seral old growth.

### 4. Alternative D

Alternative D would advance vegetation in some of the project area toward desired conditions using mostly selective cutting. Approximately 444 acres would be treated by selective cutting and about 225 acres would be underburned. An estimated two acres of regeneration cutting would occur to allow previously planted western larch and white pine seedlings room to grow. About 29 acres of the underburning would occur in one old growth stand to maintain its old growth characteristics; no cutting would occur in this stand.

Alternative D would convert about 230 acres, or five percent of the project area, from Douglas-fir and grand fir/hemlock forest cover types to western larch and ponderosa pine cover types (see figure 13 in Appendix I and table 9). There would be no change in the amount of western white pine forest cover type.

Due to estimated mortality from root disease, Alternative D would convert 809 acres (18 percent of the project area) of immature and mature high risk stands not proposed for treatment to the early succession stage of stand development (see figure 12 in Appendix I and table 9). 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. These changes are the same as under the No Action alternative, but less than under Alternatives B and C. The trend toward larger mean patch size for the early succession stage is a trend toward the historic range.

In many areas proposed for selective cutting, this alternative would enhance the health and promote desired species on dry and moist site immature forest stands, which in time could become old growth. This treatment would likely increase the acreage of future long-lived seral old growth.

### 5. Effects Common to Alternatives B, C and D

**Existing Road Decommissioning** – The decommissioning of existing, drivable roads would begin converting 1.7 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.

## *3.22c Cumulative Effects Analysis*

### 1. Methodology

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. The acreages shown under the Alternatives in table 9 include cumulative effects since the effects from the Alternatives are additive to the effects which have led to the existing condition.

No private, state or other federal lands are within the project area and only a small amount of private land lies within a few miles of the project area. Portions of this private land have personal or recreational home developments. A small amount of these private lands have had recent logging activity affecting the vegetation but the majority has not. From a vegetation standpoint, only a small percentage of private lands are trending toward the desired forest cover types of larch and ponderosa pine, as some landowners manage for these species. No management of western white pine is known. 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 these 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 on these lands. For these reasons, effects of proposed vegetation treatments in Alternatives B, C, and D are expected to be localized and therefore, would not have cumulative effects outside the project area. 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 for the Forest Vegetation analysis is the same as the project area boundary (see project file for further rationale and discussion regarding private land activities).

### 2. Cumulative Effects Common to All Alternatives

**a. Past, Ongoing and Reasonably Foreseeable Activities and Events**

Past activities (such as timber harvest) and natural processes are described in the Affected Environment section and provide baseline conditions of the vegetation in the project area. Natural processes such as insect- and disease-induced mortality are discussed as reasonably foreseeable influences on vegetation change. The following ongoing and reasonably foreseeable activities in the project area are relevant to the forest vegetation analysis.

**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. This is because a very small portion of the area is accessible from roads and the terrain is very steep.

**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 1998c), 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.

**Fire Suppression** – Under **Alternative A** (No Action), successful fire suppression would continue advancing many stands toward climax vegetation with a tendency toward shade-tolerant species. The existing long-lived seral species would tend to be shaded out and replaced by species such as grand fir and cedar on more moist sites and Douglas fir on dry sites. The forest cover types across the landscape would not change significantly from what they are now although a few stands would continue to change from ponderosa pine and western larch to Douglas-fir, grand fir, or cedar. In many areas with predominantly Douglas-fir, mortality would increase and stands would change from mature and immature structure to shrub and seedling/sapling stands of predominantly grand fir and Douglas-fir. Other stands (especially in portions of the riparian areas) would continue toward mature and eventually old growth cedar and grand fir. As stands of Douglas-fir die, larger patches of seedling/sapling would occur. Old growth structures and patch size would not change significantly although narrow stands of cedar and grand fir would trend toward old growth in riparian areas and other moist sites.

Under **Alternatives B, C and D**, successful fire suppression would continue advancing *untreated stands* in the same direction as Alternative A. In *treated stands*, fire suppression may reduce the risk of losing desired early seral species by reducing unwanted fires. Treated stands would have a much higher opportunity for control and suppression of unwanted fires (see Fire and Fuels section).

### 3. Cumulative Effects Common to Alternatives B, C and D

**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 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.

**Potential Future Salvage** – This activity would not measurably change the composition of tree species, stand size class structure, or landscape pattern. It does have the potential to reduce down coarse woody material, snags, and fuel, but with the use of the criteria specified under "Future Salvage Opportunities" in Chapter II, effects would be negligible.

### 4. Consistency with the Forest Plan

Alternative A would not be consistent with Forest Plan objectives for promoting stand structures and species mix which reduce susceptibility to insects and diseases (p. II-32, (4)).

Alternatives B, C and D 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 cutting. On the Sandpoint Ranger District, it was determined that both systems were appropriate where regeneration cutting was proposed (Timber Standard 1, p. II-31).

Regeneration cutting is proposed for stands in which mortality is either high or expected to be high in the near future and where undesirable species are occupying the growing space. 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 compositions that are less susceptible to insect and disease damage. This is consistent with Forest Plan direction that "reforestation would feature seral tree species." All stands proposed for regeneration cutting are on lands suitable for timber production and that can be adequately restocked within five years of the final cut. 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, p. 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. An update letter in 1998 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, p. 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 cutting, site preparation and planting with seral species are designed to reduce the perpetuation of pest problems (Forest Protection Standards 1 and 2, pp. 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, p. 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 Threatened or Endangered plant species or US Fish and Wildlife species of concern suspected to occur in the project area. No suitable habitat for listed Threatened plant species occurs in the project area. Refer to the TES plants report in the project file for information about those species and their habitats.

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 West Gold 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.

## *3.23c Reference and Current Conditions*

The Gold Creek EAWS provides a "step-down" in perspective from the Interior Columbia River Basin, the Northern Region and the Pend Oreille Sub-basin to the Gold Creek watershed, of which the West Gold project area is a part. Prior to this project, few TES plant surveys had been conducted, and there were no documented TES plant occurrences in the Gold Creek watershed or West Gold Creek drainage. Refer to the EAWS for more detailed information on reference and current conditions of rare plant species and habitat in the watershed.

## *3.23d 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. Pre-field review was conducted in 2000.

No peatland, wet forest, dry forest, subalpine, cold forest or deciduous riparian habitat occurs in the project area. Two small beaver ponds in West Gold Creek comprise the only known aquatic guild habitat in the project area.

## *3.23e Field Survey Results*

Field surveys were conducted in the summer of 2000. Populations of Michigan moonwort (*Botrychium michiganense*) and least moonwort (*B. simplex*) were identified in open meadows in the project area. Mingan moonwort (*B. minganense*) was identified in moist forest habitat. No sensitive moonworts were identified in proposed cutting units. No other TES species, USFWS species of concern or Forest species of concern were identified in the project area, and most proposed cutting units were found to have low potential to support rare plants.

Survey notes are included in the project file.

### 1. Species Screen

The Council on Environmental Quality (40 CFR 1502.2) directs that impacts be discussed in proportion to their significance. Table 10 displays the level of analysis for TES plant species and Forest species of concern.

Aquatic habitat in West Gold Creek would be buffered according to INFS guidelines and would not be affected by project activities. No further discussion of this habitat guild 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 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.

**Table 10. TES plant 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 Species** | | | |
| Water howellia (*Howellia aquatilis*) | ✓ | | |
| Ute ladies'-tresses (*Spiranthes diluvialis*) | ✓ | | |
| Spalding's catchfly (*Silene spaldingii*) | ✓ | | |
| **USFWS Species of Concern** | | | |
| Clustered lady's slipper (*Cypripedium fasciculatum*) | ✓ | | |
| **Region 1 Sensitive Species /Forest Species of Concern** | | | |
| Deciduous riparian guild species | ✓ | | |
| Peatland guild species | ✓ | | |
| Dry forest guild species | ✓ | | |
| Subalpine guild species | ✓ | | |
| Cold forest guild species | ✓ | | |
| Wet forest guild species | ✓ | | |
| Aquatic guild species | | ✓ | |
| Moonwort species (*Botrychium* spp.) | | | ✓ |
| Moist forest guild species | | | ✓ |

**a. Rare Moonworts (*Botrychium* species)**

Moonworts are seedless vascular plants that reproduce from spores and underground rhizomes. Mingan moonwort (*Botrychium minganense*) often occurs 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.

Michigan moonwort (*B. michiganense*) and least moonwort (*B. simplex*) often occur in disturbed meadows such as old homestead sites. The known occurrences in the project area - in an old homestead meadow - are not in or adjacent to any proposed cutting units.

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 species was warranted for listing but precluded because of higher priority species (USDI 2001). One historical occurrence of slender moonwort is documented from the IPNF approximately 60 miles 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. Habitat suitability in proposed cutting units for this and other moonworts was determined to be low to marginal.

## 3.24 Threatened, Endangered and Sensitive Plants – Environmental Consequences

### *3.24a 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. Methodology for cumulative effects analysis is discussed below in the Cumulative Effects section. The issue indicator for analysis of effects to sensitive and rare plants is the relative amount of canopy opening and/or ground disturbance in and adjacent to documented sensitive plant occurrences. The issue indicator was determined based on the affinity of moist forest moonworts for relatively closed-canopy conditions (ICDC 2001) and their dependence on soil mycorrhizae, which may be destroyed during ground-disturbing activities.

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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).

### *3.24b Direct and Indirect Effects*

#### 1. Alternative A 

Management activities would not change from current levels, and current vegetation trends would be expected to continue. No direct or indirect impacts to sensitive plants or suitable habitat would occur.

#### 2. Alternative B 

Cutting and/or underburning of 1,338 acres under this alternative would remove varying amounts of forest canopy and cause varying degrees of ground disturbance. Approximately 121 acres of moist forest habitat considered of marginal potential for sensitive plants would be impacted. Riparian areas, which have higher potential to support sensitive plants, would be buffered, reducing the risk of impacts to suitable habitat.

The construction of three miles of road would not directly affect highly suitable rare plant habitat, but could have indirect impacts, mostly by enabling noxious weeds to invade previously uninfested habitat. Mitigation for noxious weeds described in Chapter II would reduce this risk.

#### 3. Alternative C 

Areas of timber cutting and silvicultural prescriptions under this alternative are the same as under Alternative B. Units requiring road construction for logging under Alternative B would be logged by helicopter under Alternative C. Approximately 121 acres of moist forest habitat considered of marginal potential for sensitive plants would be impacted, but with less disturbance from ground-based logging systems. In addition, no new road construction would occur. Therefore, the risk of indirect impacts from noxious weed invasion would be lower than under Alternative B.

#### 4. Alternative D 

This alternative prescribes selective cutting in most units (only two acres of regeneration cutting are proposed), reducing total acres of proposed cutting and/or underburning to 475. Only 0.5 mile of new temporary road construction would occur, so risks to sensitive plants associated with potential weed spread would be similar to those under Alternative C.

Unlike Alternative B or C, under this alternative no suitable moist forest habitat for sensitive moonworts would be impacted. The risk of direct and indirect impacts to rare plants would therefore be lower with this alternative than with Alternative B or C.

#### 5. Direct and Indirect Effects Common to Alternatives B, C and D 

The documented moist forest moonwort occurrences and their habitat in the project area would be buffered from all cutting activities according to INFS guidelines; therefore, there would be no anticipated direct impacts to these occurrences. 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 tree canopy removal and/or ground disturbance from cutting activities. Undetected individuals of these species in marginal to moderately suitable habitat could be impacted under all action alternatives.

Based on past monitoring (Penny 1995), moonwort populations are generally represented by at least some aboveground plants every year. Because negative survey results reduce the risk of populations going undetected, and because moonworts appear adapted to a broad range of habitats, loss of undetected individuals is considered incidental, such impacts would not lead to a trend to federal listing or a loss of population or species viability.

No activities are planned in meadows, so no direct or indirect impacts to the occurrences of meadow moonworts would be expected to occur. There also would be no impact to the occurrences of Mingan moonwort or northwestern moonwort outside the project area near Chilco Mountain.

There would be no direct or indirect impact to any other sensitive species of the moist forest guild not found in the project area.

Reforestation would occur mostly in habitat with low potential to support rare plant species. Soil disturbance from preparation of planting spots may impact undetected sensitive moonworts, with no trend to federal listing or loss of population or species viability expected to occur.

Site-specific surveys would be conducted as needed before implementation of any road decommissioning and appropriate mitigation measures as described in Chapter II would be implemented if necessary. Removal of culverts at stream crossings may directly impact a small amount of suitable rare plant habitat, and undetected individuals of sensitive moonworts may be directly impacted. Because of the limited amount of habitat disturbance, no trend to federal listing or loss of population or species viability expected to occur.

Based on current knowledge of the species' distribution, impacts to the Forest species of concern slender moonwort (*Botrychium lineare*) would not be expected to occur from implementation of any action alternative. Although occurrences of sensitive moonworts have been identified in numerous surveys on Sandpoint Ranger District, slender moonwort has never been documented.

### *3.24c Cumulative Effects*

The cumulative effects area includes the analysis area plus the area within a one-half mile radius around the West Gold Creek watershed. The cumulative effects area is based in part on predicted seed dispersal distances (see TES plants report in the project file). Also considered was the documented occurrence of two sensitive moonworts adjacent to the project area near Chilco Mountain.

The following past, current, ongoing and reasonably foreseeable events apply to the cumulative effects analysis for TES plants:

*Past Activities and Events*

- Large scale wildfire
- Timber harvest
- Road construction

- Clearing of vegetation for the powerline right-of-way

*Current and Ongoing Activities*

- Helispot maintenance
- Road maintenance
- Powerline right-of-way maintenance

*Reasonably Foreseeable Actions*

- Other Restoration Projects - noxious weeds monitoring and treatment, native seeding and timber stand improvement (tree thinning and pruning in plantations).
- Future salvage opportunities

Cumulative effects to TES plant species or suitable habitat from proposed activities are generally described as follows:

- **very low** = no measurable effects on individuals, populations or habitat
- **low** = individuals and/or habitat not likely affected
- **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 that could support TES plant species
- **high** = populations would likely be affected and/or habitat capability may over the long term be reduced below a level that could support TES plant species.

The period for measuring cumulative effects to rare plants and suitable habitat is ten years following completion of cutting and other restoration projects, or, in the event of selection of the No Action Alternative, ten years after the date of the signing of the Record of Decision. Beyond ten years, the likelihood of events or activities affecting rare plants and suitable habitat would be difficult to predict.

### 1. Alternative A

No cumulative impacts to sensitive plants or suitable habitat would occur with implementation of the No Action alternative.

### 2. Cumulative Effects Common to Alternatives B, C and D

#### a. Proposed Activities #

Because no disturbance activities are planned in or adjacent to any known sensitive plant populations, there would be little risk of weed infestation in those populations resulting from implementation of any of the action alternatives.

#### b. Past Activities and Events #

Past large-scale wildfires, timber harvest, road construction and powerline right-of-way clearing have likely affected rare plants and/or rare plant habitat through ground disturbance, canopy removal and/or the introduction of exotic plant species. Active fire history has precluded succession of much moist forest habitat to mature forest structure, further limiting the potential for rare plant occurrence.

**c. Current and Ongoing Activities #**

Helispot, road and powerline right-of-way maintenance activities would occur in areas with low suitability as rare plant habitat. No effects to rare plants would be expected to occur from these activities.

**d. Reasonably Foreseeable Actions #**

**Other Restoration Projects** - White pine pruning and tree thinning would occur in areas with low potential to support rare plants. No ground disturbance would occur. Other than possible incidental effects to undetected individual moonworts, no impacts to rare plants would be expected to occur.

**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 potential 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.

### 3. Cumulative Effects Common to All Alternatives

**a. Reasonably Foreseeable Actions #**

**Other Restoration Projects** - Weed treatment and monitoring would follow guidelines established in the Sandpoint Noxious Weeds Control Project EIS (USDA 1998c). Effects to rare plant species were analyzed in that document and its adaptive strategy. No effects to rare plants beyond those described in that EIS are expected to occur.

**b. Summary of Cumulative Effects #**

Based on the above analysis, cumulative impacts to sensitive moist forest moonworts under any 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 that could support the species). Since no activities are proposed in meadow habitat that supports documented moonwort occurrences, and project or other activities would have no effect on these habitats, no cumulative effects to sensitive meadow moonworts would be expected to occur.

Based on the above analysis, cumulative impacts to moist forest habitat for other rare plant species would be expected to be very low (no measurable effects) to low.

## *3.24d Consistency With the Forest Plan and Other Regulations*

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 and provide for the viability of populations (see project file, section E).

# 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 (1989)
- Sandpoint Ranger District Noxious Weed Control Project EIS (1998)

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. (1991), 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 Reference and Current Conditions*

The Gold Creek EAWS provides a "step-down" in perspective from the Interior Columbia River Basin, the Northern Region and the Pend Oreille Sub-basin to the Gold Creek watershed, of which the West Gold project area is a part.

Information on current weed infestations and results of weed management in the project area is derived from past and recent weed surveys and from observations during field surveys for Threatened, Endangered and sensitive plants. Information on past surveys and treatment in the watershed are in the Sandpoint Noxious Weed Control Project File, pp. IV-403 to IV-408, and the Gold Creek EAWS. The findings of those documents are incorporated by reference and summarized below. Reference and current conditions in the West Gold drainage are similar to those described for Gold Creek watershed.

### 1. Reference Condition

Most weed species that had already established in the Pacific Northwest and had been reported in Bonner and Kootenai counties first appeared in the Gold Creek watershed (including the West Gold Creek drainage) following periods of disturbance, either human-caused or natural. Weed species of concern to the watershed were first recorded in Bonner County, for example, on dates ranging from 1912 (common tansy) to 1994 (leafy spurge) (Rice 1996).

Following construction of Forest Road 2707 (probably before 1940), oxeye daisy, bull thistle and common tansy - all of which had already established in the northwest and were recorded in Bonner or Kootenai county after 1912 - may have been introduced to Gold Creek watershed. Wildfires between 1926 and 1934 provided habitat and travel corridors for spotted knapweed; this species was recorded in Bonner and Kootenai counties shortly thereafter.

Road construction and timber harvest throughout the 1940s to the mid-1980s provided opportunities for goatweed, sulfur cinquefoil, dalmatian toadflax, and rush skeletonweed to invade the watershed; these species were first recorded in Bonner and/or Kootenai county between 1931 and 1965. Construction of the Bonneville and Avista powerlines paralleling West Gold Creek in the late 1940s and the early 1950s created an extensive corridor of disturbance that is highly susceptible to domination by weed species because of the repeated clearing necessary for powerline maintenance and safety.

The most recent timber sales and road construction have occurred in habitat susceptible to invasion by tansy ragwort and yellow starthistle. These two species have recently been reported in Bonner and Kootenai counties, but are not yet known to occur in the Gold Creek watershed.

### 2. Current Condition

#### a. Documented Weed Infestations

Current known weed species and infestation levels in the Gold Creek watershed include spotted knapweed (moderate), goatweed (moderate), common tansy (moderate), oxeye daisy (low - moderate), sulfur cinquefoil (low - moderate), meadow hawkweed (low - moderate), orange hawkweed (low), rush skeletonweed (low - moderate), dalmatian toadflax (low), bull thistle (low) and Canada thistle (low)[1].

Weed inventory and treatment in the watershed were sporadic from 1989 to 1993. Infestations of spotted knapweed, rush skeletonweed, meadow and orange hawkweed and dalmatian toadflax had been treated using biological and chemical control methods. Other infestations of goatweed, common tansy and oxeye daisy had been noted but not treated.

**b. Extent of Habitat Susceptible to Weed Invasion**

Queries of the Timber Stand Management Record System (TSMRS) were used to provide a "coarse filter" assessment of susceptible habitat in the Gold Creek watershed for two weed species considered potential new invaders of particular concern for their potential ecological impacts. These species are considered to be invasive following disturbance of soil and/or canopy cover (Rice and Toney 1997). Approximately 12,770 acres in the watershed are susceptible to invasion by tansy ragwort, and 3,747 acres are susceptible to invasion by yellow starthistle. Regeneration cutting in the last ten years has occurred in 422 acres susceptible to invasion by these species. Acreages of susceptible habitat in the West Gold drainage are similar in distribution to those in the Gold Creek watershed.

The heaviest weed infestations are found on roads, trails and powerline rights-of-way. These areas are also most susceptible to weed spread, and they serve as corridors for weed spread into recently disturbed forest habitat.

A more detailed analysis of habitat susceptibility for tansy ragwort, yellow starthistle and other species may be found in the Gold EAWS.

**c. Current Weed Management Efforts**

Spotted knapweed, goatweed and common tansy are widely established and considered naturalized in the watershed. Management of these species will emphasize reducing infestation levels and slowing their rate of spread. Orange hawkweed, meadow hawkweed and rush skeletonweed are currently established but not considered naturalized in the watershed. Infestations will be monitored and contained, with eradication where feasible.

Of major concern are potential new invaders (see project file) not yet documented in the watershed. In accordance with guidelines in the Northern Region Overview (USDA 1998), management priorities emphasize identification and eradication of tansy ragwort, leafy spurge, and yellow starthistle. Some additional weed species listed as noxious in Bonner County and recorded as occurring there have not yet been documented in the West Gold Creek drainage. These species would be a high priority for eradication if any individuals were observed during operations or monitoring in the project area.

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[1] Weed infestation levels are defined in the Sandpoint Noxious Weed Control Project File, p. IV-365. Very heavy infestation levels indicate that infestations are widespread at a heavy level in disturbed areas of the watershed, while very low levels indicate that only isolated small populations have been documented.

Three areas within the watershed have been treated under the Sandpoint Noxious Weed Control Project FEIS (site numbers are as listed in the FEIS). They include Road 278 (portion of site # 38), Bonneville Power Administration and Avista powerline rights-of-way (portion of site # 39) and 2707 (site # 43). Rush skeletonweed infestations in these sites have been designated a high priority for eradication. Roads 278 and 2707 were chemically treated in the fall of 2000 and 2001, with follow-up application of desired species seed and fertilizer. Road 2708 was treated in 2000 under the adaptive strategy provisions of the FEIS. In addition, representatives of the Forest Service and Avista met in 2001 to coordinate timing and amount of mechanical and chemical weed treatments in the watershed to conform to the requirements of the Sandpoint Noxious Weed Control Project FEIS (USDA 1998c).

Weed management efforts in the district have increased substantially since 1998. Consistently higher funding for weed treatment and the inclusion of weed treatment and prevention practices in timber sale contracts since 1998 have increased the likelihood of success in containing and reducing weed infestations in the project area and throughout the district. Information on appropriated and Knutsen-Vandenberg funding levels for weed management since 1998 is included in the project file.

## 3.26 Noxious Weeds – Environmental Consequences

### *3.26a Methodology*

Analysis was conducted using results of past noxious weed surveys, current distribution of weed species in habitats similar to those found in the proposed treatment sites, and types of proposed treatments. The estimation of risk of weed spread and introduction of new weed invaders from the proposed activity is based on peer-reviewed literature, experience in the project area and on similar sites in the IPNF, and professional judgment.

Effects of proposed actions on noxious weed spread are based on the difference between alternatives in the amount of canopy removal, and predicted amount of soil and/or understory vegetation disturbance.

Analysis of effects to noxious weeds of various activities relies on the following assumptions:

- Where logging would be ground-based, there would be more ground disturbance than with helicopter logging. Therefore, the risk of weed spread would be higher than where helicopter logging would occur.

- Selective timber harvest would remove approximately 30 percent of the tree canopy, allowing for increased understory vegetation growth, including some noxious weeds. The effects of commercial thinning would be similar to those of selective harvest.

- Regeneration treatments remove a significant portion of the canopy (greater than 70 percent), and would treat fuels with site preparation. This type of harvest carries a greater risk of weed spread than selective harvest or commercial thinning, particularly when in proximity to existing infestations.

- Even in the absence of soil or vegetation disturbance, some weed species may invade if tree canopy cover is significantly reduced.

## *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 and monitoring for new invaders would be dependent on District priorities and the availability of appropriated funding. It is likely that treatment of Forest Road 278 and its spurs would continue as needed to protect the investments made in 2000 and 2001. Treatment needs are expected to decrease over time as more desirable species establish along those roads.

With implementation of the No Action alternative, seeds from any weeds on Forest roads in the drainage may still be transported within and out of the area by vehicles, people, birds, and wildlife. Goatweed and knapweed populations established under the powerline right of way would continue to expand within the drainage unless broad scale biological control efforts are undertaken.

### 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. Based on past monitoring (see project file), 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 as desired species become established.

### 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. Alternative D

Because fewer acres would be treated under this alternative, and because mostly selective harvest would occur, there would be less ground or canopy disturbance and a lower risk of weed spread than under Alternative B or C.

### 5. Direct and Indirect Effects Common to Alternatives B and C

With regard to the predicted amount of canopy removal, there is little difference between Alternatives B and C, 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. Based on past monitoring (see project file), successful weed treatment would remove the majority of new seed source, which occurs in greater concentrations on roadsides, and would slow the rate of spread of weeds within the project area.

### 6. Direct and Indirect Effects Common to Alternatives B, C and D

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 would reduce, but not eliminate, the risk of weed spread. Treatment of weeds along haul routes would greatly reduce the risk of weed spread. Contract requirements to clean off-road harvest equipment prior to entry into the sale area would further reduce the risk of weed spread. 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 (see Chapter II, Features Common to Alternatives B, C and D).

A slight increase in the risk of weed spread is predicted for grapple piling. Though many of the common weeds invade after site preparation, they tend to decrease as the site becomes stocked with planted conifers and native vegetation. This long-term process of vegetation succession may take 20-30 years or more to achieve canopy closure.

The risk of weed spread in susceptible habitat proposed for underburning would vary for different plant communities. Those dry areas where shrub species are predicted to dominate would be at lower risk, while dry grass and forb-dominated communities would be at higher risk for weed invasion.

There would be no measurable increase in the risk of weed spread from tree planting. Only a small amount of soil disturbance would occur with clearing of planting spots. As the planted trees grew, the canopy would eventually close to shade out many weed species.

There would be a temporary increase in risk of weed spread following road decommissioning. Pre-treatment of existing infestations and preventive seeding would reduce the risk of further spread over time to current levels. In addition, newly decommissioned roads would be monitored over a three-year period to detect new weed invaders and to assess the success of preventive measures. Without the recurring disturbance of road maintenance and use, and with increasing canopy coverage of desired species, risk of weed spread would decline to below the level for open or gated roads.

Goatweed and spotted knapweed 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 knapweed canopy cover by four to six times over preburn densities (Rice and Sacco 1995). Goatweed may also increase on burned sites. Weed prevention and treatment measures would reduce but not eliminate the potential for spread of goatweed and knapweed into previously uninfested areas.

## *3.26c Cumulative Effects*

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 watersheds 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 analysis area for noxious weeds is the project area.

Cumulative effects with regard to noxious weeds from proposed activities are generally described as very low, low, moderate or high, with the following definitions:

**very low** = no measurable effect on existing weed infestations or susceptible habitat

**low** = existing weed infestations and/or susceptible habitat not likely affected

**moderate** = existing weed infestations or susceptible habitat affected, with the potential for expansion into uninfested areas and/or establishment of new invaders

**high** =weed infestations and/or susceptible habitat affected, with a high likelihood of expansion into uninfested areas and/or establishment of new invaders.

The period for measuring short-term cumulative effects to noxious weeds and susceptible habitat is ten years following completion of harvest and other restoration projects, or, in the event of selection of the No Action Alternative, ten years after the date of the signing of the Record of Decision. The ten-year period is based on the expected recovery and/or establishment of desired species in disturbed areas. Long-term irretrievable effects to noxious weeds from loss of canopy cover are addressed below.

The following past, current, ongoing and reasonably foreseeable events apply to the cumulative effects analysis for noxious weeds:

*Past Activities and Events*

- Large scale wildfire
- Timber harvest
- Road construction
- Clearing of vegetation for the powerline right-of-way

*Current and Ongoing Activities*

- Helispot maintenance
- Road maintenance
- Powerline right-of-way maintenance.

*Reasonably Foreseeable Actions*

- Other Restoration Projects - noxious weeds monitoring and treatment, native seeding and timber stand improvement.
- Future salvage opportunities

### 1. Cumulative Effects Common to All Alternatives

Under all alternatives, cumulative effects with regard to new invaders are expected to be low. Under Alternative A, because there is a high likelihood that weed management efforts would continue to protect investments already made, and because no new disturbance would occur, no new invaders would become established. Under Alternatives B, C and D, because of features designed to detect and eradicate new invaders, 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:

**a. Past Activities and Events**

Past large-scale wildfires, timber harvest, road construction and powerline right–of-way clearing provided areas of disturbance of soil, vegetation and canopy cover for invasion by non-native plant species, including noxious weeds. Because of inadequate past weed prevention and control practices, the effects of these activities on noxious weed spread are still evident. However, recent monitoring shows that current weed control efforts have greatly reduced infestations in the project area (see project file).

The loss of canopy cover from past activities and events is considered irretrievable but not irreversible. As tree canopy closes weeds that are shade-intolerant will, over the long term, be displaced by shade-tolerant species. This process could take 20-30 years or more.

**b. Current and Ongoing Activities**

Helispot maintenance would include noxious weeds monitoring and treatment activities. The risk of weed spread from this activity would be mitigated by weed treatment and preventive seeding practices.

Road maintenance activities may result in ground disturbance that would be conducive to new weed invaders becoming established, and to the spread of existing weed populations. Preventive seeding with desired species and regular monitoring for weeds would reduce but would not eliminate this risk.

Powerline right-of-way maintenance would perpetuate an open canopy condition conducive to noxious weed spread. A large scale, cooperative weed management effort including biological, cultural and chemical control is needed to reduce the incidence of noxious weeds in the powerline right-of-way. Continued powerline right-of-way maintenance would perpetuate open canopy conditions conducive to many weed species, and would increase the risk of weeds spreading into adjacent newly disturbed areas.

**c. Reasonably Foreseeable Actions**

Noxious Weed Treatment And Monitoring – These activities would follow guidelines established in the Sandpoint Noxious Weeds Control Project EIS (USDA 1998c). The risk of new invaders becoming established would be low. Mitigation measures to reduce the risk of weed spread in the watershed as a result of project activities would protect recent investments in weed management on FS roads 278, 2707 and 2708. 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 1998c), 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 away from Forest roads. 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. Based on past monitoring (see project file), 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 and would over time reduce the incidence of those species. Treatment of other weed species, which are mostly confined to road prisms, would be moderately to highly effective in reducing their spread within the project area.

### 2. Cumulative Effects Common to Alternatives B, C and D

Cumulative effects with regard to existing weed infestations are expected to be low to moderate considering the following:

#### a. Proposed Activities under Alternatives B, C and D

Short-term cumulative effects regarding susceptibility to weeds would be associated with ground disturbing activities proposed in the action alternatives. Proposed mitigation (see Chapter II – Features Common to All Action Alternatives) would reduce but not eliminate the risk. Over the long term, the loss of canopy cover from implementing the proposed activities is considered irretrievable but not irreversible. As tree canopy closes, susceptibility of areas proposed for harvest and/or underburning would decrease. This process could take 40-50 years.

#### b. Reasonably Foreseeable Actions

<u>Timber Stand Improvement</u> **-** No increase in noxious weed spread is predicted from implementation of activities (tree thinning and pruning in plantations), since no ground disturbance or significant canopy removal would occur.

<u>Native Seeding</u> - Seeding of disturbed areas with native and desired non-native species would help to reduce the risk of weed spread into these areas.

<u>Future Salvage Opportunities</u> - The same preventive measures described in Chapter II - Features Common to Alternatives B, C and D would be implemented in any future salvage operations. Because of the predicted low amount of canopy and ground disturbance from future salvage activities, the risk of new invaders becoming established would be low, and the risk of spread of existing infestations would be low.

## *3.26d Consistency with the Forest Plan*

According to the Idaho Panhandle Forest Plan (1987) direction, infestations of many noxious weed species, including knapweed, goatweed and common tansy, are so widespread that control would require major programs that are not possible within expected budget levels (Forest Plan, p.

II-7). Forest Plan direction is to "provide moderate control actions to prevent new weed species from becoming established". The No Action alternative meets Forest Plan direction by not creating disturbance conducive to new noxious weed invasions or spread of existing weed populations. Alternatives B, C and D provide moderate control actions through project design, as required by the Forest Plan, to prevent new weed species from becoming established.

It should be noted that, since the Forest Plan was implemented in 1987, the issue of weed infestations on National Forest lands has evolved to encompass broader issues of native ecosystem integrity and the effects to non-commodity resources and ecosystem processes. Appropriated and Knutsen-Vandenberg funding levels for noxious weeds programs in the IPNF have increased dramatically since the mid-1990s, and the trend is toward sustaining or increasing those funding levels (see the project file). The Forest Plan revision process will consider the increased emphasis on weed management.

# 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 is to prevent the loss of old growth.
- Activity fuels will be treated to reduce their contribution to both the rate of spread and fire intensity. This will assist the initial attack organization to meet its initial attack objectives.

Forest Service Manual (FSM) 5105 defines fuels as combustible wildland vegetation 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.

State law influences fire management practices with direction from the Idaho Forest Practices Act (Title 38, Chapters 1 and 4, Idaho code).

### *3.31a Federal Wildland Fire Management Policy*

Fire suppression policy from the early 1900s until the late 1970s was 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 Secretaries of the Interior and Agriculture chartered the Federal Wildland Fire Management Policy and Program Review 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).

**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.

## 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 River 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.

Similarly, the most significant historic natural disturbance affecting vegetation in the Pend Oreille Subbasin was fire. Based on the Zack and Morgan study (1994), historically over a 70-year period, the total acreage of stand-replacing fires would be approximately equal to one-third the area of the forest. These stand-replacing burns would be a combination of single stand-replacing fires and reburns of some of these areas a few years after the initial stand-replacing fire. Mixed-severity fires would have occurred across an area approximately the size of the forest. Although repeated burns would have occurred over some of the same area (personal communication, Art Zack 2002).

Fire was also the major natural disturbance event in the Gold Creek Watershed, including West Gold Creek. The historical descriptions that follow reveal the severity and expanse of the fire disturbances within these watersheds.

In 1891, Frederick J. Mills completed the original survey of the Boise Meridian (Mills 1891). In Mills' notes he described the timber vegetation and some of the species present along the survey. Mills noted that the timber had been burnt over many years prior and was primarily a combination of dense undergrowth and young trees. Based on Mills' description, it appears that a large lethal and mixed-severity fire occurred in this area sometime in the 1850s. Figure 14 shows a photograph of the town of Lakeview in 1899. Many of the trees that can be seen surrounding the town appear to be about 30 to 50 years old, confirming the past occurrence of such a large fire.

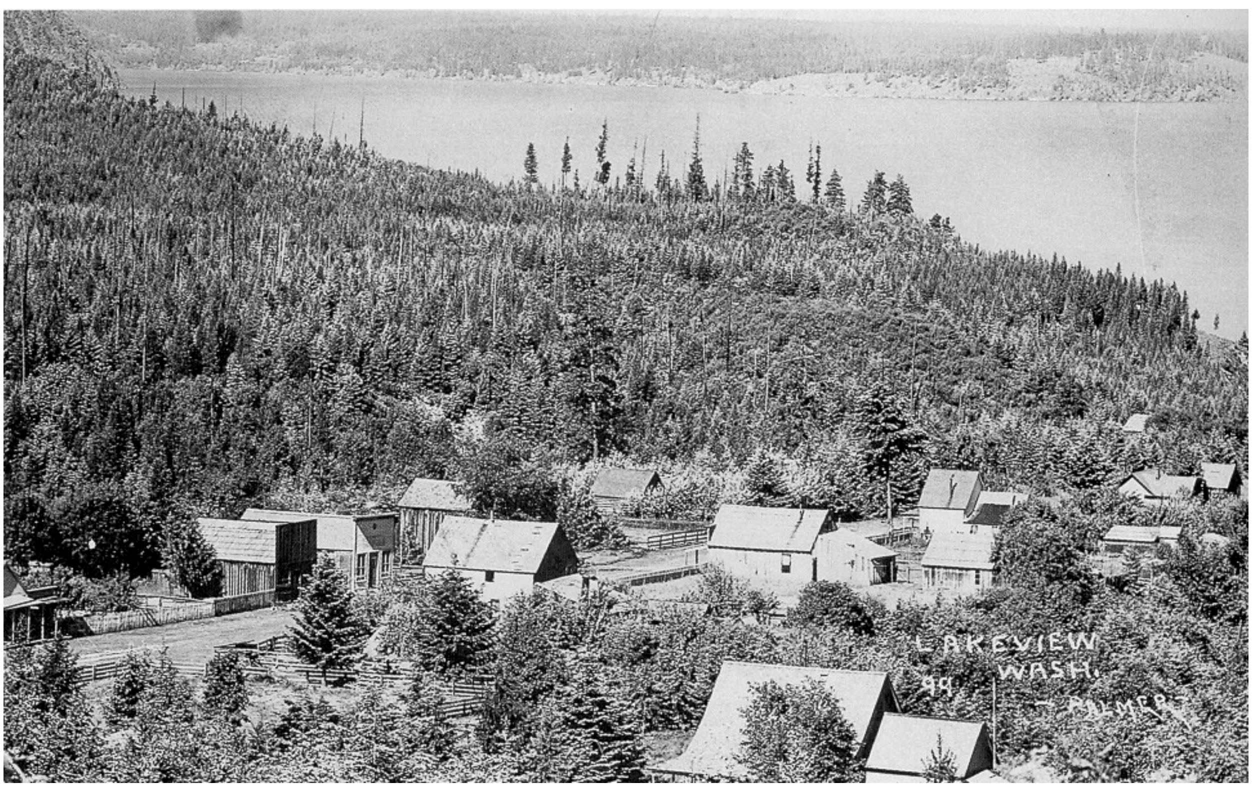


**Figure 14. Lakeview, Idaho townsite in 1899.** The photographer mistakenly labeled it "Lakeview Washington. The size of the trees surrounding the town indicates that a large stand-replacing fire swept through the area sometime in the 1850s. (Used with permission from the Museum of North Idaho)

In 1908, when the Boise Meridian was resurveyed (Penland 1908), it was again noted that the entire area was burned over, and the surveyors stated, "very few original corners remain." This fire is estimated to have occurred in 1896, as notes indicate that the Weber Mine burned in a forest fire that year (Kun 1970, Fulwider 1993).

R. M. Gumaer and J.C. Decamp give another description eight years later in writing about the Pend Oreille National Forest Classifications (USDA 1916). They describe the Gold Analysis area as being "well covered; in parts where excessive burning has destroyed the cover," and that "...a fine stand of reproduction covers the abrupt slopes and ridges."

The fire of 1896 appears to have been a very large stand-replacing and mixed-severity fire, with some nonlethal fire occurring on the dry slopes where large ponderosa pine were present. This fire and previous fires left the vegetation in an early successional stage of stand development, with grasses, brush and small trees of seedling, sapling and pole sizes dominating the landscape.

Fires continued to play an active role in vegetation disturbance through approximately 1934. In fire history mapping compiled by Warren Peterson and Larry Stone (Peterson 1963 and Stone 1990), approximately 25 percent of the analysis area reburned from the period 1926-1934 with stand-replacement and mixed-severity fires.

Approximately 74 percent of the project area consists of moist habitat types. Historic fire regimes in moist habitat types were variable consisting of long-interval, large, lethal fires mixed with shorter return interval, nonlethal, and mixed-severity fires. The remaining 26 percent of the project area consists of dry forest types scattered among larger areas of moist types. These types historically burned more frequently with nonlethal and mixed-severity fire (Smith and Fischer 1997).

### *3.32b Fire Suppression*

As a result of fire suppression during the last century, natural fire regimes do not exist anywhere in north Idaho today (Smith and Fischer 1997, page 27). 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 Gold and West Gold Watersheds. Fire suppression efforts have largely eliminated low-intensity and small, variable-intensity fires from the system. In the absence of low and 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, along with understories of dense shrubs or shade-tolerant tree reproduction. Drier sites have become more susceptible to stand-replacing fires because of multi-storied vegetation structures. The change in composition to shade-tolerant species has made stands more susceptible to root diseases, defoliating insects, Douglas-fir beetles and stand-replacing wildfires (see Vegetation section).

Since 1934, no major fire activity has taken place in the Gold Creek Watershed. The historic disturbance mechanism of fire has been temporarily interrupted by fire suppression activities for the past 60 to 70 years. At a minimum, 21 fires in the Gold Creek Watershed have been suppressed between the years 1961 to 1996, nine of those were in the West Gold drainage (project file). 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 in the past were severely burned and reburned, 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 West Gold Watershed 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 and beetle-caused mortality, and the absence of regular nonlethal and mixed-severity fires.

Because of the absence of fire and the increase in shade-tolerant species, dry forest types in the West Gold Watershed 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 loading and a change in fuel types (figure 15).

Characteristic dry type, transition, and moist type fires are described and simulated in the Douglas-fir Beetle Project FEIS for the Idaho Panhandle and Colville National Forests (USDA 1999a, pages III-542 thru 546). This simulation and description reflects a similar situation to what occurs in the Gold and West Gold Watersheds.

**Figure 15. Heavy fuel accumulations in proposed unit 27.**

## 3.33 Environmental Consequences

The primary concern regarding fuels management in the project area is to reduce fuel loading to improve our ability to suppress wildfires. As fuel loads increase from extensive tree mortality and the ingrowth of seedlings and saplings, fire intensities and flame lengths also increase. These conditions decrease our ability to safely suppress an unwanted wildfire.

### *3.33a Methodology*

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, shrubs, 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 model 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 analysts at the National Advanced Resource Technology Center in Marana, Arizona.

### *3.33b Direct and Indirect Effects Common to All Alternatives*

Dry sites in the West Gold project area have become more susceptible to stand-replacing fires because of multi-storied vegetation structures that create ladder fuels. In addition, the change in species composition to shade-tolerant species has made stands more susceptible to root disease, 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, human activities, 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 also change 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 11, replicated from the Douglas-fir Beetle Project Final Environmental Impact Statement (USDA 1999a), 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.

It should be noted that for a fire to burn, three essential components are required: fuel, oxygen, and heat. With one component eliminated fire would not be sustained. Over an entire forest, the only 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.

**Table 11. 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.

## *3.33c Cumulative Effects Common to All Alternatives*

The cumulative effects area for all fire-related effects analysis for the West Gold project area encompasses all of the federal and non-federal lands that could burn from a fire burning 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 how far and fast fires on the Sandpoint Ranger District can spread 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 and fire risk. The effects of past harvest on National Forest lands within the Gold Creek Watershed area are varied. This information is displayed in the Vegetation section in Chapter III of this document. As described, timber harvests in the early days of Forest Service management were few due to the difficult access and the small size of the trees; there were no timber harvests in the West Gold drainage until the 1970s and early 1980s. These harvests have not created large enough breaks in fuel continuity at the larger watershed scale to reduce the severity of a stand-replacing fire.

In the 1980s and 1990s other timber sales of larger size were prepared and logged. These timber sales have contributed to moving portions of the landscape back to early successional stages of stand development and regenerating longer-lived seral species. A total of 1,074 acres have been treated, yet these acres only account for 24 percent of the West Gold drainage.

**Current practices on private lands** in the Gold Creek and Chloride Gulch subwatersheds are expected to continue. Timber harvest will most likely occur on portions of the forested private lands. Typical treatments on these lands usually include some form of partial cutting that focuses on removal of 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. It is probably safe to say that inherent disturbance regimes and historic vegetation patterns would not likely be reestablished on these private land parcels.

Since private lands often include residences and other developments, fire would continue to be aggressively suppressed on private lands and National Forest lands in the vicinity. This is necessary, because reverting to the full range of historic disturbance patterns would generate significant threats to human life and property.

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. 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** 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 in the right-of-way corridor, which will help to protect these structures in a wildfire situation.

## *3.33d Alternative A (No Action)*

### 1. Direct and Indirect Effects

With the implementation of Alternative A, the No Action Alternative, there would be no change from current management direction or intensity. Tree cutting, reforestation, watershed rehabilitation, road decommissioning activities, and fuels treatments would not be initiated at this time. Helispot maintenance to aid fire suppression efforts would continue at three locations within the project area.

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).

**Cumulative Effects**

Since there are no fuels reduction activities planned with this alternative, it is reasonable to conclude that fire risk would increase over time. Within the project area, the probability of firefighter success with initial attack begins to decrease as fuel loads increase. Firefighter access would remain the same as current levels.

## *3.33e Alternatives B, C, and D*

### 1. Direct and Indirect Effects

Chapter I identified the purpose and need for this project, which includes restoring fire as an ecological process. Direct and indirect effects were analyzed by evaluating how well proposed fuel treatments restore fire as an ecological process, and how well these treatments influence our ability to suppress unwanted fires on treated sites. Three items were considered:

1. How much fuel treatment is being applied to treatment areas and how effective it is at restoring fire as an ecological process.
2. How much the fuel treatments reduce the potential for crown fire
3. How easily an unwanted fire could be suppressed

***FUEL TREATMENT DEFINITIONS***

***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.

**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. Pile burning increases combustion efficiency as much as 95 percent (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 aesthetic 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.

**How Much Fuel Treatment Would Occur** - 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. Physical effects of fire, such as biomass consumption, can also be replicated. Tree cutting to reduce fuel levels 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 project team chose underburning as the primary fuels reduction treatment method for Alternatives B, C, and D.

For Alternatives B and C, this treatment is planned for about a third of the 4,500+-acre project area (table 12). Both alternatives B and C plan to underburn 1,077 acres, and Alternative D has identified 225 acres for underburning. Implementation of either Alternative B or C would be effective at restoring fire as an ecological process. The reduced acres treated in Alternative D would be less effective at restoring fire as an ecological process in the large scope of the drainage itself.

**Reducing the Potential For Crown Fire** - The effectiveness of Alternatives B, C, and D 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, rehabilitation, and seed tree with reserves silvicultural prescriptions. Treatments following these prescriptions would include cutting of the suppressed understory trees, followed by some form of fuels reduction (mostly underburning). All of these activities combined would be very effective at reducing ladder fuels.

**Table 12. Approximate Fuel Treatment Acres**

| Treatment | ALT.A | ALT. B & C | ALT. D |
|---|---|---|---|
| Underburn | 0 | 1,077 | 225 |
| Limb and Lop | 0 | 223 | 223 |
| Yard Tops | 0 | 10 | 0 |
| Grapple Pile & Burn | 0 | 28 | 27 |
| Total Acres | 0 | 1,338 | 475 |
| Acres including piles burned at helicopter landings | 0 | 1,347 | 480 |

BEHAVE was run for both pre-treatment and post-treatment conditions in the areas to be underburned using typical summer-time conditions to estimate the probable flame lengths and fire intensities associated with the various proposed treatments (project file). As shown in table 13, the estimated pre-treatment flame lengths were over eight feet in height, and the fire intensities were 600 BTUs/foot/second. The post-treatment flame lengths were just under two and a half feet in height, and the fire intensities were 40 BTUs/foot/second. Post- treatment BEHAVE run inputs had lower fuel moistures and higher wind speeds to reflect open stand conditions compared to the closed stand conditions of the pre-treatment stands. As can be seen from these results, the reduction of the fuel loading, before and after treatment, would have a direct effect on flame lengths and fire intensities.

Alternatives B, C, and D 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. Because Alternatives B and C treat 29 percent (1,338 acres) of the project area with fuel reduction activities, versus 10 percent (475 acres) under Alternative D, Alternatives B and C would be more effective in reducing the potential for a crown fire within the project area.

**Table 13. Results of BEHAVE fire modeling on fuel treatments.**

| BEHAVE Modeling | Pre-treatment | Post-treatment |
|---|---|---|
| **Flame Lengths** | 8.5 feet | 2.4 feet |
| **BTUs/ft./sec.** | 600 | 40 |

**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 these, 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 available 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 initial attack, but the remote location could cause delays if aerial initial attack equipment is unavailable due to other initial attack activities on the forest. 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. The BEHAVE model was also used to analyze the effects of the proposed vegetation treatments in relation to firefighter success (see table 13). According to the Fireline Handbook, hand crews can be effective on fires with flame lengths of 0 to 4 feet and fire intensities between 0 and 100 BTUs/foot/second. On fires with flame lengths of 4 to 8 feet and fire intensities between 100 and 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 difficult for suppression forces to control with spotting and crowning.

By these standards, the implementation of Alternatives B, C, and D would be very effective in allowing for containment of unwanted fires on the treated areas. Again, Alternatives B and C would treat more of the project area with fuel reduction activities than Alternative D; therefore, Alternatives B and C would be more effective in improving initial attack success within the project area.

There is typically a time lag of one to two seasons from the completion of timber cutting activities and the fuels reduction treatments. This is related primarily to the limited windows of opportunity for burning in the spring and fall of each year. During tree cutting, 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.

When the two items discussed above are considered together, in relation to suppressing an unwanted fire and reducing the risk of crown fire on treated sites, implementation of either Alternative B or C would be very successful. This is based on the fact that the ground and aerial fuel loadings would be reduced in the long term, which would reduce fire 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 on the areas treated.

### 2. Cumulative Effects

Since this project proposes fuels reduction activities on 29 percent (Alternatives B and C) and 10 percent (Alternative D) 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. The fuels reduction proposed above would be in addition to the approximately 19 percent of the project area that had fuel treatment in conjunction with past harvest after 1984 (see table 5 in Forest Vegetation section, and figure 11 in Appendix I). Within the project area, the probability of firefighter success with initial attack is very high if the ignition point is within an area in which the fuels have been treated. Firefighter access into this area is good, even better if aerial resources are available, 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 that were to start on untreated sites or on lands outside the project area.

The following reasonably foreseeable actions are applicable to this cumulative effects analysis:

**Maintenance of Helispots –** Periodic maintenance of three existing helispots will continue to provide helicopter access for fire suppression crews to the project area. This will maintain the ability of fire crews to respond quickly during fire suppression activities.

**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 (over a span of 200 years), 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 (10 years), there would be a temporary increase in dead fine fuels, which would increase wildfire intensity should a wildfire occur.

**Future Salvage Opportunities** - A portion of the proposed project includes the potential for 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 would reduce fire duration (Smith and Fischer 1997), but would not greatly affect fire intensity. The fine fuels, depending on concentrations, would be either scattered or piled. Piling of the slash, followed by burning of the piles, would reduce fire intensity on the area salvaged, but would not have a real measurable effect on fire risk on the area as a whole. Likewise, if the slash were scattered and allowed to abate naturally, the fire intensity would temporarily increase. However, due to the scattered nature of salvage harvesting, this practice would not have a significant effect on fire risk on the area as a whole.

### 3. Cumulative Effects on Private Lands

Treatment of fuels within the project area would reduce the potential for fire risk on those acres treated. This would also allow for more timely and effective suppression of unwanted fires on those acres, which would reduce the chances of a fire escaping from treated areas onto adjacent lands. Most large stand-replacing fires in the IPNF are wind driven or are the result of regional climate patterns (prevailing winds are out of the southwest), which historically have pushed fires to the north and east. Examples of large fires on the north zone of the IPNF that have burned to the north and east include the Sundance, Flume Creek, and Trapper Peak Fires of 1967; the Kilroy Fire of 1991; the Lakeview Fire of 1996; and the Nosebag, East Thunder, and Northwest Peaks Fires of 2000. The area directly to the northeast of the project area contains private lands associated with past mining claims and the community of Lakeview. The closest private land to the north is three quarters of a mile away from the project area boundary. Because the project area is southwest of private lands and the prevailing winds push fires to the north and east, our increased ability to suppress unwanted fires on treated acres within the project area would reduce the risk of a fire starting on those acres and burning toward private lands.

### *3.33f 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, C, and D would treat the acres in the project area through a combination of timber cutting, prescribed burning, 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.

Alternatives B, C and D are consistent with State law (Idaho Forest Practices Act) that requires management of slash and fuel hazards from forest management practices to reduce risk of fire.

# 3.4 Air Quality

## 3.41 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, as amended by the National Forest Management Act; 2) the Federal Land Management Policy Act of 1976; 3) the Clean Air Act of 1970 as amended in 1977, 1990 and 1999, and 4) the Idaho Forest Practices Act (Title 38, Chapters 1 and 4, Idaho code).

The Clean Air Act (Section 110) requires each state to develop a State Implementation Plan (SIP), which identifies how the State will attain and maintain national air quality standards. The amendments of 1977 set up a process that included designation of Class I, II, and III airsheds for air quality management (see project file for Idaho and Montana.)

The 1990 Clean Air Act amendment 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.

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 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 that can be added to these areas. The nearest federally designated Class I area is the Cabinet Wilderness, located approximately 45 air miles northeast near the Idaho-Montana border.

**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 National Forest 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.

In response to plans by some Federal and State wildland managers to significantly increase the use of wildland and prescribed fires, the EPA responded in 1998 with a policy statement entitled the Interim Air Quality Policy on Wildland and Prescribed Fires. This national policy developed with the Department of Agriculture and other Federal land management agencies describes how Federal land managers will cooperate with State smoke management policies to maintain clean air and still allow for prescribed burning.

Airshed Groups assembled in North Idaho and Montana 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 as part of accepted forest practices, such as fuels 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 regulated during the months of March through November (North Idaho Cooperative Smoke Management Plan).

## 3.42 Affected Environment

The West Gold project area lies in a Class II airshed (see above for airshed classifications). The air quality in this area and in the adjacent airshed is generally considered very good. An occasional negative impact has occurred due to smoke from wildfires, debris and 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 25 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. Smoke from fires was noted in many early descriptions of forests in northern Idaho. Fires occurring naturally in the project area and the general weather patterns of North Idaho would cause smoke emissions to persist from a few hours to several days. These impacts would have occurred in the summer and early fall months. The 55,900-acre Sundance Fire produced 13,200 tons of PM.2.5 during its 24-hour run on September 1$^{st}$ and 2$^{nd}$ in 1967 on the Sandpoint Ranger District (Smith and Fischer 1997).

The effect of Euro-American settlement and subsequent fire protection has reduced the historical amount and duration of smoke emissions from wildland fires. Fire management programs enable managers to exert some control over the timing and quantity of smoke emissions (Smith and Fischer 1997). 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 for periods during good to excellent air 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 1997). FOFEM models emission production, not visibility or dispersion. It estimates the total pounds per acre of PM 2.5 and carbon monoxide that would 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. 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 any restrictions on burning are necessary the following day.

A list of all prescribed burning planned for the year on the Sandpoint Ranger District is forwarded to the monitoring unit in Missoula Montana directly by the District, via the Internet. Burns that are planned for the spring are to be posted on the web site before February 27, and fall burns are to be posted before August 16 of each year. By 11:00 a.m. daily, the Sandpoint Ranger District informs the monitoring unit of all burning planned for the next day. By 3:00 p.m. the same day the monitoring unit posts on the web site if any restrictions are to be in effect the following day. The Sandpoint Ranger District is able to access this information from the Internet directly.

Prescribed burning in the Sandpoint Ranger District typically occurs in the spring and fall 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 cutting operations.

**Cumulative Effects Analysis** - The cumulative effects analysis area for 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 within the project area would be from vehicle exhaust and road dust. Agricultural burning, other forest residue burning, and residential wood stove use could contribute smoke from areas outside the project area.

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, 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 could 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 Alternatives B, C, and D. The model showed that nearly 28 percent more PM 10 and PM 2.5 would be generated in a wildfire than would be generated by Alternative B or C. Comparing Alternative D to a wildfire using similar acreage, the model showed a wildfire producing nearly 20 percent more PM 10 and PM 2.5. The increase in emissions from a wildfire is due to more three-inch and larger material, branch wood, and foliage of the green timber that would be available to burn in a wildfire than under the action alternatives. This is displayed in table 14.

**Table 14. Estimated PM10 and PM2.5 Emissions (total tons per project)**

| Type of Emission | WILDFIRE*/ALT. B & C | WILDFIRE*/ALT. D |
|---|---|---|
| Total tons of PM10 | 248/181 | 52/42 |
| Total tons PM2.5 | 211/152 | 44/36 |
| Total tons | 459/333 | 96/78 |

**Simulated wildfire.*

### 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.

## *3.43c Effects Common to Alternatives B, C, and D*

### 1. Direct and Indirect Effects

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

All 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 the Class I airshed (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 (Acheson, Stanich and Story 2000). Table 14 displays the total amount of PM2.5 and PM10 that could be generated by all of the prescribed underburning and pile burning combined. Alternatives B and C would exceed the 100 tons of PM2.5 and PM10 per year if all burning activities were accomplished in the same year**.** However, to complete all slash reduction activities for a project of this size, it would typically take four to five years. Given this time frame for fuel activities, the annual expected air emissions would be roughly 60 to 80 tons per project per year, which is within the 100 tons mentioned above. Alternative D smoke emissions would be under the 100-ton emission level.

**a. Effects of Fuel Treatment Methods on Smoke Emissions**

See table 12 in the Fire and Fuels section for acres of fuels treatment. Non-fire treatments would not affect smoke emissions.

**Underburning**: 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 underburns are conducted during periods in the spring and fall when atmospheric conditions promote ventilation.

**Pile burning (machine or hand)*:*** 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 because pile burning increases combustion efficiency as much as 95 percent (Ward 1992).

## 2. Cumulative Effects

The West Gold 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 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.

**a. 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 China, 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.

**Future Salvage Opportunities** - A portion of the proposed project includes the potential for 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 be coordinated with the Montana/Idaho State Airshed Group.

### 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 coordinated with and monitored by the Idaho/Montana Airshed Group. The project meets the Clean Air Act and the EPA's Interim Air Quality Policy on Wildland and Prescribed Fires 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 (Idaho Forest Practices Act) requiring treatment of activity-created fuels to reduce the effects of burning on air quality.

# 3.5 Soils

## 3.51 Regulatory Framework

The regulatory framework providing direction for protecting a site's inherent capacity to grow vegetation comes from the following principal sources:

- *Multiple Use-Sustained Yield Act of 1960,*
- *National Forest Management Act of 1976 (NFMA),*
- *Code of Federal Regulations for Forest Planning (36 CFR 200.1),*
- *Forest Plan and Regional Soil Quality Standards (FSH 2509.18)*

The Multiple Use-Sustained Yield Act of 1960 directs the Forest Service to achieve and maintain outputs of various renewable resources in perpetuity without permanent impairment of the land's productivity. Section 6 of the NFMA charges the Secretary of Agriculture with ensuring research and continuous monitoring of each management system to safeguard the land's productivity. The Code of Federal Regulations for Forest Planning requires the Forest Service to measure effects of prescriptions, including "significant changes in land productivity" (Code of Federal Regulations 36 CFR Part 200, Section 1, 1987). To comply with requirements, the Chief of the Forest Service charged each Forest Service Region to develop soil quality standards for detecting soil disturbances indicating a loss in long-term productive potential. These standards and guidelines are built into Forest Plans.

Management direction in the IPNF Forest Plan (p. II-17) is to manage the soil resource to maintain long-term productivity. The objective is that management activities on forest lands will not significantly impair the long-term productivity of the soil or produce unacceptable levels of sedimentation resulting from soil erosion. Forest Plan standards (pp. II-32 and 33) include:

(1) Soil-disturbing management practices will strive to maintain at least 80 percent of the activity area in a condition of acceptable productivity potential for trees and other managed vegetation. Unacceptable productivity potential exists when soil has been detrimentally compacted, displaced, puddled, or severely burned as determined in the project analysis.

(2) Projects should strive to maintain sufficient large woody debris to maintain site productivity; and

(3) In the event of whole tree yarding, provisions for maintenance of sufficient nutrient capital should be made in the project analysis.

The Regional Soil Quality standards were revised in November 1999. As included in Forest Plan Standard (1) as discussed above, detrimental soil disturbance includes the effects of compaction, displacement, rutting, severe burning, surface erosion, loss of surface organic matter, and soil mass movement. The revised standard specifies that 85 percent of an activity area (i.e cutting unit) must have soil that is in satisfactory condition. In areas where more than 15 percent detrimental soil conditions exists from prior activities, the cumulative detrimental effects from project implementation and restoration should not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality. These standards do not apply to intensively developed sites such as mines, developed recreation sites, administrative sites, and permanent roads or landings.

These standards are based on the lowest magnitude of adverse change detectable, given the current monitoring technology (Powers 1990).

## 3.52 Affected Environment

### *3.52a Methodology*

The reference and current conditions of the soils in the project area were determined using landtype maps and landtype unit descriptions, information from the Pend Oreille Subbasin Geographic Assessment (USDA draft in progress), data from the Timber Stand Management Record System (TSMRS) and field surveys.

A more detailed description of the geomorphology, soils, erosion processes and soil productivity can be found in the draft soil map unit descriptions and a soil characterization for the Gold Creek portion of the Pend Oreille subbasin. These documents are included in the project file.

A systematic procedure was established to identify the existing condition of each stand proposed for treatment as it relates to soil quality standards. This procedure evaluated whether soils are at risk of not meeting standards due to being detrimentally disturbed or having low potassium content.

To determine whether soils have been detrimentally disturbed, records of past activities were queried from the TSMRS database and stands were field reviewed. To determine potassium-limited sites, a map of proposed project units was compared with a map of geologic formations to determine which units occurred on the low potassium geologic formations. A field review of some of these sites was conducted by the project silviculturist and the IPNF Forest Soil Scientist. All this information is located in the project file. *Potential for mass failure and sediment delivery to streams is addressed in the Watershed section.*

### *3.52b Characterization*

**Geology** - Both residual and continentally glaciated landscapes exist within the project area. Residual landscapes are characterized by moderate to high relief slopes with moderate to densely spaced draws. The drainage pattern is dominated by low- to mid-order drainages. Slopes are concave to straight at lower elevations and become convex with increasing elevation. Continentally glaciated landscapes are characterized by gentle toeslopes and moderately steep sideslopes perched just above Lake Pend Oreille.

Most of the residual part of the drainage is underlain by Precambrian Belt rock, primarily lower and upper Wallace formations. Siltite and quartzite are most common. There is also a small amount of Cambrian shale and quartzite and some Lakeview limestone. The lower substratum and surface bedrock are usually weakly weathered. The glaciated portion of the project area has glacial till substratum materials derived mostly from metasedimentary bedrock sources.

All of the residual and till soil material is covered with a layer of volcanic ash one to two feet thick. It is silty and has fewer rock fragments than the underlying subsoils and substratum. This material came from several of the Cascade volcanoes with most ash coming from Mt. Mazama (Crater Lake) in Oregon about 6,700 years ago.

Most of the soils in the area are forming in two different types of parent material. The soil is developing in volcanic ash and the subsoil and substratum are forming in residual quartzite or siltite parent materials, along with a small amount of shale and limestone; the till has the same parent material.

The major soils have volcanic ash-influenced loess surface layers 12 to 24 inches thick. These layers have a silt loam texture, less gravel and cobble than the underlying residual material, and a high water and nutrient holding capacity. The subsoil and substratum are forming in primarily quartzite or siltite that has a sand-loam to loam texture and 35 to 75 percent subsoil rock fragments. The permeability on most soils is good, except in some of the dissected glaciated soils and some residual draw bottoms and toeslopes where restrictive soil layers can restrict water movement.

According to the landtype descriptions in the project area, almost all proposed activity areas are located on landtypes that have a low potential for surface erosion and low and moderate potential for mass failure (see project file for maps and descriptions).

### *3.52c Reference Conditions*

#### 1. Soil Productivity

Soil productivity is the output of a specified plant or group of plants under a defined set of management practices, or total plant mass produced annually per unit area. The most productive part of the soil in the project area occurs near the surface at the contact between the forest litter and the mineral soil. Here the litter has been highly decomposed into dark colored amorphous material, which is the richest part of the soil. This layer is frequently only a few inches thick, but its presence is much more important than its thickness would indicate. This organic matter rich layer contains most of the soil nitrogen, potassium and mycorrhizae, which must be present for a site to be productive.

Below this organic horizon is volcanic ash, which occurs as the surface layer of the mineral soil. In north Idaho, the ash layer is typically 16 inches thick, ranging between 7 and 24 inches on most sites. The top part of the ash is usually enriched in organic matter, which also contributes nitrogen, potassium and mycorrhizae to this part of the soil. The lower part of the volcanic ash has less organic matter and is not as fertile as the upper part. The ash has a high water holding capacity and nutrient holding capacity, both of which are important for soil productivity.

Below the volcanic ash, the subsoils and substratum tend to be medium textured in the Belt Metasedimentary soils. These subsoil and substratum materials are very weakly weathered. They tend to have a high component of rock fragments, although this can be quite variable, particularly in the alluvial bottoms.

Most of the productivity of all project area soils is found near the soil surface. This is also the part of the soil that is most easily disturbed by management activities. Retaining large woody debris and organic matter is important to maintaining this productive layer (Graham et al. 1994).

**Activities That Can Cause Detrimentally Disturbed Soils** – The soils in an activity area are considered detrimentally disturbed when the following soil conditions exist as a result of Forest practices:

A. Detrimental displacement is the removal of 1 or more inches (in depth) of any surface soil horizon, usually the A horizon, from a continuous area greater than 100 square feet.

B. For volcanic ash-influenced surface soils, compaction results in a 20 percent or more increase in bulk density, or a 50 percent reduction in water infiltration rates. Soil compaction reduces the supply of air, water and nutrients to plants. Roading, ground-based yarding and dozer piling are the major contributors to compaction.

C. Severe fire consumes most woody debris and the entire duff and litter layer, exposing mineral soil. Burn ashes are white or reddish color, indicating that much of the carbon was oxidized by fire (Burned-Area Emergency Rehabilitation Handbook FSH 2509.13). Burns that create very high temperatures at the soil surface when surface soil moisture content is low result in almost complete loss of surface and upper soil horizon organics. Many of the nutrients stored in these organics can be lost to the atmosphere through volatilization and removed from the site in fly-ash (Garrison and Moore 1998).

**Loss of Potassium** - An important element in site productivity is potassium. Some preliminary research being done by the Intermountain Forest Tree Nutrition Cooperative (IFTNC) is showing a possible link between potassium deficiency and the lack of tree resistance to root disease; however, this correlation is an observation and has not been tested. On some sites 45 percent of the potassium is held in trees, with the remainder being held in subordinate vegetation, forest floor and soil pools. Within the trees, about 85 percent of the potassium is held in the branches, twigs and foliage (Garrison and Moore 1998). In most natural circumstances the potassium returns to the soil when the tree dies. If potassium is removed from the site, the loss is long-term. Unlike many other soil nutrients, potassium is derived almost entirely from the underlying rock formations. Some geological formations have been found to have a natural deficiency of potassium, including the Pritchard and Lower Wallace formations. The upper and lower Wallace formations are the dominant geologic types in the West Gold drainage. There is no Pritchard formation in the project area (geologic formations map, project file).

Whole tree yarding and removal of tree tops can lead to the direct loss of potassium (Morris and Miller 1994). The Intermountain Forest Tree Nutrition Cooperative is continuing to research potassium contents within tree species and different rock types in order to establish more definite minimum thresholds and effects on tree growth and resistance to root diseases. Until these minimum thresholds are developed through research, the Idaho Panhandle National Forests are using management recommendations from the IFTNC as a guideline for maintaining sufficient potassium on a site. During the winter of 2002, the Idaho Panhandle National Forests began doing tree foliar analysis in cooperation with the Cooperative in order to gather more information on forest potassium levels. Additional sampling is planned for the winter of 2003. Information gained from these samplings will be used to obtain baseline data pertaining to soil nutrient levels and tree growth and health.

The IFTNC has made the following management recommendations to retain the maximum possible amount of potassium on site after logging:

*A. Practice conventional removal (lop and scatter) rather than whole tree removal. The "lop and scatter" technique should be practiced during intermediate as well as final harvest operations.*
*B. Let slash remain on site over winter so mobile nutrients such as potassium can leach from fine materials back to the soil.*
*C. Light broadcast burn or underburn for release of potassium and other nutrients.*
*D. Avoid mechanical site preparation.*
*E. Plant species appropriate to site.*

These measures have been incorporated into the design and mitigation measures for soils (see Chapter II, Features Designed to Protect Soils and Site Productivity).

### *3.52d Existing Condition*

**Past Logging Activities** – To determine whether past activities occurred in proposed treatment areas, the TSMRS database was queried. The project silviculturist also visited and walked the majority of stands proposed for treatment and noted when past activity was evident. As a result of these investigations we found that only 6 acres of one 12-acre stand (623-02-042) had past logging activities consisting of tractor logging, piling and burning (project file). The remainder of the stand has not been logged. The TSMRS database showed 6 acres of grapple piling; however, at the site it appeared that slash was piled and burned on about two acres in corridors and that one-acre of dozer piling occurred at the landing site. Although other logging activities have occurred in the project area, this stand is the only one proposed for treatment where past logging has occurred.

In July of 2002, the forest soil scientist conducted random transects on the 6-acre previously logged area to determine the percent of detrimental disturbance. His investigations showed that

11% of the area was detrimentally disturbed from past activities and therefore meets soil quality standards (project files).

The remaining stands proposed for treatment within the project area either have not had past activities or there was minimal salvage harvest (mostly roadside) using skyline yarding with no substantial impacts (Sale Area Maps, District Files). Skyline logging systems have been shown to produce little to no (0-2%) detrimental impacts (Niehoff 2002, McIver and Starr 2000, pp.11-16).

**Existing Roads** - Existing roads constructed in the past that are designated as “classified” on the National Forest transportation system are considered “dedicated” lands. The loss of soil productivity on these sites was an irretrievable effect when the roads were constructed. There are about 28 miles of existing classified road in the project area.

**Potassium-Limited Sites** - The Forest Soil Scientist and the project silviculturist visited stands within the project area looking specifically for the relationship between potassium feldspar content and root disease problems. They found that most of the heavy root disease areas they reviewed occurred on weakly weathered argillite and carbonatic siltite rock types, or rock types on the low potassium portions of the Upper and Lower Wallace geologic formations (project file). Although some research indicates that there is a correlation between root disease occurrence and the Lower Wallace geologic formations (Garrison-Johnston, Moore and Niehoff 2001, pp.20-21), some of the more severe root disease in the project area is occurring in the Upper Wallace geologic formations (see map in project file) which is not as potassium deficient as the Lower Wallace formation. The recommendation that came from this field review was that all fine fuels (vegetation debris) should be allowed to over-winter (see Chapter II, Features Designed to Protect Soils and Site Productivity). This would enable most of the potassium to be leached out of the needles, twigs and small branches (Garrison and Moore 1998).

**Potential for Erosion and Mass Failure** – In the Idaho Panhandle National Forests, erosion and mass failures from logging are not as much a problem as it is from roads (Cacek 1989). In the West Gold drainage, most of the project area consists of landtypes with low to moderate mass failure potential and mostly low potential for surface erosion (table 15).

**Table 15. Percentages of high, moderate, and low mass failure and surface erosion potential in the project area.**

| Percent Mass Failure Potential | | | Percent Surface Erosion Potential | | |
|---|---|---|---|---|---|
| High | Moderate | Low | High | Moderate | Low |
| 2% | 31% | 67% | 0% | 2% | 98% |

Only one area with proposed activities (unit 6) is located on a landtype with high potential for mass failure and moderate potential for surface erosion (project file, Watershed section). Proposed activities in unit 6 consist of thinning using skyline-logging systems. As previously documented, skyline logging causes minimal soil disturbance. The thinning treatment would retain a fully stocked stand. Rooting strength and evapotranspiration from the site would be maintained (Swanston and Swanson 1976). For these reasons, no impacts to soils from an erosion and mass failure standpoint are anticipated anywhere in the project area due to logging systems. Therefore, there will be no further analysis in this section on these soil issues. *See the Watershed analysis for more detailed discussions about the effects of roads on erosion and mass failure.*

## 3.53 Environmental Consequences

### *3.53a Methodology*

This analysis includes potential effects from proposed logging systems, permanent and temporary roads, landings, and fuels treatments on soils. To determine whether proposed activities would detrimentally impact or have cumulative effects on soils, we used the IPNF Soil NEPA Analysis Process (Niehoff 2002). For each alternative, the detrimentally disturbed acres were calculated using coefficients based on past Forest soil monitoring data. This monitoring information is contained in Forest Plan Monitoring and Evaluation Reports and is summarized in the IPNF Soil NEPA Analysis Process. For direct and indirect effects, the calculations incorporated the acres and types of proposed logging, burning, and the acres of roads and landings constructed.

*Direct effects* on soils from proposed activities were measured by analyzing the effects of compaction, displacement, and severe burning on the soil surface, since this is the most productive layer and also the easiest layer to disturb through normal land use activities. The potential for these effects would result from the type of logging system and fuel treatments used, and the construction of roads and landings. Compaction, displacement and severe burning can affect soil physical, chemical and biological properties, which indirectly can affect the growth and health of trees and other plants. Compaction reduces soil permeability and infiltration, which can cause soil erosion. Displacement reduces plant growth where topsoil and organic matter are removed. Tractor, skyline, and helicopter logging systems are included in varying amounts for each action alternative (see figures 6, 7 and 8 in Appendix I). Roads and landings constructed that are to remain on the landscape for future use cause irretrievable effects on productivity as those lands become “dedicated” to the permanent transportation system. Those that are temporary (i.e. only needed for the project) and are planned for decommissioning have detrimental effects initially but rehabilitation efforts (subsoiling, recontouring) initiate a long-term recovery process.

Based on past monitoring efforts (Niehoff 2002), tractor logging prior to 1990 has had the most detrimental impacts to soils (between 24% and 42%). Since 1990, tractor-logging methods and recommended protection measures have decreased most detrimental impacts to an average of 13%, two percent less than the maximum allowable criteria established by regional guidelines. Helicopter and skyline logging systems tend to have between 0% and 2% detrimental effects (Niehoff 2002, McIver and Starr 2000, pp. 11-16). These logging systems have less impact than tractor systems because the equipment stays on the road, and the logs are partially suspended over the ground; impacts to soils in skyline logging result largely from the logs being dragged over the ground (Krag 1991, Seyedbagheri 1996 pp.7-9). Helicopter logging has minimal impacts as the logs are lifted into the air and transported to a landing site (Poff 1996, McIver and Starr 2000, pp. 11-16). The landing site, which consists of a cleared area averaging one acre in size, may be the most impactive part of helicopter logging since large trucks and equipment compact the ground as they process logs for transport.

Acres of detrimental disturbance were calculated by multiplying the acres of activity disturbance by the disturbance coefficient derived from monitoring reports. Coefficients used for proposed logging systems were:

| | |
|---|---|
| Tractor Logging | |
| With spring burning or grapple piling | 13% |
| With fall burning | 15% |
| Skyline and Aerial Logging | |
| With spring burning | 0% |
| With fall burning on south/southwest aspects | 2% |

Coefficients for road construction used 35-foot widths, which take into account a 14-foot wide surface, and cut and fill slope disturbance. Landing sites constructed along with road construction were accounted for in road calculations. Landing sites outside of proposed units were calculated at one acre each. Since these sites are along existing roads, they would become dedicated lands and cause irretrievable effects.

*Indirect effects* include the loss of site productivity due to removal of large woody debris and potassium. Large woody debris is essential for maintenance of sufficient microorganism populations. Research has indicated that potassium is an important element in site productivity. Mitigation measures were designed to meet the management of large woody debris and organic matter as detailed in the research guidelines contained in Graham et al. (1994). These recommendations emphasize tons/per acre and are not dependent on specific diameter size classes of material. On potassium limited sites, foliage and branches would be left over the winter to allow potassium to leach out of these materials (Garrison and Moore 1998). See Features Designed to Protect Soils and Site Productivity in Chapter II for all soil protection measures proposed.

*Cumulative effects* include the combination of direct and indirect effects with effects of past, present and reasonably foreseeable activities. Since direct and indirect effects from soils are measured within "activity areas," the cumulative effects analysis area for the soils resource consists of those activity areas proposed for soil-disturbing activities within the project area only where previous management activities have occurred. Existing roads and landings designated as "classified" on the National Forest transportation system are considered designated lands. The loss of soil productivity on these sites occurred when the roads and landings were constructed and was an irretrievable effect; therefore, these lands are not considered in cumulative effects.

## *3.53b Direct and Indirect Effects*

### 1. Effects Common to *All* Alternatives

**Risk of Lethal Wildfire** – Given the decades of fire suppression that have occurred in this watershed, the chance of a lethal fire occurring is high if a fire ignites in an untreated area in extreme, dry weather conditions. As stated in the Fire and Fuels section, the proposed vegetation and fuels treatments in this project would not necessarily prevent a lethal fire from occurring in the West Gold drainage, but it would increase our ability to suppress such a fire were it to ignite on treated acres. Vegetation and fuels treatments would also reduce the chance that a wildfire would have as severe an effect on the soils in treated areas as it would in untreated areas since there would be reduced tons per acre of fuels on these sites (see Fire and Fuels section).

If such a fire occurred that could not be safely suppressed, there would be a high potential for impacts to soils in areas of severe burning. These impacts would increase the risk of soil damage that would detrimentally reduce the productivity of the soil. Erosion increases following a fire are directly proportional to fire intensity (Megahan 1990, p. 146). Burn ashes are white or a reddish color, indicating that much of the carbon was oxidized by fire. Other effects would include the loss of organics, loss of nutrients, and a reduction of water infiltration (Wells et al. 1979, p. 26). Burns that create very high temperatures at the soil surface when surface soil moisture content is low result in almost complete loss of most woody debris and the entire duff and litter layer, exposing mineral soil. Many of the nutrients stored in these organics can be lost to the atmosphere through volatilization and removed from the site in fly-ash (DeBano 1991, pp. 152-153; Amaranthus et al. 1989, p. 48). A loss of potassium would occur through fly ash removal.

Overall, if a severe fire were to occur that caused hydrophobic soils, there would be moderate potential for surface erosion and low potential for mass failure throughout the project area because of its underlying landtypes. The primary risks for erosion and mass failure would be from roads, especially at stream crossings in the event of debris flows. These risks are discussed in more detail in the Watershed section. Following a severe fire, rehabilitation efforts to mitigate the fire's effects on erosion and sediment delivery would likely occur, substantially reducing potential negative effects.

### 2. Alternative A (No Action)

No direct effects to soils would occur in Alternative A as no road construction, logging, or fuels treatment would occur. There would be no compaction or displacement beyond existing levels. On existing roads, no change in use or management would occur in the foreseeable future.

The continued absence of fire would affect the structure, composition, and function of the soil resource (Landsberg 1992, p. 8). In terms of indirect effects, continuing mortality would continue to ensure sufficient nutrient capital by creating large downed wood. Potassium would stay on the site and be released to the soil through decomposition.

### 3. Effects Common to Alternatives B, C and D

Refer to figures 3 through 8 in Appendix I for maps of proposed activities and logging systems.

To reduce the impacts to soils, each alternative would protect soil productivity through the use of Soil and Water Conservation practices as outlined in the Soil and Water Conservation Practices (SWCP) Handbook FSH 2509.22. This handbook outlines Best Management Practices (BMPs) that protect the soil and water resources at a higher level than do existing Idaho Forest Practices rules and regulations, thereby incorporating all Idaho state standards. BMPs would have a moderate to high effectiveness in minimizing soil erosion (IDEQ 2001). Other BMPs would deal with seeding disturbed areas, limiting operations when soil moistures are high such as during the spring months, and conduct of logging. Specific BMPs and their effectiveness ratings are included in Appendix A.

Mitigation as specified in Chapter II, "Features Designed to Protect Soil and Site Productivity" would also be implemented as part of this alternative to ensure that activities are consistent with Forest and Regional guidelines in terms of soil compaction, displacement, and nutrient retention.

**Road Construction –** Alternative B proposes 3.0 miles of road construction, and Alternative D proposes 0.5 mile. This road construction would cause soil compaction and displacement and would cause some irreversible effects to site productivity (see "Irreversible and Irretrievable Commitment of Resources" later in this Chapter) due to the removal of topsoil. One 0.3-mile segment in Alternatives B and D would become permanent classified roads put into storage after use. The remaining roads proposed in Alternative B and D are temporary and would be decommissioned.

**Existing and Temporary Road Decommissioning** – In Alternatives B, C and D, 1.7 miles of existing roads would be decommissioned. In Alternative B, 2.7 miles of temporary road would be decommissioned. In Alternative D, 0.2 mile of temporary road would be decommissioned. Decommissioning would include ripping and recontouring the road prism, culvert removal, stabilizing fill slopes, restoring stream channel crossings back to natural grade where applicable, seeding, fertilizing, planting trees, and topping the areas with woody debris. This would begin to restore the soil productivity and hydrologic function on these road sites by decompacting the soil and replacing some of the topsoil that was buried under the road fills.

**Road Storage** – In Alternatives B and D, there are portions of new road and 1.7 miles of existing classified Road 2708A that would be put in storage after use for the project. Past monitoring shows that compaction and risks of erosion and sediment delivery would be reduced substantially while in storage (USDA 1999, p.38, USDA 2000 p. 34); however, this condition would only occur until these roads are needed for future management. Therefore, roads put into storage are considered dedicated lands with irretrievable effects.

**Road Maintenance** – No additional impacts to soil would occur from proposed road maintenance activities (blading, drainage improvement and surfacing) on existing roads, which are considered dedicated lands.

**New Motorized Vehicle Access on Roads 2707A and 2707AA** – As described in Chapter II, motorized vehicles less than 50 inches in width (Off-highway vehicles – OHVs) would be allowed on these roads during summer and fall months with the exception of elk hunting seasons and during soft roadbed conditions. These roads already allow winter snowmobile access. The size of vehicles allowed in non-winter months would be limited by redesigning the gates to have a section that could be opened just wide enough to fit vehicles 50 inches and less. This access would be restricted to occur when the road surface is driest to avoid potential road damage during wet periods. With these size restrictions and seasonal limitations, there should be no additional impacts to soils on these roads, which are considered dedicated lands.

**Vegetation Treatments** – This analysis assumes that all proposed activities would occur during non-winter conditions to show potential effects of activities when they would have the greatest potential for impact. Some units could be logged during winter months, and if so there would be reduced effects of compaction and displacement than that which was estimated in the analysis (Krag 1991, p.64).

Alternatives B and C propose regeneration cutting on 898 acres and selective cutting on 411 acres. Alternative D proposes selective cutting on 444 acres and regeneration cutting on 2 previously harvested acres. Three different logging systems are proposed to accomplish these activities (see table 1, Chapter II). Fuels treatments are proposed on all these acres, as well as one 29-acre area proposed for underburning only.

A direct effect of management actions, particularly in stands where multiple activities such as road and landing construction, fuels treatment, and tractor logging are planned, would be an increase in detrimental soil disturbances such as compaction and displacement. Using design and mitigation measures listed in "Features Designed to Protect Soil and Site Productivity" in Chapter II and data from past project monitoring (Niehoff 2002), detrimental impacts are predicted to be no more than 8 percent total in any proposed activity area under any of the action alternatives (see table 16 and project file). Within one activity area, the most detrimental disturbance would occur under Alternative B within unit 31, where there would be 30 acres of tractor logging with fall burning and some temporary road construction. On the 30 acres, detrimental disturbance is predicted to be 15 percent based on past monitoring (Niehoff 2002). However, the entire activity area is 232 acres in size and includes skyline and helicopter logging so the entire activity area impacts were calculated at 10 acres or 4 percent (table 16).

Minor disturbances would occur on skyline and helicopter-logged units and where fireline is constructed around units, but past monitoring shows these activities result in very little detrimental impacts (USDA 1991). Table 16 displays only those activity areas (units) that contain tractor logging combined with cable or aerial logging systems, road construction, fall burning or helicopter landings (or a combination of these) since these activities tend to have the highest amounts of detrimental impacts. Activity areas consisting solely of skyline and/or helicopter logging systems with spring burning and no road construction are not shown in table 16 since they have negligible detrimental impacts (0-2%). A complete list of units and their predicted disturbance is available for review in the soils section of the project file.

The helicopter landing sites shown in figures 6, 7 and 8 (Appendix I) are all *potential* locations. These were placed on each map for planning and analysis purposes; however, not all of these may be constructed. Where landings are located within a cutting unit, they were considered in the activity area calculations for detrimental impacts. Helicopter landing sites are estimated to impact about one acre of soils each. Disturbance on these sites due to compaction, displacement and pile burning would result in some irretrievable effects, meaning productivity would take a long time to be recovered but the effects are not irreversible. Landings associated with existing classified roads would become dedicated lands. These sites would be scarified and seeded after use. All non-dedicated landings would be stabilized with subsoiling to re-establish hydrologic function and revegetated to prevent erosion. These measures would help restore soil productivity in the long-term (Carr 1989).

Harvesting on all sites would remove, with each tree bole, about 14 percent of the potassium that is contained within a tree, which may have an indirect effect on some plants. The percentage of the existing tree boles that would be removed from within the proposed treatment units varies by the type of silvicultural prescription that is being proposed. A positive effect would occur when the foliage and branches of harvested Douglas-fir and trees are left to recycle on site, thereby releasing stored nutrients such as potassium and nitrogen back to the soil.

Douglas-fir consumes and stores more potassium than most other trees. The release and availability of this stored potassium would benefit larch and ponderosa pine, which require less potassium for growth and maintenance (Garrison and Moore 1998). These more potassium-efficient trees would be planted in all regeneration harvest units and retained within selective cutting units.

**Prescribed Burning and Slash Disposal** - Alternatives B and C propose 1,077 acres of underburning, 223 acres of limb and lop fuel treatments along with 28 acres of grapple piling and burning. Only 10 acres are proposed for yarding of tops. Yarding tops was necessary in those areas where underburning, lopping or grapple piling would not meet fuel management objectives. Alternative D proposes 225 acres of underburning, 223 acres of limb and lop fuel treatments along with 27 acres of grapple piling and burning. No tops would be yarded in Alternative D. Limiting burning to those times when surface soil moisture would be above 25 percent would reduce the potential for damage from hot burns (Niehoff 1985). To the extent feasible, all fuel treatments would retain the maximum possible amount of coarse woody debris and potassium on the site after logging consistent with the fuel treatment objectives of the site. All low potassium acres would meet the recommendations of the IFTNC.

The effects of yarding tops in Unit 25 (10 acres in size) could result in some loss of potassium with the potential of reducing site productivity, but measuring the effects on site productivity cannot be done with certainty until more research information becomes available. Since this stand is proposed for thinning, much of the biomass would be retained in the trees left on site.

In order to minimize potential potassium concentration in piled areas, slash would be allowed to remain on site over the winter prior to piling to allow nutrient leaching to take place. The grapple piled sites could end up with more fines removed (potassium) off some areas and concentrated primarily on skid trails for burning. Burn piles would be formed after the leaching process, and burned during cool, wet fall weather to mitigate potential soil damage.

As mentioned in the Fire and Fuels section, there is typically a time lag of one to two seasons from the completion of timber cutting activities and fuels reduction treatments. During this time there is increased risk of fire in the cured logging slash that is left on site. If a fire were to ignite in this slash in hot and dry conditions with low soil moistures, there could be impacts to soils in the form of severe burning.

**Conclusion -** Given that logging systems consist mostly of skyline and helicopter systems (see table 1, Chapter II), that design and mitigation measures would be used to keep detrimental impacts at low levels, that the amount of road construction is limited, and that most proposed roads would be decommissioned (see Chapter II, Features Designed to Protect Soil and Site Productivity), none of the areas where activities are proposed under any alternative are expected to exceed Forest Plan or Regional Soil Quality Standards. No activity areas are located on highly sensitive landtypes and detrimental disturbance from proposed activities is predicted to be no greater than 8%. In each alternative across all activity acres, impacts to soils would be less than 3 percent (see table 16).

## *3.53c Cumulative Effects*

### 1. Past Activities

The only proposed activity area where past activities have occurred is in Unit 30 (see Affected Environment section). After soil transects were conducted in this unit, it was determined that 11% of the former 6-acre previously tractor-logged area was in a detrimentally disturbed condition (project file). For these reasons, unit 30, which is only two acres in size, is proposed for helicopter yarding to avoid cumulative effects. By using the soil mitigation measures described in Chapter II and proposed helicopter yarding, there would be little if any change to the existing detrimental soil disturbance level and, therefore, no cumulative effects of proposed activities on soils.

**Table 16. Detrimental disturbance conditions for each alternative. Proposed units displayed are only those with existing detrimental conditions or proposed units that have activities that could cause detrimental effects of 2% or greater (for a complete list of units and their estimated disturbance values see the soils section of the project file).**

| Proposed Unit | Acres | | Alternative A (Existing Condition) | | Alternative B (Proposed Action) | | | Alternative C (No Road Construction) | | | Alternative D (Selective Cutting Only) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Alts B&C | Alt. D | Acres Detr. Disturbed Soil | Percent of Activity Area | Acres Detr. Disturbed Soil | Percent of Activity Area | Cumulative Effects | Acres Detr. Disturbed Soil | Percent of Activity Area | Cumulative Effects | Acres Detr. Disturbed Soil | Percent of Activity Area | Cumulative Effects |
| 19 | 21 | 27 | 0 | 0 | 2 | 8% | 0 | 2 | 8% | 0 | 2 | 8% | 0 |
| 23 | 116 | 0 | 0 | 0 | 6 | 5% | 0 | 2 | 2% | 0 | N/A | N/A | 0 |
| 24 | 101 | 0 | 0 | 0 | 2 | 2% | 0 | 0 | 0% | 0 | N/A | N/A | 0 |
| 27 | 116 | 0 | 0 | 0 | 2 | 2% | 0 | 2 | 2% | 0 | N/A | N/A | 0 |
| 29 | 13 | 0 | 0 | 0 | 0.3 | 2% | 0 | 0.3 | 2% | 0 | N/A | N/A | 0 |
| 30 | 2 | 2 | 0.2 | 11% | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0 |
| 31 | 232 | 0 | 0 | 0 | 10 | 4% | 0 | 5 | 2% | 0 | N/A | N/A | 0 |
| 32 | 14 | 14 | 0 | 0 | 0.5 | 3% | 0 | 0 | 0% | 0 | 0.5 | 3% | 0 |
| 33 | 7 | 7 | 0 | 0 | 0.1 | 2% | 0 | 0.1 | 2% | 0 | 0.1 | 2% | 0 |
| 34 | 4 | 0 | 0 | 0 | 0.5 | 8% | 0 | 0.5 | 8% | 0 | N/A | N/A | 0 |
| 1 acre landings outside activity areas | | | 0 | | 10 landings = 10 acres dedicated lands | | | 13 landings = 13 acres dedicated lands | | | 8 landings = 8 acres dedicated lands | | |
| TOTALS | | | Total Acres of Impacts=0 | | Total Acres of Impacts=33.4<br>Total Acres of Activity Areas=1,347<br>Total % Impacts in Activity Areas=2.5% | | | Total Acres of Impacts=24.9<br>Total Acres of Activity Areas=1,347<br>Total % Impacts in Activity Areas=1.8% | | | Total Acres of Impacts=10.6<br>Total Acres of Activity Areas=480<br>Total % Impacts in Activity Areas=2.2% | | |

#### 2. Ongoing and Reasonably Foreseeable Activities

The ongoing and reasonably foreseeable activities applicable to the soils analysis are fire suppression and native seeding. Helispots, existing roads, and the powerline corridor are all dedicated lands and uses. Firewood gathering and hunting are activities that have undetectable impacts to soils. Noxious weed treatment and timber stand improvement would not cause compaction, displacement or burning since these activities do not use large machinery or fire. Any future salvage opportunities would only occur using specified soil protection guidelines (see Chapter II, Future Salvage Opportunities).

**Fire Suppression –** Successful fire suppression activities would eliminate the chance of a severe wildfire that could have detrimental impacts to soil productivity. The ability to predict where fire suppression activities would occur is difficult. Light suppression activities, hand fireline construction and use of water or retardant would likely have little detrimental effects. Use of large machinery to construct fire breaks could have cumulative compaction and displacement effects if used in proposed treatment areas following project activities. However, the availability of existing roads and the steep topography of the landscape would likely limit the ability to use such equipment in many proposed treamtent areas.

**Native Seeding –** Native seeding on dry sites following prescribed burning would provide beneficial effects to soils by establishing vegetation quickly on the sites and would increase soil holding capabilities.

### *3.53d Consistency with the Forest Plan and other Regulatory Direction*

All alternatives would comply with Forest Plan Standards and Regional Soil Quality Standards (FSH 2509.18) related to detrimentally disturbed soils, maintaining or exceeding 85 percent of the area in a productive state. Soil disturbing management practices would not exceed 15 percent detrimental conditions and would maintain at least 85 percent of each activity area in a condition of acceptable productivity potential for trees and other managed vegetation. Large woody debris would follow the research guidelines of Graham et al. (1994) to insure the maintenance of site productivity. IFTNC guidelines would ensure the retention of the maximum amount of potassium on sites after treatments. As discussed in the cumulative effects section, no additional impacts to the previously tractor-logged area would occur that would cause Forest Plan or Regional Soil Quality standards to be exceeded.

# 3.6 Wildlife

## 3.61 Regulatory Framework

Regulatory direction applicable to the management of wildlife resources include the Endangered Species Act of 1973 (ESA) as amended, 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.

# 3.62 Affected Environment

## *3.62a Introduction*

Ecological disturbances resulting from either natural processes or human manipulation commonly alter landscape patterns and strongly influence wildlife populations. Disturbances that arise from physical processes (e.g. landslides, fire, insect and disease outbreaks) lay down the foundation for wildlife habitat and direct wildlife abundance and composition. Humans can alter these landscape patterns and create features such as roads, or they can alter the frequency, extent and magnitude of natural disturbances such as fire. Wildlife species will occupy their preferred niche on 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 follows 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 have a certain successional strategy. Some species are more suited to the early stages of forest succession where grasses, forbs and shrubs dominate the site, while others are better suited for the later stages of forest development (e.g. old growth). Other species have adapted to a wide array of vegetation patterns. Because species and their environments are dynamic, wildlife species will not necessarily persist indefinitely in some areas where they are found today.

## *3.62b Characterizations of Habitats*

As discussed in the Vegetation Section (Affected Environment) fire, insect and disease, and to a lesser extent, tree harvesting have been the major disturbances that have shaped the vegetation in the West Gold project area. Past fires left the vast majority of the landscape in the early succession phase of forest development (e.g. grass/forbs, brush). Since the fires of 1896 and 1934, the majority of the forested landscape has advanced toward the pole and immature size class with minor components of older forest types. The older forests are found on drier habitat types where lower intensity and more frequent fires have prompted the development of larger ponderosa and Douglas-fir. Some forest harvesting in the 1970s and 80s altered the spatial pattern of the landscape, reverting harvested areas to earlier stages of forest development.

The Gold Creek watershed is characterized by mostly moderate to high relief slopes with relatively densely spaced drainage patterns (56% of the watershed consists of slopes > 40 percent). Large portions of these slopes are covered with intermediate size conifers stands dominated by shorter-lived species such as Douglas-fir and grand fir. The predominance of these species has created homogenous stands that are highly susceptible to epidemic levels of insect and disease.

The West Gold project area is situated in the Lakeface zone of the Pend Oreille subbasin. Of the five ecologic zones within the Pend Oreille Lake subbasin, the Lakeface Zone has a high percentage of dry habitats (USDA draft in progress). This characterization emphasizes the value of dry habitats within the West Gold area and the importance of maintaining and restoring these habitats for species that use them (e.g. flammulated owl, white-headed woodpecker, pygmy nuthatches).

## 3.62c Methodology

### 1. Species Screen

The combination of the various vegetation types and other environmental components in and around the project area provide habitat for an assortment of wildlife species. To facilitate the management of all wildlife species associated with the project area, the Idaho Panhandle National Forests selected a number of species to help 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 impacts be discussed in proportion to their significance. Some wildlife issues require a detailed analysis/discussion to determine effects on a particular species. Other issues may either not be impacted or impacted at a level that does not increase risk to the species. Some issues can be adequately mitigated through altering the design of the project. Generally, these issues do not require a detailed discussion and analysis.

Table 17 displays Forest MIS and other focal species, and the level of analysis for each species.

Forest Service policy (FSM 2670) requires a documented review (Biological Assessment) of Forest Service programs or 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 Appendix K. The documentation of effects and rationale for conclusions for Sensitive species are consolidated into the main text of this EIS and the project file (USDA 1995b). A summary of the conclusion of effects for all MIS can be found in Appendix K.

## 3.62d Species Habitats and Requirements

This section includes a brief discussion of the species habitat preferences and requirements based on scientific literature and information from site-specific information. 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.

### 1. Flammulated Owl

Flammulated owls are seasonal migrants to the northern latitudes during 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 (1992) noted a stronger correlation between prey availability and this cover type than with other common western conifers.

**Table 17. 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*) | ✓ | | |

### a. Reference Condition

The Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin (Quigley and Arbelbide 1997) revealed that the amount of single strata, interior ponderosa pine forests that have been maintained by frequent, low-intensity fires have declined by approximately 80 percent from historic conditions to present. Accordingly, species associated with this community, such as the white-headed woodpecker and the flammulated owl, have declined in abundance.

While no population numbers exist for the historic presence of flammulated owls, inferences can be made when comparing the historical occurrence of ponderosa pine with current levels. Based on historic vegetation estimates, ponderosa pine comprised 11 percent of the National Forests lands within the Pend Oreille sub-basin. Today, only 2 percent of these lands consist of sites that are predominately ponderosa pine (USDA draft in progress). This is a 80 percent change from historic conditions. Therefore, flammulated owls were probably more abundant in the past than they are today.

### b. Current Conditions

Twenty-six percent of the West Gold watershed represents drier forest habitats associated with flammulated owls. These drier habitats tend to produce older, single strata ponderosa pine/Douglas-fir communities, which in turn provide the necessary habitat attributes for flammulated owls.

However, similar to the findings in Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin, fire suppression policies have allowed the natural advance of vegetation change through time, causing a decline in habitat conditions for flammulated owls. Forest stands that were mostly dominated by low densities of ponderosa pine and Douglas-fir trees, have given way to more shade tolerant species, leaving a forest that is highly vulnerable to drought stress, insect and disease infestations, and high-intensity fires (Clark and Sampson 1995). Historically, fire and other disturbances intervened to rein in the advances of succession, producing healthier forests and more stable habitats for wildlife.

In July 2000, presence surveys were conducted for flammulated owls. Surveys focused on areas that were likely to support flammulated owls based on habitat suitability. The results of surveys identified flammulated owl vocalizations at two different points along a ridge system that separates the West Gold drainage from Lake Pend Oreille (project file), an area not proposed for treatment. Nevertheless, surveys did confirm the presence of flammulated owls within the project area, affirming the objective to manage for flammulated owl habitat in the West Gold drainage.

## 2. Black-backed woodpeckers

Snags, or standing dead trees, are vital components of the forest ecosystem. In the Interior Columbia River basin they provide habitat for more than 80 species of birds, mammals, reptiles, and amphibians and play a critical function in long-term site productivity (Bull et al. 1997). Many forest-dwelling animals use these structures for nesting, foraging, denning and roosting.

Most notable users of this habitat are primary excavators, such as black-backed woodpeckers and pileated woodpeckers, which create cavities in decaying wood of standing trees. These cavities are subsequently used by other wildlife species once the primary excavators have abandoned them

(Bull et al. 1997). Fallen snags or dead and down woody material have important ecological functions including nutrient cycling, nitrogen fixation, and wildlife habitat.

Black-backed woodpeckers are nearly restricted to early post-fire habitat (Hutto 1995). They are uncommon, year-round residents of coniferous forests where they naturally occur at low population levels. They experience local population increases and temporary range extensions resulting from fire or insect and disease outbreaks that increase populations of wood-boring insects. Black-backed woodpeckers typically select smaller trees with light to medium decay for nesting. The availability of habitat for this species is negatively affected by the prevention of stand-replacing fires, and post-fire salvage harvesting (Hutto 1995).

**a. Reference Condition**

Historically, ecosystems in north Idaho were shaped by disturbance patterns that altered the size and distribution of forest structure 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 vary across the landscape, from areas with low densities to other areas with high densities.

Snag habitat associated with the West Gold project area has been strongly influenced by fire and the subsequent changes in vegetation composition. The severe fires of the 1800s left much of the landscape in the early stages of forest development. A large lethal and mixed-severity fire in the 1850s probably left a lot of snags across the landscape. This change in condition likely increased, temporarily, 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 vegetation change. Because most snags generally do not persist long after a catastrophic fire, black-backed woodpecker populations probably dispersed from the burn areas within several years following the fire. Morrison and Raphael (1993) found that snags created by fire fell sooner than non-fire-created snags. Burning at their base probably weakens snags created by fire. Also, snags in large burned areas are directly exposed to wind, causing them to fall sooner than snags surrounded by live trees. In addition, the large-scale fires of 1896 and 1934 consumed most of the remaining snags on the landscape.

**b. Current Condition**

While there have been no observations of black-backed woodpeckers in the project area, some suitable habitat does exist. Although black-backed woodpeckers are primarily a post-fire obligate species, pockets of root disease have created an abundance of snags in localized areas.

Fire exclusion and the introduction of white pine blister rust have laid the foundation for today's vegetation patterns and habitat conditions for black-backed woodpeckers. There are few large snags available in the project area because of the past fires mentioned above. Remnant western larch and ponderosa pine snags are scarce throughout the project area due to the continual decline in the presence of these species. In more recent times, snag habitat has declined in areas where timber harvesting, road construction and firewood gathering from roadsides occur.

The change in dominance of tree species to Douglas-fir and grand fir have increased the prevalence of insect and disease (e.g. root disease, Douglas-fir bark beetle), resulting in higher levels of tree mortality. In root disease pockets and areas infected with the Douglas-fir bark beetle, higher levels of snags are present. However, these snags are generally small and degenerate more quickly than snags from longer-lived, healthy trees. More shade-tolerant Douglas-fir trees replace these dead trees and in time, perpetuate the cycle of disease, creating snags in the smaller size classes. Consequently, small diameter snags (<12 inches) are relatively abundant in the West Gold watershed.

### 3. Pileated Woodpecker

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 represents a wider ecological range of forest age structure, 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 they need large dead trees for nesting and dead woody material (standing and down) for foraging (Bull et al. 1990). They have specific requirements for nesting, which consist of large trees in relatively uncut stands for nesting purposes. Nest cavities are usually located more than 30 feet above the ground, at a level with the canopy of the surrounding forest (Warren 1990).

#### a. Reference Condition

As discussed previously in the black-backed woodpecker section, snag habitat within the project area has been strongly influenced by vegetation succession and natural fire events. Most of the snags created by past wildfires have yielded to repeated lethal fires or have since fallen. Since the 1930s, the landscape has progressed and is dominated by 80-90 year-old trees. Consequently, there is only a small amount of old growth and few large-diameter snags associated with the project area. Remnant western larch and ponderosa pine snags occur infrequently throughout the project area.

#### b. Current Condition

The change in species composition resulting from white pine blister rust and fire exclusion, has slowly and methodically replaced such species as ponderosa pine, white pine and western larch, trending stands toward smaller and younger size classes. Consequently, snag production is shifting from the larger, longer-lived species to the smaller, shorter-lived species. This condition is affecting the long-term stability and persistence of large snag habitat in the West Gold area. Consequently, the habitat is in decline for species associated with large snags, such as the pileated woodpecker.

### 4. 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 in the watershed because of their high social, cultural, and economic importance.

**a. Reference condition**

Early records indicate that Rocky Mountain elk occurred throughout most of Idaho. However, large herds were apparently absent from the narrow, northern portion of the State (Thomas and Toweill 1982). With the discovery of gold in Pierce, Idaho in 1860, and the subsequent settlement and exploitation, elk numbers were reduced to a few isolated herds in the State. A translocation program was initiated in 1915 and proceded through 1946. In 1938 the Bonner Sports Association (today Bonner County Sportsmen's Association) received a shipment of elk from Yellowstone National Park to restock areas in northern Idaho. Today, elk populations exceed their distribution and population levels of a century ago (Thomas and Toweill 1982).

Beginning in the 1970s, accelerated timber harvest and associated road building have 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 (USDI and USDA 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.

**b. Current Condition**

Although elk populations are generally higher today than 100 years ago, high open road densities have increased elk vulnerability to hunting loss and have led to over-harvesting of some local populations. The heavy losses experienced during the winter of 1996/1997 have further stressed the importance to manage low road densities.

The West Gold project area lies within Game Management Unit 4A. Idaho Department of Fish and Game's elk management objective for unit 4A and other game management units is to recover elk populations, which experienced heavy losses during the 1996-97 winter season. Since that time, recovery has been slow. According to Cole (2000), the 1999 elk rifle season had the lowest hunter success on record. Therefore, maintaining low road densities in the West Gold sub-drainage would support the recovery of elk populations in Game Management Unit 4A.

### 5. Forest Land Birds

**a. Reference Condition**

Hejl (1994) acknowledges that while we do not know all of the specifics of bird-habitat relations, we do understand many principles that would help maintain a healthy forest for most bird species: encourage old-growth characteristics, leave snags and replacement trees, leave or plant the natural diversity of trees found in the area, burn and allow fires to happen in a manner similar to natural fire regimes, and mimic 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 will capitalize on 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 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).

**b. Current Condition**

Large scale fires of the 1800s that reburned in the early 1900s, in combination with fire suppression and the introduction of blister rust, have led to today's vegetative conditions. Today, the vast major of the West Gold drainage is a homogeneous landscape dominated by Douglas-fir. Due to this uniform setting, the landscape lacks the vegetative species and structural diversity to attract a wide array of forest land birds. No single forest condition or structural type will benefit all species. Providing a mosaic of habitat conditions containing a variety of habitat components or niches will maximize habitat values for forest birds.

## *3.62e Species Not Analyzed Further*

### 1. Gray Wolf

Wolves are highly social animals requiring large areas to roam and feed. Conservation requirements for wolf populations are not fully understood, but the availability of prey and reducing risk of human-caused mortality are considered key components (USDI 1987, Tucker et al. 1990). The risk of human-caused mortality can be directly related to the density and distribution of open roads.

**a. Reference Condition**

The northern Rocky Mountain wolf (a subspecies of the gray wolf) was listed as Endangered in 1973. However, based on enforcement problems and a trend to recognize fewer subspecies of wolves, the entire species was listed as Endangered throughout the entire lower 48 states, except Minnesota, in 1978 (USDI 1987). In the past, substantial declines in numbers of wolves resulted from control efforts to reduce livestock and big game depredations. By the 1940s, the Rocky Mountain wolf was essentially eradicated from its range.

In 1994, final rules in the Federal register made a distinction between wolves that occur north of Interstate 90 and wolves that occur south of Interstate 90, in Idaho. Gray wolves occurring north of Interstate 90 are listed as endangered species and receive full protection in accordance with provisions of the Endangered Species Act. Gray wolves occurring south of Interstate 90 are listed as part of a nonessential, experimental population with special regulations defining their protection and management.

**b. Existing Condition**

The West Gold project occurs north of Interstate 90. The project area lies within the northwest Montana Recovery Area (Mack and Laudon 1998). Occasional sightings have been reported on National Forest lands. However, there have been no recent sightings (within five years) reported in the vicinity of the project area. Sightings in north Idaho thus far seem to indicate transient individuals or lone wolves, detached from a resident pack. There is no evidence of resident wolf packs (i.e. lack of sightings or observations of reproduction, den sites and rendezvous sites) in the area.

Wolves feed mostly on ungulates. The project area supports primarily elk as potential prey. Although no specific population numbers are available, elk are common enough to provide an ample food supply for the occasional wolf that may visit the area. The action alternatives, to varying degrees, would improve habitat conditions for elk by promoting a more diverse, less uniform landscape. Also, the project would decommission about two miles of road, thereby reducing road densities and decreasing potential risk to wolves.

Given that there have been no recent sightings or evidence reported within the last five years in proximity to the proposed action area and that there is no evidence of resident wolves or packs in north Idaho, the West Gold project is not expected affect wolves directly, indirectly or cumulatively. Therefore, no further analysis and discussion is warranted.

### 2. Harlequin Duck

Harlequin ducks are sea ducks that migrate to mountain streams for breeding. They are classified as sensitive species in the Northern Region of the Forest Service and are on the sensitive species list for the Idaho Panhandle National Forests (USDA 1999b). Their breeding habitat consists of clear, low gradient, mountain streams (2nd order or larger) with rocky substrates and riparian bank vegetation. Potential threats to harlequin ducks include activities or disturbances that affect water quality, water yield, riparian habitat and seclusion or isolation (Cassirer et al. 1996).

#### a. Reference Condition

A map from the Boise Meridian surveys of the early 1900s shows Gold Creek intermittent above the confluence with West Gold Creek (see Aquatic Environment). Consequently, it is inconclusive whether harlequin duck habitat was much different than it is today.

#### b. Current Condition

Gold Creek is considered a "bellwether" stream in northern Idaho and northeastern Washington because it helps depict the breeding range for harlequin ducks throughout northern Idaho and has had consistent duck observations (Cassirer 1995). Recorded observations of harlequin ducks in the watershed have occurred in Gold Creek and West Gold Creek. There are no known occurrences in Kick Bush Gulch, a tributary to lower Gold Creek.

Currently, suitable harlequin duck habitat extends from Lake Pend Oreille up Gold Creek to its confluence with West Gold Creek, and into the lower reaches of West Gold Creek. The Gold Creek Ecosystem Assessment (USDA 2002) stated, “no significant natural and human-related disturbances have fundamentally altered the stream channel or erosion processes to a degree that would affect the ability of West Gold or Lower Gold Creek to achieve reference conditions.”

Mining activity has altered water quality characteristics (through increases in heavy metal concentrations) of Upper Gold Creek and Chloride Gulch. However, watershed conditions are being met further downstream within these drainages and in West Gold Creek (see *Water Quality* section, Gold Creek EAWS [USDA 2002]). Consequently, harlequin duck habitat is fully functional at this time.

Applying Best Management practices and Inland Native Fish Strategy (INFS) protection measures would protect and maintain riparian habitat that occurs along West Gold Creek and its tributaries (see Design Criteria and Mitigation Section, Chapter II-18, 19). In addition, implementing features designed to protect harlequin duck habitat would screen breeding populations from possible disturbances (see Design Criteria and Mitigation Section, Chapter II-22). For these reasons, the West Gold project is not expected to impact harlequin ducks or their habitat. Therefore, no further analysis and discussion is warranted.

### 3. Northern Goshawk

The northern goshawk is a forest habitat generalist that uses a wide variety of forest age classes, 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) having moderate to high tree densities and occurring on the lower one-third or bottom of the slope (Hayward and Escano 1989, Warren 1990; Reynolds et al.1991; Graham et al. 1999). Foraging habitat includes a wider range of forest age classes and structures that provide a relatively open forest environment for unimpeded movement or flight through the understory.

#### a. Reference Condition

Fires in the late 1800s and early 1900s have also played an important role in shaping and fashioning habitat for goshawks in the West Gold area. These fires burned over much of the area, removing most of the suitable nesting habitat for goshawks and leaving the landscape in the early successional stages of development. Since this time, fire exclusion and the introduction of white pine blister rust have laid the foundation for today's vegetation patterns.

#### b. Current Conditions

White pine blister rust and fire exclusion have changed the species composition of stands within the West Gold project area. Today's landscape contains only remnant examples 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. This change in dominance has increased the forest's vulnerability to drought stress, insect and disease infestations, and large, stand-replacing fires. This has resulted in unusually high levels of tree mortality, affecting stand structure and subsequent habitat suitability for goshawks.

Controlling wildfires since the early 1900s has also reduced the age class diversity on the landscape. 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. However, in the absence of a disturbance, the 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 suitable habitat in the project area. No goshawks were observed or heard during these surveys (see project file).

Because the Gold Creek watershed is characterized by mostly moderate to high relief slopes with a relatively high percent of drier habitats, goshawk habitat is somewhat marginal. Goshawk habitat was evaluated using a habitat suitability model derived from data in the Forest timber stand database (TSMRS).

This evaluation identified only 120 acres of suitable nesting habitat scattered throughout the analysis area and mostly outside treatment areas. Although 33 acres fall within treatment areas, these acres are high on the slope and scheduled for selective cutting. Selective cutting would sustain forest structure that is compatible with suitable goshawk nesting habitat. Most of the unsuitable, but capable habitat (as defined in the Environmental Consequences section) resides on the lower profile of slopes and is unaffected by the proposed actions. For this reasons the proposed actions would not impact the Northern goshawk. No further discussion or analysis is necessary.

### 4. White-headed Woodpecker

The white-headed woodpecker is restricted to drier forest types dominated by pine trees in the mountains of far western North America. Abundance appears to decrease north of California. They are generally uncommon or rare in Washington and Idaho and quite rare in British Columbia.

Modern forestry practices including clearcutting, snag removal and fire suppression have fragmented the forest and contributed to local declines of the species, particularly north of California (Garrett et al. 1996). However, this species persists in burned or cutover forests with residual snags and stumps; thus populations are more tolerant of disturbance than those species associated with closed-canopy forests (Raphael et al. 1987).

Because of habitat similarities with flammulated owl, the white-headed woodpecker would be treated as a guild with flammulated owl. The effects on white-headed woodpeckers are represented by the effects analysis for flammulated owls (see Environmental Consequences section).

### 5. Coeur d'Alene Salamander

Coeur d'Alene salamanders are found in scattered locations through the Idaho Panhandle National Forests associated with three types of select habitats: seeps and springs, waterfall spray zones, and streams edges. Coeur d'Alene salamanders are usually found above ground at night during moist weather in the spring and fall and retreat into the narrow spaces between fractured rocks to avoid drying out in the summer and freezing in the winter.

There are no known occurrences of Coeur d’Alene salamanders within the West Gold drainage. Although suitable salamander habitat may be present (live stream edges) within the planning area, impacts to these areas would be avoided through treatment area design and application of INFS standards. Therefore, the West Gold project would have no impact on the Coeur d'Alene salamander. No further analysis and discussion is necessary.

### 6. Northern Leopard Frog

Northern leopard frogs are typically found in and adjacent to permanent slow moving water or standing water (Maxell 2000). Leopard frogs apparently require moderately high grove cover for concealment because this species attaches its eggs to aquatic vegetation. It prefers ponds or lakeshores, which have fairly dense aquatic and emergent vegetation during the spring egg-laying season. Adults of this species overwinter on the bottom surface of permanent water bodies, under rubble in streams, or in underground crevices that do not freeze (USDA 2000b).

#### a. Reference Condition

Within the last twenty years northern leopard frog populations have declined or have been extirpated from large portions of its range. Suggested causes for declines in Northern leopard frog populations include the loss of wetlands and natural hydrological regimes, the introduction of predators, the application of pesticides and herbicides, and drought. More recently the chytrid fungus (*Batrachochytrium dnedrobatisis)* may be responsible for declines in amphibians in western United States (Maxell 2000).

**b. Current Condition**

While there are no known records or observations of Northern leopard frogs within the West Gold drainage, limited habitat may be available. Based on the National wetland inventory maps, the only possible habitat is riverine or standing water and moist vegetation associated with West Gold Creek and its tributaries. There are no ponds or lakes found in the West Gold drainage. The Inland Native Fish Strategy guidelines (INFS) and Best Management Practices (BMPs) are intended to protect the integrity of wetlands and other riparian habitat areas from sedimentation, habitat modification, changes in natural hydrological regimes and other possible impacts. Because of these protection measures, the proposed actions would have no impact to the Northern leopard frog or its habitat. Therefore, no further analysis and discussion is warranted.

## 7. Boreal Toad

Boreal toads are found in a wide variety of habitats including wetlands, forests, and floodplains in the mountains and mountain valleys. Breeding takes place from May to July in shallow areas of large and small lakes, beaver ponds, temporary ponds, slow moving streams, and backwater channels of rivers. After a brief spring breeding season, adult toads leave aquatic habitats and travel to a variety of upland habitats. Adults and juveniles overwinter and shelter in underground caverns, or more commonly in rodent burrows. Adults may move more than four kilometers away from water after breeding and can remain away from surface water for relatively long periods of time. Juveniles may disperse up to or more than four kilometers from their natal sites (Maxell 2000). As a result of these findings, the Northern Region Regional Forester listed the boreal toad as a sensitive species.

**a. Reference Condition**

Survey results combined with incidental observations indicate that this species is found throughout much of northern Idaho. While toads may be found widespread across the landscape, it is unknown in what proportion of suitable habitat they occur. Surveys conducted in the northern Rocky Mountains in the 1990s revealed that toads were absent from a large portion of their historic range and, although they were considered widespread across the landscape, they occupied only a small proportion of suitable habitat (Maxell 2000).

**b. Current Condition**

The primary risk factor for toads is loss of breeding habitat. While there are no known records or observations of boreal toads within the West Gold drainage, limited habitat is available. The proposed treatment areas in the West Gold project do not provide breeding habitat, although toads may breed in the meandering portions of West Gold Creek. Implementation of INFISH and BMPs would prevent impacts to this habitat. In addition, the proposed actions are not expected to alter any non-breeding habitat used by boreal toads since this species uses a variety of upland habitat types. For these reasons, the West Gold project is not expected to impact boreal toads or their habitat. Therefore, no further analysis and discussion is warranted.

#### 8. White-tailed Deer

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

Climatic factors affect the seasonal variation of forage quality and quantity, accessibility to foraging areas and the energetic requirements to the animal (Pfingsten 1983). 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.

**a. Reference Condition**

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 rebounded to a point where they are 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.

**b. Current Condition**

The West Gold Creek project area is located outside recognized critical winter range boundaries. Critical winter range is generally found at lower slopes and on valley floors below 3,000 feet where conditions (i.e. snow accumulations) are moderate enough to sustain white-tailed deer populations.

White-tailed deer habitat within the project area consists of transitory and summer range. These habitats depict closed forest, open forest, created openings and riparian stream bottoms. Since the proposed actions are not located within crucial winter habitat and white-tailed deer are prospering in north Idaho, the West Gold project is not expected to impact white-tailed deer. Therefore, no further analysis and discussion is necessary.

## 3.63 Environmental Consequences

### *3.63a 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.

### *3.63b Methodology*

**Cumulative Effects Analysis** - The cumulative effects analysis for alternatives is the aggregate of all past, present, ongoing and reasonably foreseeable future actions, regardless of the source.

Relevant past, present, ongoing and foreseeable future actions considered in the cumulative effects analysis for each species are described in each effects analysis.

The appropriate scale or geographic bounds for a cumulative effects analysis relates to an area that would be affected by the proposed action or reasonable alternative. This area is referred to as the cumulative effects analysis area and may vary between resources. Determining this area for wildlife depends upon a species' relative home range size in relation to its available habitat, topographic features that influence how a species move and utilize their home range (e.g. watershed boundaries), and boundaries that represent the point of diminishing potential effects (table 18).

Past actions and events have shaped the forest vegetation and provide the baseline conditions for analyzing effects of proposed activities on habitat. This is especially true for the habitat suitability models (i.e. flammulated owl, Rocky Mountain elk) that incorporate the changes in vegetation resulting from disturbance and succession into analysis. Therefore, the cumulative effects discussion for wildlife species habitats will focus on the incremental changes that may occur from ongoing and reasonably foreseeable actions.

**Table 18. Project impact zones for species analyzed.**

| Species Analyzed | Cumulative Effects Area |
|---|---|
| Flammulated Owl | West Gold sub-watershed |
| Black-backed woodpecker | West Gold sub-watershed |
| Pileated Woodpecker | West Gold sub-watershed |
| Rocky Mt. Elk | Elk Analysis Area (EAA) |

**Analysis Indicators for Selected Species** - Table 19 displays the issue indicators that will be used to measure effects on selected wildlife species and their habitats. Indicators for each species may vary and are based on those factors that could result in measurable adverse or beneficial effects. 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). The changes in suitable habitat for each relevant species are disclosed and a discussion of the effects on species is displayed in this Section.

**Table 19. Wildlife issue indicators used to measure effects**

| Species | Indicator |
|---|---|
| Flammulated owl | ▪ Trend in habitat suitability |
| Black-backed woodpecker | ▪ Changes in distribution and quality of snag habitat |
| Pileated woodpecker | ▪ Changes to large snag habitat |
| Rocky Mountain Elk | ▪ Changes in elk habitat effectiveness |

An important concept in discussing habitat suitability is the distinction between *capable habitat* and *suitable habitat*. Capable habitat refers to the inherent potential of a site to produce the necessary biotic and abiotic 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.

## *3.63c Flammulated Owl*

### a. 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 (see stand condition field notes, project file). Modeling rules and assumptions can also be found in the project file. The potential effects on the flammulated owl and its habitat were determined by predicting the change in habitat suitability that would result from each alternative. The following assumptions and/or research findings were used to aid in the assessment of effects:

Flammulated owls are associated with late successional ponderosa pine and Douglas fir forests. Reynolds and Linkhart (1992) reported that all published North American records of nesting, except one, came from forests in which ponderosa pine was at least present, if not dominant.

### b. Alternative A

**Direct and Indirect Effects** - The analysis area encompasses 4,543 acres. Of these acres, 1,187 acres (26 percent of the analysis area) are classified as capable habitat for the flammulated owl. Currently, there are only 145 acres of capable habitat that meet suitable habitat conditions. The lack of suitable habitat is due mostly to the relatively young age of stands.

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. There would be a continued shift toward more shade-tolerant species in the majority of the stands. Forest encroachment that historically would have been held in check by fire would continue to proliferate and crowd out remaining open stands of ponderosa pine and Douglas-fir. Douglas-fir trees would continue to be recycled through disease-prone stands, creating a scenario that would discourage the development of more open, older forests of ponderosa pine and Douglas-fir. Consequently, habitat suitability for flammulated owls would decline.

Without management intervention, the dry habitats in the Gold Creek Watershed would continue to decline. High fuel accumulations resulting from fallen trees would lead to a higher risk of stand-replacing fires. If a stand-replacing fire were to occur, it would take about 100 years for successional processes to restore habitat which would be similar to today’s condition due to continued fire suppression and subsequent dominance of shorter-lived, shade-tolerant species.

**Cumulative Effects** - Cumulatively, Alternative A would not impact flammulated owls because it does not propose any actions or activities that would alter habitat conditions.

### c. Alternatives B and C

**Direct and Indirect Effects** - Because Alternatives B and C differ only by logging 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 this analysis.

Alternatives B and C would affect 373 acres or 31 percent of the capable flammulated owl habitat, including 7 acres of suitable habitat; 814 acres would be unaffected.

Because of the high incidence of insect and disease associated with high-risk stands (stands with a high component of Douglas-fir that are at high risk of mortality), there is the expectation that these stands would lose sufficient forest structure, composition and/or density to maintain suitable habitat conditions for flammulated owls. All regeneration vegetation treatments that fall within capable flammulated owl habitat are characterized as high risk stands (190 acres).

Converting these high-risk stands through regeneration cutting methods would alter species composition and favor the longer lived, more disease resistance species like ponderosa pine. This activity would promote the restoration of more open grown, older forests of ponderosa pine/Douglas-fir on these sites and lead to long-term habitat stability for flammulated owls.

Alternatives B and C also propose treating 183 acres of capable habitat using selective cutting, including 7 acres of currently suitable habitat. This technique would remove trees in areas where there is the opportunity to maintain or enhance the growth of ponderosa pine, or move the stands toward desired structural stages. Trees removed would generally be smaller and less dominant in the stand and species not desired for future species composition. Therefore, treatments associated with selective cutting would tend to move stands toward meeting desired habitat conditions for flammulated owls.

This analysis recognizes that active management through regeneration and selective tree cutting can help restore natural processes in an ecological system. Although some stands have lost or are losing sufficient forest structure to maintain habitat suitability, proposed actions would lead to long-term stability of habitat for flammulated owls.

### d. Alternative D

**Direct and Indirect Effects** - Alternative D would affect 171 acres or 14 percent of the capable flammulated owl habitat, including 7 acres of suitable habitat; 1,016 acres would be unaffected. Most treated acres (except for 2 acres) use selective cutting prescriptions. As discussed for Alternatives B and C, treatments associated with selective cutting would trend stands toward meeting desired habitat conditions for flammulated owls.

While this analysis recognizes that active management through selective tree cutting can help restore natural processes in an ecological system, Alternative D would trend less acres toward desired conditions than Alternatives B and C.

### e. Cumulative Effects Common To Alternatives B, C and D

The following past, ongoing and reasonably foreseeable actions are considered relevant in a cumulative effects discussion for black-backed woodpeckers:

<u>Past Events and Activities</u> - In combination with past natural and human-caused events, the total effect of these alternatives would help restore natural processes by favoring tree species

composition and structures that are consistent with historic vegetative patterns of dry site ecosystems. While some stands have lost or are losing sufficient forest structure to achieve habitat suitability, proposed actions would lead to long-term stability of habitat for flammulated owls by promoting more open grown stands of ponderosa pine and Douglas-fir and creating opportunities for managing stands with fire in the future.

Timber Stand Improvement - Thinning young, small diameter trees would be designed to increase the overall health and vigor of the stands. Additionally, this thinning would improve species composition, resulting in stands that are more ecologically stable in the face of potential disturbances. Consequently, thinning actions would promote long-term stability of habitat conditions for flammulated owls.

Potential Future Salvage - Future salvage would not trigger incremental impacts as long as established design and mitigation measures are followed because there would be no impacts to forest structure that is relevant to flammulated owls (see Chapter II).

**Conclusion of Effects**

Alternative B, C, or D would have a beneficial impact on flammulated owls. These alternatives would allow flammulated owls to maintain their same general distribution, thus maintaining species viability.

#### f. 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 (USDA 1987 p. II-28). Therefore, these actions would also be consistent with the National Forest Management Act requirements for population viability (36 CFR 219.19).

### *3.63d Black-backed woodpeckers*

#### a. Methodology

The potential effects on the black-backed woodpecker and other snag dependent species were determined by estimating the change in distribution and quantity of snag habitat that would result from implementation of alternatives.

#### b. Cumulative Effects Common to All Alternatives

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. However, fewer snags would be vulnerable to firewood gathering in Alternatives B, C, and D because there would be a reduction in miles on open roads (0.3 mile unclassified road) and gated roads (1.4 miles) that are sometimes opened for firewood gathering.

Black-backed woodpeckers have been described primarily as a post-fire obligate species--a species dependent upon habitat that results from a mixed lethal or stand-replacement fire that produces an abundance of snags. Interrupting the periodic disturbances created by lethal wildfires through continued fire suppression may threaten local populations of black-backed woodpeckers.

Conversely, if a wildfire occurs in the project area that could not be suppressed, habitat may be enhanced.

**c. Alternative A**

**Direct and Indirect Effects -** No immediate changes in snag habitat would occur as a result of implementing this alternative. Habitat conditions would change according to natural events over time. As a healthy forest matures, some trees die from competition and other natural forces, resulting in higher quality and quantity of snags. Consequently, nesting and foraging habitat would be improved for snag dependent species in healthy, low risk stands.

In the high risk stands, the prevalence of root disease and insect damage would be expected to spread in this alternative, resulting in higher levels of tree mortality. The dead trees would be replaced by other shade tolerant species, which would be re-infected and die, perpetuating the cycle. This change would slowly and methodically replace such species as ponderosa pine, white pine, and western larch, preventing many stands from reaching mature structures.

Tree mortality would continue to provide an abundance of nesting and foraging habitat for some species. Because black-backed woodpeckers are nearly restricted to post-fire habitat, their populations would remain at low endemic levels. However, high fuel accumulations resulting from elevated tree densities would lead to a higher risk of fires, increasing the chance of stand-replacing fires. If a stand-replacing fire were to occur, it would create a temporary flush of habitat for black-backed woodpeckers.

**Cumulative Effects** – While Alternative A does not alter existing conditions, the abnormal levels of fuels from years of fire suppression have altered historic fire regimes, resulting in possible catastrophic losses of potential habitat. Consequently, Alternative A 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 the species.

**d. Alternatives B and C**

**Direct and Indirect Effects** -Tree cutting would affect approximately 1,309 acres that contain some form of snag habitat in Alternatives B and C. In the long-term ($\geq$ 80-100 years), these alternatives would increase the occurrence of quality snags (longer lived, seral tree species such as western white pine, western larch and ponderosa pine) by converting 898 acres of species at high risk of insect and disease (i.e. Douglas-fir and grand fir) to more resilient, longer-lived species. However, these alternatives represent an overall decrease in snags, as tree cutting would remove small snags and subsequent stand conditions would result in lower levels of small snag recruitment. In addition, the removal of young Douglas-fir and grand fir and the subsequent open stand conditions would result in reduced susceptibility to disease. Habitat loss due to tree removal would be compensated by snag and live tree replacement where opportunities exist. In addition, prescribed burning is expected to kill a portion of the residual green trees, thereby, creating habitat for black-backed woodpeckers.

While tree cutting would remove many small snags, and subsequent stand conditions would result in lower levels of small snag recruitment, approximately 47 percent of the West Gold project area would remain unaffected by past and proposed cutting. Areas outside of proposed treatment areas would continue to be susceptible to insect and disease, thereby, perpetuating small to medium sized snag habitat for black-backed woodpeckers.

### e. Alternative D

**Direct and Indirect Effects** -Tree cutting would affect approximately 446 acres that contain some form of snag habitat. These acres represent selective vegetation treatments in lower risk stands where there is a greater likelihood that quality snags exist, although small in size. Selective treatments would promote the persistence of longer-lived, seral species (e.g. ponderosa pine, western larch), resulting in high value snags in the future.

Snag and live tree replacement measures are designed for these treatment areas to ensure that snags persist at levels and distributions shown to support viable populations of species that use snags and logs (see 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 to six snags per acre (Bull et al. 1997). Outside of proposed units, tree mortality in lower risk stands would continue to advance, producing higher quality snags.

### f. Cumulative Effects Common to Alternatives B, C and D

The following past, ongoing and reasonably foreseeable actions are considered relevant in a cumulative effects discussion for black-backed woodpeckers:

Future Salvage Opportunities - Future salvage opportunities could cause some incremental impacts to snag habitat. However, salvage opportunities would be confined to proposed treatment areas. Approximately 50% of the project area would remain unaffected by past and proposed tree cutting.

### Conclusion of Effects

Although the proposed actions would reduce the quantity of available snag habitat, tree mortality would continue to persist in the analysis area, allowing black-backed woodpeckers to maintain populations at low endemic levels. Consequently, Alternatives B, C and D may impact black-backed woodpeckers or their habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species. For these alternatives, black-backed woodpecker populations would remain at reduced densities and their current distribution would be maintained.

### g. Consistency with Forest Plan and Other Regulations

All proposed alternatives would meet and exceed Forest Plan goals and objectives for managing snag habitat (USDA 1987, Appendix X). The Forest Plan calls for managing snags at 40% of the potential capacity throughout Management Area 1 lands. This translates into retaining 8 snags > 20 inches dbh, 82 snags > 12 inches dbh, and 45 snags > 10 inches dbh, per 100 acres or 1.35 snags per acre. Design features for this project calls for retaining at least 4 snags from the largest representative size class on dry habitats and at least 6 snags from the largest representative size class size on the moist habitats.

Also, all action alternatives are consistent with 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 (USDA 1987, p. II-28). Therefore, these actions would also be consistent with the National Forest Management Act requirements for population viability (36 CFR 219.19).

## *3.63e Pileated Woodpecker*

### a. Methodology

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

### b. Cumulative Effects Common to All Alternatives

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. However, most snags available to firewood cutting activities would be in the smaller size class. Therefore, this activity would probably have inconsequential impacts to pileated woodpecker habitat. Fewer snags would be vulnerable to firewood gathering in Alternatives B, C, and D because there would be a reduction in miles on open roads (0.3 mile unclassified road) and gated roads (1.4 miles) that are sometimes opened for firewood gathering.

### c. Alternative A

**Direct and Indirect Effects** - There would be a continued shift in species composition toward more shade tolerant species in the majority of the stands. This change 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 West Gold area. Habitat for species associated with large snags, such as the pileated woodpecker, would continue to decline. Although timber harvests over the last 20 years have begun to change the species composition toward long-lived seral tree species, the presence of large snags would continue to be relatively uncommon due to the overabundance of Douglas-fir and grand fir.

High fuel accumulations resulting from dead and dying trees would lead to a higher risk of stand-replacing fires. If a stand-replacing fire were to occur, there would be little consequence to pileated habitat because there would only be loss of a small amount of mature and old growth habitat components.

**Cumulative Effects** - Cumulatively, Alternative A would not impact pileated woodpeckers because it does not propose any actions or activities that would alter habitat conditions.

### d. Alternatives B and C

**Direct and Indirect Effects** - Due to past disturbances (repeated large scale lethal fires), older, larger-diameter trees and late successional forests are lacking on the landscape. Pileated woodpeckers need patches of large diameter trees (mature and old growth structure) for nesting, however, the project area does not currently have enough suitable and dependable habitat to support breeding pairs of pileated woodpeckers.

Consequently, proposed treatments would have negligible, immediate effect on pileated woodpecker habitat. The limited old growth that occurs within the West Gold project area (dry habitats) would be excluded from cutting prescriptions. Outside of proposed units, tree mortality in lower risk stands would continue to advance, producing higher quantities of smaller snags, but not quality snags required by pileated woodpeckers.

Tree cutting would affect approximately 1,309 acres of habitat that contain some form of snag habitat. Of these 1,309 acres, only 11 acres are characterized as mature. These 11 acres were found to have considerable mortality. Even if left untreated, it is unlikely that they would reach late successional forest structure because of the predominance of Douglas-fir and the mortality occurring and predicted to occur. Given that the suitability of the 11 acres of suitable habitat cannot be sustained, population viability would not be threatened.

Over the long-term (about 80-100 years), 898 acres of regeneration vegetation treatments would convert tree species composition to longer-lived seral species (e.g. ponderosa pine, western larch, western white pine) and encourage the persistence and sustainability of large snag habitat.

Selective tree cutting is scheduled on 411 acres that would favor leaving the desired tree species and trend these stands to an older size class and promote larger size snags. Of these acres, only 25 acres are characterized as mature stands.

**e. Alternative D**

**Direct and Indirect Effects** - Alternative D proposes selective cutting on 444 acres. Of these acres, only 25 acres are characterized as mature stands. Selective tree cutting would favor leaving the desired tree species and trend these stands to an older size class and promote larger size snags. The old growth that occurs within the West Gold analysis area (dry habitats) would be excluded from cutting treatments.

**f. Cumulative Effects Common To Alternatives B, C and D**

The following past, ongoing and reasonably foreseeable actions are considered relevant in a cumulative effects discussion for pileated woodpeckers:

<u>Past Activities and Events -</u> Although the proposed actions would reduce the quantity of snag habitat, older, large diameter snags are lacking on the landscape due to past large-scale fires. There are a few large, fire residual snags scattered throughout the analysis area, but not in concentrations that would support nesting territories of pileated woodpeckers.

<u>Potential Future Salvage</u> - Future salvage opportunities would not trigger incremental impacts. Opportunities would be confined to the proposed cutting areas; areas not likely considered suitable nesting habitat for pileated woodpeckers.

<u>Timber Stand Improvement</u> - Thinning young, small diameter trees would be designed to increase the overall health and vigor of the stands. Additionally, this thinning would improve species composition, resulting in stands that are more ecologically stable in the face of potential disturbances. Consequently, thinning actions would help promote long-term stability of habitat conditions for pileated woodpeckers.

**Conclusion of Effects**

For these alternatives, pileated woodpecker populations would maintain their current distribution. Cumulatively, Alternatives B, C and D would have minimal impact on pileated woodpeckers because of the predominance of immature size structure and the preponderance of Douglas-fir and its susceptibility to mortality (see Forest Vegetation Section). Consequently, Alternatives B, C, and D are not likely to impact pileated woodpeckers.

#### g. Consistency with Forest Plan and Other Regulations

All proposed alternatives would meet and exceed Forest Plan goals and objectives for managing snag habitat (USDA 1987, Appendix X). All action alternatives would not impact the pileated woodpecker because they do not propose any activities or actions that would alter suitable habitat conditions.

Since no tree cutting would occur within designated old growth, the West Gold drainage would continue to be managed for old-growth characteristics. This is consistent with Forest Plan direction for old-growth habitat management. There are no Forest Plan standards specific to pileated woodpeckers and old growth other than to provide for viable populations. Therefore, these actions would also be consistent with the National Forest Management Act requirements for population viability (36 CFR 219.19).

### *3.63f Rocky Mountain Elk*

#### a. Methodology

The methodology presented in *Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho* (Leege 1984) was used to evaluate factors affecting quality of elk habitat. Game Management Unit 4A was divided into Elk Analysis Areas (EAA) using these guidelines. The West Gold Project lies within the West Gold EAA (figure 16). The methodology provides guidance for spring-summer-fall habitat for elk. Winter habitat is addressed in the previous discussion for white-tailed deer.

Elk Habitat Effectiveness (EHE) is used as an expression of habitat quality based on factors that influence elk use and behavior. It reflects the potential for change in elk use relative to past and future levels of effectiveness. As supported by previous discussion, roads are the most important factor in weighting EHE calculations since most disturbances originate from roads, both road construction and subsequent use (Leege 1984).

This model determines a numerical value for habitat suitability using factors such as the length of road, types of roads, whether roads are open or closed, and size and distribution of hiding and thermal cover. When all habitat factors are optimum in abundance and distribution, the EHE value is 100%. The Idaho Fish and Game recommends a minimum EHE value of 50% for general elk summer range (IDFG 1980).

#### b. Alternative A

**Direct and Indirect Effects** – The existing condition of big game habitat is directly related to disturbance factors that have influenced vegetation patterns. Since the advent of fire suppression policies, past timber harvesting has been the primary disturbance factor that has interrupted the successional creep, reinitiating the early stages of forest development and creating forage areas.

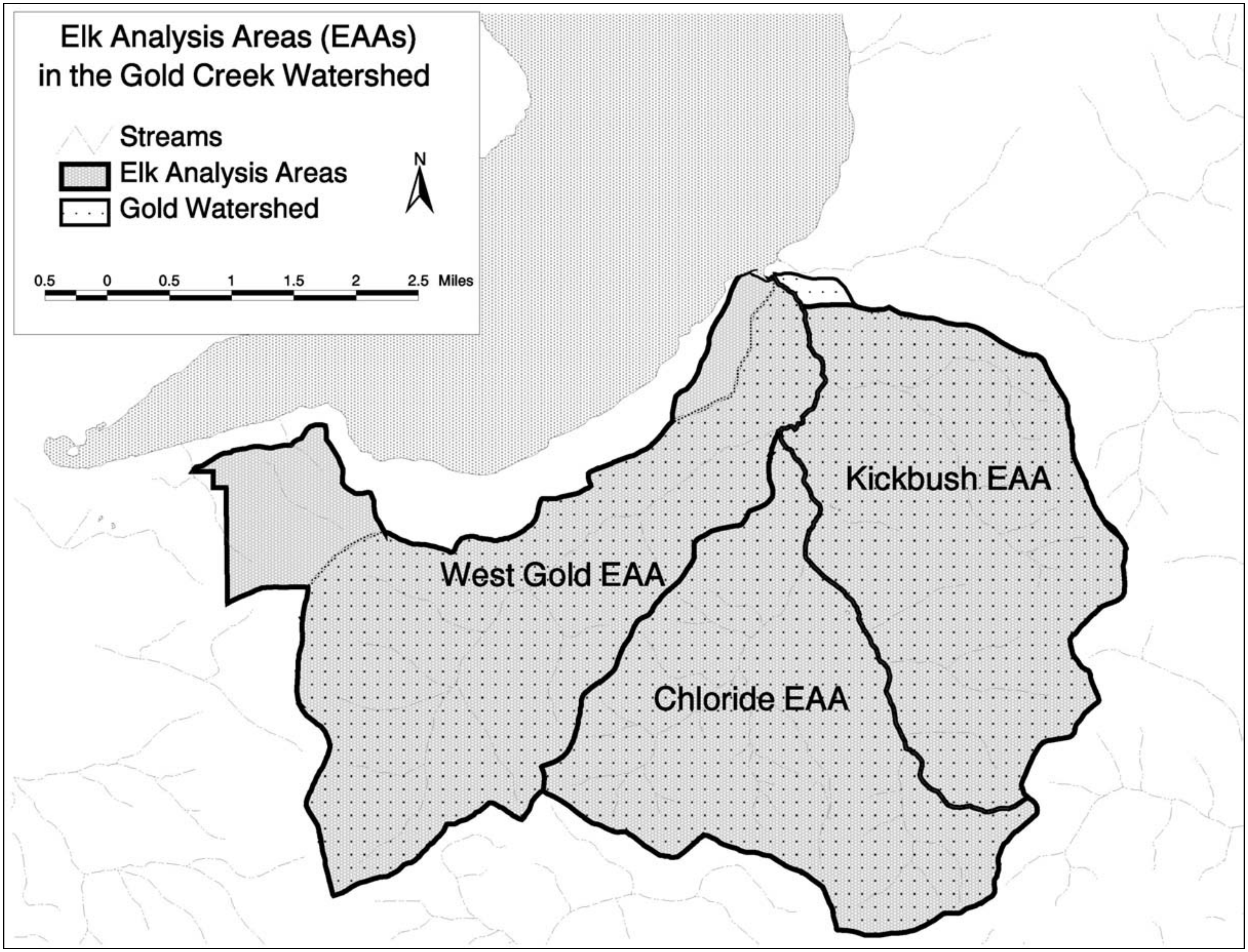


**Figure 16. Elk Analysis Areas in the Gold Creek Watershed.**

The natural tendency for these open stands is to progress toward later stages of forest development that become dominated by mixed conifer trees, shading out an important forage component. Without periodic disturbance, the production of forage on a meaningful scale would be unsustainable.

No new roads would be constructed and no additional forage areas would be created in summer range. The EHE value for the West Gold Elk Analysis Area is currently 55 percent (project file). Existing non-roaded and security areas would remain essentially the same. The EHE value would be expected to remain at this level in the future unless hiding cover is reduced through stand-replacing fire or other natural disturbances.

**Cumulative Effects** - Alternative A would not have cumulative effects to elk because it does not propose any actions or activities that would alter EHE values.

### c. Alternative B

**Direct and Indirect Effects** – Removing trees on 898 acres of regeneration cutting would extend foraging opportunities into the future. In combination with prescribed burning, Alternative B and C would improve habitat conditions for elk by promoting a more diverse, less uniform landscape.

Alternative B would construct 3.0 miles of temporary roads. These roads would be used only for management activities connected with the project. They would be decommissioned when management activities are completed (except 0.3 mile that would be put into storage). About 8.5 miles out of 9.9 miles of gated roads would be used to accomplish the project.

The EHE modeling assumes: 1) all haul routes and tree cutting would be used and accomplished simultaneously, and 2) all activities would take place during the elk use season (though it is possible that some of the units may be winter logged). The "during harvest" model is a "worst-case scenario" estimate. By dividing the project cutting activities into geographic subdivisions that require most work to be completed in each subdivision prior to working in another one, actual effects to localized areas at any given time during implementation would be considerably less because they would occur at varying times during the life of the project (about 5 to 8 years).

The worst-case scenario EHE value for Alternative B during a 5-year activity period would be 47 percent. This decrease in EHE is a result of upgrading proposed haul routes (changing from "primitive, gated" to "secondary, open" during cutting activities), and a result of creating approximately 900 acres of new openings (of which about 250 acres will be adjacent to open motorized routes once activities cease). While the "during harvest" model appears to cause a substantial impact to EHE, these calculations reflect a "worst-case" scenario as mentioned previously. Because of the variability in shelterwood prescriptions, the amount of post-cutting hiding cover in these units is difficult to predict. Therefore, we took a conservative approach and assumed that these units provide no hiding cover for elk, when in fact irregular shelterwood prescriptions would result in groups of leave trees that would provide a patchy network of potential cover throughout these units. In light of this, as well as the use of subdivisions for contracted activities, EHE values would more likely result at or above the 50 percent level.

The long-term EHE value would be 53 percent. The 2 percent loss in EHE from the current value is a result of: 1) loss of hiding cover adjacent to "main roads" and 2) the conversion of a "primitive" gated road to a "secondary" motorized trail. While this alternative results in the removal of 3.4 miles of drivable road (gated or open with a drivable road surface), these segments do not weigh heavily in standard mile calculations.

Although this value reflects a decrease from existing condition, elk habitat effectiveness would remain above the minimum standard recommended by IDFG. Despite the small reduction in EHE, this alternative would result in a net decrease in miles of drivable road while providing additional motorized recreation opportunities in the project area. Maintenance of EHE values above a minimum level of 50 percent is consistent with IDFG guidelines.

**Cumulative Effects** - There are no past, ongoing and reasonably foreseeable actions considered relevant in a cumulative effects discussion for Rocky Mountain elk. There are no other ownerships within the West Gold EAA, and the only other broad-scale activity in the unit is the maintenance of the powerline corridor. This maintenance will not cause any measurable effects to elk hiding cover, and, in fact, is designed to maintain existing vegetation in a static state.

### d. Alternative C

**Direct and Indirect Effects** - The effects for Alternative C are the same as the effects described in Alternative B, except there would be no new road construction with this alternative. Changes to existing vegetation and road management would result in a "during harvest" EHE value of 49%. Once again, this model assumes a worst-case scenario that all project activities would be realized simultaneously, when in fact, effects would be distributed across the landscape throughout the duration of the project.

The long-term EHE for this alternative would be 53% and post-project conditions would be identical to that of Alternative B.

**Cumulative Effects** - There are no ongoing and reasonably foreseeable actions that are considered relevant in a cumulative effects discussion for Rocky Mountain elk.

### e. Alternative D

**Direct and Indirect Effects** – Alternative D would only provide modest improvements of habitat conditions for elk. This alternative would treat 442 acres by selective cutting treatments. Although treatment would open up these areas and provide some opportunities for forage development, they would not be converted to the early stages of forest development.

Alternative D would cause the least impact to elk habitat during project activities of all the action alternatives, resulting in a "during harvest" EHE of 52%. Effects to elk habitat from this alternative differ from Alternatives B and C due to two major design features: 1) there would be approximately 0.5 miles of temporary road construction for Alternative D, and 2) no regeneration cutting units. As a result, habitat effectiveness during project activities is greater than the other action alternatives because there would be no loss of hiding cover due to vegetation management, and only 6.2 miles of gated roads would be used to access cutting units.

Post-project motorized route density is virtually identical to the other action alternatives (53%). There would be slight differences in habitat effectiveness, mainly due to the retention of existing hiding cover built into this alternative.

**Cumulative Effects** - There are no ongoing and reasonably foreseeable actions that are considered relevant in a cumulative effects discussion for Rocky Mountain elk.

**f. Consistency with Forest Plan and Other Regulations**

All alternatives are consistent with the Forest Plan standards and guidelines dealing with the management of big game species (USDA 1987, p. II-1). Elk are not considered a Management Indicator Species on the North Zone of the IPNF, and therefore there are no Forest Plan standards for elk habitat effectiveness. Elk are analyzed and discussed because they have import social and economic value to the surrounding communities.

There are no other laws or regulations specific to open road densities, or elk management.

## *3.63g Forest Land Birds*

**a. Methodology**

Species differ in habitat requirements and their responses to management activities. Due to the sizable number of species that can occur in a forested landscape, it is impractical and nearly impossible to take a species by species approach. Rather, this analysis looks at the avian community as a whole, in the context with the surrounding landscape. It addresses priority habitats identified by Idaho Partners in Flight (2000) and discusses how management activities, or even a lack of management activities, can affect bird species composition and richness.

**b. Alternative A**

**Direct and Indirect Effects** - 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).

Two of these priority habitats, riparian habitat and dry ponderosa pine/Douglas-fir/grand fir forests, occur in the West Gold project area. Currently the long-term viability of the dry ponderosa pine/Douglas-fir habitats are at risk. According to Idaho Partners in Flight (2000), 31 species of Idaho's breeding species use this habitat for nesting.

Under this alterative, a homogeneous landscape dominated by Douglas-fir would continue. High tree densities and fuel accumulations would continue to present a risk to the survival of ponderosa pine on the drier habitats and western larch on the moister habitats. Therefore, it is unlikely that there would be a shift to old growth ponderosa pine structure conditions (representing historical vegetative patterns). Also, as stated in the "Vegetation " section, Douglas-fir trees are likely to die before reaching the old growth stage.

Consequently, this shift in species composition and susceptibility to abnormal disturbance events (stand replacing fires resulting from abnormal fuel levels) has resulted in severe modifications of the forest ecosystem and to biodiversity. The perpetuation of a homogeneous landscape dominated by Douglas-fir would decrease habitat richness and habitat diversity, thereby providing limited niches to support the diversity of land birds that occur on a forested landscape.

**c. Alternatives B and C**

**Direct and Indirect Effects** - Priority habitats would not be adversely impacted by the proposed actions. Applying Best Management practices and the Inland Native Fish Strategy (INFS) would protect and maintain riparian habitat that occurs along West Gold Creek and its tributaries (see

Design Criteria and Mitigation Section). Also, a purpose of this project is to promote the restoration of dry ponderosa pine/Douglas-fir forests. These alternatives would encourage the long-term stability of dry habitats by altering species composition, treating overcrowded conditions of shade tolerant trees, and include fire to provide the benefits similar to natural disturbances.

Opening the forest canopy on an otherwise monotonous landscape and managing for snags in these areas would increase landscape diversity and provide for those species that rely on more open habitat conditions (e.g. chipping sparrows, Williamson's sapsucker, hair woodpecker, pine siskin). Addressing current stand conditions resulting from a homogeneous landscape dominated by Douglas-fir would increase habitat richness and habitat diversity, thereby providing more niches to support land birds.

**d. Alternative D**

Similar to Alternatives B and C, Alternative D would not adversely impact priority habitats. However, this alternative would not in a meaningful way contribute to landscape diversity and provide habitat for those species that rely on more open stand conditions. It would promote the persistence of ponderosa pine and western larch trees and encourage the sustainability of large snag habitat on acres treated.

**e. Cumulative Effects Common to All Alternatives**

<u>Past Activities and Events</u> **-** Past activities (such as timber harvest) and natural processes (such as succession) are described in the Affected Environment section and provide baseline conditions for habitats.

<u>Fire Suppression</u> - Where active management does not occur (whether Under the No Action Alternative or in areas not proposed for treatment), continued fire suppression will retain the current homogeneous nature of the vegetation. This would result in less diversity of habitat that might benefit a greater variety of species.

**f. Cumulative Effects Common to Alternatives B, C and D**

<u>Timber Stand Improvement</u> - Thinning young, small diameter trees would be designed to increase the overall health and vigor of the stands. Additionally, this thinning would improve species composition, resulting in stands that are more ecologically stable in the face of potential disturbances. For those acres treated, thinning would complement alternatives by promoting long-term stability of habitat conditions for land birds.

<u>Future Salvage Opportunities</u> - Future salvage would not trigger incremental impacts as long as established design and mitigation measures are followed. There would be no anticipated changes to forest structure that would affect habitat conditions for forest landbirds (see Chapter II).

**g. Consistency with Forest Plan and Other Regulations**

While the Forest Plan does not address specific Standards or Guidelines for managing forest landbirds, it does provide guidance for managing snag habitat and old growth. This project would exceed Forest Plan Standards for snag management and would not adversely impact inventoried old growth stands. Therefore, these actions would also be consistent with the National Forest Management Act requirements for population viability (36 CFR 219.19).

# 3.7 Watershed and Fisheries

## 3.71 Affected Environment

### *3.71a Regulatory Framework*

The regulatory framework governing management of watershed and fisheries for the analysis is based on:

- *National Forest Management Act*
- *Endangered Species Act*
- *Clean Water Act and amendments.*
- *State of Idaho's implementation of the Clean Water Act*
- *Rules Pertaining to the Idaho Forest Practices Act (Title 38, Chapter 13, Idaho Code, 2000)*
- *Executive Order 12962 (Recreational Fishing)*
- *State of Idaho Governor's Bull Trout Plan*

The National Forest Management Act (NFMA) (1976) requires that the Forest Service manage for a diversity of fish habitat to support viable fish populations (36 CFR 219.19). Regulations further state that the effects on these species and the reason for their choice as management indicator species be documented (36 CFR 219.19(a)(1)). Direction is also included in the Idaho Panhandle National Forests Forest Plan (USDA 1987). The Inland Native Fish Strategy (INFS; USDA 1995) amended some Forest Plan direction regarding stream and fish habitat protections measures. See Appendix B for details.

Section 7 of the 1973 Endangered Species Act (ESA) includes direction that Federal agencies, in consultation with the U.S. Fish and Wildlife Service, will not authorize, fund, or conduct actions that are likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat.

Under authority of the Clean Water Act, the Environmental Protection Agency and the States must develop plans and objectives that will eventually restore identified stream segments of concern. Gold Creek is currently a listed 303(d) water quality limited segment from the headwaters to Pend Oreille Lake (IDEQ 2000). The pollutants of concern are sediment and heavy metals. The current status is that there is an approved Total Maximum Daily Load (TMDL), and its implementation plan is pending. Under this status, there should not be a net increase in sediment through management activities to Gold Creek.

The Forest Service will develop an implementation plan for its portion of the TMDL in Gold Creek in cooperation with IDEQ, IDL, and interested local parties. In the interim, any activities we undertake or permit on NFS lands will be designed to substantially reduce pollutants of concern, where feasible. The timeframe for completion of the implementation plan has not yet been determined. Information and recommendations from the Gold Creek Watershed Analysis will be carried forward into the TMDL implementation plan. Other recent documents such as the *Engineering Evaluation/Cost Analysis (EECA) for the Idaho Lakeview Operable Unit* and future EECAs will also be used in the implementation plan.

The Forest Service has agreements with the State to implement Best Management Practices or Soil and Water Conservation Practices for all management activities. Proposed activities will be in compliance with the guidelines in the Soil and Water Conservation Handbook (Forest Service Manual 2509.22), which outlines Best Management Practices that meet the intent of the water quality protection elements of the Idaho Forest Practices Act.

Executive Order 12962 (June 7, 1995) states objectives "to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by: (h) evaluating the effects of Federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order."

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 (PBTTAT 1998) and a conservation plan was developed (Resource Planning Unlimited 1999) for the Lake Pend Oreille key watershed.

## *3.71b Methodology*

### 1. Literature and Office Review

The assessment of existing condition is critical to an environmental analysis because it both describes the current condition of the project area and provides a basis for comparing the effects of management alternatives. Information for the watershed and fisheries analysis was compiled using data from the Pend Oreille Basin Geographic Assessment (USDA draft in progress), the Gold Creek Ecosystem Analysis at the Watershed Scale (EAWS; USDA 2002), and the Lake Pend Oreille Bull Trout Problem Assessment (Panhandle Bull Trout Technical Advisory Team; PBTTAT 1998). A Roads Analysis (USDA 1999c) was also completed, which established recommendations for long-term road management objectives within the Gold Creek Watershed.

Additional information was gathered from district fish and hydrology files, historical records, aerial photographs, and published scientific literature. Also, discussions with the Idaho Department of Fish and Game (IDFG) and United States Fish and Wildlife Service (USFWS) provided electrofishing and stocking data and comprehensive knowledge of the fisheries resources in the Pend Oreille River Basin.

### 2. The WATSED Model

The anticipated sediment and water yield runoff modification for the West Gold subwatershed were estimated from the methods documented in the R1/R4 Sediment Guides (USDA 1981) and the WATBAL Technical User Guide (Patten 1989). The version calibrated for the Idaho Panhandle National Forests, known as WATSED, is an analysis tool that spatially and temporally organizes typical watershed response relationships as a result of forest practices. The estimated responses are combined with other sources of information and analyses to help determine the findings of probable effects.

WATSED estimates a series of anticipated annual values over a period of years. The model predicts an estimate of most likely mean annual sediment loads (reported as tons per square mile per year), and the expected sediment load modifications over time. The estimate of additional loading is expressed as a percent of the "natural" (i.e., historic mean load prior to significant development activities) sediment load, which is based on the history of disturbances and average climate patterns in the watershed. In this analysis, the existing condition represents the year 2002, which is prior to any anticipated disturbances related to the proposed activities.

The estimates of sediment and peak flow reflect how watersheds with similar conditions and landtypes have responded over time to a similar history of disturbance. WATSED is not intended nor designed to model event-based processes and functions, or specific in-channel responses. It does, however, incorporate the results of those processes in the calibration of its driving coefficients. WATSED does not evaluate increases in sediment and peak flows specifically resulting from "rain-on-snow" events or other stochastic events, nor does it attempt to estimate in-channel and stream-bank erosion. The Idaho Panhandle National Forests (IPNF) frequently validates the WATSED coefficients and estimates using long-term water quality monitoring networks on the IPNF (USDA 2000, 1999, and 1998b).

The forest management activities used to calibrate the model include standard BMPs and Soil and Water Conservation Practices; therefore, standard BMPs and Soil and Water Conservation Practices are necessary requirements for maintaining an effective confidence level in the model's use. Non-standard BMPs, management or natural disturbances not related to forest practices, and site-specific non-standard BMPs must be integrated into the final analysis to fully determine watershed response.

WATSED was designed to address and integrate a vast and complex array of landtypes and disturbances within the context of a watershed and organize the evaluation according to rule sets established by the author and cooperators. In the case of WATSED, the rule sets reflect watershed processes and functions based on research, data, and analyses collected locally and regionally. Forest Plan monitoring reports (USDA 2000, 1999, and 1998b) describe how the calibration and validation of WATSED has been an annual process on the forest and where changes have been made. The model, however, also includes simplifying assumptions, and does not include all possible controlling factors. Therefore, the use of models is to provide one set of information to the technical user, who, along with a knowledge of the model and its limitations, other models, data, analysis, experience and judgment must integrate all those sources to make the appropriate findings and conclusions.

### 3. Field Review

All roads and streams within the project area were surveyed during the 2000 field season. Road drainage crossings were inventoried to assess erosional hazards and risks to aquatic ecosystems, using the *Methods for Inventory and Environmental Risk Assessment of Road Drainage Crossings* (Flanagan et al 1998). This method gathered information on road-stream crossings that included fill volumes, culvert sizes, erosional features, and other variables, then ranked each crossing for treatment (watershed project file).

A modified version of the R1/R4 fish and fish habitat inventory (Overton et al. 1997) was conducted along West Gold Creek and some of its tributaries during the 2000 field season (watershed project file). Additional stream information was collected to determine stream channel types, cross sectional profiles, woody debris composition and stream temperature. Existing and potential in-channel and stream-bank erosion sites were also documented with this survey.

## *3.71c Characterization*

### 1. Watershed

The West Gold drainage is approximately 4,543 acres and is one of five subwatersheds within the 13,900-acre Gold Creek watershed (figure 17). The watershed is within Lake Pend Oreille Subbasin, which is a high priority subbasin for restoration and protection of aquatic resources, especially bull trout (State of Idaho 1996). Gold Creek is also the second most important bull trout, spawning tributary within the Lake Pend Oreille Subbasin (PBTTAT 1998).

The West Gold project area encompasses the entire West Gold drainage. The Gold Creek watershed is located within the Coeur d'Alene mountain range, which usually receives an average annual precipitation of 41 inches (USDA 2002).

### 2. Fisheries

**a. Threatened and Endangered Species** 

<u>Bull Trout</u>

Bull trout, listed under the Endangered Species Act as a threatened species, are known to reside in the Pend Oreille Basin, which includes West Gold Creek subwatershed. Bull trout in the Lake Pend Oreille watershed appear to be entirely adfluvial[2] (PBTTAT 1998). Bull trout spawn primarily in lower Gold Creek and are known to utilize the lowest reach of West Gold Creek at times (fisheries project file). Gold Creek consistently has the second highest number of bull trout redds in the Lake Pend Oreille watershed and may play an important role in the recovery of the species (USDA 2002).

*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 (Jakober 1995, Rieman and McIntyre 1993, Pratt 1985).

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, Fraley and Shepard 1989) 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).

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

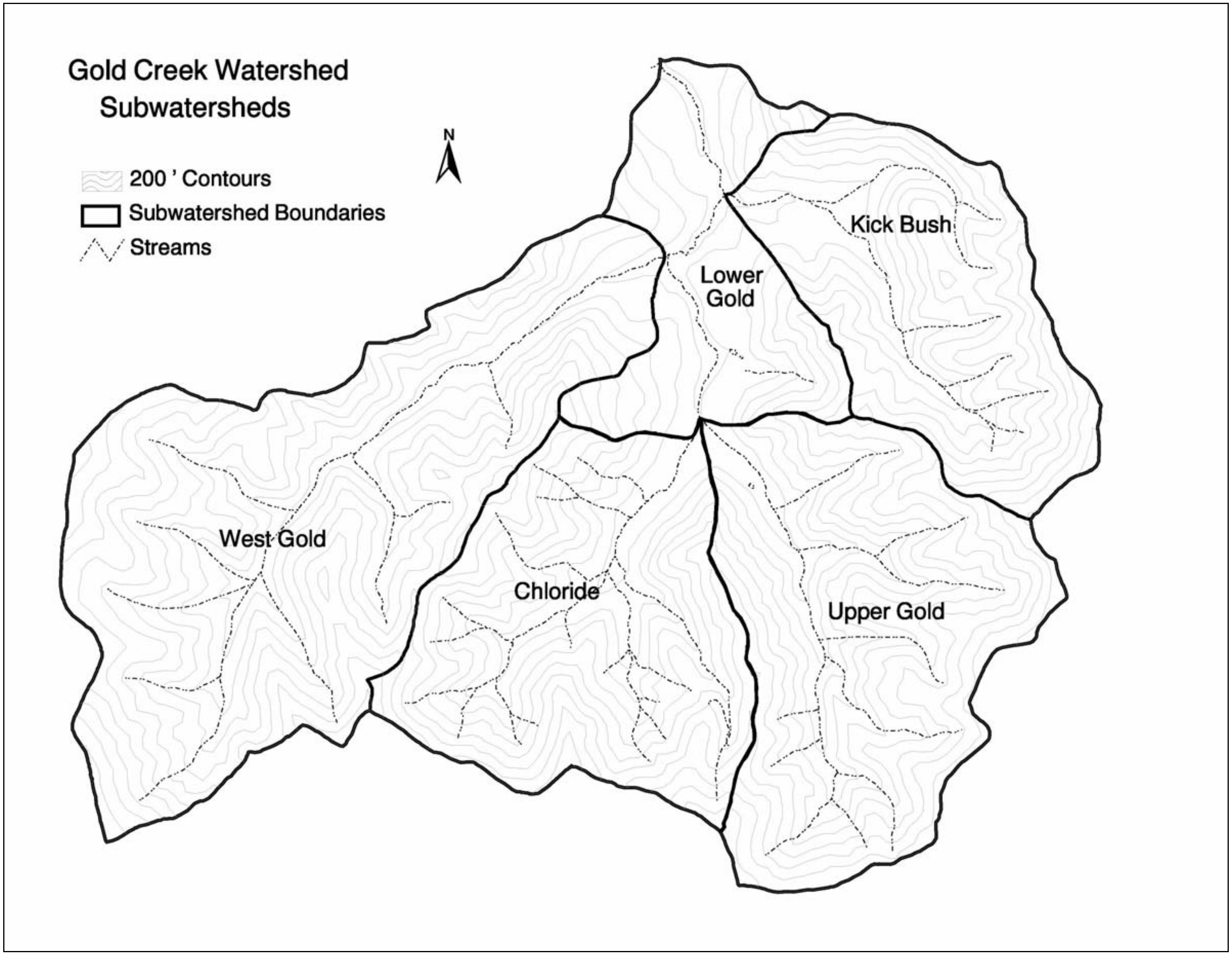


**Figure 17. The Gold Creek Watershed and subwatersheds.** Bull trout are known to use the lower reaches of Gold and West Gold Creeks.

Stream temperature (below 15 º 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 Celsius (ranging from 3 to 6 degrees Celsius) and should equate to ground water temperatures of about 5 to 10 degrees Celsius (Meisner 1990). Water temperature can be strongly influenced by land management activities (Henjum et al. 1994).

*Risks to Bull Trout Populations and Habitat*

As part of the Bull Trout Problem Assessment for the Lake Pend Oreille Key Watershed, threats and limiting factors to bull trout were assessed and prioritized by watersheds (PBTTAT 1998). While the assessment concentrated on bull trout, the threats and limiting factors apply, to varying degrees, to all aquatic species and habitat in the Gold Creek watershed. Efforts are underway to reduce or eliminate many of the risks to bull trout described below. Since West Gold Creek drains into Gold Creek, and the majority of bull trout spawning and rearing is in Gold Creek with incidental use of the lowest reach of West Gold Creek, the following paragraphs focus on conditions in the Gold Creek watershed (the cumulative effects area for the watershed and fisheries analysis). This lays the foundation to help understand the cumulative effects to bull trout in later discussions.

The Bull Trout Problem Assessment states that excess bedload in stream channels from past mining disturbance is the single greatest limiting factor for bull trout in the Gold Creek Watershed and has caused fragmentation and decreased available spawning and rearing habitat for bull trout and other aquatic species. The assessment does not discuss whether subsurface flows in Upper Gold Creek and Chloride Gulch have historically been present, giving the impression that removing the mine waste might lead to a potential for restoring fish habitat in these reaches. However, a map and field notes related to the resurveying of the Boise Meridian in 1908 documents that Gold Creek and Chloride Gulch were documented as intermittent channels. The majority of the mining activity occurred in the years following the survey and continued until approximately 1981. This historic information suggests that the seasonally dry segments of Gold Creek and Chloride Gulch may have naturally been intermittent.

The assessment also mentions how the mine waste has added material to the delta at the mouth of Gold Creek and threatens to block access between Gold Creek and Lake Pend Oreille at low flows in some years. Besides excess bedload, testing on waste rock at the mines showed heavy metal concentrations in various segments of Gold Creek, although the degree to which it is affecting downstream water quality is not clear[3]. Bedload effects from past mining were estimated to cause 70 percent of the threats to bull trout in the Gold Creek Watershed (PBTTAT 1998). Efforts to clean up these mine sites is underway—rehabilitation efforts are scheduled to begin in 2003 and will continue for several years.

Roads, the power line corridor, past timber harvest, and illegal fish harvest are additional continuing threats to bull trout in the Gold Creek watershed. The Kick Bush Slide, a very steep road cut on Road 278 has a history of failures that have contributed fine sediment to Gold Creek. During fall rains, sediment from the road enters Gold Creek and is deposited on bull trout redds.

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*[3] Surface water tests for heavy metals were performed in the summers of 1996 and 1997 and results are only representative of the conditions occuring at time of testing, not a constant level.*

This road is being repaired at this time and is scheduled for completion this fall (2002). Other road-related effects are described under Watershed Existing Condition. The powerline corridor has caused site-specific effects to fish habitat, most notably the lack of large woody debris in channel segments where the corridor parallels or crosses the stream; however, recent data shows the effects have not been as detrimental as previously thought, especially in West Gold Creek. Past timber harvest has led to loss of long-term woody debris recruitment in some headwater tributaries. Poaching of adult bull trout occurs in lower Gold Creek (PBTTAT 1998). Through continuing funding from the Cabinet Gorge and Noxon dams re-licensing agreement, the Idaho Department of Fish and Game has increased law enforcement efforts in the Lake Pend Oreille area to reduce poaching.

Other, relatively minor, threats to bull trout in the Gold Creek Watershed include past severe wildfires (streams are still recovering), urbanization (residential home sites along lower Gold Creek), and dams (lake level fluctuations from Albeni Falls dam may hinder migration of spawning fish between Gold Creek and Lake Pend Oreille (PBTTAT 1998). Conservation easements aimed at recovering bull trout habitat have been placed on recently purchased private land parcels in the Gold Creek watershed.

Despite rather widespread past disturbances and continuing detrimental effects on the watershed, bull trout continue to successfully spawn in lower Gold Creek and West Gold Creek. There are many springs flowing into lower Gold Creek; these are most likely key to the persistence of this population. The springs keep water temperatures low and presumably improve water quality by diluting potential toxic influences from upstream mine waste. Although the population continues to persist, current and future improvements to the watershed will be beneficial for bull trout.

**b. Sensitive Species**

<u>Westslope Cutthroat Trout</u>

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) (USDI 2002), although this species was recently determined “not warranted” for listing (USDI 2000a).

Cutthroat trout have been identified in all reaches of West Gold Creek and two of its tributaries during snorkeling and electrofishing surveys in 2000. Unknown variations of cutthroat trout were stocked in Gold Creek in the 1950s and 1960s by Idaho Department of Fish and Game; however, the populations that resided there prior to the introductions were likely native westslope cutthroat trout. In 1978, Richard Wallace from the University of Idaho analyzed samples of cutthroat trout taken from West Gold Creek for their genetic purity. Results showed these fish to be nearly pure strain westslope cutthroat trout with a small percentage of hybridization with rainbow trout (Thorson 1984). Hoelscher (1993) theorized that adfluvial westslope cutthroat trout are dominant in tributaries to lower reaches of a drainage and in small streams directly flowing into Lake Pend Oreille. Based on this theory, adfluvial westslope cutthroat trout have access to the same habitat as do bull trout. However, since westslope cutthroat trout are spring spawners, there is a possibility that these fish have much more habitat available to them in the Gold Creek Watershed than bull trout because of the higher water flows through areas that are dry in the summer and fall.

The preferred habitat of westslope cutthroat trout is cold, clear streams with rocky, silt-free riffles for spawning and slow, deep pools for feeding, resting, and over-wintering (Reel et al. 1989). Pools are a particularly important habitat component as cutthroat trout occupy pool habitat more than 70 percent 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 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 percent of the original Idaho range. The primary cause of the decline was found to be habitat degradation (Rieman and Apperson 1989).

Torrent Sculpin

Torrent Sculpin were added to the Idaho Panhandle National Forests' sensitive species list March 12, 1999. It is unknown if torrent sculpin inhabit the Gold Creek watershed; however, presence of torrent sculpin is unlikely in West Gold Creek due to the small size of the creek. 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. Analyzing effects on the westslope cutthroat trout will cover possible effects to this species.

## *3.71d Reference Condition*

### 1. Watershed and Erosional Processes

The Gold Creek EAWS (pages 21-31) describes how past natural events and management activities have influenced water and sediment yield values within the Gold Creek and West Gold drainages. To understand responses and recovery rates from these past activities, average annual water and sediment yields were calculated using WATSED. The time period modeled was from 1865 to 2015, within the West Gold subwatershed. Fluctuations in water and sediment yields can provide a good basis for the reference condition, the historic range of variation, and current trends. Understanding historical patterns and processes helps evaluate consequences and provides a basis for predicting natural and human disturbances (Rieman et al. in press).

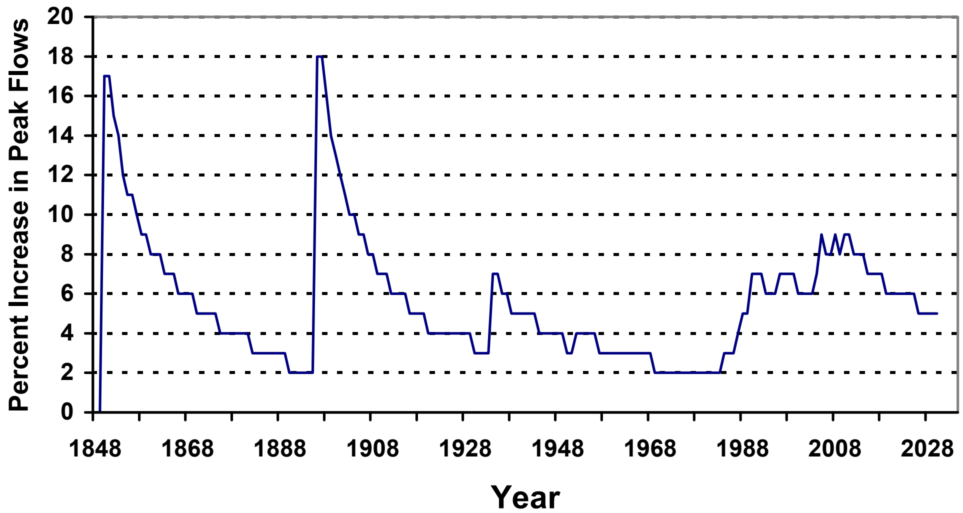
#### a. Water Yield and Peak Flows

Changes in duration and intensity of peak flows are often used to measure changes in water yield from vegetation conditions. Patterns of large stand-consuming fires, forest insects and diseases, and regeneration cutting can alter snowmelt patterns (McCaughey et al. 1997, King 1993, Megahan 1983). The timing and duration of summer or base flows can also be altered through vegetation changes. Keppeler (1998) found that when 50 percent or greater of the drainage basin had been harvested, summer flows were altered during the long dry summer season.

To understand changes and fluctuations with historic water yield and peak flow conditions, peak flows were modeled using WATSED. Figure 18 displays the increases, duration and patterns of peak flows from past fires, road construction and timber cutting activities between 1848 and 2030. From figure 18, it is evident that peak flows are not static, but dynamic following disturbances. Following the fires, the project area was far less heavily timbered than at present. One effect of this open landscape was higher peak flows and greater fluctuations in flows than what are present in West Gold and Gold Creek today.

The large spikes in 1850 and 1896 are attributed to a combination of fires that burned over 90 percent of the drainage. The spike in 1850 is an estimated time period for this fire, since it is known that a fire of this magnitude burned between 1850 and 1870 (USDA 2002). The 1896 fire is modeled as the remaining portion of the watershed that was not burned from the 1850 fire.

**Figure 18. Historic and existing condition of percent increase in peak flows within the West Gold Subwatershed.**




Fires have caused the primary peaks in water yield shown in figure 18. Historically, when stand-replacing fires removed the forest vegetation, water yield values rose sharply, then gradually declined to baseline condition. The peaks of 17 and 18 percent during the 1850 and 1896 fires are used as the maximum water yield increase for the historic range of variation. The minimum water yield value can be considered at 2 percent, from the 50-year recovery period between 1850 and 1896. It can be assumed that these sorts of peaks and recovery rates were common to historic fires prior to 1870. This pattern mimics other studies within the region (McCaughey et al. 1997). In 1934, a 1000-acre reburn caused a small water yield spike to 7 percent. Between 1940 and 1985, fire suppression activities have maintained water yield values below 5 percent. In the eighties and nineties, timber harvest activities have created a gradual increase in water yield.

Research in the region has shown that causes of peak flows are also associated with less frequent mid-winter rain-on-snow events and rain-on-spring-snow events (MacDonald and Hoffman 1995). From their research, spikes are usually higher and over a shorter duration than what is currently modeled in figure 18. WATSED cannot predict peak flows from these events because the frequencies are random; they do not occur on an annual basis and are dependent on certain climatic conditions such as air temperature, intensity and duration of precipitation, rain-on-snow elevations and snowpack characteristics (Berris and Harr 1987). However, it can be assumed that West Gold has been subjected to larger peak flows than what is modeled through WATSED.

### b. Sediment Yield

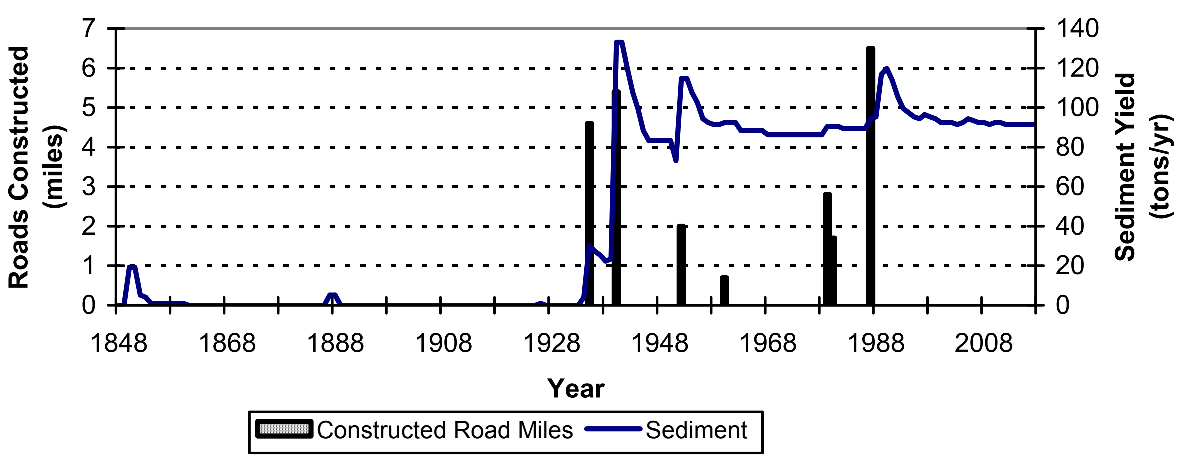
Disturbances such as fire and rain-on-snow events are distinct in time and space and can occur anywhere across the landscape. Random sediment inputs to stream channels occur as a complex series of pulses that are delivered and stored within low order, high gradient stream channels (Benda and Dunne 1997). Sediment accumulates for centuries within these channels before being transported or "flushed" downstream by episodic events with large increases in water yield (Kirchner et al 2001).

Following any erosional event, large volumes of sediment are concentrated in different sections of the stream channel, mainly near tributary junctions along the larger order, lower gradient sections. The stream channel transports bed material downstream from these storage sites at different rates. The bed material travels slowly, creating temporary patterns of sediment transport, sediment storage and channel morphology throughout the stream channel (Benda and Dunne 1997a). This process has been active over centuries within Gold Creek, especially following the fires and rain-on-snow events that resulted in flooding.

Management Induced Sediment

Within West Gold, the dominant sediment sources have been from road construction activities and, to a lesser degree, fires and harvest activities. Figure 19 displays this relationship over the last 150 years. The first sediment spike, which was caused by effects from wildfire, occurred in 1850. The model estimates the sediment level at 19.3 tons/year above background levels. Recovery from the fires was quick and sediment yields were back to baseline conditions within four years.

**Figure 19. Historic and existing condition of sediment yield within the West Gold Subwatershed associated with road construction activities.** WATSED is unable to estimate sediment delivery reductions and recovery periods back to natural conditions when roads are decommissioned or have become stabilized. Therefore current sediment yields above background are probably overestimated.



The dominant source of sediment within the West Gold drainage has been caused by road construction activities (figure 19 and watershed project file records). Numerous research studies have documented that forest roads are usually the leading contributor of sediment to stream channels (Gucinski et al 2001, Bilby et al 1989, Duncan et al 1987).

Road construction activities started in 1935 with the construction of Forest Roads 332 and 2708. There were 4.6 miles of roads constructed that produced an estimated sediment yield of 30.5 tons/year above background levels. In 1940, the construction of 5.4 miles of Road 2707 caused the greatest peak in sediment at an estimated 133.0 tons/year above background levels. In 1952 the construction of the powerline access roads caused another spike in sediment at an estimated 114.7 tons/year, above background levels. The construction of these roads occurred before standard best management practices were required and presumably produced more sediment.

In 1987, 6.4 miles of spur roads were constructed off of Road 278 and again elevated sediment yields to an estimated 94.4 tons/year. Compared to past road construction, the increase in sediment associated with these spur roads was small, with more constructed miles. The location of the spur roads on ridge tops combined with restricted access, accounts for the smaller spike in sediment yield. This is consistent with research findings that have shown when roads are designed with specific criteria and best management practices, that they produce less sediment yields (Megahan et al 1992).

Within the larger Gold Creek watershed, the dominant sediment inputs were from mining activities. Waste rock and spoil material were deposited into streams and across the floodplain. Stream channels were either rerouted into culverts or left to drain through the deposit material. Roads constructed to access the mines had no standard road design criteria, were built without best management practices, and also contributed sediment to Gold Creek.

**c. Sensitive Landtypes**

The Gold Creek EAWS (USDA 2002, pages 4-5) references sensitive landtypes and the erosional processes that may occur within the Gold Creek and West Gold drainages. Sensitive landtypes are defined as those with high potential for mass erosion, surface erosion, and a high and moderate potential for sediment delivery. These are classified by the Idaho Panhandle National Forest land system inventory (watershed project file).

Within the project area, there are 1,516 acres of sensitive landtypes or 33 percent of the drainage area (figure 20). There are no landtypes within the project area that are prone to surface erosion (almost all of the watershed is rated as low and only one proposed treatment area is rated as moderate). Moderate and high sediment delivery potential landtypes are delineated based on proximity to perennial and intermittent stream channels. Complete descriptions and activity recommendations for each sensitive landtype are located in the project file.

Sensitive landtypes are used to indicate areas where careful planning is needed and to apply design criteria or restoration activities to avoid resource impacts. Results from WATSED modeling, and the amount of activity and reduction of risks on sensitive landtypes are used as indicators for the potential for production and delivery of sediment.

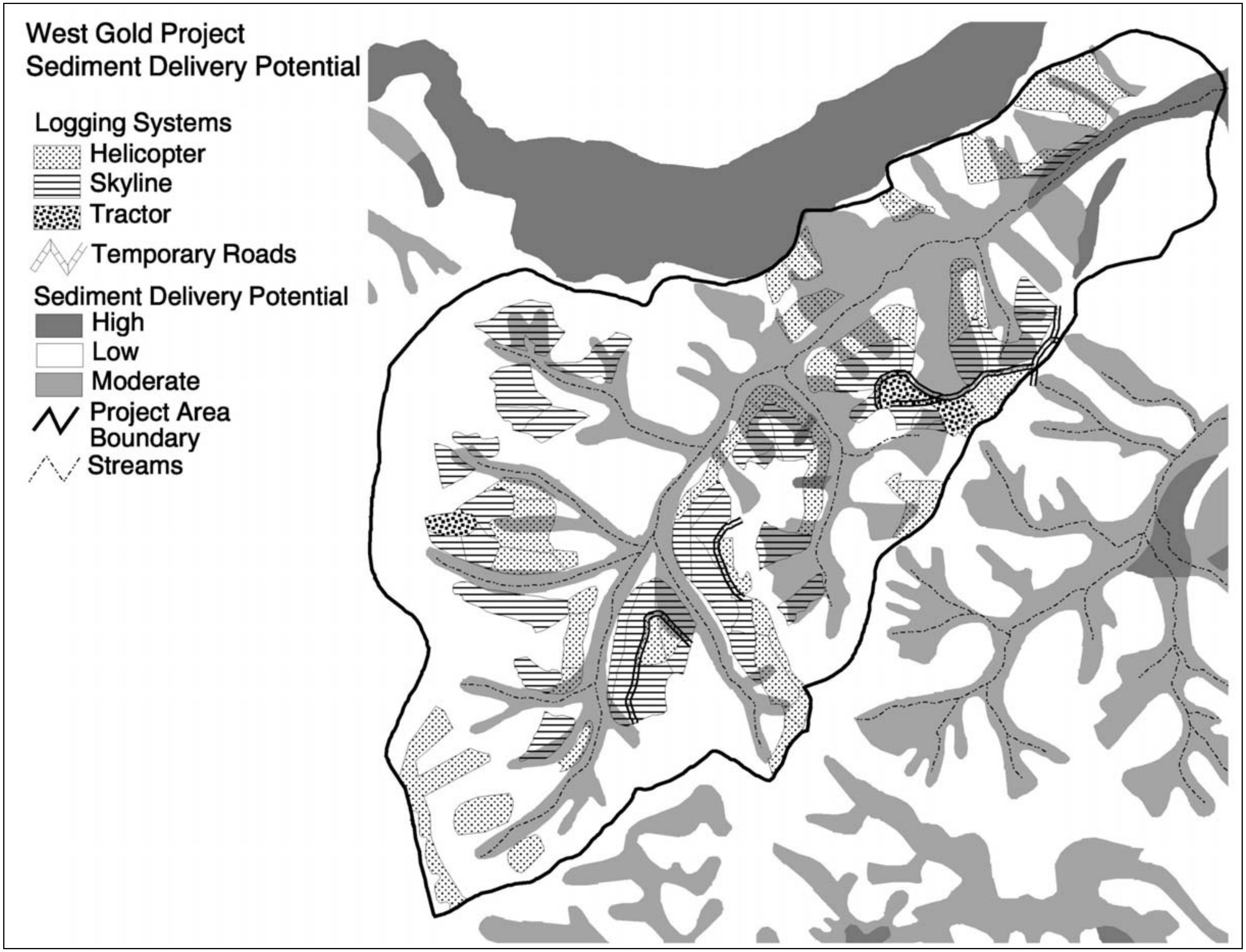



**Figure 20. Sediment delivery potential shown with proposed logging systems and temporary road construction (Alternative B is shown since it would be the most impactive). .**

### 2. Fisheries

The reference condition for fish habitat is based on reference reaches in West Gold Creek (see Watershed Reference Condition), historic information, knowledge of basic ecological processes, and professional judgment.

Physical attributes of fish habitat are mainly defined by stream channel condition. The bedrock-controlled nature of the lower Gold Creek and West Gold Creek channels have made them resilient to natural and human-caused disturbances over time. As a result, habitat degradation in these streams is relatively minor.

The historic distribution of bull trout in the Gold Creek Watershed is unknown. Their current distribution is limited to lower Gold Creek and lower West Gold Creek; they cannot access habitat in upper Gold Creek. It is possible that more habitat was historically available to bull trout, however it is unlikely that upper Gold and Chloride Gulch historically flowed year round.

Nearly two decades of redd counts indicate a stable bull trout population trend; however, it is unknown how these numbers compare with historic populations. No known population data exist from the pre-mining era. It appears that bull trout are currently using much of the available spawning habitat in lower Gold Creek, yet continuing effects from past mining and other disturbances (e.g. sediment from Kick Bush Slide) are likely depressing spawning and fry emergence success (Everest et al 1987; Bjornn and Reiser 1991; Nelson et al 1991).

## *3.71e Existing Condition*

### 1. Watershed

#### a. Beneficial Uses

The Idaho Department of Environmental Quality (IDEQ) designates beneficial uses to be protected for each water body in the state. Since both Gold and West Gold Creeks currently maintain cold-water biota and support spawning of bull trout and westslope cutthroat trout, they have a default designation for support of cold-water biota and salmonid spawning.

#### b. Watershed and Erosional Processes

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). The Gold Creek EAWS shows that 80 percent of West Gold and 69 percent of Gold Creek are within the rain-on-snow zone. This is an elevation zone between 3,000 feet and 4,500 feet, where the snow pack generally accumulates all season long but is constantly near isothermal[4]. When warm air masses associated with moisture raise the freezing level to above 4,500 feet, rain falling below the freezing level can result in rapid snowpack melting and flash flooding.

Rain-on-snow and resulting flash floods and/or debris flows are natural processes within the Coeur d'Alene Mountains. In the event of a flash flood, the impacts to stream channels are

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[4] *An isothermal snow pack is when the entire snow pack reaches the temperature of 32 degrees farhenheit.*

predominately caused by road-stream crossing failures: see "Sediment Risk Associated with Drainage Structures" below (USDA 1996).

Within the Gold Creek Watershed, the dominant channel forming and sediment transport events are associated with spring runoff. West Gold and Gold Creek are very stable and resilient because they developed in response to the variability of the climatic processes and the dominant geology of the basin.

Water Yield

The West Gold and Lower Gold Creek drainages are snowmelt-dominated systems; where peak flows are generated during the spring melt periods. Mean monthly peak flows within West Gold are estimated at 32.8 cubic feet second and current background water yield value is estimated at 6 percent over natural (project file). Figure 18 displays the current water yield percentage and its projected trend over the next five years. As tree mortality continues at a rate of 4 to 5 percent, water yield values are projected to increase one to two percent from canopy openings. This trend is evident in figure 18 starting with the year 2002.

Sediment Yield

The WATSED model estimates that the natural background sediment yield rate within the West Gold subwatershed is 101.5 tons/year (project file). Sediment yields have been static above background levels by about 92 tons/year since 1988, as displayed in figure 19. This is based on past natural events and road construction activities within the drainage. This value stays consistent through 2015.

Aerial photo interpretation shows there are no active or past management-induced mass failures within the West Gold subwatershed (project file).

Sediment Risk Associated with Drainage Structures

Road drainage structures (e.g. culverts) at stream crossings are commonly sites of ongoing or potential erosion and sediment sources. Failures occur when debris flows plug culverts and either concentrate water over the tops of road fills or divert water down the road or ditch and onto hillslopes unaccustomed to concentrated overland flow. Both scenarios produce large concentrations of sediment, which can scour the receiving channel bed and banks adding to the total sediment delivery (USDA 1998b). This detrimentally affects water quality and habitat for aquatic organisms.

Road drainage crossings were inventoried to assess erosional hazards and risks to aquatic ecosystems, using the *Methods for Inventory and Environmental Risk Assessment of Road Drainage Crossings* (Flanagan et al 1998). . Crossings were analyzed by collecting site-specific data organized into four categories:

- *Culvert Hazard* - the likelihood of culvert capacity being exceeded and potentially failing;
- *Fill Hazard* – the likelihood of the stream crossing fill failing;
- *Consequences* – the erosion effects of culvert failure, and;
- *Impacts* – the effects of culvert failure on downstream resources.

Factors in each category were given scores that were then weighted based on importance. The sums of the weighted scores are located in the project file. Using the Environmental Risk Score and professional judgment, stream-crossing sites were then identified as high, medium and low priority sites. These are listed in table 20 and data calculations are located within the watershed project file.

The first four crossings are ranked moderately high for risk to failure. This was due to the potential for diversion, lack of maintenance, and large throughfill volumes. At a minimum it would be these four crossings that would be high priority for treatment. The net associated risk of sediment delivery associated with the four crossings is 2,574 tons. This value is the estimated amount of sediment that would be contributed to West Gold if these culverts were to fail. It is not assumed that the culverts would fail all at once.

**Table 20. Hazard and risk summary of road drainage crossings within the West Gold subwatershed.**

| Road Crossing ID # | Net Associated Risk (tons) | Risk to Failure | Hazard |
|---|---|---|---|
| 2707A-4 | 892.3 | Moderately High | Lack of maintenance. |
| 2707A-5 | 859.9 | Moderately High | Diversion potential, high fill volume and lack of maintenance. |
| 2707A-3 | 299.2 | Moderately High | Diversion potential and distance, and lack of maintenance. |
| 278-1 | 522.6 | Moderately High | Diversion potential and high fill volumes. |
| 2707A-1 | 144.6 | Moderate | Diversion potential and moderate fill volume, and recently improved. |
| 2707A-2 | 169.9 | Moderate | Recent improvements, moderate fill volume. |
| 332-1 | 170.3 | Low | Adequately sized, low fill volume. |
| 2707-1 | 28.1 | Low | Adequately sized and recently improved. |
| 2707-2 | 26.8 | Low | Adequately sized and recently improved. |
| 2707-3 | 11.1 | Low | Adequately sized, low fill volume. |

### c. Stream Channel Characteristics

The dominant channel types along West Gold are classified as B3 and B4, with varying gradients (B3a, B3c and B4c; Rosgen 1996). These channel types are characterized as moderately confined and entrenched with limited floodplain development and not very sinuous. Gradients range between 2 to 4 percent with the B3 and B4 channel types, between 4 to 6 percent with the B3a, and below 2 percent with the B3c and B4c. The substrate is mainly composed of cobbles and gravels, with a lesser amount of small boulders and bedrock. Gravel deposits are located sporadically along West Gold where gradients are usually below 3 percent and appear to be temporary depositional areas.

Stream habitats are influenced by woody debris constrictions and local confinement, which typically produce scour pools and riffles. Streambank erosion rates are normally low as are channel aggradation and degradation process rates.

Along the upper reach of West Gold and its tributaries, the channel type changes to steeper A2 and A3 channel types. These are characterized as well-entrenched, confined channels with low width-to-depth ratios and gradients steeper than 4 percent. Habitat types are typically step pools with chutes, debris flows, and plunge or scour pools. The dominant substrate is mainly composed of cobbles and boulders with some bedrock intrusions at the confluences and upstream of the main stream channels.

Beaver activities are present in the upper reaches. Beaver dams appear to be stable and are causing the formation of new channels. However, these dams could fail during a large runoff event or rain-on-snow event, which would remobilize sediments that are stored behind the dams.

Along West Gold, the Bonneville Power Administration and Avista Powerline encroaches upon the stream channel for about one mile just above the Gold Creek confluence. Maintenance activities have removed riparian vegetation and potential large woody debris, and have introduced a noxious weed problem. The absence of overstory riparian vegetation can lead to increases in stream temperature and stream bank erosion, degradation of riparian habitat and the loss of woody debris recruitment. However, stream temperature data from 1999, 2000, and 2001 (fisheries project file) have shown that this is not the case along this reach.

## 2. Fisheries

### a. Fish Population

Bull trout are known to use habitat from the mouth of Gold Creek upstream to the confluence of West Gold Creek; a distance of 1.5 miles (2.4 km). Bull trout also occasionally spawn in lower West Gold Creek and have been observed holding in pools in the summer (district files). Bull trout redd counts have been conducted by the Idaho Department of Fish and Game in Gold Creek since 1983 (table 21). Analysis of these data shows that the bull trout populations in the Gold Watershed are relatively stable.

Above areas of dry channels and barriers, resident populations of rainbow trout, cutthroat trout, and rainbow-cutthroat trout hybrids inhabit Gold Creek and its tributaries (data in district fisheries files). Westslope cutthroat trout densities calculated from electrofishing/snorkeling samples in 2000 averaged >38 fish/100 meters in West Gold Creek. Westslope cutthroat trout are found throughout West Gold Creek and in at least two of its unnamed tributaries

### b. Habitat

Fisheries habitat data was collected in Gold Creek (1991) and West Gold Creek (2000, 1991). In addition, water temperature was monitored at points throughout the watershed in 1999, 2000, and 2001. All data and summaries are located in the project file.

<u>West Gold Creek</u>

West Gold Creek contains the best fish habitat in the Gold Creek watershed. This stream has many bedrock and beaver pools and good spawning habitat (Miller 1992). Large woody debris is prevalent throughout the channel except where the powerline parallels the creek (Sec. 9). In the lower reaches, pools are deep and usually formed by bedrock or boulders. Wood acts mostly as cover and less often as formative features of pools. In the upper reaches of West Gold Creek, pools are smaller and primarily formed by wood.

**Table 21. Bull Trout redd counts in Gold Creek from 1983 to 2001.**

| Year | # Redds |
|---|---|
| 1983 | 131 |
| 1984 | 124 |
| 1985 | 11 |
| 1986 | 78 |
| 1987 | 62 |
| 1988 | 111 |
| 1989 | 122 |
| 1990 | 84 |
| 1991 | 104 |
| 1992 | 93 |
| 1993 | 120 |
| 1994 | 164 |
| 1995 | 95 |
| 1996 | 100 |
| 1997 | 76 |
| 1998 | 120 |
| 1999 | 147 |
| 2000 | 168 |
| 2001 | 127 |

The reach along the powerline lacks instream wood and riparian trees and shrubs, primarily from powerline maintenance. Lower pool density and pool quality would be expected from a lack of instream wood, and increased water temperatures would be expected from a lack of riparian shade. However, temperature data indicates this is not the case. Although there are no wood-formed pools in this stream segment, there are many deep pools, and residual pool volume is equal to or greater than in other reaches. Temperature data from continuous-recording thermographs indicate no differences in water temperatures above or below the powerline corridor (fisheries project file). Fish densities are similar to those in other reaches.

Portions of West Gold Creek in Section 17 have historic and current beaver activity. As a result, residual pool volume is high. Many small cutthroat trout inhabit these pools.

Although historic cutting units in the headwaters of West Gold Creek did not have protection buffers and were clearcut across the channels, tributary streams appear to be in stable condition, the only exception being the result of a culvert failure on the 2707A road (project file). Material from the culvert failure has accumulated in upper West Gold Creek and caused some aggradation of the channel (project file). The effects of these erosional processes are being seen downstream; however, they are localized within the approximately 1.2 mile low-gradient section. This reach is the nearest depositional reach that the headwater tributaries drain into and may naturally store sediment routed from these high-gradient streams. The habitat in this reach of West Gold Creek is of lesser quality than in downstream segments.

Past wildfires removed the majority of the older classes of woody debris in most of the riparian areas (only 8.6 percent of the West Gold Creek drainage is classified as mature or old growth), although woody debris is the formative feature for 90 percent of pools in the uppermost reach. Past harvest removed large woody debris where clearcuts occurred across riparian areas in the headwater tributaries. Woody debris does not appear to be a limiting factor in the lower reaches as 76 percent of surveyed pools were bedrock or boulder formed. Bull trout spawn in West Gold Creek only occasionally; snorkeling surveys indicate that they commonly inhabit the lowest reach. Overall, the stream channel condition and physical habitat of West Gold Creek and its tributaries have been resilient in the face of past natural and human-caused disturbances.

Lower Gold Creek

The lowest reach of Gold Creek contains long, low-gradient riffles with excellent spawning substrates and many pools with good holding areas for fish (Miller 1992). Large woody debris occurrence in lower Gold Creek is scarce compared to that in West Gold Creek. Approximately 0.2 miles upstream from the mouth, Gold Creek is more confined with bedrock intrusions and boulder substrate. Spawning habitat is limited to pockets of gravels that are widely used by bull trout (as opposed to the long, low gradient riffles found downstream). Deep pools are common and are formed primarily by bedrock or boulders; pools formed by large woody debris are less common. Many springs feed lower Gold Creek. These springs strongly influence water temperatures, which stay below 12°C[5] throughout the summer despite higher temperatures in the main feeder tributaries of West Gold Creek and Kick Bush Gulch.

# 3.72 Environmental Consequences

## *3.72a 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 of cutting units, methods of logging systems, road construction and road work, and reasonably foreseeable actions) are expected to affect Gold Creek, West Gold and its tributaries.

### 1. Sediment Yield

Percent increase in sediment yield is estimated as the annual sediment loading into West Gold Creek above existing levels. This percent is compared to the current sediment load discussed in the affected environment section. Sediment yield percent is calculated for each alternative using the WATSED model. The proposed timber harvest units, construction, reconstruction and decommissioning of temporary and classified roads, and site preparation treatments are included in the analysis. Some of the reasonably foreseeable actions discussed below are also calculated in the analysis. The estimated short-term or direct and indirect effects analysis timeframe for sediment yields is through 2015, the latest year that sediment yield would recover to baseline.

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[5] Idaho state water quality standards are 13º C or less for salmonid spawning and 22º C or less for cold water biota.

### 2. Water Yield

Peak flows represent the change in runoff and is expressed as the percent change from the estimated "natural" peak month discharge. The WATSED model was also used for this analysis to estimate the effects of the proposed timber harvest, construction, reconstruction and decommissioning of temporary and classified roads, and site preparation treatments. Reasonably foreseeable actions are included in this analysis. Changes in peak flows are compared to the existing peak flows discussed in the affected environment section. The estimated direct and indirect effects analysis timeframe for all alternatives is through 2030. This period is longer than the sediment yield since the water yield recovery period takes longer with vegetation regrowth.

### 3. Sediment Risk Associated with Drainage Structures

This is the anticipated change in sediment risk associated with stream crossings that were inventoried within the scope of the project. The associated risk is presented in terms of tons of sediment as discussed in the affected environment section. This figure was calculated based on measurements or estimates of road throughfill located at stream crossings. This issue indicator is important in assessing watershed improvement work associated with the alternatives.

## *3.72b Direct and Indirect Effects*

### 1. Alternative A

Since no management activities would be implemented with this alternative, there would be no direct effects associated with this project. Water and sediment yield values and trends as discussed in the affected environment would not change from existing conditions and predicted trends. Water yield values would increase 1 to 2 percent over time due to dead and dying trees. Sediment yield values would stay at about 90 percent above natural through 2015.

Under this alternative, none of the identified at-risk road drainage crossings would be improved. Without the proposed improvements, the net associated risk of sediment delivery is estimated at 2,572 tons (watershed project file). The failure of these crossings would likely happen under two scenarios. First, if a large stand replacing fire occurs and is then followed by a high intensity rain or a rain-on-snow event. Second, if just a rain-on-snow event were to occur as discussed in the affected environment section. Under both scenarios, if a flash flood and/or debris flow is triggered by either event, culvert failures occur when debris plugs culverts or when the capacity of the culvert is exceeded. Water then is either concentrated over the top of road fills or is diverted down the road or ditch and onto hillslopes unaccustomed to concentrated overland flow.

With either of these scenarios, the additional sediment pulse could result in adverse effects to fish populations. If either of these events were to occur while bull trout eggs or alevins were still in the gravels, they could potentially be entombed by the additional sediment and suffocate.

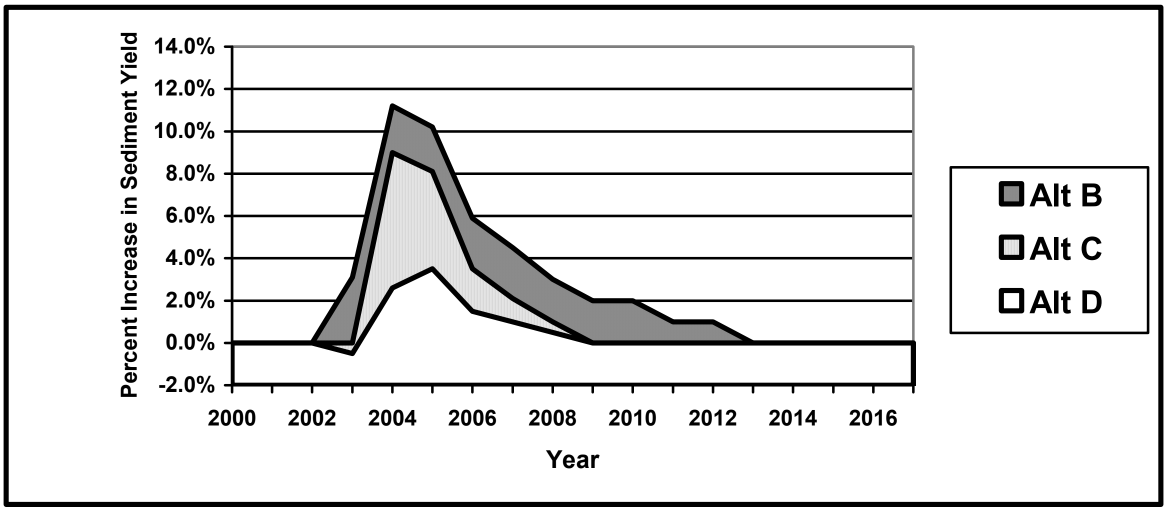
### 2. Effects Common to Alternatives B, C, and D

**a. Sediment Yield**

Changes in sediment yield values for the three alternatives over the term of the project are displayed in figure 21 and within the watershed project file. Logging and cutting prescriptions, temporary road construction, road maintenance, temporary road decommissioning, and post-harvest activities are modeled. Figure 21 does not show the reduction in sediment from the removal and upgrade of the at risk culverts identified in table 20.

Recent validation WATSED runs indicated that the WATSED measured responses were accurate for flow, but appeared to over estimate sediment loads (USDA 2000). As mentioned before, the model is one tool used to determine effects and is used as a relative comparison of alternatives.

**Figure 21. Alternative comparisons in sediment yield increases within West Gold Creek.** Differences between Alt. B and C are due primarily to temporary road construction and, to a lesser extent, differences in logging systems. Alternative A is not shown since it is assumed it would be a zero percent increase from the existing condition.




**Effects of Sediment from Temporary Road Construction** – In Alternatives B and D, temporary roads would be designed and planned as part of the transportation system then decommissioned after use. Slope stability would be restored, surface erosion would be eliminated, and all crossings and associated fills would be removed from the channel and floodplain and stabilized. These sites should need no future maintenance after decommissioning.

Since Alternatives B and C are identical in vegetation treatment prescriptions, the differences in sediment yields are primarily attributed to temporary road construction activities and to a lesser degree, changes in logging systems. This is evident in figure 21 where the darker gray colors for Alternative B represent elevated levels in sediment yield above harvest activities. This estimate of sediment is based on the deterministic nature of the WATSED model, which establishes sedimentation coefficients on road construction activities. The model does not incorporate buffer distances between roads and the nearest stream channel or the type and amount of storage material (rocks, coarse woody debris) within this buffer. These attributes are considered critical in estimating sediment delivery quantities from roads and other ground disturbance activities (Megahan and Ketcheson 1996, Elliott and Hall 1997).

Since temporary road construction activities proposed in Alternatives B and D do not occur on sensitive landtypes; only cross intermittent draws; are over 1,000 feet from West Gold Creek; and incorporate design features described in Chapter II, the risk of sediment delivery from road construction would be less than predicted. Other projects that have modeled temporary road construction activities that incorporate buffer distances and sediment storage capacities demonstrate that sediment delivery rates are low (USDA 2002a).

About 500 feet of new road is proposed outside the project area boundary and within the Chloride Gulch drainage. The road, 278 D1, would take off from Road 278D to the ridge and then split off in two separate roads (see figure 3, Appendix I). As with the temporary roads, this road is not constructed on any sensitive landtypes; does not cross any intermittent or perennial stream channels; and incorporates design features described in Chapter II. Therefore, the risk of sediment delivery from the construction of this road is low.

**Effects of Sediment from Road Decommissioning** - WATSED is unable to estimate sediment delivery reductions and recovery periods back to natural conditions with decommissioned roads. Therefore, the long-term reduction in sediment delivery from the decommissioning of 3.0 miles of temporary roads and 1.7 miles of existing roads is not fully depicted in the model outputs. We estimate that at least 1,752 tons of sediment would be reduced through the removal of the two at-risk crossings on the 2707A road (table 20).

Research has shown recovery of decommissioned roads within three to five years of the work (Hickenbottom 2001, USDA 2001, and Redente et al 1994). Under the worse case scenario, it is assumed that temporary roads will be on the landscape for eight years, so sediment delivery is estimated to recover to natural conditions in 2013.

**New Motorized Access** - Alternatives B, C and D propose changing road access along Roads 2707A and 2707AA to begin allowing OHV (vehicles less than 50 inches wide) use except during soft roadbed conditions. Road surveys for these two sections of road show that the road is in good condition and sediment delivery from the road surface is minimal (watershed project file). Changes in sediment delivery associated with this proposal are reflected in the WATSED sediment delivery rates. High and moderate risk culverts located on 2707A road (table 20, Affected Environment) would be upgraded under the design features (see Chapter II).

With the change in access management along these two roads, there would not be any direct or indirect effects from sediment yield increases to West Gold. With soft roadbed restrictions, ongoing road maintenance activities and the improvement of high-risk culverts, this will ensure no direct and indirect effects.

**Effects of Sediment from Logging and Vegetation Prescriptions -** Activities occurring on sensitive landtypes consist only of vegetation prescriptions and logging activities. One thinning prescription in unit 6 is categorized to have high mass failure potential and high sediment delivery potential. The prescription for this unit is to thin approximately 11 acres of the stand with a skyline yarding logging system. Treatments on this landtype recommend minimal soil disturbance and timing restrictions (see Chapter II, Features Designed to Protect Soil, Water and Fish Habitat). Skyline logging during the summer months is appropriate on this landtype because of the limited ground disturbance that is created and because soils are not saturated (project file).

Additional activities proposed on sensitive landtypes include vegetation prescriptions and logging on high and moderate sediment delivery potential landtypes. Table 22 summarizes these activities.

**Table 22. Summary of harvest activities and logging methods on high sediment delivery potential landtypes with Alternatives B and C.**

| Vegetation Prescription | Logging Methods | Acres on Sensitive Landtypes |
|---|---|---|
| Thinning | Skyline | 21.3 |
| | Helicopter | 110.4 |
| Irregular Shelterwood | Skyline/Helicopter | 23.3 |
| | Helicopter | 40.3 |
| Rehabilitation | Skyline/Helicopter | 115.0 |

Sediment delivery rates from the proposed harvest activities on these landtypes are reflected in the WATSED sediment runs. Since the majority of these units are going to be helicopter logged and there would be no logging within the RHCAs, sediment delivery from these units is considered negligible. Research studies and monitoring results conducted on the Idaho Panhandle National Forest verify that when RHCAs or buffer strips are incorporated into timber sales, sediment delivery to stream channels is not measurable or negligible (USDA 2000, 1999, 1998b, 1997b, Belt et al 1992, Reid and Hilton 1998). Also, Cacek 1989 determined that clearcut logging on sensitive landtypes within the Lightning Creek watershed only accounted for 1.4 percent of the mass failures. The dominant cause of the mass failures and resulting sedimentation to Lightning Creek was from abandoned road networks.

**Sediment Risk Associated with Drainage Structures** - All three-action alternatives propose replacing or removing drainage structures at risk and therefore would reduce potential for road crossing failures. Increasing the size of the culvert or removing the drainage structure would reduce the risk of failure, as a result of reduced capacity. Table 23 displays which culverts are replaced and improved and associated sediment reduction.

**Table 23. Net associated risk reduction in sediment associated with removing the 2707A-4 and 5 culverts and improving the 2707A-3 and 278-1 culverts.**

| Road Crossing ID Number | Treatment | Reductions in Net Associated Risk (tons) |
|---|---|---|
| 2707A-4 | Decommission road and remove throughfill. | 892.3 |
| 2707A-5 | Decommission road and remove throughfill. | 859.9 |
| 2707A-3 | Remove a portion of throughfill and upgrade culvert. | 299.2 |
| 278-1 | Upgrade culvert. | 522.6 |

With these improvements, the likelihood that culverts would fail in the event of a flash flood or debris flow triggered by a large stand-replacing fire followed by high-intensity rain or rain-on-snow event is greatly reduced, as opposed to taking no action under Alternative A. These improvements would reduce the net associated risk of sediment delivery to West Gold Creek by at least 1,752 tons with the removal of crossings 2707A 4 and 5, and potentially 2,572 tons with the improvements made to 2707A-3 and 278-1.

There would be a short-term increase in sediment delivery during the removal or upgrading of the culverts, but with timing restrictions, onsite direction, and BMPs as outlined in Appendix A, sediment input would be limited. Because of the potential negative effects to fish populations and habitat in the event of culvert failures, the removal or upgrades of culverts would have a long-term beneficial effect to fisheries over the existing condition.

**b. Effects of Sediment Yield by Alternative**

**Alternative B** would have the highest percent increase in sediment yield, with an estimated 11 percent increase for the first two years of the project and recovery back to baseline in 2013 (see figure 21). Over the life of the project, this alternative would generate an estimated 137 tons of sediment (table 24 and watershed project file) Overall, there would be a net decrease of 1,615 tons of sediment yield when considering the difference between the removal of the at-risk culverts and road decommissioning activities, and the sediment generated from the proposed activities.

**Alternative C**, which does not propose any road construction, would treat the same amount of vegetation and would decommission the same miles of existing road as Alternative B. It would create an estimated 9 percent increase in sediment yield for the first year of the project and would recover back to baseline conditions in 2009. Over the life of the project, this alternative would generate an estimated 52 tons of sediment (table 24 and watershed project file). Overall, there would be a net decrease of 1,700 tons of sediment yield when considering the difference between the removal of the at-risk culverts and road decommissioning activities, and the sediment generated from the proposed activities.

**Alternative D** has the smallest increase in sediment yield at an estimated 3.5 percent and would recover back to baseline conditions in 2009. The treatment of only 440 acres and the construction of 0.5 mile of road are the primary causes in sediment increases. Over the life of the project, this alternative would generate an estimated 20 tons of sediment (table 24 and watershed project file). Overall, there would be a net decrease of 1,722 tons of sediment yield when considering the difference between the removal of the at-risk culverts and road decommissioning activities, and the sediment generated from the proposed activities.

**c. Effects of Sediment Yield on Fisheries**

Increases in sediment delivery can affect fish habitat by filling in the interstitial spaces in spawning gravels. This results in decreased water flow through the gravels that is imperative for oxygen delivery to incubating eggs and removing wastes. Filling of interstitial spaces can also displace macroinvertebrates, thereby reducing an important food source for fishes. High amounts of sediment can fill in pools and reduce rearing habitat for juvenile fishes.

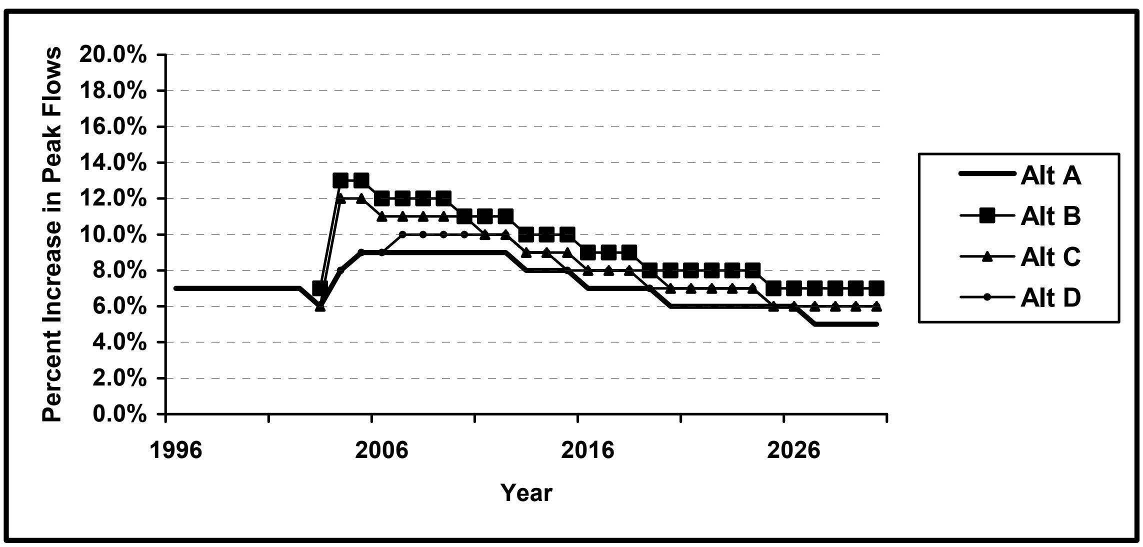
Since all ground disturbing activities would occur outside of RHCAs, the risk of any sediment generated by logging activities actually reaching a live channel is very low (Belt et al., 1992). By using timing restrictions, onsite direction, and BMPs, sediment delivery to occupied fish habitat associated with culvert removals and upgrades would be minimized. Since the identified culverts are located high in the drainage, the likelihood that any escaped sediment would be transported into the lowest reaches of West Gold and Gold Creek below the confluence is very low. The higher-gradient channel types present in West Gold Creek would likely carry any sediment to the nearest low gradient area where it would settle out. Similarly, sands and gravels would be deposited on gravel bars or other energy reducing features. In-channel sediment levels have remained relatively stable since 1955 and would continue to remain that way in the short term. Risk of sediment delivery would be immediately reduced from culvert upgrades and removals and the sediment levels would trend back toward baseline in the long term with any action alternative.

### d. Water Yield

For West Gold Creek and its tributaries, the estimated differences in water yield increases between the three action alternatives is small. Figure 22 compares the percent increase in water yield values to Alternative A, (no action). Alternative B raises peak flows to 13 percent, a 5 percent increase over the existing condition; Alternative C raises water yield to 12 percent, a 4 percent increase over the existing condition; and Alternative D, raises water yield to 10 percent, a 2 percent increase.

The difference in water yield increases between Alternatives B and C annually is one percent (figure 22 and watershed project file). Both alternatives would initiate a small increase in flows within the first order, headwater drainages. Increases in water yield under any of the alternatives would probably not be detectable in the main West Gold channel and could not be differentiated from normal climatic fluctuations.

**Figure 22. Alternative comparisons in water yield increases for West Gold Creek.**




Alternative D is only one percent of Alternative C and two percent of Alternative B (figure 22 and watershed project file). These differences would also not be measurable within West Gold and in the headwater drainages.

All three action alternatives are within the historic range of variability (HRV). The maximum HRV was measured at 17 percent (figure 18, Affected Environment), which is 4 percent higher than Alternative B. Also, all three alternatives are within the HRV when comparing the difference in the rise of water yield from the existing condition. During the 1850 and 1896 fires, the spike climbed from 2 percent to 17 percent, a 15 percent rise. The largest spike would be with Alternative B, which has a 5 percent spike, less than half than what occurred from the fires.

All three action alternatives also mimic the recovery pattern from what occurred naturally following fires of the late 1880s. From the fires, it was estimated that recovery gradually occurred over 20 years. This is apparent in figure 22 with recovery occurring in 2030 for Alternatives C and D and only one percent higher for Alternative B.

Since any change in water yield associated with this project would likely be undetectable in West Gold Creek, additional bedload scour during high flows would not be expected. Redds existing in the cumulative effects area would not be affected by the expected increase in water yield.

**e. Stream Channel Morphology**

Changes in the magnitude, intensity or duration of peak flows and sediment yields have the potential to change stream channel characteristics. Stream channels that are primarily alluvial systems (sediment deposited and formed) are the most susceptible to stream bank erosion, changes in sediment supplies, and large woody debris removal (Chamberlin et al 1991, Rosgen 1996). Stream channels where the substrate is composed of bedrock and boulders that have a good portion of large woody debris jams and are more confined within the valley bottom, are more stable with respect to fluctuations in flow and sediment yields (Chamberlin et al 1991, Rosgen 1996).

All three action alternatives modify the magnitude, intensity and duration of peak flows and sediment yields at different levels, with Alternative B having the greatest change. Based on the stream channel and landtype characteristics of West Gold and its tributaries, the estimated changes in peak flows, sediment yields and the potential increases in flows from a rain-on-snow event, would not affect stream channel morphology from any of the three action alternatives, and therefore would not change fish habitat. West Gold and its tributaries are not alluvial channels. The dominant stream bank material is primarily composed of boulders, cobbles and bedrock outcrops that are not easily erodible. Plus, the channels are well confined and entrenched, which allow sediment and debris to be easily transported.

Stream survey data from the summer of 2000 indicates that woody debris recruitment levels are high, except where boulders and bedrock dominate the stream substrate (watershed project file). These pool formative features and beaver dams also dissipate stream energy. A maximum increase in water yield of 5 percent over the existing condition would likely result in some elevated flows in the headwaters, but would be undetectable in West Gold Creek.

## *3.72c Cumulative Effects*

### 1. Analysis Area

The cumulative effects analysis area is defined as the Gold Creek watershed. The 21.7 square mile watershed is the next scale larger that would exhibit any cumulative effects if they were to occur from the project. Figure 23 displays the cumulative effects area and where some of the present and future foreseeable actions will occur.

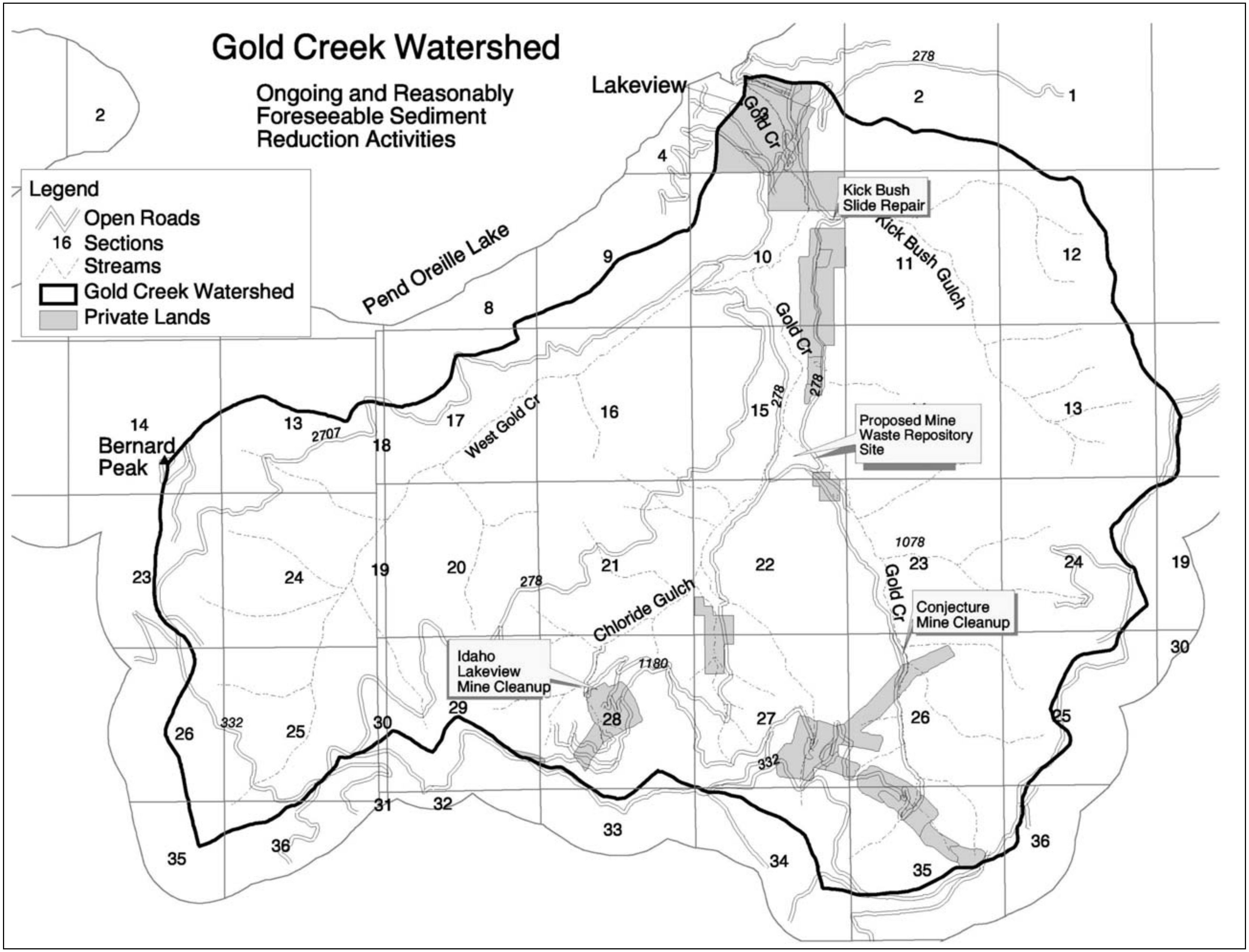



**Figure 23. Cumulative Effects Analysis Area for Watershed and Fisheries.** Map shows ongoing and reasonably foreseeable sediment reduction activities.

## 2. Past, Present and Reasonably Foreseeable Actions

The following is a description of past, present and reasonably foreseeable actions, to establish the appropriate geographic and time boundaries for the cumulative effects analysis. Activities identified below were ones that are relevant to the watershed and fisheries cumulative effects analysis. Other activities listed in Chapter I are not discussed here because there is no soil or watershed disturbance created by these activities. These include tree planting, firewood gathering, hunting, and helispot maintenance.

### a. Past Activities and Events

**Wildfires, timber harvesting and road construction activities** have occurred throughout the watershed. The Gold Creek Watershed Analysis (USDA 2002) discusses in detail the history, acreages and mileages for each activity and their time periods. For the West Gold drainage, all three events were used in the WATSED model to determine the current baseline condition and to look at historic ranges of variability. This is discussed in the affected environment section of this document.

**Mining in Gold Creek and Chloride Gulch** - Extensive mining activities occurred within Gold Creek and Chloride Gulch drainages, starting around the late 1880s and continuing through the 1980s. During the operation of the mines, numerous roads were constructed and the stream channels of Gold Creek and Chloride Gulch were channelized and contaminated with heavy metals and waste rock. Heavy metal deposits have been located up to two miles downstream of the mine sites and waste rock deposits have added a tremendous amount of bedload material to both streams.

**Road Construction and Clearing of Vegetation for the Powerline Corridor** - The construction of the Bonneville Power Administration and Avista powerline corridor within West Gold occurred in 1952. This involved constructing two miles of roads to access transmission towers and clearing of 130 acres along the right-of-way. Roads were constructed with no best management practices or current road design standards. About one mile of the corridor is directly over West Gold Creek. Vegetation clearing, which involves cutting all trees greater in heights of usually 35 feet within the riparian area, has historically occurred.

### b. Present and Ongoing Activities

**Fire suppression activities** over the last century within the West Gold and Gold Creek drainages have allowed stands to progress towards climax vegetative condition. The current trend is toward more shade tolerant species that are not as long-lived and are more susceptible to insects and disease (Forest Vegetation section). Since changes in water yield are associated with vegetation conditions, the existing and future trends would have an effect on water yield.

**General Motor Vehicle, Off Road Vehicle and Snowmobile Use on Roads** - The Gold Creek watershed analysis (USDA 2002) identified this general area as one that would likely see an increase in recreational vehicle use. Since motorize use is not as restricted as other areas on the district, the increasing popularity from the Coeur d'Alene area, motorcycles, ATVs and snowmobile use is increasing. This has forced additional needs in road and trail maintenance. The lack of road and trail maintenance causes increases in erosion and sediment delivery.

Currently, road and trail maintenance has been reasonable in the Gold Creek watershed and have addressed the immediate concerns with erosion and sediment delivery.

**Road maintenance activities** occur annually to some degree within the watershed. These activities include, but are not limited to, blading, brushing, and culvert cleaning. Maintenance activities typically improve drainage and decrease erosion from water channeling down the road surface. Culvert cleaning and associated maintenance lowers the associated risk of failure. Recent road maintenance agreements from Bonner County has allowed the Forest Service to take over road maintenance activities along road 278. This should improve road surface runoff and reduce sediment delivery along this section of road since it would observe a greater frequency in road maintenance.

**Activities on Private Lands within the Gold Creek Watershed** - Private land consists of 7 percent of the Gold Creek watershed, with the majority of the land within or near the town of Lakeview. The private lands around Lakeview primarily consist of summer homes and a year round hotel. Some of the private roads accessing these homes have delivered sediment to Gold Creek from road fill failures and road surface runoff. Sediment delivery levels from these private roads are based on the level of road maintenance activities.

The other portions of private lands are the abandoned and active mine claims and parcels scattered in the Upper Gold Creek and Chloride drainages. The impacts of those lands are discussed in the abandoned mine section. Idaho Department of Lands has received a permit for harvesting trees near the headwaters of Chloride Gulch (watershed project file). According to the permit information, timber harvesting has recently occurred near the Weber mine. Timber harvest activities must follow the rules and best management practices set by the Idaho Forest Practices Act (Idaho Forest Practices Act, Title 38, Chapter 13, Idaho Code). These rules and BMPs are designed to prevent sediment delivery to stream channels and to prevent any cumulative watershed effects. Current and ongoing activities on private lands are not anticipated to have any cumulative effects to watershed resources and aquatics.

**Powerline Right-of-Way Maintenance** – Removal and cutting of trees in a one-mile section of the powerline corridor along West Gold has resulted in a long-term loss of large woody debris recruitment. Large wood debris is an important component as a pool formative feature and in storing sediment. Pool formation along this reach is dominated by bedrock intrusions and form a step-pool complex. This complex is providing pool habitat and storing sediments.

Temperature-monitoring information reveals that the decreases in shade have had only a minor effect and that springs and seepage entering the system downstream, lowers stream temperatures. Thermographs from data collected in 2000 and 2001 verify that the average maximum temperature in West Gold exceeds 16˚ C during late July through early August above where the powerline is within the RHCA. Data collected below the powerline intrusion to the confluence with Gold Creek shows an average maximum temperature of under 15˚ C during the same time period. The majority of bull trout redds is found in Gold Creek, below the confluence with West Gold Creek. Temperatures are approximately five degrees cooler than West Gold Creek temperatures due to the abundance of springs flowing directly into Gold Creek.

Maintenance activities will continue to inhibit woody debris recruitment to West Gold Creek, but are not expected to have any effect on stream morphology due to the bedrock-controlled nature of the stream. These activities are also not expected to influence temperature fluctuations based on the thermograph data.

**Gold Creek and Chloride Mine Clean-Up** - Extensive mine reclamation work is scheduled to occur over the next ten years within both Gold Creek and Chloride Gulch drainages. The Idaho Lakeview and Conjecture Mines have been identified as the top two priority cleanup sites within the watershed. Current planning efforts entail the cleanup of 2,260 cubic yards of tailings at the Idaho Lakeview Mine. These tailings have elevated concentrations of antimony, arsenic, cadmium, copper, lead and zinc. Average arsenic concentrations in tailings are 3,784 mg/kg (Idaho Lakeview Mine Tailings Operable Unit EECA, 2002). These tailings compose the stream banks and floodplain of Chloride Gulch. It can be estimated that an average annual estimate of 39.6 tons/year of tailings are contributed to Chloride Gulch and Gold Creek annually (watershed project file).

Restoration of the Chloride Gulch stream channel at the Idaho Lakeview Mine is also planned. This would restore about 400 feet of the stream channel back to its natural pattern, profile and dimensions. All these activities are scheduled to start in 2003.

All mine cleanup activities will adhere to about twenty federal and state standards designed to protect surface and subsurface water quality, endangered species, wetlands, and floodplains (Draft Idaho Lakeview Mine Tailings Operable Unit EECA, 2002). Federal and state laws mandate these standards and also provide design features and best management practices. Similar cleanup activities that have occurred in the Idaho Panhandle National Forests and within the Northern Region of the Forest Service where similar reclamation practices have been used have been successful (watershed project file).

With the restoration of Chloride Gulch there would be short-term (two to three year) increases in sediment due to the removal of deposited heavy metal tailings and the reestablishing of natural stream channel characteristics. Mitigation measures such as sediment detention ponds, diverting stream flows and timing of restoration activities, would keep sediment levels much below current levels. Once the mine cleanup is complete, sediment delivery will be greatly reduced from current levels and bedload transport rates would return to background levels. This will enhance aquatic habitat and reduce heavy metal concentrations in Gold Creek and Chloride Gulch.

**Kick Bush Slide Road Repair** - The Kick Bush Slide is an eroding cutslope along road Road 278. The site is a chronic sediment source to Kick Bush Gulch and Gold Creek. The stabilization of the cutslope is scheduled in 2002 and should be completed in 2003. The estimated sediment reduction from the Kick Bush slide is about 193.6 tons per year. Any short-term sediment delivery increases from this project would be much lower than what the existing condition is generating. Plus, with the implementation of best management practices, there should not be any sediment delivery to Kick Bush Gulch. Over the long term, there will be a substantial decrease in sediment delivery to the entire Gold Creek watershed.

**Noxious Weeds Monitoring and Treatment** - This activity would follow guidelines established in the Sandpoint Noxious Weeds Control Project EIS (USDA 1998c). 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 and timing restrictions would be enacted. No detrimental direct or indirect effects to watershed and fisheries are expected to occur.

**Future Salvage Opportunities** - Salvage opportunities, as described in Chapter II, are not expected to cause additional effects to watershed or fisheries resources. The criteria stated in Chapter II ensures that no additional disturbance would occur (e.g. salvage must meet INFS guidelines, would not take place on high risk soils or where it may adversely affect floodplains, wetlands, or if it can adversely affect threatened, endangered, or sensitive fish species or their habitat; there would be no new road construction, and only existing skid trails would be used).

**Fire Suppression Activities** - Successful fire suppression activities within the West Gold and Gold drainages will continue to allow stands to progress towards climax vegetation conditions where stands are not treated. As this occurs, water yield values will stay stagnant around 6 to 9 percent and will deter any entrainment and sorting of sediments or delivery and transport of large woody debris from natural events. Gold and West Gold Creeks will continue storing sediment in the channel in areas of deposition until an episodic event increases peak flows high enough to flush and entrain sediments (Benda and Dunne 1997).

## 3. Cumulative Effects

### a. Sediment Yield

The combination of direct and indirect effects of the proposed alternatives with past, present and reasonably foreseeable activities, will result in an overall net decrease in sediment yield to the Gold Creek Watershed. Table 24 summarizes sediment inputs and reductions within the Gold Creek Watershed.

Alternative D would result in the largest net reduction in sediment by 1,926 tons, followed by Alternative C with 1,894 tons, Alternative B with 1,809 and then Alternative A with only 194 tons from the Kickbush Slide restoration. The greatest sediment reduction activities within the watershed are from the proposed removal of the at-risk culverts along Road 2707A.

The improvement and removal of the high-risk culverts will reduce the net associated risk of sediment delivery by at least 1,752 tons and up to an estimated 2,572 tons. The decommissioning of 1.7 miles of existing roads would also reduce sediment yields over the long term. Differences in sediment yields between the action alternatives are tied to the construction of temporary roads and vegetation treatment acres. Of the three action alternatives, Alternative C would provide the least amount of risk in sediment yields since no temporary roads are constructed and it treats the greatest amount of acres.

Studies have discussed that when disturbance patterns created by timber harvesting are used to achieve some of the benefits of natural disturbances, activities should be concentrated in a drainage rather than dispersed, that riparian areas need protection, and that harvest rotations should require longer intervals (Reeves et al 1995). Alternatives B and C best address this criteria by concentrating all activities within West Gold, incorporating riparian habitat conservation areas, and prescribing vegetation treatments that are needed throughout the West Gold Subwatershed.

**Table 24. Summary of estimated cumulative sediment delivery and reduction within the Gold Creek Watershed. Mine cleanup work is not included in this sediment budget spreadsheet since the work has not yet been completed and it is still unknown how much material will be removed from both the Idaho Lakeview and Conjecture mines.**

| **Estimated Sediment Delivery (tons)** | **Alt A** | **Alt B** | **Alt C** | **Alt D** | **Comments** |
|---|---|---|---|---|---|
| *West Gold Project* | 0.0 | 137 | 52 | 20 | Estimated delivery over the life of the project. Values include timber harvesting, temporary road construction, road maintenance, temporary road decommissioning, and post-harvest activities are modeled.. |
| **Estimated Sediment Reduction (tons)** | | | | | |
| *West Gold Project* | 0.0 | -1752 | -1752 | -1752 | Sediment reduction is based on removal of road fill material from the at risk culverts. Indirectly reflects road decommissioning activities. |
| *Kick Bush Slide* | -194 | -194 | -194 | -194 | |
| **Overall Net Sediment Reduction within the Gold Creek Watershed (tons)** | **-194** | **-1809** | **-1894** | **-1926** | |

Within Gold Creek, the ongoing activities and reasonably foreseeable projects such as restoration of the Kick Bush Slide, the mine cleanup in Gold Creek and Chloride Gulch, and acquiring road maintenance work along Road 278 will greatly reduce the majority of sediment that is contributed to this watershed. The estimated sediment increases from the West Gold project are immeasurable compared to the current sediment levels that the mines and the Kick Bush slide are currently delivering.

The amount of sediment produced by the West Gold project combined with the sediment reduced by activities within the Gold Creek watershed, would result in a net decrease in sediment delivery. Therefore, this project would not impair beneficial uses within Gold Creek and would meet the intent of the Gold Creek TMDL. Alternative C would provide the greatest cumulative benefit in reducing short and long-term sediment yields, since no temporary roads are constructed and it treats the greatest amount of acres.

### b. Water Yield: Increases in Peak Flows

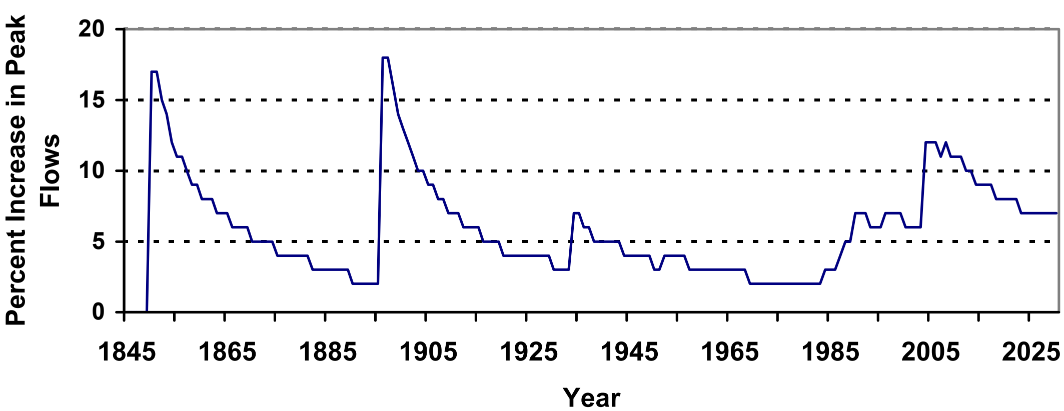
With any of the action alternatives, the direct and indirect effects of increased peak flows combined with the effects from past, present and reasonably foreseeable activities, would not result in any cumulative effects to West Gold and Gold Creek. Estimated water yield increases are within the historic range of variability for magnitude, intensity and duration when compared with estimates for past natural events (figure 24). The effects of Alternatives B and C are more consistent with what likely occurred with natural events (figure 24) than Alternative D, where water yield increases are probably not measurable.

The proposed activities in West Gold would increase peak flows to Gold Creek but to a much smaller degree. The historic fires in West Gold also burned much of the Gold Creek watershed (USDA 2002); therefore it can be assumed that the magnitude, intensity and duration of the peak flows were very similar and large. Since the proposed canopy-opening activities only account for 9 percent of the total area within the watershed and the reasonably foreseeable activities would not significantly increase peak flows, the increases in flows from West Gold would also be within the historic range of variability for Gold Creek.

### c. Effects to Peak Flows from Rain-On-Snow Events

In the event of a rain-on-snow event, peak flow increases would not cause any cumulative effects to West Gold and Gold Creek. These events are natural processes that occur episodically in time and space. Vegetation prescriptions would trend vegetation towards conditions and patterns, which would be similar to those formed by past disturbance events. As discussed in the Affected Environment section, the greatest impacts observed from rain-on-snow events occur when culverts become plugged from resulting floods and debris flows. By improving or removing the high-risk culverts, the risk to a road failure is significantly reduced and net associated risk of sediment delivery would drop by at least 1,752 tons and potentially 2,572 tons.

**Figure 24. Comparison of historic water yields to Alternative B. Alternative B is represented in the graph from 2004 through 2030 since it estimates the highest increases in peak flows. Differences between alternatives are displayed in figure 22.**




### d. Cumulative Effects to Stream Channel Morphology

Estimated peak flow increases would also not effect channel incision nor stream bank erosion. Since the estimated increases in peak flows are within the historic range of variation, there would not be any cumulative effects to changes in stream channel morphology. The existing condition of West Gold and Lower Gold Creek are such that they are well armored with bedrock and large substrate, have excellent stream vegetation, and are stable and resilient (existing condition section).

The estimated short-term increases in sediment yield associated with this project, the mine cleanup, and road decommissioning are expected to be routed through the stream channel and would not be of a magnitude that would cause changes to stream channel morphology (e.g., migration, braiding, and widening of channels).

Overall, stream channel morphology to West Gold and Lower Gold Creek would be maintained and improved since known sediment delivery sources are being rehabilitated. This includes the reduction of 193 tons of sediment from the Kick Bush slide; the removal and upgrades of at-risk culverts; the mine cleanup and stream channel restoration work at the Lakeview Operable Unit; and road maintenance work along Road 278.

**e. Cumulative Effects to Fisheries**

The West Gold project, in conjunction with reasonably foreseeable actions, would result in a net decrease in sediment yield in the short term, and an overall reduction in sediment risk in the long term. Based on the direct and indirect effects discussed above the risk of any sediment delivery actually reaching a live channel is very low. The modeled short-term increase in sediment yield directly associated with the West Gold project is very small compared to the overall reduction in sediment yield and risk of sediment delivery resulting from the culvert upgrades, the Kick Bush Slide repair, and the mine cleanup. The potential short-term increase in sediment may affect individual westslope cutthroat trout and torrent sculpin, but would not lead toward a trend in federal listing. In the long term, the reduction in sediment yield is expected to benefit survival of individuals. Similarly, cumulative effects from the project and reasonably foreseeable actions may affect, but are not likely to adversely affect, federally listed bull trout, and are expected to benefit individual survival in the long term. Any increases in water yield would be localized and would not be measurable in fish-bearing channels.

## *3.72d Consistency with the Forest Plan and Other Regulations*

### 1. Idaho Panhandle National Forests Plan

All alternatives meet the requirements of the IPNF Forest Plan for water resources and fisheries. Specific requirements and how this project meets them are listed in Appendix A (watershed) and Appendix B (fisheries). Alternative A would not change riparian habitat conditions, except for a steady increase in the risk of a stand replacement fire over time and the potential for road drainage failures from high risk culverts. The alternatives also meet the requirements for fisheries resources in Forest Plan, as amended by the Inland Native Fish Strategy.

### 2. Endangered Species Act

All alternatives meet requirements of the Endangered Species Act. The project may affect but is not likely to adversely affect threatened bull trout, and would not jeopardize their continued existence. Critical habitat has not been designated for bull trout.

### 3. National Forests Management Act – Species Viability

Fish species that may be affected by the project (bull trout, westslope cutthroat trout, rainbow trout) are also distributed across the Forest. For example, bull trout and rainbow trout are found in eight of 13 (61%) of 4th code HUC watersheds (i.e., large watersheds, such as Pend Oreille Lake) on the IPNF. Cutthroat trout currently occur in 100% of 4th code watersheds on the Forest. There is no connectivity between the Pend Oreille Lake watershed, which includes Gold Creek, and nine of the other 4th code HUC watersheds on the Forest (e.g., Kootenai River, St. Joe River).

At the smaller watershed scale (e.g., Gold Creek, a $6^{th}$ code HUC watershed), bull trout are known to inhabit approximately 80% of the watersheds in the Pend Oreille Lake, while westslope cutthroat trout and rainbow trout occur in approximately 100%.

Based on the distribution of species across the Forest, the lack of connectivity between large watersheds, and the limited cumulative effects area (i.e., effects are limited to the Gold Creek watershed), the West Gold Project will not affect viability of any threatened, endangered, sensitive, or MIS fish species on the IPNF.

#### 4. Clean Water Act, Including State of Idaho Implementation

All alternatives would be consistent with the requirements of the Clean Water Act, 33 U.S.C. §1251. Sediment and heavy metals, the pollutants of concern, would not increase in the water quality limited segment on Gold Creek. Risks to beneficial uses in Gold Creek would not be changed by this project. In compliance with the current TMDL status, there would be no net increase in sediment through management activities in West Gold or Gold Creek.

#### 5. Idaho Forest Practices Act

Best Management Practices or Soil and Water Conservation Practices would be applied under all alternatives, and all activities are in compliance with the guidelines in the Soil and Water Conservation Handbook.

#### 6. Executive Order 12962

All alternatives are consistent with this executive order regarding aquatic systems and recreational fisheries. Short-term effects of this project may affect westslope cutthroat trout individuals but would not lead toward a trend in federal listing. Long-term effects (i.e., net reduction in sediment) are expected to benefit westslope cutthroat trout survival and habitat.

#### 7. State of Idaho Governors Bull Trout Plan

All alternatives are consistent with the direction in the Governor's Bull Trout Plan. Long-term effects are expected to benefit bull trout and their habitat.

# 3.8 Visual Quality

## 3.81 Affected Environment

### *3.81a 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 travel corridors and other features having a high visual sensitivity level. Visual Quality Objectives were assessed using guidelines contained in the Visual Management

Handbook, Volume 2, Chapter I of the National Forest Landscape Management Series (project file).

## *3.81b Methodology*

### 1. Visual Quality Objective Analysis

VQOs are determined by (1) landscape variety class, (2) viewer sensitivity level, and (3) distance from the viewer. 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:

<u>Variety Classes</u> 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.

<u>Sensitivity Levels</u> 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.

<u>Distance Zones</u> 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 middleground is *background*. In background, colors and patterns dominate the visual impression. Texture in stands of uniform tree cover is generally very weak or nonexistent.

**West Gold Area VQOs** - 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.

*Rehabilitation*[6] – is a short-term management alternative used to restore landscapes containing views that do not meet VQOs to a desired visual quality. It may not always be possible to immediately achieve the prescribed visual quality objective with rehabilitation but it should provide a more visually desirable landscape in the interim.

### 2. Scenery Management Objectives

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, tree species (colors, textures, etc.) 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.

## *3.81c 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. This has resulted in a more uniform textured and

[6] See definition (2) in the Glossary (Appendix G). This term is not related to that of definition (1) in the Glossary having to do with a type of regeneration cutting prescription.

colored timber canopy. This uniform canopy is currently undergoing a change to patchy openings created by root disease and bark beetles. These openings generally consist of tall brush and shrubs, which are a lighter color than that of the timber stand around them. Roading, logging, mining, and other human activities such as power transmission corridors and towers have also altered the scenic character from historic conditions. In the recent past (late 1970s and early 1980s) numerous square clearcuts were created when select areas were logged, burned, and planted. Although these clearcuts have facilitated the reintroduction of the preferred tree species, their square shape is not natural appearing or appealing to the eye. Combined with the BPA/Avista powerline corridor, which runs through the length of the project area, the clearcuts have left some views that do not meet the assigned visual quality objectives. These two areas are considered to meet the definition of rehabilitation

The project area is bordered by National Forest land except for some private land near and including the town of Lakeview approximately ½ mile to the east. Most of the privately owned land has had some development or timber harvesting. Development is in the form of home sites, small resorts and wood lots.

This area is characterized as predominantly a common variety class. It can be seen from Sensitivity Level 1 and 2 viewpoints. The sensitivity Level 1 viewpoint is Lake Pend Oreille. The very highest portions of the project area can be seen from the lake as background with some very small portions occurring in the middleground. These areas have an assigned VQO of *Partial Retention.* The Sensitivity level 2 viewpoints are Roads 278 and 332. Road 278 provides many foreground and middle ground views of the clearcuts and powerline corridor while Road 332 provides a few short views of them in the middle ground. Although the views from these two roads have assigned VQOs of *Partial Retention* and *Modification*, an interim short-term level of *Rehabilitation* will most generally be applied when the view includes the square clearcuts.

## 3.82 Environmental Consequences

### *3.82a 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.

### 3.82b 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. The existing square clearcuts, power line corridor and roads would continue to dominate many of the foreground and middle ground views from Road 278. They would continue to recover tree growth, muting the visual effects of tree lines and unnaturally shaped openings over time.

#### 2. Cumulative Effects

With no treatment of forest fuels in the project area, the ability to suppress an unwanted fire could be difficult. 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 appearance of the landscape.

### 3.82c 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. The existing square clearcuts do not currently meet the Forest Plan assigned VQOs and have been assigned an interim description of rehabilitation.

Timber harvest would result in a discernable change in pattern, form and color. However these changes would blend with the natural landscape because layout and timber marking would incorporate irregular boundaries and leave-tree patterns into the design of the units. 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 as spotty patterns are created due to needle scorch. This would be short-term and would appear somewhat like the dying clumps of Douglas-fir and grand fir in root disease pockets occurring on the natural landscape.

A low- to moderate-intensity underburn of irregular shelterwood, dry site thinning, and rehabilitation units would have a short-term effect by showing varying degrees of color change (from shades of dark green to reds and yellows). 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 with varying degrees of 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 gray. 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 natural 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.

Both alternatives would tend to reduce the appearance of unnatural straight lines from the existing clearcuts and power line corridor wherever a regeneration cutting prescription is applied next to them. Units that are treated with a thinning prescription would not be as effective as those treated with a regeneration prescription but they would have a tempering effect on any existing artificial straight lines. This would move the view toward its assigned VQO as well as that of a more natural but more open landscape. This change would provide a more visually desirable landscape in the interim and achieve the Forest Plan assigned VQOs in the long-term.

## *3.82d Effects Specific to Alternative B*

### 1. Direct and Indirect Effects

One of the longest lasting alterations to the visual landscape is soil disturbance from road construction. On steep terrain, roads tend to leave unnatural 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 landforms and the existing evidence of man's activity 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 to achieve minimal cut and fill slopes. The roads as proposed would not be visible to any sensitivity level 1 or 2 viewpoints except for two small areas in units 23 and 24 as seen from Road 278. These two roads are scheduled to be decommissioned and would meet the short-term and long-term VQOs assigned.

## *3.82e Effects Specific to Alternative D*

### 1. Direct and Indirect Effects

Many of the harvest prescriptions of Alternative D do not open up as much of the tree canopy as the regeneration prescriptions of Alternatives B and C. Also, this alternative does not treat as many areas next to existing clearcuts and the power line corridor. The amount of opening required to "absorb" the existing clearcuts into an open landscape mosaic is not feasible with selective harvest prescriptions. For these reasons it would not begin to visually rehabilitate as much of the existing landscape as Alternatives B and C. It would however make improvements where harvest unit boundaries can feather and shape the straight edges of the existing adjacent clearcuts and power line. This alternative would begin to rehabilitate the views from the Road 278 to a small degree.

## *3.82f Cumulative Effects Common to All Action Alternatives*

The cumulative effects analysis area consists of the project area and associated viewpoints outside the project area as described in the existing condition. Since project activities are designed to meet VQOs, there should be no cumulative effects on viewpoints outside the project area.

#### 1. Reasonably Foreseeable Actions

Future salvage of dead and dying trees could take place within and next to some 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.

The visual change of the landscape caused by private development (i.e. the powerline and associated corridor) cannot be predicted or designed. Therefore, there are no cumulative visual effects associated with alternatives B, C or D as proposed.

No other reasonably foreseeable actions are expected to affect this resource.

### *3.82g Consistency with the Forest Plan*

All action alternatives would meet VQOs as prescribed in the Forest Plan. Alternative A would not be consistent with the Forest Plan in the short-term as the existing clearcuts do not currently meet VQOs.

## 3.9 Finances

### *3.91a Regulatory Framework*

Forest Service policy sets a minimum level of financial analysis for timber sale planning (Forest Service Handbook 2409.18 section 32).

### *3.91b Methodology*

This analysis deals with project-level financial attributes of each alternative, and a qualitative discussion of the loss of timber resource value if no timber is harvested, which helps display the effects of the No Action Alternative. The financial analysis was used to determine the economic feasibility of accomplishing the project using a timber sale. This analysis will essentially determine whether selling the trees to be removed 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 (new road construction, decommissioning, maintenance), fuel treatment, regeneration and other mitigation measures described in Chapter II.

#### 1. 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 value (referred to as “stumpage”) of trees removed. The TE appraisal method predicts the value through the use of several independent variables 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. Currently there is 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 maintenance[7], and grass seeding. Costs for road construction, road maintenance, 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 maintenance costs.

Non-commodity values were not included in this analysis because these resources are evaluated under each specific resource section. Title 40, Code of Federal Regulations for NEPA (40 CFR 1502.23) states, “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.

This analysis focuses on the direct and indirect effects of proposed activities. Past, present and reasonably foreseeable activities on National Forest and other lands within the project area would not have an effect on the economic issues for these alternatives. Therefore, there would be no cumulative effects.

## *3.91c Existing Condition*

Stumpage prices are noticeably down across the United States at present, largely due to imports of inexpensive timber from other countries.

## *3.91d Environmental Consequences*

### 1. Direct and Indirect Effects

**a. Alternative A**

Since no trees would be cut and sold with this alternative, there would be no monetary costs or revenues. Not managing the forest vegetation in this area would result in a loss of productivity over the long-term due to insect and disease mortality, and a loss of opportunity to provide usable wood products from merchantable-sized trees.

**b. Alternatives B, C and D**

Table 25 provides a summary of the financial appraisal of each alternative. The predicted high bid reflects the differences in road costs, environmental protection costs, logging costs, volumes, and silvicultural prescriptions between alternatives. This figure uses the value of timber removed (based on size, species and volume), yarding methods used and hauling distances. Logging, hauling, and contractual work (clean-up, fire line construction, fuel treatment, grass-seeding and road decommissioning) costs are deducted from the value of the timber.

Using a timber sale to accomplish project objectives would be economically viable under all “action” alternatives and none are expected to be below cost.

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[7] In the TE Analysis, some road maintenance is referred to as reconstruction.

**Table 25. Predicted high bids, values and timber volume by alternative.**

| | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|
| **Total Estimated CCF/MBF** | 0 | 19,664 CCF/9,832 MBF | 19,664 CCF/9,832 MBF | 4,154 CCF/2,077 MBF |
| **Predicted High Bid** | 0 | $89.56/ccf | $75.01/ccf | $46.65/ccf |
| **Predicted High Bid Value** | 0 | $1,761,108 | $1,474,997 | $193,784 |

CCF=hundred cubic feet
MBF=thousand board feet

Alternative B would be more economical than Alternative C since it has the least amount of helicopter logging. The construction of roads would reduce the costs of logging, burning and planting. It would generate the most revenue.

Alternative C would be more expensive to log, burn and plant and would be less economical than Alternative B. It would generate less revenue than B but more than D.

Alternative D does not build as many roads, removes less timber and uses helicopter yarding for over half the acres logged. Due to these variables this alternative would have the least revenue.

All alternatives would provide additional revenues to fund other restoration projects described in Chapter II; however, Alternative B would provide $286,111 more than C and $1,567,324 more than Alternative D.

### *3.91e Consistency with the Forest Plan*

Forest-wide goals, objectives and standards for finances are not specifically addressed in the Forest Plan. This issue was addressed indirectly in the discussion of community stability. Chapter II of the Forest Plan states, “management activities will continue to contribute to local employment, income, and lifestyles. The Forest will be managed to contribute to the increasing demand for recreation and resource protection while at the same time continuing to provide traditional employment opportunities in the wood products industry,” (Forest Plan, p. II-11). All the action alternatives would meet this direction to varying extents.

# 3.10 Roads and Access Management

## 3.101 Regulatory Framework

In January 2001, the Forest Service Manual, which governs regulations concerning the management, use and maintenance of the National Forest Transportation (Road) System, (Chapter 7700) was revised with a “Final Rule.” The revision de-emphasized the development of forest road systems and added a requirement for science-based roads analysis. The intent of the revision is “to help ensure that additions to the National Forest network of roads are those deemed essential for resource management and use; that, construction, reconstruction, and maintenance of roads minimize adverse environmental impacts; and finally, that unneeded roads are decommissioned and restoration of ecological processes are initiated” (36 CFR Part 212).

An interim directive issued in December 2001 established that all road management decisions signed after January 12, 2002 must be informed with a "roads analysis" (Interim Directive 7710-2001-3, project file). The Final Rule set forth that if a forest level roads analysis has not been completed, the Responsible Official (in this case, the Sandpoint District Ranger) determines whether a roads analysis is needed at the project scale, and if so, what level of analysis is necessary to support a project-level decision. On February 5, 2002 the Sandpoint District Ranger established direction for a roads analysis for the West Gold project (project file).

Forest Plan objectives call for constructing, managing and maintaining transportation facilities "to meet the management area goals in a cost effective way while meeting safety, user and resource needs" (USDA 1987, p. II-10).

## 3.102 Affected Environment

### *3.102a Methodology*

Information to determine the existing conditions of roads and associated uses in the project area was obtained through road and project area field surveys, maps, photos, discussions with off-highway vehicle (OHV) user groups, and road management objectives. A roads analysis was completed, and that document provides the basis for the road management, maintenance, construction, and decommissioning activities proposed in this project (project file). All roads and portions of roads located within the watershed are discussed in this analysis whether those segments are used for the project or not.

### *3.102b Current Conditions*

**Description of Roads in the Watershed** - There are about 35 miles of existing roads associated with the West Gold drainage. Not all roads are wholly within the project area boundary; about 28 miles of road are actually within the project area. The road system in the West Gold drainage consists of portions of two primary forest access routes that pass through the watershed (Roads 278 and 332), a couple of roads that receive a moderate amount of use (Roads 2707 and 2708), and several roads gated to restrict motorized access (see figure 1a in Chapter 1). Although the drainage is not a major recreation destination, there are scenic overlooks of Lake Pend Oreille on Road 2707, and access to Bernard Peak and Bernard Peak trail on Road 2708. Some dispersed camping occurs on the unclassified road (2707UF) and at the gate of 278B, and many of the gated roads receive non-motorized use by berry pickers and hunters.

Road 2707 and eight short spurs serve as the primary access route for the Bonneville Power and Avista Utilities powerlines that pass through the watershed. In general, the existing roads provide access for the landowners, recreationists, and residents in Lakeview and other areas farther north, for utility companies and for National Forest management and fire suppression.

**Road Conditions** - With the exception of a few short segments of road, most of the existing roads in the watershed are in good condition (USDA 2002, Appendix A). The exceptions consist of areas where culverts need to be replaced or resized (see table 20 in the Watershed section), and where minor work needs to be done to improve wet areas or rutting. Many of the gated roads are high ridge roads closed to motorized vehicle use and require little to no maintenance.

**Motorized Use** - Almost 19 miles of the roads in the drainage are open for all motor vehicles to use, while an additional 8.2 miles of road are open only to snowmobiles. The remaining 1.7 miles of road are closed to all motorized use, primarily for big game security and preventative maintenance reasons (see table 26).

The area surrounding the West Gold drainage is receiving increasing OHV and snowmobile use each year. Many OHV users are coming over from roads and trails in the Coeur d'Alene River Ranger District. The demand is high for safe routes off of primary road systems that do not have mixed traffic and can allow young, unlicensed riders to join in family rides (see project file, Public Involvement).

Two gated roads, Road 2707A and a short connector road between 2707A and Road 332 (2707AA) serve as a snowmobile bypass route in winter when Road 332 is plowed for forest management activities. Some illegal OHV use has occurred on this route during the dry season as people have driven around gates. There is also an area above Road 2707A where an unclassified road (2707UF) leads into a plantation and some people are using an old skid road to illegally access Road 2707A. Pioneering of trails in the watershed has not been a significant problem, most likely because of the steep terrain and the fact that most of the existing gated roads end at locations not desirable for continuing routes.

### *3.102c Reference Conditions*

Access into the West Gold drainage was limited to stock trails until Forest Road 332 on the upper end of the watershed was constructed in the 1930s. In the late-1940s, the Powerline access roads (Road 2707 and spurs) were constructed. In the 1980s Road 278 and spurs 278 A through E were constructed for the Prospect timber sale. The spurs were all gated to motorized access following the project to avoid the establishment of motorized use, maintain elk security, and reduce maintenance needs. The roads were retained on the landscape for future resource management needs.

## 3.103 Environmental Consequences

### *3.103a Methodology*

The analyses of the effects of roads and proposed changes in access management on various natural resources (i.e. wildlife, soils, watershed) are addressed in the applicable resource sections of this chapter. This section focuses only on the different alternative's effects on access management. Since proposed roads and road access changes are not on roads that extend outside the project area, the cumulative effects area boundary is the same as the project area.

### *3.103b Direct and Indirect Effects*

#### 1. Alternative A

Under this alternative, there would be no change in access and no new road construction. Regularly scheduled road maintenance would continue. Illegal OHV use on roads 2707A and AA would likely continue as riders use the unclassified route (2707UF) to get to these roads or continue to drive around gates.

**Table 26. Current and proposed access management by alternative.**

| Road Number | Length in miles in project area | Miles of Proposed Maintenance | Current Access Management (Alternative A) | Proposed Change in Access Management Alternatives B, C and D | Reason |
|---|---|---|---|---|---|
| **2707** (and spurs) | 8.5 | 6.8 | Open to all motor vehicles | Improve for project use. No change in access management. | Designated permanent open road needed for powerline access |
| **278** | 1.7 | 6.8 | Open to all motor vehicles | No change in access management. | Designated permanent open road, primary route to Lakeview |
| **332** | 1.3 | 1.3 | Open to all motor vehicles | No change in access management. | Designated permanent open road, primary route between Athol and Clark Fork |
| **2708** | 6.8 | 0.4 | Open to all motor vehicles | Improve for project use. No change in access management. | Designated permanent open road, access to Bernard Peak and trail |
| **2708A** | 1.7 | 1.7 | Gated, brushed in and undrivable | Improve for project use. No change in access management. Put 1.7 miles into storage at end of project to restore undrivable condition. | Keep in storage for potential future management needs while minimizing risks to watershed and to avoid establishing use patterns to protect goat habitat and elk security. |
| **2707A** | 3.9 | 3.9 | Gated, closed to non-winter public motorized use. Serves as snowmobile route when 332 plowed | Improve for project use. Modify gate to allow vehicles <50" on 3.2 miles. Continue use for snowmobiles. Retain current restrictions to vehicles larger than 50". Decommission last 0.7 mile. | Allow OHVs to accommodate demand for routes off primary road systems. Restrict larger vehicles to keep maintenance needs down. Close to all motor vehicles during soft roadbed conditions to avoid erosion. Last 0.7 mile not needed for future management or conducive to trail opportunities. |
| **2707AA** | 0.3 | 0.3 | Gated, closed to non-winter public motorized use. Serves as snowmobile route when 332 plowed | Modify gate to allow vehicles <50" during dry summer months on 0.3 mile. Continue use for snowmobiles. Retain current restrictions to vehicles larger than 50" | Same as 2707A regarding OHV use and restrictions. |
| **2707UF** | 1.0 | 0.3 | Open drivable unclassified road (about 0.3 mile drivable with large vehicle, rest is OHV limited) | Improve first 0.3 mile for project use, then keep open to all motorized vehicles. Decommission lower 0.7 mile of unclassified OHV road/trail. | First 0.3 mile is well-used dispersed site with no resource damage concerns. Decommission lower 0.7 mile to prevent OHV use across plantation once 2707A becomes designated OHV route. |
| **278A** | 1.1 | 1.1 | Gated, closed to non-winter public motorized use. Snowmobiles allowed. | Improve for project use. Maintain gate and motorized restriction, decommission last 0.4 mile. | Keep for potential future management needs. Last portion of road not needed and not conducive to trail opportunities. Decommissioning will reduce erosion potential and increase wildlife security. |
| **278B** | 0.8 | 0.8 | Gated, closed to non-winter public motorized use. Snowmobiles allowed. | Improve for project use. Maintain gate and motorized restriction, decommission last 0.3 mile. | Keep for potential future management needs Last portion of road not needed and not conducive to trail opportunities. Decommissioning will reduce erosion potential and increase wildlife security. |
| **278D** | 2.1 | 2.1 | Gated, closed to non-winter public motorized use. Snowmobiles allowed. | Improve for project use. No change in access management. | Keep for potential future management needs. Maintain closure to reduce erosion and maintenance costs and provide wildlife security. |
| **278E** | 0.8 | 0 | Gated, closed to non-winter public motorized use. Snowmobiles allowed. | No change in access management. | Road is not proposed for use in this project. |
| **Total** | **30** | **25.5** | **Net Change in Access:** None | **Net Change in Access:** + 3.5 miles available to OHV use. -1.4 miles non-motorized access -0.7 miles of open unclassified trail | |

#### 2. Alternatives B, C, and D

Under alternatives B, C and D, there would be 3.5 miles of roads newly available for OHV use on Roads 2707A and 2707AA (see table 26). OHV use would be allowed anytime the road is accessible by such vehicles except when there are soft roadbed conditions. The potential for OHV users to pioneer new trails from this new route would be low due to the topography and surrounding steep terrain.

With the proposed decommissioning of existing road segments that are currently closed to all motorized use, non-motorized road access would be reduced by 1.4 miles (the decommissioned segments would be restored to natural slope contours). Decommissioning of the unclassified OHV trail extending from 2707UF across the plantation would reduce existing OHV use by 0.7 mile. With the legal designation of 2707A as an OHV route and the planned decommissioning of the old logging road, we anticipate that OHV use across the plantation will cease.

Under Alternatives B and D, none of the new road construction would result in any public access opportunities. All roads proposed for construction would be located behind existing gates which would remain closed to public use at all times during the life of the project. At the end of the project, all constructed roads are scheduled for either decommissioning or storage; therefore, there would be no increase in access on new roads.

Road maintenance activities and use of roads associated with project activities would improve the drivability of some roads that are currently closed to wheeled motorized vehicles, but designs to keep public access restricted during project activities would prevent establishing use patterns and maintain existing access restrictions (see Chapter II, Features Related to Roads and Access Management). The only roads that would have access management changes under any of the action alternatives would be 2707A, 2707AA and 2707UF (see table 26).

### *3.103c Cumulative Effects*

#### 1. Cumulative Effects Common to All Alternatives

There are no anticipated cumulative effects from changes in road management or use as a result of any of the action alternatives.

## 3.11 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 Alternatives B, C or D. Effects relating to Alternative A (the No Action Alternative) are disclosed in each resource section.

### *3.111a 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 can 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.

### *3.111b Aquatics*

Road maintenance activities as well as temporary 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.

### *3.111c 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 would 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 (i.e. cutting unit) 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 Regional or Forest Plan standards.

### *3.111d 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.

### *3.111e 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.

### *3.111f Visuals and Recreation*

Road construction, maintenance and log truck hauling would temporarily affect aesthetics and public use of the area.

## 3.12 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.

### 3.121a 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 habitats and 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.

### 3.121b Aquatics

Under the action alternatives, road construction and decommissioning may temporarily increase a small amount of sediment to West Gold 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.

### 3.121c Fuels and Fire Behavior

Timber harvest could 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 logging may result. Proposed fuel treatments would reduce some ignition risk over time and improve our ability to control fire.

### 3.121d 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.

### 3.121e 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.

# 3.13 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).

### *3.131a Vegetation*

The loss of production or use of natural resources can be considered an irretrievable loss. A low level of cutting of dead and dying trees in an alternative could be increased under future decisions, but dead trees not retrieved for wood products now would not be available in the future, and that output would be "lost".

### *3.131b Soil Productivity*

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.

Permanent road and landing construction cause irreversible effects to soil productivity since there is removal of the topsoil and compaction. These sites can only be restored after a long period of time or after ripping and revegetation. In small, localized areas of severe burning such as slash piles, there would likely be sterilization of soils.

### *3.131c 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.

# 3.14 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.

# 3.15 Other Required Disclosures

### *3.151a 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.

The nearest community to the West Gold project area is Lakeview, an unincorporated town that consists of 39 residences, two of which are occupied year-round. There is no specific census datat on this community. Lakeview is not likely to consist low-income populations, since most of the residents can afford more than one dwelling. Although one or more residents may be considered a minority, it is unlikely that the entire community of Lakeview is a minority population since minority populations of Bonner County are less than 4%. There are no other communities in the vicinity of the project area. Effects of the proposed activities are concentrated on National Forest System lands and are not anticipated to spread beyond the project area. All contracts offered by the Forest Service contain Equal Employment Opportunity requirements.

See the project file for information on minority groups and income levels in Bonner County provided by the most recent census.

### *3.151b American Indian Religious Freedom Act*

Consultation with the Kalispel Tribe revealed that no effects on American Indian social, economic or subsistence rights are anticipated.

### *3.151c 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.

### *3.151d Effects to Floodplains and Wetlands*

The Inland Native Fish Strategy (INFS) standards and guidelines implemented with this project would protect floodplains and wetlands.

### *3.151e Incomplete or Unavailable Information*

**Incomplete Soils 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.

**Unavailable Information on Reasonably Foreseeable Activities** - As stated in Chapter I, the reasonably foreseeable actions that include the Chloride Bush project and Other Mine Site Cleanup and Rehabilitation are projects that do not have detailed proposals at this time. With such detailed information unavailable, these actions cannot be analyzed in this EIS's cumulative effects discussions.

# Appendix A – Best Management Practices and Forest Plan Consistency for Aquatic Resources

**Site Specific Best Management Practices**

**PRACTICE 11.05 - Wetlands Analysis and Evaluation**

Objective: To delineate wetlands within sale areas in order to prevent damage to facilities or degradation of soil and water resources.

*Effectiveness:* High

Compliance: FPA Rule 4.d.v(c) – Meets

**PRACTICE 13.03 - Tractor Operation Excluded from Wetlands, Bogs, & Wet Meadows**

Objective: To maintain wetland functions and avoid adverse soil and water resource impacts associated with the destruction or modification of wetlands, bogs and wet meadows.

*Effectiveness:* Much of this mitigation consists of avoiding the impact [40 CFR 1508.20(a)]. The Forest Service has near-complete control over construction operations. Effectiveness is expected to be high.

Compliance: FPA Rule 3.h.iii - Meets

Implementation: At a minimum, the following specific protective requirements for wetlands identified on the Sale Area Map (SAM) will be incorporated into CT6.61# (Wetlands Protection):

1. Soil and vegetation along lakes, bogs, swamps, wet meadows, springs, seeps, or other sources where the presence of water is indicated will be protected from disturbance which would cause adverse effects on water quality, quantity, and wildlife and aquatic habitat (FPA Rule 3.h.iii].
2. An equipment exclusion zone shall extend a minimum of 50 feet from the wetlands, bogs, and wet meadows.

**PRACTICE 13.04 - Revegetation of Surface Disturbed Areas**

**PRACTICE 14.14 - Revegetation of Areas Disturbed by Harvest Activities**

Objective: To protect soil productivity and water quality by minimizing soil erosion.

*Effectiveness:* Revegetation can be moderately effective at reducing surface erosion after one growing season following disturbance and highly effective in later years. Effectiveness has been shown to vary from 10 percent on 3/4:1 slopes to 36 percent on 1:1 slopes to 97 percent on 1:1 slopes in later years (King, John G. and E. Burroughs. Reduction of Soil Erosion on Forest Roads. Intermountain Research Station General Technical Report, 1988).

Compliance: FPA Rules 3.d.iii & e.i, ii - Meets

Implementation: All temporary roads, landings, and skid trails in the sale area will be seeded within one year after harvesting is completed. Seed mixes and fertilizer specifications will be incorporated into Timber Sale Contract provision CT6.601# (Erosion Control Seeding). Timber Sale Contract provision CT6.623# (Temporary Road, Skid Trail/Skid Road and Landing) will identify that scarification/ripping of compacted landings and closed roads will be a minimum of 4 inches, not to exceed 2 feet.

a. All temporary roads, landings, and skid trails will also be fertilized to give the new plants extra support in becoming established.

b. The standard Idaho Panhandle National Forests moist site erosion control seed mix will be used.

**PRACTICE 14.06 - Riparian Area Designation**

**PRACTICE 15.12 - Control of Construction in Riparian Areas**

Objective: To minimize the adverse effects on Riparian Areas with prescriptions that manage nearby logging and related land disturbance activities.

*Effectiveness:* Moderate

Compliance: FPA Rules 3.g.ii, iii, & iv; 3.f.iv - Meets

Implementation: Riparian areas will be protected through the following requirements that will be incorporated into timber sale layout, or into the timber sale contract as identified below:

1. Provide the large organic debris, shading, soil stabilization, wildlife cover, and water filtering effects of vegetation along Class I streams [FPA Rule 3.g.i-iii]. The following measure(s) are implemented during sale layout:

   (a) A Stream Protection Zone that consists of a buffer of 300 feet slope distance from the edge of the channel for West Gold Creek. No timber harvest activities shall occur within the Stream Protection Zone.

   (b) A Stream Protection Zone that consists of a buffer of 100 feet slope distance from the edge of the channel for the intermittent tributaries to West Gold Creek. No timber harvest activities shall occur within the Stream Protection Zone.

2. Waste resulting from logging operations, such as crankcase oil, filters, grease and fuel containers, shall not be placed inside the Stream Protection Zones [FPA Rule 3.f.iv and TSC Provision BT6.34].

**PRACTICE 14.11 - Log Landing Erosion Prevention and Control;**

**PRACTICE 14.12 - Erosion Prevention & Control During Timber Sale Operations;**

**PRACTICE 14.15 - Erosion Control on Skid Trails.**

Objective: To protect water quality by minimizing erosion and subsequent sedimentation derived from log landings and skid trails.

*Effectiveness*: Moderate

Compliance: FPA Rules 3.e.i, ii; 3.d.iii - Meets

Implementation: The following criteria will be used in controlling erosion and restoring landings and skid trails to minimize erosion:

General:

1. Deposit waste material from construction or maintenance of landings and skid and fire trails in geologically stable locations at least 100 feet outside of the appropriate Stream Protection Zone [FPA Rule 3.f.iii].

2. Skid trails and landings will be seeded with a mix specified in C6.601#.

Landings:

1. During period of use, landings will be maintained in such a manner that debris and sediment are not delivered to any streams.

2. Landings shall be reshaped as needed to facilitate drainage prior to fall and spring runoff. Landings shall be stabilized by establishing ground cover or by some other means within one year after harvesting is completed [FPA Rule 3.e.ii].

3. Landings will drain in a direction and manner that will minimize erosion and will preclude sediment delivery to any stream.

4. After landings have served the Purchaser's purpose, the Purchaser shall ditch or slope them to permit the water to drain or spread [Provision BT6.63 (Landings)].

Skid Trails:

1. Skid trails and fire trails shall be stabilized whenever they are subject to erosion, by waterbarring, cross-draining, outsloping, scarifying, seeding, or other suitable means. This work shall be kept current to prevent erosion prior to fall and spring runoff [FPA Rule 3.e.i].

2. The sale administrator and/or watershed specialist will designate the spacing of water bars on skid trails. [Reference FSH 7709.56]

**PRACTICE 14.19 - Acceptance of Timber Sale Erosion Control Measures Before Sale Closure**

Objective: To assure the adequacy of required timber sale erosion control work.

_Effectiveness_: High

Compliance: No directly related FPA Rule

Implementation and Responsibility: Timber Sale Contract provision B6.35 requires that upon the purchaser's written request and assurance that work has been completed, the Forest Service shall perform an inspection. Areas that the purchaser might request acceptance for are specific requirements such as logging, slash disposal, erosion control, or snag felling. In evaluating acceptance the following definition will be used by the Forest Service: "Acceptable" erosion control means only minor deviation from established standards, provided no major or lasting impact is caused to soil and water resources. Certified Timber Sale Administrators will not accept as complete erosion control measures that fail to meet these criteria.

**PRACTICE 15.03 - Road and Trail Erosion Control Plan**

Objective: To minimize the effects of erosion and the degradation of water quality through erosion control work and road design.

*Effectiveness:* Moderate

Compliance: No Related FPA Rule

Implementation: Prior to the start of construction, the Contractor shall submit a schedule for proposed erosion control work as required in the Standard Specifications. The schedule shall include all erosion control items identified in the specifications. Erosion control work to be done by the Contractor will be defined in Standard Specification 204 and/or in the Drawings. The schedule shall consider erosion control work necessary for all phases of the project. The Engineer will certify that the Contractors Erosion Control Plan meets the specifications of Std. FS Spec. Section 204.

**PRACTICE 15.07 - Control of Permanent Road Drainage**

Objective: To minimize the erosive effects of concentrated water and the degradation of water quality by proper design and construction of road drainage systems and drainage control structures.

*Effectiveness:* Moderate. Designed and controlled ditches, cross drain spacing, and culvert discharge prevent water from running long distances over exposed ground.

Compliance: FPA Rules 4.c.viii; 4.d.iii(a) & (b) - Meets

Implementation: The following items will be included in the timber sale contract provisions or road contract special project specifications.

1. Drainage ways shall be cleared of all debris generated during construction and/or maintenance that potentially interfere with drainage or water quality [IFPA Rule 4(c)(ii), Timber Sale Contract Clause C5.4, and Standard Road Specifications-Special Project Specification 204.04].

2. During and following operations on out-sloped roads, out-slope drainage shall be retained and berms shall be removed on the outside edge except those intentionally constructed for protection of road grade fills [IFPA Rule 4(c)(vi) and Timber Sale Contract Clause C5.4].

3. Cross drains and relief culverts shall be constructed to minimize erosion of embankments. The time between road construction and installation of erosion control devices shall be minimized. Drainage structures or cross drains shall be installed on uncompleted roads which are subject to erosion prior to fall or spring runoff. Relief culverts shall be installed with a minimum grade of 1 percent [IFPA Rule 4(c)(viii) and Standard Road Specifications-Special Project Specification 204.1].

4. Cross drains and relief culverts will be installed so as to minimize concentrations of intercepted water (see also Practice 15.02 f.(3)).

**PRACTICE 15.08 - Pioneer Road Construction**

Objective: To minimize sediment production and mass wasting associated with pioneer road construction.

*Effectiveness:* Moderate

Compliance: No directly related FPA Rule

Implementation: The following contract specifications will be required:

1. Construction of pioneer roads shall be confined to the designed location of the road prism unless otherwise approved by the Contracting Officer (Std. FS Spec. 203.11).
2. Pioneering shall be conducted so as to prevent undercutting of the designated final cut slope, and to prevent avoidable deposition of materials outside the designated roadway limits (Std. FS Spec. 203).
3. Permanent culverts will be installed at wet crossings during the pioneer phase unless positive control of sediment can be accomplished during installation, use, and removal of the temporary structure.

**PRACTICE 15.09 - Timely Erosion Control Measures on Incomplete Road and Stream crossing Projects**

Objective: To minimize erosion of, and sedimentation from, disturbed ground on incomplete projects.

*Effectiveness:* Moderate

Compliance: FPA Rules 4.c.ii,iii,iv; & 4.d.iii - Meets

Implementation: The following measures will be implemented during projects:

1. Temporary culverts, side drains, flumes, cross drains, diversion ditches, energy dissipaters, dips, sediment basins, berms, debris racks, or other facilities needed to control erosion will be installed as necessary. The removal of temporary culverts, culvert plugs, diversion dams, or elevated stream crossing causeways will be completed as soon as practical;
2. The removal of debris, obstructions, and spoil material from channels and floodplains;
3. Seeding with an erosion control seed mix approved for use on the Idaho Panhandle National Forests to minimize erosion.
4. Install drainage structures or cross drain uncompleted roads that are subject to erosion prior to fall or spring runoff. (Std Spec 204)

Erosion control measures must be kept current with ground disturbance, to the extent that the affected area can be rapidly "closed," if weather conditions deteriorate. Areas must not be abandoned for the winter with remedial measures incomplete.

**PRACTICE 15.10 - Control of Road Construction Excavation and Sidecast Material**

**PRACTICE 15.18 - Disposal of Right-of-Way and Roadside Debris**

See also Practice 13.05

Objective: To insure that unconsolidated excavated and sidecast material, construction slash, and roadside debris, generated during road construction, is kept out of streams and to prevent slash and debris from subsequently obstructing channels.

_Effectiveness:_ High

Compliance: FPA Rule 4.c.iii,iv; & 4.d.i,ii,iii

The slash windrow and other erosion control devices will not be placed in existing stream channels or obstruct culvert outfalls. Large limbs and cull logs may be bucked into manageable lengths and piled alongside the road for fuelwood.

Implementation: In the construction of road fills near streams, compact the material to reduce the entry of water, minimize the amount of snow, ice, or frozen soil buried in the embankment. No significant amount of woody material shall be incorporated into fills. Slash and debris may be windrowed along the toe of the fill, but in such a manner as to avoid entry into a stream and culvert blockage.

Where slash windrows are not desirable or practical, other methods of erosion control such as erosion mats, mulch, and straw bale or fabric sediment fences will be used. Where exposed material (excavation, embankment, borrow pits, waste piles, etc.) is potentially erodible, and where sediments would enter streams, the material will be stabilized prior to fall or spring runoff by seeding, compacting, rip-rapping, benching, mulching or other suitable means.

The following standard specs will be included in all road contracts that include clearing and excavation.

1. Standard Specification 201 (Slash Treatment)
2. Standard Specification 203 (Excavation and Embankments)

**PRACTICE 15.13 - Controlling In-Channel Excavation**

Objective: To minimize downstream sedimentation by insuring that all in-channel excavations are carefully planned.

_Effectiveness_: High

Compliance: SCA Rule 9,1(a) - Meets

Implementation: Location and method of stream crossings will be designed and agreed to prior to construction. The following items highlight some of the principal provisions incorporated into the TSC that will govern channel protection:

1. Construction equipment may cross, operate in, or operate near stream courses only where so agreed to and designated by the Forest Service prior to construction (B6.5, B6.422). Crossing of perennial stream channels will be done in compliance with the specifications in the Stream Channel Alteration Act Rules and Regulations and included in the project specifications.

2. No construction equipment shall be operated below the existing water surface except that fording the stream at one location only will be permitted, and work below the water level that is necessary for culvert bedding or footing installations will be permitted to the extent that it does not create unnecessary turbidity or stream channel disturbance [SCA Rule 9,1 (a) and Standard Road Specifications-Special Project Specification 204.04].
3. Wheeled or track laying equipment shall not be permitted to operate within 5 feet slope distance of the apparent high water mark of Class II streams and 75 feet of Class I streams. (C6.6 Erosion Prevention and Control).
4. Construction of any hydraulic structures in stream channels will be in compliance with the Rules and Regulations pertaining to the Stream Channel Protection Act, Title 42, Chapter 38, Idaho Code).

**PRACTICE 15.21 - Maintenance of Roads**

Objective: To conduct regular preventive maintenance operations to avoid deterioration of the roadway surface and minimize disturbance and damage to water quality, and fish habitat.

*Effectiveness:* Moderate

Compliance: FPA Rule 4.d.i, ii, iii, iv, v - Meets

Implementation: For roads in active timber sale areas standard TSC provision B5.4 (Road Maintenance) requires the purchaser to perform or pay for road maintenance work commensurate with the purchasers use. Purchaser's maintenance responsibility shall cover the before, during, and after operation period during any year when operations and road use are performed under the terms of the timber sale contract (C5.4 - Road Maintenance). Purchaser shall perform road maintenance work, commensurate with purchaser's use, on roads controlled by Forest Service and used by purchaser in connection with this sale except for those roads and/or maintenance activities which are identified for required deposits in C5.411# and C5.412#. All maintenance work shall be done concurrently, as necessary, in accordance with T-specifications set forth herein or attached hereto, except for agreed adjustments (TSC C5.4- T301, 310).

1. Sidecast all debris or slide material associated with road maintenance in a manner to prevent their entry into streams [IFPA Rule 4(d)(i), Timber Sale Contract Clause C5.4, and Standard Road Specification-Special Project Specification T108].
2. Repair and stabilize slumps, slides, and other erosion features causing stream sedimentation [IFPA Rule 4(d)(ii), Timber Sale Contract Clauses C5.4 and C5.253, and Special Project Specification T108].
3. Active Roads. An active road is a forest road being used for hauling forest products, rock and other road-building materials. The following maintenance shall be conducted on such roads.
    (a) Culverts and ditches shall be kept functional.
    (b) During and upon completion of seasonal operations, the road surface shall be crowned, out-sloped, in-sloped or water barred, and berms removed from the outside edge except those intentionally constructed for protection of fills.

(c) The road surface shall be maintained as necessary to minimize erosion of the subgrade and to provide proper drainage.

(d) If road oil or other surface stabilizing materials are used, apply them in such a manner as to prevent their entry into streams [IFPA Rule 4(d)(iii)] and Timber Sale Contract Clauses C5.441 and C6.341].

Effectiveness: These measures should effectively minimize erosion from roads.

4. Inactive roads. An inactive road is a forest road no longer used for commercial hauling but maintained for access (e.g., for fire control, forest management activities, recreational use, and occasional or incidental use for minor forest products harvesting). The following maintenance shall be conducted on inactive roads.

   (a) Following termination of active use, ditches and culverts shall be cleared and the road surface shall be crowned, out-sloped or in-sloped, water barred or otherwise left in a condition to minimize erosion. Drainage structures will be maintained thereafter as needed.

   (b) The roads may be permanently or seasonally blocked to vehicular traffic [FPA Rule 4.d.iv].

   (c) Roads will be seeded and fertilized.

   (d) The roads may be permanently or seasonally blocked to vehicular traffic.

5. Abandoned Roads. An abandoned road is not intended to be used again. No subsequent maintenance of an abandoned road is required after the following procedures are completed:

   (a) The road is left in a condition suitable to control erosion by out-sloping, water barring, seeding, or other suitable methods.

   (b) Ditches are cleaned.

   (c) The road is blocked to vehicular traffic.

   (d) The department may require the removal of bridges and culverts except where the owner elects to maintain the drainage structures as needed.

For roads not in an active timber sale area, road maintenance must still occur at sufficient frequency to protect the investment in the road as well prevent deterioration of the drainage structure function. This will be accomplished by scheduling periodic inspection and maintenance, including cleaning dips and cross drains, repairing ditches, marking culvert inlets to aid in location, and cleaning debris from ditches and culvert inlets to provide full function during peak runoff events (FSH 7709.15).

**PRACTICE 15.24 - Snow Removal Controls**

Objective: To minimize the impact of snow melt on road surfaces and embankments and to reduce the probability of sediment production resulting from snow removal operations.

*Effectiveness:* Moderate

Compliance: No directly related FPA Rule

Implementation: For Forest roads that will be used throughout the winter, the following measures will be employed:

1. The Purchaser is responsible for snow removal in a manner that will protect roads and adjacent resources.
2. Rocking or other special surfacing and/or drainage measures may be necessary before the operator is allowed to use the roads.
3. During snow removal operations, banks shall not be undercut nor shall gravel or other selected surfacing material be bladed off the roadway surface. Ditches and culverts shall be kept functional during and following roadway use. If the road surface is damaged, the Purchaser shall replace lost surface material with similar quality material and repair structures damaged in blading operations.
4. Snow berms shall not be left on the road surface or shall be placed to avoid channelization or concentration of melt water on the road or erosive slopes. Berms left on the shoulder of the road shall be removed and/or drainage holes opened at the end of winter operations and before the spring breakup. Drainage holes shall be spaced as required to obtain satisfactory surface drainage without discharge on erodible fills. On insloped roads, drainage holes shall also be provided on the ditch side, but care taken to insure that culverts and culvert inlets are not damaged.

**Idaho Panhandle National Forest Forest Plan Consistency (IPNF, II-33)**

Specific management objectives in the Idaho Panhandle National Forests Forest Plan pertaining to water resources are:

1. Management activities on Forest Lands will not significantly impair the long-term productivity of the water resource and ensure that state water quality standards will be met or exceeded.

   Idaho State Best Management Practices (BMPs) are designed to protect the long-term productivity of the water resource and ensure state water quality standards will be met. The West Gold Project will meet standard BMPs. Site-specific BMPs were also included with this project as mitigation measures to improve water quality.

2. Maintain concentrations of total sediment or chemical constituents within state standards.

   The net production and delivery of sediment from the No Action alternative is only expected to decrease if the recommendations for road reconstruction and maintenance are implemented. Alternative B & C would substantially reduce production and potential for delivery of sediment to streams.

   The action alternatives would likely meet State standards for chemical constituents given that "Required Design Criteria for All Action Alternatives," State and site-specific BMPs, and INFS standards would be applied if an action alternative is selected.

3. Implement project level standards and guidelines for water quality contained in the Best Management Practices.

   Specific road maintenance and repair is needed for Alternative A to be consistent with Idaho Forest Practices Rules. The action alternatives are consistent with this criterion. In addition to standard State BMPs, other soil and water conservation practices that are approved BMPs are built into the timber sale contract. Site-specific BMPs are specified and are listed in the BMP portion of this appendix. Soil and water conservation principles were used during alternative design to determine the location and types of treatments including which areas should be avoided or restored. The specified and designed measures surpass those required by the State Forest Practices Act and are consistent with Forest Service standards.

4. Cooperate with the states to determine necessary instream flows for various uses.

   Instream flows are not an issue with any of the proposed projects. Therefore, this Standard is not applicable to any alternative.

5. Manage public water system plans for multiple uses by balancing present and future resources with public water supply needs.

   Streams not defined as public water systems, but used by individuals for such purposes, will be managed to standards established by the state's forest practices rules and/or the National Forests' BMPs or to the fisheries standards whichever is applicable

   West Gold Creek is not defined as a public water system.

6. Activities within non-fishery drainages, including first and second order streams, will be planned and executed to maintain existing biota.

   The existing biota will be maintained in first and second order streams through standard and site specific BMPs and the application of INFS standards and guidelines. Site Specific BMPs and applicable INFS standards and guidelines are listed and described in the BMP portion of this appendix.

7. It is the intent of this plan that models be used as a tool to approximate the effects of National Forest activities on water quality values.

   All alternatives meet this standard. The WATSED model was used to predict water and sediment yield changes. Road drainage crossings were inventoried to assess erosional hazards and risks to aquatic ecosystems, using the *Methods for Inventory and Environmental Risk Assessment of Road Drainage Crossings* (Flanagan et al 1998). This method gathered information on road-stream crossings that included fill volumes, culvert sizes, erosional features, and other variables, then ranked each crossing for treatment (project file).

   A modified version of the R1/R4 fish and fish habitat inventory (Overton et al 1997) was conducted along West Gold Creek and some of its tributaries during the 2000 field season. Additional stream information was collected to determine stream channel types, cross sectional profiles, woody debris composition and stream temperature. Existing and potential in-channel and stream-bank erosion sites were also documented with this survey.

# Appendix B – Fisheries Management Direction and Guidelines

## INFS Standards and Guidelines (USDA A7-13; 1995)

Only INFS standards and guidelines that apply to the range of alternatives for the West Gold Project are addressed here; those standard and guidelines that do not apply are in the INFS document located in the project file. These INFS standards and guidelines are addressed with comments in italics as follows:

### Timber Management (A-7)

**TM-1**. Prohibit timber harvest, including fuelwood cutting, in Riparian Habitat Conservation Areas, except as described below.

a. Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting in Riparian Habitat Conservation Areas only where present and future woody debris needs are met, where cutting would not retard or prevent attainment of other Riparian Management Objectives, and where adverse effects can be avoided to inland native fish. For priority watersheds, complete watershed analysis prior to salvage cutting in RHCAs.

b. Apply silvicultural practices for Riparian Habitat Conservation Areas to acquire desired vegetation characteristics where needed to attain Riparian Management Objectives. Apply silvicultural practices in a manner that does not retard attainment of Riparian Management Objectives and that avoid adverse effects on inland native fish.

*Using "Standard Widths Defining Interim RHCAs," no commercial timber harvest activities are proposed under the action alternatives within RHCAs in the project area.*

<u>*Effectiveness*</u>: *High. No commercial harvest is to occur within the RHCAs.*

### Roads Management (A-7-8)

**RF-1**. Cooperate with Federal, Tribal, State, and county agencies, and cost-share partners to achieve consistency in road design, operation, and maintenance necessary to attain Riparian Management Objectives.

*The proposed activities are all on National Forest lands, but have been coordinated with all those listed where applicable.*

<u>*Effectiveness*</u>: *High. This coordination is standard policy.*

**RF-2**. For each existing or planned road, meet the Riparian Management Objectives and avoid adverse effects to inland native fish by:

a. Completing watershed analyses prior to construction of new roads or landings in Riparian Habitat Conservation Areas (RHCAs) within priority watersheds.

This project area is within an INFS priority watershed and the Gold EAWS (USDA 2001) has been completed; however, no construction of new roads, temporary roads, or landings is proposed within RHCAs.

b. Minimizing road and landing locations in Riparian Habitat Conservation Areas.

*No new roads or landings are proposed within RHCAs under any of the action alternatives.*

Effectiveness: *High.*

c. Initiating development and implementation of a Road Management Plan or a Transportation Management Plan. At a minimum, address the following items in the plan:

1. Road design criteria, elements, and standards that govern construction and reconstruction.
2. Road management objectives for each road.
3. Criteria that govern road operation, maintenance, and management.
4. Requirements for pre-, during-, and post-storm inspections and maintenance
5. Regulation of traffic during wet periods to minimize erosion and sediment delivery and accomplish other objectives such as protection of the road surface.
6. Implementation and effectiveness monitoring plans for road stability, drainage, and erosion control.
7. Mitigation plans for road failures.

*The interdisciplinary team (IDT) evaluated access and road improvement needs within the project area. The project includes spot gravelling to improve drainage on Forest Roads 2707, 2707A, and 332.*

Effectiveness: *Moderate.*

d. Avoiding sediment delivery to streams from the road surface.

1. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe.

*This standard is applied directly for the proposed temporary roads.*

Effectiveness: *High. Roads would be constructed with this design.*

2. Route road drainage away from potentially unstable stream channels and hillslopes.

*Effectiveness:* *High. Improved road drainage would be part of the road package. Water would be less concentrated below existing roads than at present.*

e. Avoiding disruption of natural hydrologic flow paths.

*Roadwork associated with this project including road reconstruction and decommissioning will be completed.*

*Effectiveness:* *High. Road reconstruction projects would restore the hydrologic flow paths.*

f. Avoid sidecasting of soils or snow. Sidecasting of road material is prohibited on road segments within or abutting RHCAs in priority watersheds.

*Gold Creek is a priority watershed. Sidecasting of snow and/or soils would be prohibited at all stream crossings*

**RF-3.** Determine the influence of each road on the Riparian Management Objectives. Meet Riparian Management Objectives and avoid adverse effects on inland native fish by:

a. Reconstructing road and drainage features that do not meet design criteria or operation and maintenance standards, or that have been shown to be less effective than designed for controlling sediment delivery, or that retard attainment of Riparian Management Objectives, or do not protect priority watersheds from increased sedimentation.

b. Prioritizing reconstruction based on the current and potential damage to inland native fish and their priority watersheds, the ecological value of the riparian resources affected, and the feasibility of options such as helicopter logging and road relocation out of Riparian Habitat Conservation Areas.

c. Closing and stabilizing; or obliterating and stabilizing; roads not needed for future management activities. Prioritize these actions based on the current and potential damage to inland native fish in priority watersheds, and the ecological value of the riparian resources affected.

*The proposed road reconstruction and maintenance described in Chapters II and III originate from the above standards. The action alternatives would meet this standard.*

*Effectiveness:* *High. Existing roads are proposed for reconstruction with the Timber Sale Contract, so the likelihood that the projects would be completed is high.*

**RF-4.** Construct new, and improve existing, culverts, bridges, and other stream crossings to accommodate a 100-year flood, including associated bed load and debris, where those improvements would/do pose a substantial risk to riparian conditions. Substantial risk improvements include those that do not meet design and operation maintenance criteria, or that have been shown to be less effective than designed for controlling erosion, or that retard attainment of Riparian Management Objectives, or that do not protect priority watersheds from increased sedimentation. Base priority for upgrading on risks in priority watersheds and the ecological value of the riparian resources affected. Construct and maintain crossings to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

*The proposed road crossing improvements originate from the above standard. The action alternatives would meet this standard.*

Effectiveness: High. *There are no stream crossings for any of the temporary roads proposed under Alternatives B or D.*

**RF-5.** Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.

*The only crossing of a fish-bearing stream is the West Gold Creek crossing on Forest Road 2707. This crossing is a bottomless arch and is unlikely to be a migration barrier for fish.*

Effectiveness: *High. There are currently no crossings that are known fish barriers in the project area. The proposed road design would maintain fish passage.*

## Fires/Fuels Management (A-11)

**FM-1**. Design fuel treatment and fire suppression strategies, practices, and actions so as not to prevent attainment of Riparian Management Objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could perpetuate detrimental conditions, or be damaging to, long-term ecosystem function or inland native fish.

**FM-2**. Locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of Riparian Habitat Conservation Areas. If the only suitable location for such activities is within the Riparian Habitat Conservation Area, an exemption may be granted following a review and recommendation by a resource advisor. The advisor would prescribe the location, use conditions, and rehabilitation requirements, with avoidance of adverse effects to inland native fish a primary goal. Use an interdisciplinary team, including a fishery biologist, to predetermine incident base and helibase locations during presuppression planning.

**FM-3**. Avoid delivery of chemical retardant, foam, or additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or, following a review and recommendation by a resource advisor and a fishery biologist, when the action agency determines that an escape fire would cause more long-term damage to fish habitats than chemical delivery to surface waters.

**FM-4**. Design prescribed burn projects and prescriptions to contribute to the attainment of the Riparian Management Objectives.

*The proposed prescribed burn projects described in Chapters II and III originate from the above standards. The action alternatives would meet this standard.*

*Effectiveness: High. Planting of long-lived tree species to provide for large woody debris recruitment would follow prescribed burning within the RHCAs.*

**FM-5**. Immediately establish an emergency team to develop a rehabilitation treatment plan to attain Riparian Management Objectives and avoid adverse effects on inland native fish whenever a wildfire or a prescribed fire burning out of prescription significantly damages Riparian Habitat Conservation Areas.

*The proposed fires/fuels management described in Chapter 2, and 3 originate from the above standards. The action alternatives would meet this standard.*

*Effectiveness: Moderate to High. Prescribed fire in the project area is designed to meet these standards.*

### General Riparian Area Management (A-12)

**RA-1**. Identify and cooperate with Federal, Tribal, State and local governments to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.

*This project does not adversely affect instream flows.*

**RA-2.** Trees may be felled in Riparian Habitat Conservation Areas when they pose a safety risk. Keep felled trees on site when needed to meet woody debris objectives.

*Slashing of the understory may occur within RHCAs in order to accomplish burning and planting of long-lived species such as cedar, larch, and white pine.*

**RA-3**. Apply herbicides, pesticides, and other toxicants, and other chemicals in a manner that does not retard or prevent attainment of Riparian Management Objectives and avoids adverse effects on inland native fish.

*By following the BMPs listed in the Sandpoint Noxious Weed FEIS, all alternatives would meet this standard.*

*Effectiveness: High. Standards would be met as required by the Sandpoint Noxious Weed EIS.*

**RA-4**. Prohibit storage of fuels and other toxicants within Riparian Habitat Conservation Areas. Prohibit refueling with Riparian Habitat Conservation Areas unless there are no other alternatives. The Forest Service must approve refueling sites within a Riparian Habitat Conservation Area or Bureau of Land Management and have an approved spill containment plan.

*Effectiveness: High. This is a standard BMP that is part of the timber sale contract.*

**RA-5**. Locate water-drafting sites to avoid adverse effects to inland native fish and instream flows, and in a manner that does not retard or prevent attainment of Riparian Management Objectives.

*Effectiveness: Moderate. This standard would be applied in the prescribed burn plans associated with the West Gold project. However, wildfire suppression is beyond the scope of this project and water drafting associated with such an emergency would be addressed as a separate issue.*

### Watershed and Habitat Restoration (A-12)

**WR-1**. Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and contributes to attainment of Riparian Management Objectives.

*Effectiveness: High. The proposed watershed restoration projects originate from the above standard. The action alternatives would meet this standard.*

**WR-2.** Cooperate with Federal, State, local, and Tribal agencies, and private landowners to develop watershed-based Coordinated Resource Management Plans (CRMPs) or other cooperative agreements to meet Riparian Management Objectives.

*Effectiveness: Moderate to High. Cooperation at the multiple levels as listed occurred within the framework for developing the proposed activities of this project and is consistent with the recommendations in the Lake Pend Oreille Bull Trout Problem Assessment (PBTTAT 1998), the Lake Pend Oreille Bull Trout Conservation Plan-Final Draft (Resource Planning Unlimited 1999), and Gold EAWS (USDA 2001).*

### Fisheries and Wildlife Restoration (A-13)

**FW-1**. Design and implement fish and wildlife habitat restoration and enhancement actions in a manner that contributes to attainment of the Riparian Management Objectives.

*Effectiveness: High. Improvements to culverts, road decommissioning, and riparian planting are habitat enhancement actions that will be implemented in a manner that contributes to attainment of Riparian Management Objectives.*

**FW-4.** Cooperate with Federal, Tribal, and State fish management agencies to identify and eliminate adverse effects on native fish associated with habitat manipulation, fish stocking, fish harvest, and poaching.

*Cooperation at the multiple levels as listed occurred within the framework for developing the proposed activities of this project. Using the INFS Standard Widths Defining Interim RHCAs for the project activities, habitat manipulation does not apply. Fish stocking, harvest and/or poaching are all regulated by State management guidelines.*

*Effectiveness: High. Existing habitat would be preserved under this project.*

# Forest Plan Guidelines (USDA 1987, pp. II – 29-31)

1 and 2. **Fry Emergence (Fish Standard 1 and 2):**

The IPNF Forest Plan contains standards for fry emergence that are no longer valid since the Inland Native Fish Strategy was developed. This section explains why.

The objectives for fisheries in the Forest Plan state that the forest "will be managed to maintain and improve fish habitat capacities in order to achieve cooperative goals with the State Fish and Game Department and to comply with state water quality standards. Sediment arising from land management activities will be managed so that in forest fisheries streams the objective is to maintain 80 percent fry emergence success as measured from pristine condition" (II-7). The first two standards for fish use similar language (II-29). The Fishery/Watershed Analysis to determine effects of land management activities on fry emergence is described in Appendix I (I-1, 2).

Appendix I requires that if, during the environmental assessment process, cumulative effects of the proposed and past activities on stream sedimentation are projected to result in greater than 20% reduction in fry emergence, then additional detailed analysis will be undertaken. The analysis is then used to determine the significance of the project on water resources. If the project is judged to have a "significantly negative effect" on water resources, it will be reviewed by the State for conformance with water quality standards prior to the final decision.

At the time the Forest Plan was written, models determining fry emergence (e.g., Stowell *et al.* 1983) were popular. These empirical models were later found to have limited application and were unreliable outside of where they were developed (Kershner 2001 personal communication). In addition, the use of fry emergence survival (regardless of the threshold) as a surrogate for viability came into question, primarily for two reasons:

- First, fry emergence is highly variable. This can be due to changing natural conditions (e.g., floods, temperature regimes, geology) or human-induced causes (e.g., increased sediment input, chemical spills). Both agents are at work in most cases so it is difficult to determine what proportion of egg-to-fry mortality is due to each cause. As a result the underlying relationship between sediment in redds and survival is difficult to predict (Chapman 1988).
- Second, and more important, egg-to-fry mortality is usually density-independent (i.e., a percentage of fry will survive regardless of the number of eggs). This means that in most cases there are enough fry to inhabit all available habitat within a stream. Therefore fry-to-smolt (sub-adult) survival, where density dependent mortality plays a significant role, is a more effective and appropriate predictor of population viability than egg-to-fry survival (for a review of these concepts see Hilborn and Walters 1992). Currently the indicator used as a surrogate of fry-to-smolt survival is stream habitat characteristics.

The 1989 Forest Plan Evaluation and Monitoring Report documents the change away from use of the fry emergence standard (Item G-1, pages C-1 and C-2). The findings were that it was not a good monitoring tool to report stream health. G-1 was combined with item G-3, which includes a comprehensive array of fisheries and hydrology parameters.

The Inland Native Fish Strategy (INFS; USDA 1995) amended the Forest Plans "…except where existing Plan direction would provide more protection" for inland native fish habitat (page 4). All INFS standards and guidelines are intended to either make progress toward Riparian Management Objectives (which describe "good" fish habitat within the context of what is capable of the watershed) or to ensure that activities will not retard the natural rate of recovery of RMOs in a watershed (USDA 1995, A6-A16). In addition, the strategy states that actions that reduce habitat quality, whether existing conditions are better or worse than objective values, are not consistent with INFS direction (USDA 1995, A-3).

INFS supersedes the original IPNF Forest Plan direction because it offers far more protection to inland native fish habitat for the following reasons:

- INFS directs the establishment of Riparian Habitat Conservation Areas (RHCAs) and only allows activities within RHCAs that maintain or improve, and do not retard, the attainment of the RMOs. The original Forest Plan direction actually permitted degradation of water resources at the discretion of the line officer, and allowed "significant" degradation after review by the State.
- Activities that reduce habitat quality to any extent are contrary to INFS direction, regardless of whether RMOs have been attained. The original Forest Plan direction allowed for apparent degradation of fish habitat by permitting up to a 20 percent reduction of potential fry emergence.

In *The Lands Council v. Vaught* the U. S. District Court for the Eastern District of Washington, in its reading of the plain language of the INFS documents and giving deference to the Forest Service's expertise in interpreting its Forest Plans, concluded that INFS does supersede the Forest Plan in all areas where RHCA guidelines and standards apply (i.e., where delivery of sediment to streams is the identified threat that proposed project activities pose to fish habitat). The Forest Plan standards remain in effect in all other areas.

In conclusion, this project complies with original Forest Plan direction because, although fry emergence was not computed, a detailed analysis of the effects to fish habitat and water resources was developed as required in Appendix I; and the project has been determined to be fully consistent with the INFS Forest Plan amendment and state water quality standards for supporting beneficial uses (see Watershed discussion).

3. The stream and river segments (if listed) will be managed as low access fishing opportunities to maintain a diversity of fishing experiences for the public and to protect sensitive fish populations. Special road management provisions will be used to accomplish this objective. "<u>Low Access Fishing Streams</u>"

Forest Plan standards 3 are not inclusive to this analysis because no streams in the analysis area are listed under "low access fishing streams." However, streams within the analysis area are recognized as to providing beneficial uses.

4. Provide fish passage to suitable habitat areas, by designing road crossings of streams to allow fish passage or removing in-stream migration barriers.

Within the project area, no human-caused fish migration barriers have been identified; therefore, this objective does not apply to the West Gold Project.

5. Utilize data from stream, river, and lake inventories to prepare fishery prescriptions that coordinate fishery resource needs with other resource activities. Pursue fish habitat improvement projects to improve habitat carrying capacities on selected streams.

As stated in Chapter III, information was utilized from 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 (IDF&G), the United States Fish and Wildlife Service (USFWS), electrofishing data from the Idaho Division of Environmental Quality (DEQ) and comprehensive knowledge of the fisheries resources in the Gold Creek Watershed.

6. Coordinate management activities with water resource concerns as described in MA 16, Appendix I, and Appendix O.

Water resource concerns are protected in Management Area 16 through INFS standards and guidelines.

## State of Idaho Governor's Bull Trout Plan

The following describes a "step down" process from the Governors Bull Trout Plan.
Governors Bull Trout Plan (State of Idaho 1996):

- The mission of the plan is to "…maintain and or restore complex interacting groups of bull trout populations throughout their native range in Idaho.
- The Plan created the Basin Advisory Groups, which oversee the Watershed Advisory Groups (WAG). The Technical Advisory Team's role is to assist the WAG with issues regarding recovery of bull trout in each key watershed.

Lake Pend Oreille Key Watershed Problem Assessment (Technical Advisory Team 1998)

- Threats and limiting factors to restoration of bull trout in Gold Creek include excess bedload in stream channels from historic mining activities, lack of large woody debris in some reaches, and inputs of fine sediment from the Kickbush slide. Poaching and disturbance of spawning bull trout also pose a potential threat.

Lake Pend Oreille Bull Trout Conservation Plan (Final Draft; LPOWAG July 1999)

- Watersheds were ranked by the TAT based on the following criteria:
    - The probability of persistence for bull trout;
    - Current habitat/watershed conditions;
    - The need for watershed restoration and/or protection;
    - The potential to increase bull trout numbers.
- (South) Gold Creek is a High Priority subwatershed for restoration.
- The conservation plan emphasizes restoration activities in High Priority watersheds only.

The Final Draft of the Lake Pend Oreille Bull Trout Conservation Plan was forwarded to the Governor's office as the final plan. The WAG has not regrouped to implement the plan; however, many of the restoration activities are being accomplished through other means (Dave Mosier, personal communication, 2001). The Kickbush Slide repair will be completed in summer of 2002. The CERCLA cleanup of mining activities in Gold Creek will also begin in summer of 2002, and will be a multi-phase project over several years. Other activities including the purchase of private land parcels and road closures for bull trout protection, as well as increased law enforcement presence to discourage poaching, have been implemented and will continue to occur.

# Appendix C – Vegetation Information

## Regulatory Framework

Regulatory constraints applying to the management of forest vegetation 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.

- *RPA states, "It is the policy of Congress that all forested lands in the National Forest System be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth, and conditions of stand designed to secure the maximum benefits of multiple use sustained yield management in accordance with land management plans."*

- *The 1976 National Forest Management Act directs that Forest Plans will be developed which specify guidelines to identify the suitability of lands for resource management; provide for the diversity of plant and animal communities based on the suitability and capability of land areas to meet multiple-use objectives; where appropriate, to the degree practicable, preserve the diversity of tree species similar to that existing in the planning area; insure that timber will be harvested from National Forest System Lands only where soil, slope, or other watershed conditions will not be irreversibly damaged; the lands can be adequately restocked within five years after harvest; protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water where harvests are likely to seriously and adversely affect water conditions and fish habitat; and the harvesting system used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber.*

- *Any cut designed to regenerate an even-aged stand of timber must be determined to be appropriate to meet the objectives and requirements of the land management plan and, in the case of clearcutting, is the optimum method; has had an interdisciplinary review of impacts and the cuts are consistent with the multiple use of the general area; will be shaped and blended, to the extent practicable, with the natural terrain; meets established, suitable size limits; and is carried out in a manner consistent with protection of soil, watershed, fish, wildlife, recreation, esthetic resources, and the regeneration of the timber resource.*

- *NFMA amended RPA and requires that stands of trees shall generally have reached the culmination of mean annual increment of growth prior to harvest, but this does not preclude the use of sound silvicultural systems such as thinning and other stand improvement measures; it also allows salvage or sanitation harvest following fire, windthrow, or other catastrophe or within stands in imminent danger of insect and disease attack.*

Forest Service policy directs land managers to:

- *Use only those silvicultural practices that are best suited to the land management objectives for the area. Consider all resources, as directed in the appropriate forest plan.*

- *Prescribe treatments that are practical in terms of cost of preparation, administration, transportation systems, and logging methods.*

- *Monitor practices, using procedures specified in forest plans to ensure objectives are met.*

- *Before scheduling stands for regeneration harvest, ensure, based on literature, research, or local experience, that stands to be managed for timber production can be adequately restocked within five years of final harvest. Five years after final harvest means five years after clearcutting, final overstory removal in shelterwood cutting, the seed tree removal cut in seed tree cutting or after selection cutting.*

- *Perform all silvicultural activities in the most cost effective manner consistent with resource management objectives.*

Forest Service policy further directs that:

- *The size of tree openings created by even-aged silvicultural methods will normally be 40 acres or less. With some exceptions, creation of larger openings will require 60-day public review and Regional Forester approval.*

- *For management purposes, cut areas created by even-aged management will no longer be considered openings when both vegetation and watershed conditions meet management objectives established for the management area.*

- *Management activities will promote programs that provide a sustained yield of forest products consistent with the multiple-use goals established in Regional Guides and the Forest Plan.*

- *Timber management activities will be the primary process used to minimize the hazards of insects and diseases and will be accomplished primarily by maintaining stand vigor and diversity of plant communities and tree species.*

- *Protection of timber stands from insect and disease problems will center around the silvicultural treatments prescribed for timber management activities.*

- *Proposed activities will be consistent with Management Area objectives. Descriptions and objectives of these Management Areas are included in the Forest Plan.*

| WEST GOLD ALTERNATIVE B STAND TREATMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | **Stand ID** | **Acres** | **Alternative B Prescription** | **Size Class** | **Forest Cover Type** | **Alt B. Harvest System** | **Fuels Treatment** | **Reforestation** |
| **06** | 63201001 | 3.57 | Thin | IMSA | DF | S | LL | NONE |
| **06** | 63201043 | 7.07 | Thin | IMSA | DF | S | LL | NONE |
| **07** | 63302032 | 22.87 | Thin/Group Select | IMSA | L | S | UB | NONE |
| **08** | 63301034 | 38.23 | Irregular Shelterwood | IMSA | DF | S | UB | PP/WL |
| **09** | 63301025 | 23.86 | Irregular Shelterwood | IMSA | DF | S | UB | WL/WP |
| **10** | 63301013 | 8.81 | Thin | IMSA | DF | S | LL | NONE |
| **10** | 63302028 | 16.59 | Thin/Group Select | MHRS | PP | S | LL | NONE |
| **11** | 63302042 | 9.97 | Thin/Group Select | IMSA | DF | S | LL | NONE |
| **12** | 63302043 | 12.60 | Seedtree w/reserves | IMSA | GF/WH | S | UB | WL/WP |
| **13** | 63302004 | 10.87 | Irregular Shelterwood | IMSA | L | H | UB | WP/WL |
| **15** | 63302004 | 4.44 | Irregular Shelterwood | IMSA | L | H | UB | WL/WP |
| **16** | 63302046 | 19.43 | Rehabilitation | IMSA | DF | S | UB | WL/WP |
| **17** | 63302002 | 18.36 | Seedtree w/reserves | IMSA | GF/WH | S | UB | WL/WP |
| **17** | 63302004 | 34.19 | Seedtree w/reserves | IMSA | L | H | UB | WL/WP |
| **18** | 63302045 | 14.15 | Irregular Shelterwood | IMSA | LP | S | UB | WL/PP/WP |
| **19** | 63302045 | 7.61 | Irregular Shelterwood | IMSA | LP | S | GP | NONE |
| **19** | 63302045 | 13.48 | Thin | IMSA | LP | T | GP | NONE |
| **20** | 63302021 | 35.87 | Thin/Group Select | IMSA | C | S | LL | NONE |
| **21** | 63302049 | 13.24 | Irregular Shelterwood | IMSA | DF | S | UB | WL/WP |
| **22** | 63302003 | 18.18 | Thin/Group Select | IMSA | DF | S | LL | NONE |
| **23** | 63302020 | 14.07 | Irregular Shelterwood | IMSA | C | S | UB | WL/WP |
| **23** | 63302022 | 7.64 | Irregular Shelterwood | IMSA | DF | H | UB | WL/WP |
| **23** | 63302022 | 23.28 | Irregular Shelterwood | IMSA | DF | S | UB | WL/WP |
| **23** | 63302023 | 58.95 | Irregular Shelterwood | IMSA | DF | S | UB | PP/WL/WP |
| **23** | 63302023 | 12.12 | Irregular Shelterwood | IMSA | DF | H | UB | PP/WL/WP |

| WEST GOLD ALTERNATIVE B STAND TREATMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | **Stand ID** | **Acres** | **Alternative B Prescription** | **Size Class** | **Forest Cover Type** | **Alt B. Harvest System** | **Fuels Treatment** | **Reforestation** |
| **24** | 63202008 | 12.29 | Irregular Shelterwood | IMSA | DF | S | UB | PP |
| **24** | 63202031 | 6.76 | Irregular Shelterwood | IMSA | L | H | UB | PP/WL |
| **24** | 63202031 | 7.89 | Irregular Shelterwood | IMSA | L | S | UB | PP/WL |
| **24** | 63202032 | 19.29 | Irregular Shelterwood | IMSA | DF | S | UB | PP |
| **24** | 63202037 | 28.23 | Irregular Shelterwood | IMSA | DF | S | UB | PP/WL |
| **24** | 63202038 | 10.24 | Irregular Shelterwood | IMSA | DF | S | UB | PP |
| **24** | 63302013 | 12.99 | Irregular Shelterwood | IMSA | DF | S | UB | PP |
| **24** | 63302013 | 2.97 | Irregular Shelterwood | IMSA | DF | H | UB | PP |
| **25** | 63202032 | 4.80 | Thin/Group Select | IMSA | DF | H | WTY | NONE |
| **25** | 63202038 | 5.24 | Thin/Group Select | IMSA | DF | H | WTY | NONE |
| **26** | 63202025 | 28.58 | Underburn Only | MHRS | PP | None | UB | NONE |
| **27** | 63202004 | 21.17 | Rehabilitation | IMSA | DF | H | SL/UB | PP/WL/WP |
| **27** | 63202004 | 19.34 | Rehabilitation | IMSA | DF | S | SL/UB | PP/WL/WP |
| **27** | 63202020 | 6.67 | Rehabilitation | MHRS | GF/WH | H | SL/UB | PP/WL/WP |
| **27** | 63202027 | 17.22 | Rehabilitation | IMSA | DF | S | SL/UB | PP/WL/WP |
| **27** | 63202027 | 9.92 | Rehabilitation | IMSA | DF | H | SL/UB | PP/WL/WP |
| **27** | 63202028 | 22.00 | Rehabilitation | SAWT | DF | S | SL/UB | PP/WL/WP |
| **27** | 63202028 | 11.75 | Rehabilitation | SAWT | DF | H | SL/UB | PP/WL/WP |
| **27** | 63202041 | 3.13 | Rehabilitation | MHRS | C | H | SL/UB | PP/WL/WP |
| **27** | 63202048 | 4.55 | Rehabilitation | MLRS | DF | S | SL/UB | PP |
| **28** | 63302007 | 23.73 | Thin | IMSA | GF/WH | H | LL | NONE |
| **29** | 63202006 | 12.71 | Rehabilitation | IMSA | DF | S | SL/UB | WL/WP |
| **30** | 63202042 | 2.27 | Final Removal w/Reserves | MULT | L | H | LL | NONE |
| **31** | 63202002 | 14.25 | Irregular Shelterwood | IMSA | GF/WH | H | UB | PP/WL |
| **31** | 63202002 | 31.10 | Irregular Shelterwood | IMSA | GF/WH | S | UB | PP/WL |
| **31** | 63202003 | 38.83 | Irregular Shelterwood | IMSA | DF | H | UB | PP/WL |

| WEST GOLD ALTERNATIVE B STAND TREATMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | **Stand ID** | **Acres** | **Alternative B Prescription** | **Size Class** | **Forest Cover Type** | **Alt B. Harvest System** | **Fuels Treatment** | **Reforestation** |
| **31** | 63202003 | 2.28 | Irregular Shelterwood | IMSA | DF | T | UB | PP/WL |
| **31** | 63202003 | 31.06 | Irregular Shelterwood | IMSA | DF | S | UB | PP/WL |
| **31** | 63202014 | 3.28 | Irregular Shelterwood | IMSA | DF | H | UB | PP/WL |
| **31** | 63202018 | 21.46 | Irregular Shelterwood | IMSA | DF | H | UB | PP/WL |
| **31** | 63202018 | 21.58 | Irregular Shelterwood | IMSA | DF | S | UB | PP/WL |
| **31** | 63202019 | 20.45 | Irregular Shelterwood | MLRS | GF/WH | H | UB | PP/WL/WP |
| **31** | 63202019 | 11.36 | Irregular Shelterwood | MLRS | GF/WH | T | UB | PP/WL/WP |
| **31** | 63202019 | 5.41 | Irregular Shelterwood | MLRS | GF/WH | S | UB | PP/WL/WP |
| **31** | 63202022 | 6.36 | Irregular Shelterwood | IMSA | DF | S | UB | PP/WL |
| **31** | 63202022 | 7.97 | Irregular Shelterwood | IMSA | DF | T | UB | PP/WL |
| **31** | 63202023 | 2.88 | Irregular Shelterwood | IMSA | LP | T | UB | PP/WL |
| **31** | 63202024 | 6.23 | Irregular Shelterwood | MHRS | LP | S | UB | PP |
| **31** | 63202024 | 1.86 | Irregular Shelterwood | MHRS | LP | H | UB | PP |
| **31** | 63202024 | 5.36 | Irregular Shelterwood | MHRS | LP | T | UB | PP |
| **32** | 63202017 | 13.82 | Thin & Group Select | IMSA | DF | S | UB | NONE |
| **33** | 63202023 | 6.71 | Thin | IMSA | LP | S | UB | NONE |
| **34** | 63202026 | 1.78 | Thin & Group Select | IMSA | DF | S | UB | NONE |
| **34** | 63202026 | 2.31 | Thin & Group Select | IMSA | DF | T | UB | NONE |
| **35** | 63201024 | 40.25 | Irregular Shelterwood | MHRS | L | H | UB | NONE |
| **35** | 63201025 | 21.96 | Irregular Shelterwood | MHRS | L | H | UB | NONE |
| **36** | 63201043 | 31.41 | Thin & Group Select | IMSA | DF | H | UB | NONE |
| **37** | 63201010 | 7.67 | Thin & Group Select | IMSA | DF | H | UB | NONE |
| **37** | 63201011 | 4.82 | Thin & Group Select | MHRS | DF | H | UB | NONE |
| **38** | 63201003 | 9.47 | Thin & Group Select | IMSA | DF | H | UB | NONE |
| **38** | 63201004 | 8.23 | Thin & Group Select | IMSA | PP | H | UB | NONE |
| **38** | 63201007 | 7.02 | Thin & Group Select | IMSA | DF | H | UB | NONE |

| WEST GOLD ALTERNATIVE B STAND TREATMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | **Stand ID** | **Acres** | **Alternative B Prescription** | **Size Class** | **Forest Cover Type** | **Alt B. Harvest System** | **Fuels Treatment** | **Reforestation** |
| **39** | 63201014 | 4.98 | Thin & Group Select | SAWT | DF | H | UB/LL | NONE |
| **39** | 63201032 | 14.88 | Thin & Group Select | MULT | PP | H | UB/LL | NONE |
| **40** | 63302007 | 11.37 | Thin | MULT | GF/WH | H | LL | NONE |
| **41** | 63202008 | 23.01 | Irregular Shelterwood | IMSA | DF | H | UB | PP |
| **41** | 63202009 | 9.20 | Irregular Shelterwood | IMSA | GF/WH | H | UB | PP |
| **41** | 63202038 | 7.19 | Irregular Shelterwood | IMSA | DF | H | UB | PP |
| **41** | 63202040 | 13.43 | Irregular Shelterwood | IPOL | LP | H | UB | PP |
| **42** | 63202026 | 10.09 | Thin & Group Select | IMSA | DF | H | UB | NONE |
| **42** | 63202036 | 7.83 | Thin & Group Select | IMSA | DF | H | UB | NONE |
| **42** | 63202042 | 5.43 | Thin & Group Select | MULT | L | H | UB | NONE |
| **43** | 63302003 | 8.12 | Thin | IMSA | DF | H | LL | NONE |
| **44** | 63302007 | 63.54 | Thin | MULT | GF/WH | H | LL | NONE |
| **45** | 63302021 | 7.34 | Irregular Shelterwood | IMSA | DF | H | GP | WL/WP |
| **46** | 63302049 | 6.96 | Irregular Shelterwood | IMSA | DF | H | UB | WP/WL |
| **48** | 63302049 | 14.06 | Thin/Group Select | IMSA | DF | H | LL | NONE |
| | | | | | | | | |
| | **TOTAL** | **1,337.79** | | | | | | |

**Size Class**
IMSA – Immature sawtimber
MHRS- Mature high risk
MULT – Mulitstory
SAWT – Sawtimber
IPOL – Immature Pole

**Forest Cover**
DF – Douglas fir
GF – grand fir
WH – western hemlock
LP – lodgepole pine
PP – ponderosa pine
L - larch
C - cedar

**Harvest System**
T – tractor
S – skyline
H – helicopter

**Fuels**
UB – underburn
LL – limb and lop
GP – grapple pile
WTY – whole tree yard

**Reforestation**
WL – western larch
WP – white pine
PP – ponderosa pine

| WEST GOLD ALTERNATIVE C STAND TREATMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | **Stand ID** | **Acres** | **Size Class** | **Forest Cover Type** | **Alternative C Prescription** | **Alt C Harvest system** | **Fuels Treatment** | **Reforestation** |
| **06** | 63201001 | 3.57 | IMSA | DF | Thin | S | LL | NONE |
| **06** | 63201043 | 7.07 | IMSA | DF | Thin | S | LL | NONE |
| **07** | 63302032 | 22.87 | IMSA | L | Thin/Group Select | S | UB | NONE |
| **08** | 63301034 | 38.23 | IMSA | DF | Irregular Shelterwood | S | UB | PP/WL |
| **09** | 63301025 | 23.86 | IMSA | DF | Irregular Shelterwood | S | UB | WL/WP |
| **10** | 63301013 | 8.81 | IMSA | DF | Thin | S | LL | NONE |
| **10** | 63302028 | 16.59 | MHRS | PP | Thin/Group Select | S | LL | NONE |
| **11** | 63302042 | 9.97 | IMSA | DF | Thin/Group Select | S | LL | NONE |
| **12** | 63302043 | 12.60 | IMSA | GF/WH | Seedtree w/reserves | S | UB | WL/WP |
| **13** | 63302004 | 10.87 | IMSA | L | Irregular Shelterwood | H | UB | WP/WL |
| **15** | 63302004 | 4.44 | IMSA | L | Irregular Shelterwood | H | UB | WL/WP |
| **16** | 63302046 | 19.43 | IMSA | DF | Rehabilitation | H | UB | WL/WP |
| **17** | 63302002 | 18.36 | IMSA | GF/WH | Seedtree w/reserves | S | UB | WL/WP |
| **17** | 63302004 | 34.19 | IMSA | L | Seedtree w/reserves | H | UB | WL/WP |
| **18** | 63302045 | 14.15 | IMSA | LP | Irregular Shelterwood | S | UB | WL/PP/WP |
| **19** | 63302045 | 13.48 | IMSA | LP | Thin | T | GP | NONE |
| **19** | 63302045 | 7.61 | IMSA | LP | Thin | S | GP | NONE |
| **20** | 63302021 | 35.87 | IMSA | C | Thin/Group Select | S | LL | NONE |
| **21** | 63302049 | 13.24 | IMSA | DF | Irregular Shelterwood | S | UB | WL/WP |
| **22** | 63302003 | 18.18 | IMSA | DF | Thin/Group Select | S | LL | NONE |
| **23** | 63302020 | 10.18 | IMSA | C | Irregular Shelterwood | H | UB | WL/WP |
| **23** | 63302020 | 3.90 | IMSA | C | Irregular Shelterwood | S | UB | WL/WP |
| **23** | 63302022 | 22.79 | IMSA | DF | Irregular Shelterwood | H | UB | WL/WP |
| **23** | 63302022 | 8.13 | IMSA | DF | Irregular Shelterwood | S | UB | WL/WP |

| WEST GOLD ALTERNATIVE C STAND TREATMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | **Stand ID** | **Acres** | **Size Class** | **Forest Cover Type** | **Alternative C Prescription** | **Alt C Harvest system** | **Fuels Treatment** | **Reforestation** |
| **23** | 63302023 | 32.03 | IMSA | DF | Irregular Shelterwood | H | UB | WL/WP |
| **23** | 63302023 | 39.04 | IMSA | DF | Irregular Shelterwood | S | UB | PP/WL/WP |
| **24** | 63202008 | 12.29 | IMSA | DF | Irregular Shelterwood | S | UB | PP |
| **24** | 63202031 | 14.66 | IMSA | L | Irregular Shelterwood | H | UB | PP/WL |
| **24** | 63202032 | 19.29 | IMSA | DF | Irregular Shelterwood | H | UB | PP |
| **24** | 63202037 | 20.68 | IMSA | DF | Irregular Shelterwood | H | UB | PP/WL |
| **24** | 63202037 | 7.55 | IMSA | DF | Irregular Shelterwood | S | UB | PP/WL |
| **24** | 63202038 | 3.11 | IMSA | DF | Irregular Shelterwood | H | UB | PP |
| **24** | 63202038 | 7.13 | IMSA | DF | Irregular Shelterwood | S | UB | PP |
| **24** | 63302013 | 15.95 | IMSA | DF | Irregular Shelterwood | H | UB | PP |
| **25** | 63202032 | 4.80 | IMSA | DF | Thin/Group Select | H | WTY | NONE |
| **25** | 63202038 | 5.24 | IMSA | DF | Thin/Group Select | H | WTY | NONE |
| **26** | 63202025 | 28.58 | MHRS | PP | Underburn Only | None | UB | NONE |
| **27** | 63202004 | 21.17 | IMSA | DF | Rehabilitation | H | SL/UB | PP/WL/WP |
| **27** | 63202004 | 19.34 | IMSA | DF | Rehabilitation | S | SL/UB | PP/WL/WP |
| **27** | 63202020 | 6.67 | MHRS | GF/WH | Rehabilitation | H | SL/UB | PP/WL/WP |
| **27** | 63202027 | 9.92 | IMSA | DF | Rehabilitation | H | SL/UB | PP/WL/WP |
| **27** | 63202027 | 17.22 | IMSA | DF | Rehabilitation | S | SL/UB | PP/WL/WP |
| **27** | 63202028 | 11.75 | SAWT | DF | Rehabilitation | H | SL/UB | PP/WL/WP |
| **27** | 63202028 | 22.00 | SAWT | DF | Rehabilitation | S | SL/UB | PP/WL/WP |
| **27** | 63202041 | 3.13 | MHRS | C | Rehabilitation | H | SL/UB | PP/WL/WP |
| **27** | 63202048 | 4.55 | MLRS | DF | Rehabilitation | S | SL/UB | PP |
| **28** | 63302007 | 23.73 | IMSA | GF/WH | Thin | H | LL | NONE |
| **29** | 63202006 | 12.71 | IMSA | DF | Rehabilitation | S | SL/UB | WL/WP |
| **30** | 63202042 | 2.27 | MULT | L | Final Removal w/Reserves | H | LL | NONE |

| WEST GOLD ALTERNATIVE C STAND TREATMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | **Stand ID** | **Acres** | **Size Class** | **Forest Cover Type** | **Alternative C Prescription** | **Alt C Harvest system** | **Fuels Treatment** | **Reforestation** |
| **31** | 63202002 | 45.35 | IMSA | GF/WH | Irregular Shelterwood | H | UB | PP/WL |
| **31** | 63202003 | 72.17 | IMSA | DF | Irregular Shelterwood | H | UB | PP/WL |
| **31** | 63202014 | 3.28 | IMSA | DF | Irregular Shelterwood | H | UB | PP/WL |
| **31** | 63202018 | 43.04 | IMSA | DF | Irregular Shelterwood | H | UB | PP/WL |
| **31** | 63202019 | 37.22 | MLRS | GF/WH | Irregular Shelterwood | H | UB | PP/WL/WP |
| **31** | 63202022 | 14.33 | IMSA | DF | Irregular Shelterwood | H | UB | PP/WL |
| **31** | 63202023 | 2.88 | IMSA | LP | Irregular Shelterwood | H | UB | PP/WL |
| **31** | 63202024 | 13.44 | MHRS | LP | Irregular Shelterwood | H | UB | PP |
| **32** | 63202017 | 13.82 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **33** | 63202023 | 6.71 | IMSA | LP | Thin | H | UB | NONE |
| **34** | 63202026 | 4.09 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **35** | 63201024 | 40.25 | MHRS | L | Irregular Shelterwood | H | UB | NONE |
| **35** | 63201025 | 21.96 | MHRS | L | Irregular Shelterwood | H | UB | NONE |
| **36** | 63201043 | 31.41 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **37** | 63201010 | 7.67 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **37** | 63201011 | 4.82 | MHRS | DF | Thin & Group Select | H | UB | NONE |
| **38** | 63201003 | 9.47 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **38** | 63201004 | 8.23 | IMSA | PP | Thin & Group Select | H | UB | NONE |
| **38** | 63201007 | 7.02 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **39** | 63201014 | 4.98 | SAWT | DF | Thin & Group Select | H | UB/LL | NONE |
| **39** | 63201032 | 14.88 | MULT | PP | Thin & Group Select | H | UB/LL | NONE |
| **40** | 63302007 | 11.37 | MULT | GF/WH | Thin | H | LL | NONE |
| **41** | 63202008 | 23.01 | IMSA | DF | Irregular Shelterwood | H | UB | PP |
| **41** | 63202009 | 9.20 | IMSA | GF/WH | Irregular Shelterwood | H | UB | PP |
| **41** | 63202038 | 7.19 | IMSA | DF | Irregular Shelterwood | H | UB | PP |

| WEST GOLD ALTERNATIVE C STAND TREATMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | **Stand ID** | **Acres** | **Size Class** | **Forest Cover Type** | **Alternative C Prescription** | **Alt C Harvest system** | **Fuels Treatment** | **Reforestation** |
| **41** | 63202040 | 13.43 | IPOL | LP | Irregular Shelterwood | H | UB | PP |
| **42** | 63202026 | 10.09 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **42** | 63202036 | 7.83 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **42** | 63202042 | 5.43 | MULT | L | Thin & Group Select | H | UB | NONE |
| **43** | 63302003 | 8.12 | IMSA | DF | Thin | H | LL | NONE |
| **44** | 63302007 | 63.54 | MULT | GF/WH | Thin | H | LL | NONE |
| **45** | 63302021 | 7.34 | IMSA | DF | Irregular Shelterwood | H | GP | WL/WP |
| **46** | 63302049 | 6.96 | IMSA | DF | Irregular Shelterwood | H | UB | WP/WL |
| **48** | 63302049 | 14.06 | IMSA | DF | Thin/Group Select | H | LL | NONE |
| | | | | | | | | |
| | **TOTAL** | **1,337.79** | | | | | | |

**Size Class**
IMSA – Immature sawtimber
MHRS- Mature high risk
MULT – Mulitstory
SAWT – Sawtimber
IPOL – Immature Pole

**Forest Cover**
DF – Douglas fir
GF – grand fir
WH – western hemlock
LP – lodgepole pine
PP – ponderosa pine
L - larch
C - cedar

**Harvest System**
T – tractor
S – skyline
H – helicopter

**Fuels**
UB – underburn
LL – limb and lop
GP – grapple pile
WTY – whole tree yard

**Reforestation**
WL – western larch
WP – white pine
PP – ponderosa pine

| WEST GOLD ALTERNATIVE D STAND TREATMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | **Stand ID** | **Acres** | **Size Class** | **Forest Cover Type** | **Alternative D Prescription** | **Alt. D Harvest System** | **Fuels Prescription** | **Reforestation** |
| **06** | 63201001 | 3.57 | IMSA | DF | Thin | S | LL | NONE |
| **06** | 63201043 | 7.07 | IMSA | DF | Thin | S | LL | NONE |
| **07** | 63302032 | 22.87 | IMSA | L | Thin/Group Select | S | UB | NONE |
| **08** | 63301034 | 38.23 | IMSA | DF | Improvement Cut | S | UB | NONE |
| **10** | 63301013 | 8.81 | IMSA | DF | Thin | S | LL | NONE |
| **10** | 63302028 | 16.59 | MHRS | PP | Thin/Group Select | S | LL | NONE |
| **11** | 63302042 | 9.97 | IMSA | DF | Thin/Group Select | S | LL | NONE |
| **19** | 63302045 | 10.79 | IMSA | LP | Thin | S | GP | NONE |
| **19** | 63302045 | 15.79 | IMSA | LP | Thin | T | GP | NONE |
| **20** | 63302021 | 35.87 | IMSA | C | Thin/Group Select | S | LL | NONE |
| **22** | 63302003 | 18.18 | IMSA | DF | Thin/Group Select | S | LL | NONE |
| **26** | 63202025 | 28.58 | MHRS | PP | Underburn Only | None | UB | NONE |
| **28** | 63302007 | 23.73 | IMSA | GF/WH | Thin | H | LL | NONE |
| **30** | 63202042 | 2.27 | MULT | L | Final Removal w/Reserves | H | LL | NONE |
| **32** | 63202017 | 13.82 | IMSA | DF | Thin & Group Select | S | UB | NONE |
| **33** | 63202023 | 10.02 | IMSA | LP | Thin | H | UB | NONE |
| **36** | 63201043 | 31.41 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **37** | 63201010 | 7.67 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **37** | 63201011 | 4.82 | MHRS | DF | Thin & Group Select | H | UB | NONE |
| **38** | 63201003 | 9.47 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **38** | 63201004 | 8.23 | IMSA | PP | Thin & Group Select | H | UB | NONE |
| **38** | 63201007 | 7.02 | IMSA | DF | Thin & Group Select | H | UB | NONE |
| **39** | 63201014 | 4.98 | SAWT | DF | Thin & Group Select | H | UB/LL | NONE |
| **39** | 63201032 | 14.88 | MULT | PP | Thin & Group Select | H | UB/LL | NONE |

| WEST GOLD ALTERNATIVE D STAND TREATMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Unit** | **Stand ID** | **Acres** | **Size Class** | **Forest Cover Type** | **Alternative D Prescription** | **Alt. D Harvest System** | **Fuels Prescription** | **Reforestation** |
| **40** | 63302007 | 11.37 | MULT | GF/WH | Thin | H | LL | NONE |
| **42** | 63202026 | 10.09 | IMSA | DF | Thin & Group Sel | H | UB | NONE |
| **42** | 63202036 | 7.83 | IMSA | DF | Thin & Group Sel | H | UB | NONE |
| **42** | 63202042 | 5.43 | MULT | L | Thin & Group Sel | H | UB | NONE |
| **43** | 63302003 | 8.12 | IMSA | DF | Thin | H | LL | NONE |
| **44** | 63302007 | 63.54 | MULT | GF/WH | Thin | H | LL | NONE |
| **48** | 63302049 | 14.06 | IMSA | DF | Thin/Group Select | H | LL | NONE |
| | | | | | | | | |
| | **TOTAL** | **475.08** | | | | | | |

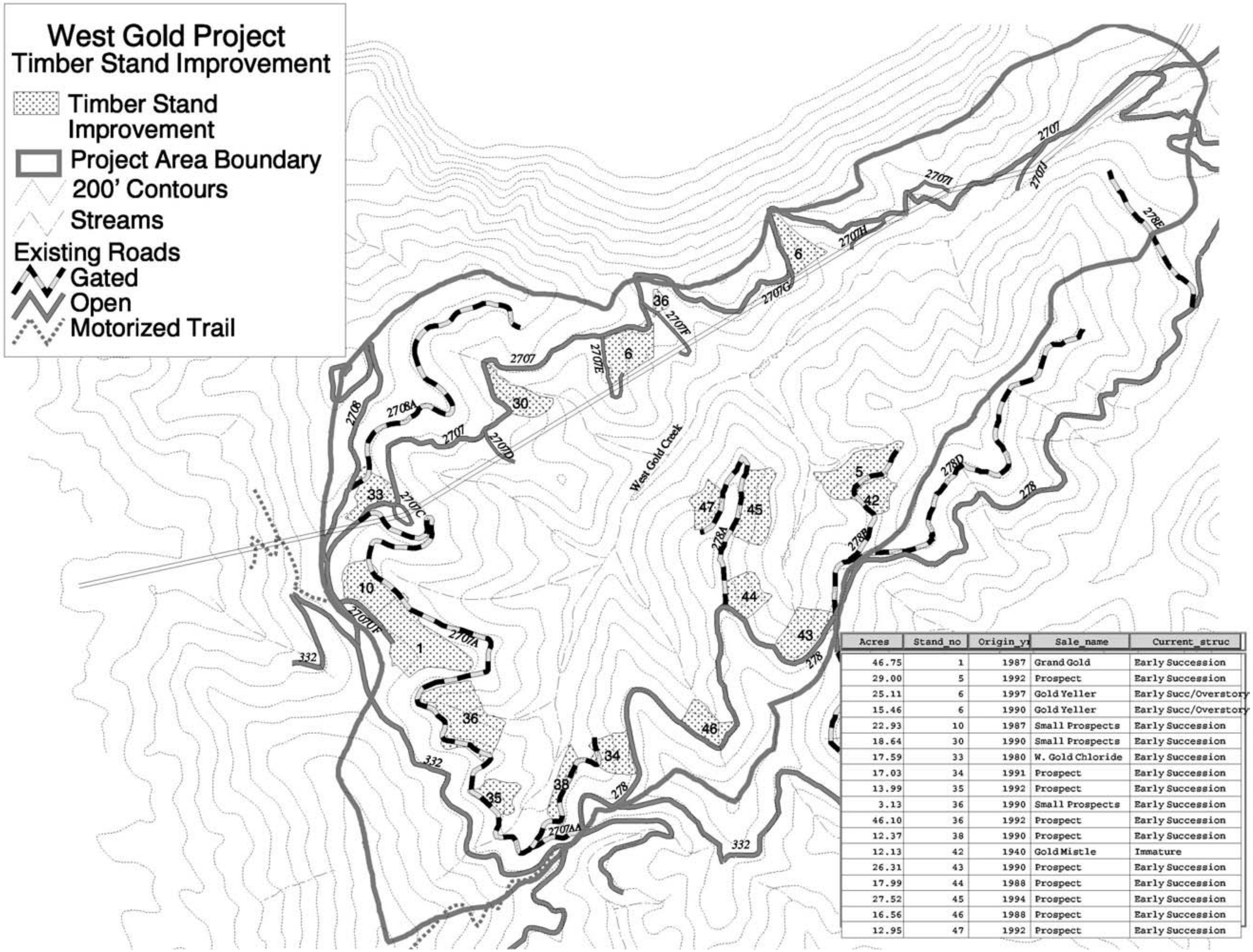
**Size Class**
IMSA – Immature sawtimber
MHRS- Mature high risk
MULT – Mulitstory
SAWT – Sawtimber
IPOL – Immature Pole

**Forest Cover**
DF – Douglas fir
GF – grand fir
WH – western hemlock
LP – lodgepole pine
PP – ponderosa pine
L - larch
C - cedar

**Harvest System**
T – tractor
S – skyline
H – helicopter

**Fuels**
UB – underburn
LL – limb and lop
GP – grapple pile
WTY – whole tree yard

**Reforestation**
WL – western larch
WP – white pine
PP – ponderosa pine




| Acres | Stand_no | Origin_yr | Sale_name | Current_struc |
|---|---|---|---|---|
| 46.75 | 1 | 1987 | Grand Gold | Early Succession |
| 29.00 | 5 | 1992 | Prospect | Early Succession |
| 25.11 | 6 | 1997 | Gold Yeller | Early Succ/Overstory |
| 15.46 | 6 | 1990 | Gold Yeller | Early Succ/Overstory |
| 22.93 | 10 | 1987 | Small Prospects | Early Succession |
| 18.64 | 30 | 1990 | Small Prospects | Early Succession |
| 17.59 | 33 | 1980 | W. Gold Chloride | Early Succession |
| 17.03 | 34 | 1991 | Prospect | Early Succession |
| 13.99 | 35 | 1992 | Prospect | Early Succession |
| 3.13 | 36 | 1990 | Small Prospects | Early Succession |
| 46.10 | 36 | 1992 | Prospect | Early Succession |
| 12.37 | 38 | 1990 | Prospect | Early Succession |
| 12.13 | 42 | 1940 | Gold Mistle | Immature |
| 26.31 | 43 | 1990 | Prospect | Early Succession |
| 17.99 | 44 | 1988 | Prospect | Early Succession |
| 27.52 | 45 | 1994 | Prospect | Early Succession |
| 16.56 | 46 | 1988 | Prospect | Early Succession |
| 12.95 | 47 | 1992 | Prospect | Early Succession |

# Appendix D – Corporate Monitoring

| Issue | Core Data | Unit of Measure | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|---|---|
| Water Yield | Intensity and duration of peak flow increases above existing condition. Comparison to Historic Range of Variation | Percent increase | 3% increase above existing levels due to dead and dying trees. | 5% increase above existing levels. Intensity and duration of peak flows within HRV. | 4% increase above existing levels. Intensity and duration of peak flows within HRV. | 2% increase above existing levels. Intensity and duration of peak flows within HRV. |
| Net Associated Risk of Sediment Delivery. | Anticipated change in sediment risk associated with high risk stream crossing. | Tons of sediment. | Current net associated risk of sediment delivery is 2572 tons. | Reduction in sediment by 2572 tons. | Same as Alternative B. | Same as Alternative B. |
| Hydrologic Integrity | Road Density within the short term (including temp roads) and long term (decommissioning of all roads). | Miles/Mi$^2$ | 3.3 mi/mi2 | Short Term: 3.8<br>Long Term: 2.7 | Short Term: 3.3<br>Long Term: 2.7 | Short Term: 3.4<br>Long Term: 2.7 |
| Changes in Forest Structure | Forest Structure by size/age class groups | Percent/ acres | Early Succession +18%, +809ac<br>Immature Forest -16% -736ac<br>Mature Forest -1% - 73ac<br>Old Growth 0% 0ac | Early Succession +25%, +1148ac<br>Immature Forest -23% -1021ac<br>Mature Forest -1% -127ac<br>Old Growth 0% 0ac | Same as Alternative B. | Same as Alternative A. |
| Changes in Species Composition | Forest composition by forest cover type group | Percent | Douglas-fir 0%<br>Grand fir/Hemlock 0%<br>Western Larch 0%<br>Cedar - <1%<br>Ponderosa pine 0%<br>No trees 0%<br>Lodgepole pine 0%<br>White pine 0% | Douglas-fir -16%<br>Grand fir/Hemlock - 6%<br>Western Larch + 4%<br>Cedar - <1%<br>Ponderosa pine +15%<br>No trees 0%<br>Lodgepole pine - 1%<br>White pine + 4% | Same as Alternative B. | DF - 2%<br>GF/WH - 3%<br>WL + 3%<br>C - <1%<br>PP + 2%<br>No Trees 0%<br>LP - <1%<br>WP 0% |

| Issue | Core Data | Unit of Measure | Alternative A | Alternative B | Alternative C | Alternative D |
|---|---|---|---|---|---|---|
| Changes in Landscape Pattern | Landscape Pattern Measures | Patch size/ edge/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. | Same as Alternative B, except that the changes would occur over fewer acres than Alternatives B or C. The trend to larger mean patch size would be toward the historic range. |
| Habitat Loss and Species Decline | TES Dry and Moist/Cold Site habitat Restoration | Acres | There are 1,187 acres of capable flammulated owl habitat. There would be a continued shift toward more shade tolerant species in the majority of stands. If left untreated, attributes of dry site habitat would fade away. | Restore and maintain the persistence of 186 acres of capable flammulated owl habitat. In addition, would restore, long-term, dry site forest conditions on 190 acres that have conceded to high incidences of insect and disease. The remaining 811 acres would not be affected. | Same as Alternative B | Restore and maintain the persistence of 174 acres of capable flammulated owl habitat. The remaining 1,013 acres would not be affected. |

Issues and core data not tracked with this document are discussed below.

| Issue/Core Data | Reason not considered in analysis |
|---|---|
| Riparian Function | Riparian road density would not change at the project or 6th code HUC level. The construction of temporary roads and the decommissioning of existing roads are not within riparian areas. |
| Mass Failures and Erosion – Road density on sensitive landtypes | Does not apply. No proposed temporary roads are on sensitive landtypes. |
| Riparian Function, temperature and large wood recruitment | Standard Inland Native Fish Standards are included as design criteria for this project. The only work proposed in the Riparian Habitat Conservation Areas is the improvement of 4 road crossings over intermittent streams. No change in riparian hydrologic opening acreage is expected with this work. |
| Restricted Fish Use | There are no fish barriers within the project area. |

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# Appendix F - List of Preparers

### West Gold Project Interdisciplinary Team Members:

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|---|---|---|---|
| Shanda Dekome | Fisheries Biologist | Aquatic Species and Habitat | B.A. Wildlife, M.S. Fisheries; USDA FS 14 yrs |
| Larry Elliot | Civil Engineer Technician | Roads Analysis | USDA FS 30 years |
| Don Gunter | Silviculturist | Forest Health and Productivity | B.S. Forestry; Certified Silviculturist; USDA FS 30 yrs |
| Anna E. Hammet | Botanist | TES Plants and Noxious Weeds | B.A. Biology (Botany); USDA FS 24 yrs |
| Dave Lux | District Fire Management Officer | Fire/Fuels and Air Quality Analysis | B.S. Forestry, USDA FS 26 years |
| David Roberts | Wildlife Biologist | Wildlife Species and Habitat | B.S. Wildlife Biology; USDA FS 25 yrs |
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### Support Team Members – The following individuals provided technical or other support to the analysis:

| Name | Title | Area of Support |
|---|---|---|
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| Dave Dillon | Forester | Visuals and Logging Systems |
| Rachel Docherty | Assistant Fire Management Officer | Fire/Fuels and Air Quality Analysis Support |
| Mary Ann Hamilton | Recreation Technician | Recreation Information |
| Nancy Kertis | Forester | Economic Analysis, Document editing |
| Angelic Koch | Supervisory Engine Leader | Fire/Fuels and Air Quality Analysis Support |
| Brett Lyndaker | Biological Technician | Wildlife Technical Support |
| Bill McPherson | Engineer | Roads Analysis, Design and Location |
| Jerry Niehoff | IPNF Soil Scientist | Soils Analysis |
| Tom Sandberg | Archaeologist | Heritage Resources Analysis |
| Linda Swartz | Botanist | TES and Rare Plants |

# Appendix G - Glossary

## A

**Air Pollutant –** Any substance in air that could, if in high enough concentration, harm humans, animals, vegetation, or material. Air pollutants may include almost any natural or artificial matter capable of being airborne, in the form of solid particles, liquid droplets, gases, or a combination of these.

**Air Quality –** The composition of air with respect to quantities of pollution therein; used most frequently in connection with "standards" of maximum acceptable pollutant concentrations.

**Alternative –** In an Environmental Impact Statement (EIS), one of a number of possible options for responding to the purpose and need for action.

**Amenity –** Resource use, object, feature, quality, or experience that is pleasing to the senses; typically refers to resources for which monetary values are not or cannot be established, such as scenic or wilderness values.

**Aquatic –** Pertaining to water.

**Aspect –** The direction the slope of a hillside or landform faces (for example, a slope with a southern aspect faces south).

**Assessment –** The collection, integration, examination, and evaluation of information and values.

**Attainment Area –** A geographic area that is in compliance with the National Ambient Air Quality Standards (see below). An area considered having air quality as good as or better than the national ambient air quality standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.

## B

**Basin (river) –**In general, the area of land that drains water, sediment, and dissolved materials to a common point along a stream channel. River basins are composed of large river systems.

**Bedload –** Sediment moving in or near a streambed.

**Beneficial Uses –** Any of the various uses that may be made of water including, but not limited to, domestic water supplies, industrial water supplies, agricultural water supplies, navigation, recreation in and on the water, wildlife habitat, and aesthetics. The beneficial use depends on actual use, the ability of the water to support a non-existing use either now or in the future, and its likelihood of being used in a given manner. The use of water for the purpose of wastewater dilution or as a receiving water for a waste treatment facility effluent is not considered a beneficial use.

**Best Management Practices (BMPs) –** Practices determined by the State of Idaho to be the most effective and practicable means of preventing or reducing erosion, and water pollution to meet water quality goals.

**Biological Diversity (biodiversity) –** The variety and variability among living organisms and the ecological complexes in which they occur.

**Board Foot (bf) –** A unit of wood 12” x 12” x 1”.

**Broad Scale –** A large regional area, such as a river basin; typically a multi-state area.

**BTU** (British Thermal Unit) – The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at a specified temperature. For this EIS, the measurement unit used to measure heat intensities in fire behavior modeling.

# C

**Canopy –** In a forest, the branches from the uppermost layer of trees; on rangeland, the vertical projection downward of the aerial portion of vegetation.

**Canopy Closure –** The amount of ground surface shaded by tree canopies as seen from above. Used to describe how open or dense a stand of trees is, often expressed in 10 percent increments.

**Carbon Monoxide –** A colorless, odorless, poisonous gas produced by incomplete fossil fuel combustion; primarily emitted by motor vehicles and other mobile sources. Carbon monoxide is an air pollutant that interferes with the blood’s ability to carry oxygen to the body’s tissues and results in numerous adverse health effects.

**Channel (stream) –** A stream or riverbed through which the main current of water flows.

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

**Clearcutting –** A regeneration harvest method that removes all merchantable trees in a single cutting, except for wildlife trees or snags. A “clearcut” is an area from which all merchantable trees have been cut.

**Climate –** The composite or generally prevailing weather conditions of a region throughout the year, averaged over a series of years.

**Coarse Woody Debris (soils)** - Pieces of woody material derived from tree limbs, boles, and roots in various stages of decay, generally having a diameter of at least three inches and a length greater than three feet.

**Commodity –** Commercial article that can be bought, sold and transported, such as mining, agricultural, timber, or other forest products.

**Compaction –** Making soil hard and dense, decreasing its ability to support vegetation because the soil can hold less water and air and because roots have trouble penetrating the soil.

**Competition –** An interaction that occurs when two or more individuals make demands on the same resources that are in short supply.

**Composition (species) –** The mix of different species that make up a plant or animal community, and their relative abundance.

**Connectivity –** The arrangement of habitats that allows organisms and ecological processes to move across the landscape; patches of similar habitats are either close together or linked by corridors of appropriate vegetation. The opposite of fragmentation.

**Corridor (landscape) –** Landscape elements that connect similar patches of habitat through an area with different characteristics. For example, streamside vegetation may create a corridor of willows and hardwoods between meadows or through a forest.

**Cover –** (1) Trees, shrubs, rocks, or other landscape features that allow an animal to partly or fully conceal itself. (2) The area of ground covered by plants of one or more species.

**Cover Type –** A vegetation classification depicting a genus, species, group of species, or life form of tree, shrub, grass, or sedge. The present vegetation of an area.

**Crown –** The part of a tree containing live foliage; treetops.

**Crown Fire –** A forest fire that burns in the crowns of trees.

**Cumulative Effects –** Impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. In this EIS, potential cumulative effects include those that were assessed for all ownerships, including lands administered by other federal lands and non-federal lands, especially regarding terrestrial and aquatic species.

# D

**Data –** Facts used in an analysis.

**Debris (organic) –** Logs, trees, limbs, branches, leaves, bark, etc., that accumulate, often in streams or riparian areas.

**Decay (decomposition) –** The breakdown of organic matter, usually as a result of bacterial or fungal actions.

**Decommission (roads)** – Activities that result in the stabilization and restoration of unneeded roads to a more natural state. May include removal of all stream crossings and full recontour of the entire road prism, introduction of woody debris, and revegetation as needed. Fully decommissioned roads would be removed from the transportation system.

**Degradation –** (1) General lowering of the earth's surface by erosion or moving of materials from one place to another. (2) Reduction in value or quality.

**Degrade (habitats) –** Measurably change a feature at a defined scale in a way that: further reduces habitat quality, where existing conditions meet or are worse than the objective; reduces habitat quality, where existing conditions are better than the objective.

**Density (stand) –** The number of trees growing in a given area, usually expressed in terms of trees per acre.

**Detrimental Soil Disturbance** – The effects of compaction, displacement, rutting, severe burning, surface erosion, loss of surface organic matter, and soil mass movement.

**Direct Effects –** Impacts on the environment that are caused by the action and occur at the same time and place.

**Displacement (soils)** – The removal and horizontal movement of soil from one place to another, usually by mechanical forces such as dozer blades, repeated vehicular traffic, or the yarding of logs.

**Disturbance –** Refers to events that alter the structure, composition, or function of terrestrial or aquatic habitats. Natural disturbances include, among others, drought, floods, wind, fires, wildlife grazing, and insects and diseases. Human-caused disturbances include, among others, actions such as timber harvest, livestock grazing, roads, and the introduction of exotic species.

**Dominant –** A group of plants that by their collective size, mass, or number exert a primary influence on other ecosystem components.

**Downed Wood –** A tree or part of a tree that is dead and laying on the ground.

**Duff –** The partially decomposed organic material of the forest floor that lies beneath freshly fallen leaves, needles, twigs, stems, bark, and fruit.

# E

**Early Succession –** The stage of forest stand structure created by some form of natural or human-caused disturbance such as wildfire or tree cutting. Trees in this stage consist of seedlings and saplings less than 5 inches in diameter.

**Emission –** A release of air contaminants into the outdoor atmosphere.

**Endangered Species –** A plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range.

**Environment –** The combination of external physical, biological, social, and cultural conditions affecting the growth and development of organisms and the nature of an individual or community.

**Erosion –** The wearing away of the land surface by running water, wind, ice, gravity, or other geological activities; can be accelerated or intensified by human activities that reduce the stability of slopes or soils.

**Even-aged Stands –** Stands of trees of approximately the same age. Silviculture methods that generate even-aged stands include clearcutting, shelterwood, and seed tree.

**Exotic –** A plant or animal species introduced from a distant place; not native to the area.

# F

**Fines (sediment) –** Sediment particles smaller than 0.2 inch. Excessive fines in streams can trap newly hatched fish and decrease the amount of water percolating through spawning gravels. High fine sediment loads slow plant growth and reduce available food, oxygen, and light.

**Fire Regime –** The characteristics of fire in a given ecosystem, such as frequency, predictability, intensity, and seasonality.

**Floodplain –** The portion of a river valley or level lowland next to streams that is covered with water when the river or stream overflows its banks.

**Forage –** Vegetation (both woody and non-woody) eaten by animals, especially grazing and browsing animals.

**Forbs –** Broad-leaf plants; includes plants that commonly are called weeds or wildflowers.

**Forest Health –** The condition in which forest ecosystems sustain their complexity, diversity, resiliency, and productivity to provide for specified human needs and values. It is a useful way to communicate about the current condition of the forest especially with regard to resiliency, a part of forest health that describes the ability of the ecosystem to respond to disturbances. Forest health and resiliency can be described, in part, by species composition, density, and structure.

**Forest Plan (Forest Land and Resource Management Plan) –** A document that guides natural resource management and establishes standards and guidelines for a National Forest; required by the National Forest Management Act.

**Fragmentation (habitat) –** The break-up of a large land area (such as a forest) into smaller patches isolated by a different land type and lacking corridors of appropriate vegetation to allow organisms and ecological processes to move across the landscape. The opposite of connectivity.

**Fry –** A recently hatched fish, after the yolk sac has been absorbed.

**Fuel (fire) –** Dry, dead parts of trees, shrubs, and other vegetation that can burn readily.

**Fuel Ladder –** Vegetation structures or conditions such as low-growing tree branches, shrubs, and other vegetation that can burn readily and contribute to crown fires (see above).

**Fuel Load –** The dry weight of combustible materials per unit area; usually expressed as tons per acre.

**Fuel Model** – A means of organizing fuels data for input into a fire behavior model. Fuel models 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 such fuels as grass, shrubs, timber, and logging slash groups.

# G

**Game Species –** Wild animals that people hunt or fish for food or recreation according to prescribed seasons and limits.

**Gradient –** A rate of vertical elevation change per unit of horizontal distance; also called slope.

**Ground Fire** – A fire that burns the organic material in the soil layer and the decayed material or peat below the ground surface.

# H

**Habitat –** A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community or population of plants or animals.

**Habitat Guild** – An artificial assemblage of rare plants that have similar habitat requirements. Rare plant habitat guilds occurring in the IPNF include aquatic, peatland, deciduous riparian, wet forest, moist forest, dry forest, subalpine and cold forest.

**Habitat Type –** A group of plant communities having similar habitat relationships.

**Harvest –** (1) Felling and removal of trees from the forest; (2) removal of game animals or fish from a population, typically by hunting or fishing.

**Headwaters –** Beginning of a watershed; unbranched tributaries of a stream.

**Historical Range of Variability (HRV) –** The natural fluctuation of ecological and physical processes and functions that would have occurred during a specified period of time. In this EIS, refers to the range of conditions that are likely to have occurred prior to settlement of the project area by Euro Americans (approximately the mid-1800s), which would have varied within certain limits over time. HRV is discussed in this document only as a reference point, to establish a baseline set of conditions for which sufficient scientific or historical information is available to enable a comparison to current conditions.

**Homogeneous –** Regular, similar; uniform throughout.

**Hydrologic –** Refers to the properties, distribution, and effects of water. "Hydrology" refers to the broad science of the waters of the earth-their occurrence, circulation, distribution, and physical properties, and their reaction with the environment.

**Hydrologic Unit Code (HUC) –** A hierarchical coding system developed by the U.S. Geological Survey to identify geographic boundaries of watersheds of various sizes.

# I

**Immature Forest Structure –** The stage of stand development consisting of trees between 5 and 21 inches in diameter that are less than 100 years old.

**Implement –** To carry out.

**Improvement Cutting –** The removal of less desirable trees of any species in a stand of poles or larger trees, primarily to improve composition and quality.

**Indicator Species –** A species that is presumed to be sensitive to habitat changes; population changes of indicator species are believed to best indicate the effects of land management activities.

**Indirect Effects –** Impacts on the environment that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable.

**INFS –** Inland Native Fish Strategy for the Intermountain, Northern and Pacific Northwest Regions (Forest Service).

**Intermittent Stream –** A stream that flows only at certain times of the year when it receives water from other streams or from surface sources such as melting snow.

**Invasion (plant) –** The movement of a plant species into a new area outside its former range.

**Irregular Shelterwood With Reserves –** A shelterwood prescription cut with irregular spacing leaving individual trees and groups of trees (see Shelterwood With Reserves).

**Irretrievable Commitment –** A term that applies to losses of production or commitment of renewable natural resources. For example, while an area is used as a ski area, some or all of the timber production there is "irretrievably" lost. If the ski area closes, timber production could resume; therefore, the loss of timber production during the time the area is devoted to skiing is irretrievable but not irreversible, because it is possible for timber production to resume if the area is no longer used as a ski area.

**Irreversible Commitment –** A term that applies to non-renewable resources, such as minerals and archaeological sites. Losses of these resources cannot be reversed. Irreversible effects can also refer to effects of actions on resources that can be renewed only after a very long period of time, such as the loss of soil productivity.

**Issue –** A matter of controversy, dispute, or general concern over resource management activities or land uses.

# L

**Landscape -** All the natural features such as grasslands, hills, forest, and water, that distinguish one part of the earth's surface from another part; usually that portion of land which the eye can comprehend in a single view, including all its natural characteristics.

**Large Snag –** A standing dead tree with a diameter at breast height of at least 21 inches.

**Large Woody Debris –** Pieces of wood that are of a large enough size to affect stream channel morphology.

**Lethal (stand-replacing) Fires –** In forests, fires in which less than 20 percent of the basal area or less than 10 percent of the canopy cover remains; in rangelands, fires in which most of the shrub overstory or encroaching trees are killed.

**Long-term –** Generally refers to a period longer than 10 years. The length of time is dependent upon the resource in question.

# M

**Maintain –** (1) To continue. (2) For this document, the term is intended to convey the idea of keeping ecosystem functions, processes, and/or components (such as soil, air water, vegetation) in such a condition that the ecosystem's ability to accomplish current and future management objectives is not weakened. Management activities may be compatible with ecosystem maintenance if actions are designed to maintain or improve current ecosystem condition.

**Management Direction –** A statement of goals and objectives, management prescriptions, and associated standards and guidelines for attaining them.

**Mass Failure (erosion) –** A large land slump, in which a mass of rock or soil slips in one unit down from a cliff or slope.

**Mature Forest Structure –** The stage of stand development consisting of trees between 9 and 21 inches in diameter and greater than 100 years old.

**Merchantable Timber –** Timber that can be bought or sold.

**Minimize –** Apply best available technology, management practices, and scientific knowledge to reduce the magnitude, extent, and/or duration of impacts.

**Mitigation –** Measures designed to counteract environmental impacts or to make impacts less severe.

**Monitoring –** A process of collecting information to evaluate whether or not objectives of a project and its mitigation plan are being realized. Monitoring allows detection of undesirable and desirable changes so that management actions can be modified or designed to achieve desired goals and objectives while avoiding adverse effects to ecosystems.

**Morphology –** Form and structure.

**Multiple-use Management –** The management philosophy articulated by the Multiple Use-Sustained Yield Act of 1960. This law provides that the renewable resources of the National Forests are to be managed in the combination that best meets the needs of the American people. It further stipulates that the Forest Service is to make judicious use of the land for some or all of these resources and related services over areas large enough to ensure that sufficient latitude exists to subsequently adjust management in conformity with changing needs and conditions.

# N

**National Ambient Air Quality Standards (NAAQSs) –** Standards set by the Federal Environmental Protection Agency for the maximum levels of air pollutants that can exist in the outdoor air without unacceptable effects on human health or the public welfare.

**National Environmental Policy Act (NEPA) –** An act of Congress passed in 1969 declaring a national policy to encourage productive and enjoyable harmony between people and the environment, to promote efforts that will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of people, and to enrich the understanding of the ecological systems and natural resources important to the nation, among other purposes.

**National Forest Management Act (NFMA) –** A law passed in 1976 requiring the preparation of Forest Service regional guides and forest plans and the preparation of regulations to guide that development.

**Native –** (1) one born or reared in a particular place. (2) something original or indigenous to a particular locality.

**Native Species –** Species that normally live and thrive in a particular ecosystem or region.

**Natural Resources –** Water, soil, wild plants and animals, air, minerals, nutrients, and other resources produced by the earth's natural processes.

**No Action Alternative –** An alternative of an EIS that would not change current management activities. NEPA requires full analysis of a no action alternative to provide a baseline for comparison of effects with those of action alternatives. Selection of the no-action alternative would not necessarily preclude a change from current conditions.

**Nonlethal Fire –** In forests, fires in which more than 70 percent of the basal area or more than 90 percent of the canopy cover survives; in rangelands, fires in which more than 90 percent of the vegetation cover survives (implies that fire is occurring in a herbaceous-dominated community).

**Non-point Source Pollution –** Pollution whose source is not specific in location; the sources of the pollutant discharge are dispersed, not well defined or constant. Examples include sediments from logging activities and runoff from agricultural chemicals.

**Noxious Weed –** A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic a carrier or host of serious insects or disease; or non-native, new, or not common to the United States.

According to the Federal Noxious Weed Act (PL 93-639), a noxious weed is one that causes disease or has other adverse effects adverse effects on man or his environment and therefore is detrimental to the agriculture and commerce of the United States and to the public health.

# O

**Old Growth –** Forests that are distinguished by old trees and related structural attributes. They encompass the later stages of stand development that typically differ from earlier stages in characteristics such as tree age, size, number of large trees per acre and basal area. Attributes such as decadence, dead trees, the number of canopy layers and canopy gaps are also important, but are more difficult to describe because of high variability both between and among types of old growth. For example, dry old growth forests dominated by ponderosa pine differ in these attributes from moist and wet old growth forests of western hemlock and western redcedar. Methods for defining old growth in the Northern Region of the Forest Service are found in Green et al. (1992).

**Openings** – In this EIS, openings as described in reference to regeneration cutting units are areas that are designed to regenerate a predominantly even-aged stand of timber (this may include reserve patches and individual trees). See Vegetation project file “Authorization to Exceed 40-acre Opening Size Limitation.”

**Overstory –** The upper canopy layer.

# P

**Particulates –** Solid particles or liquid droplets suspended or carried in the air.

**Patch –** An area of uniform vegetation that differs in structure and composition from what surrounds it. Examples might include a patch of forest surrounded by a cutover area or a patch of dense young forest surrounded by a patch of open old forest.

**Pattern –** The spatial arrangement of landscape elements (patches, corridors, matrix) that determines the function of a landscape as an ecological system.

**Perennial Stream** – A stream that flows water year-round.

**$PM_{10}$ –** Particulate matter that measures 10 micrometers in diameter or less, a size considered small enough to invade the alveolar regions of the lung. $PM_{10}$ is one of six pollutants for which there is a national ambient air quality standard.

**Pool –** Portion of a stream where the current is slow, often with deeper water than surrounding areas and with a smooth surface texture. Often occur above and below riffles and generally are formed around stream bends or obstructions such as logs, root wads, or boulders. Pools provide important feeding and resting areas for fish.

**Preferred Alternative –** The alternative identified in a Draft Environmental Impact Statement that has been initially selected by the agency as the most acceptable resolution to the problems identified in the purpose and need.

**Prescribed Fire –** Intentional use of fire under specified conditions to achieve specific management objectives.

**Prescription –** A management pathway to achieve a desired objective(s).

**Project Area –** In this EIS, refers to National Forest lands to which decisions in the Record of Decision will apply.

**Proper Functioning Condition (PFC) –** Riparian and wetland areas achieve Proper Functioning Condition when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows. Attainment of Proper Functioning Condition reduces erosion and improves water quality; filters sediment, captures bedload, and aids floodplain development; improves floodwater retention and groundwater recharge; develops root masses that stabilize streambanks against cutting action; develops diverse ponding and channel characteristics to provide habitat and water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and supports greater biodiversity. The functioning condition of riparian and wetland areas is a result of the interaction of geology, soil, water, and vegetation.

**Proposed action –** A proposal by a federal agency to authorize, recommend, or implement an action.

# Q

**Qualitative –** Traits or characteristics that relate to quality and can’t be measured with numbers.

**Quantitative –** Traits or characteristics that can be measured with numbers.

# R

**Record of Decision (ROD) –** An official document in which a deciding official states the alternative that will be implemented from a prepared Final EIS.

**Recovery –** (1) Return of an ecosystem to a specified condition after a disturbance; (2) return of a previously threatened or endangered species to a condition of population viability.

**Recruitment Old Growth –** Stands that do not yet have the characteristics of old growth but are being managed to develop those characteristics over time.

**Redd –** Spawning nest made by salmonid fish species in the gravel bed of a river.

**Reforestation –** Treatments or activities that help to regenerate stands of trees after disturbances such as harvest or wildfire. Typically, reforestation activities include preparing soil, controlling pests, and planting seeds or seedlings.

**Regeneration –** The process of establishing new plant seedlings, whether by natural means or artificial measures (planting).

**Regeneration Cutting -** For this EIS**,** 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 five 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, final removal with reserves and shelterwood.

**Rehabilitation** – 1) In the West Gold project, several forest stands have been decimated by root disease and insect attack. Rehabilitation of these stands would include removal of a small number of trees per acre followed by slashing of the brush and seedling/sapling grand fir and Douglas-fir to create a fuel bed for burning. Burning would prepare the stands for reforestation with desired tree seedlings. Rehabilitation and reforestation in the West Gold project area would be used where there are already large openings created by root disease and insect attack. 2) Relating to visual quality objectives (VQOs), rehabilitation is a short-term management alternative used to restore landscapes containing views that do not meet VQOs to a desired visual quality.

**Resilient, Resilience, Resiliency –** (1) The ability of a system to respond to disturbances. Resiliency is one of the properties that enable the system to persist in many different states or successional stages. (2) In human communities, refers to the ability of a community to respond to externally induced changes such as larger economic or social forces.

**Restoration –** Holistic actions taken to modify an ecosystem to achieve desired, healthy and functioning conditions and processes. Generally refers to the process of enabling the system to resume acting or continue acting following disturbance as if the disturbance were absent.

Restoration management activities can be either active (such as control of noxious weeds, thinning of over-dense stands of trees, or redistributing roads) or more passive (more restrictive, hands-off management direction that is primarily conservation-oriented).

**Revegetation –** Establishing or re-establishing desirable plants on areas where they are absent or of inadequate density, by management alone (natural revegetation) or by seeding or transplanting (artificial revegetation).

**Riffle –** Relatively shallow section of a stream or river with rapid current and a surface broken by gravel, rubble or boulders.

**Riparian Area –** Area with distinctive soil and vegetation characteristics between a stream or other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation.

**Road Work, Road Maintenance -** Includes, as needed, installation of rolling dips, installation of relief culverts, rolling the road grade for increased drainage, armoring of culvert catch basins and outlets, and adding gravel surfacing, replacing existing stream crossings, cut and fill slope stabilization, and removal of encroaching road fills.

# S

**Salmonid** – One of a number of fishes of the genus *Onchorhynchus* of the North Pacific, which ascend freshwater streams to spawn. Bull char (commonly known as bull trout) are salmonids.

**Salvage –** The harvest of trees that are dead, dying, or deteriorating due to fire, wind, insect or other damage or disease.

**Scale –** (1) The level of resolution under consideration (for example, broad scale or fine scale); (2) the ratio of length on a map to true length.

**Scoping –** The early stages of preparation of an environmental impact statement, used to solicit public opinion, receive comments and suggestions, and determine the issues to be considered in the development and analysis of a range of alternatives. Scoping may involve public meetings, telephone conversations, mailings, letters, or other contacts.

**Sediment –** Solid materials, both mineral and organic, in suspension or transported by water, gravity, ice, or air; they may be moved and deposited away from their original position and eventually will settle to the bottom of the stream.

**Seed Trees –** Mature trees left standing after timber harvest to provide seeds to regenerate the new stand; seed tree cutting is a harvest prescription.

**Seed Tree With Reserves –** a cutting method in which some or all of the seed trees are retained after regeneration has become established to attain goals other than regeneration.

**Selective Cutting –** a cutting method that removes only a portion of trees in a stand. For this EIS, 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. 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, improvement cutting and salvage cutting.

**Sensitive Species –** Species identified by a Forest Service Regional Forester for which population viability is a concern either (a) because of significant current or predicted downward trends in population numbers or density, or (b) because of significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

**Seral –** Refers to the stages that plant communities go through during succession. Development stages have characteristic structure and plant species composition. Early seral refers to plants that are present soon after a disturbance or at the beginning of a new successional process (such as seedling or sapling growth stages in a forest); mid seral in a forest would refer to pole or medium sawtimber growth stages; late or old seral refers to plants present during a later stage of plant community succession (such as mature and old forest stages).

**Shade-tolerant –** Species of plants that can develop and grow in the shade of other plants. Generally these are fire-intolerant species.

**Shelterwood –** Prescription that cuts most trees in a stand, leaving those needed to create sufficient shade to produce a new age class in a moderated microenvironment.

**Shelterwood Removal Cut –** A final removal that releases established regeneration from competition with overstory trees after they are no longer needed for shelter under the shelterwood regeneration method. If the removal is a sequence of a shelterwood with reserves regeneration method, reserve trees are retained during the final removal cut.

**Shelterwood With Reserves –** Prescription where some or all of the shelter trees in a shelterwood harvest unit are retained after regeneration has become established to attain goals other than regeneration.

**Short-term –** Generally refers to a period of 10 years or less.

**Silviculture –** The practice of manipulating the establishment, composition, structure, growth, and rate of succession of forests to accomplishment specific objectives.

**Site –** A specific location of an activity or project, such as a campground, a lake, or a stand of trees to be harvested.

**Snag –** A standing dead tree, usually larger than five feet tall and six inches in diameter at breast height. Snags are important habitat for a variety of wildlife species and their prey.

**Soil –** The earth material that has been so modified and acted upon by physical, chemical and biological agents that it will support rooted plants.

**Soil Disturbance –** Disturbance of the soil surface from activities such as road construction or reconditioning, tree skidding and fuels treatment. In this EIS, used to describe effects of the alternatives on soil productivity.

**Soil Productivity** - The capacity of a soil to produce plant growth, due to the soil's chemical, physical, and biological properties (such as depth, temperature, water-holding capacity, and mineral, nutrient, and organic matter content).

**Spatial –** Related to or having the nature of space.

**Spawning Habitat –** Areas used by adult fish for laying and fertilizing eggs.

**Species –** A population or series of populations of organisms that can interbreed freely with each other but not with members of other species.

**Specified Road** – A road with specific features designed by Forest Service engineers and included in the timber sale contract.

**Stand –** A group of trees in a specific area that is sufficiently alike in composition, age, arrangement, and condition to be distinguishable from the forest in adjoining areas.

**Stand Composition –** The species of vegetation that make up a stand.

**Stand Density –** Refers to the number of trees growing in a given area, usually expressed in trees per acre.

**Stand-replacing Fire –** See lethal fire.

**Stand Structure –** The mix and distribution of tree sizes, layers and ages in a forest. Some stands are all one size (single-story), some are two-story, and some are a mix of trees of different ages and sizes (multi-story).

**Step-down –** In this EIS, refers to the process of applying broad scale science findings and land use decisions to site-specific areas using a hierarchical approach of understanding current resource conditions, risks and opportunities.

**Storage (roads) -** 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. Storage also includes some kind of road closure method such as with a guardrail barrier, gate, an earthen berm, or a short section of full recontour. These roads would remain as classified roads on the transportation system.

**Structure –** the size and arrangement, both vertically and horizontally, of vegetation.

**Structural Stage –** A stage of development of a vegetation community that is classified on the dominant processes of growth, development competition, and mortality.

**Subbasin –** A drainage area of approximately 800,000 to 1,000,000 acres, equivalent to a 4$^{th}$-field hydrologic unit code (HUC). Hierarchically, subwatersheds (6$^{th}$-field HUC), which in turn are contained within a watershed (5$^{th}$-field HUC), which in turn are contained within a subbasin (4$^{th}$-field HUC). This concept is shown graphically in Figure 2-1.

**Substrate –** The soil or underlying rock on which an organism is growing or to which it is attached.

**Subwatershed –** A drainage area of approximately 20,000 acres, equivalent to a 6$^{th}$-field Hydrologic Unit Code (HUC). Hierarchically, subwatersheds (6$^{th}$-field HUC) are contained within watershed (5$^{th}$-field HUC), which in turn contained within a subbasin (4$^{th}$-field HUC). This concept is shown graphically in Chapter 2.

**Succession –** A predictable process of changes in structure and composition of plant and animal communities over time. Conditions of the prior plant community or successional stage create conditions that are favorable for the establishment of the next stage. The different stages in succession are often referred to as seral stages.

**Surface Fire –** A fire that burns surface litter, dead woody fuels, other loose debris on the forest floor, and some small vegetation, without significant movement into the overstory, usually with a flame less than a few feet high.

**Sustainability –** (1) Meeting the needs of the present without compromising the abilities of future generations to meet their needs; emphasizing and maintaining the underlying ecological processes that ensure long-term productivity of goods, services, and values without impairing productivity of the land. (2) In relation to snags, it refers to the continuous production of snags over the long-term.

# T

**Temporary Roads -** Those roads not intended to be retained for long-term management.

**Terrestrial –** Pertaining to the land.

**Thermal cover –** Cover used by animals to protect them against weather.

**Thinning –** An operation to remove stems from a forest for the purpose of reducing fuel, maintaining stand vigor, regulating stand density/composition, or for other resource benefits.

**Threatened Species –** Species listed under the Endangered Species Act that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

**Topography –** Physical features of the ground surface such as hills, plains, mountains and steepness of slope.

**Tribe –** Term used to designate any Indian tribe, band, nation or other organized group or community (including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act) that is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

# U

**Unclassified Road** – A road on National Forest land that is not managed in the forest transportation system.

**Underburn –** A burn by a surface fire that can consume ground vegetation and ladder fuels.

**Understory –** Plants that grow beneath the canopy of other plants. Usually refers to grasses, forbs, and low shrubs under a tree or shrub canopy.

**Uneven-aged Silvicultural Systems –** Methods of forest management in which trees of different species in a given stand are maintained at many ages and sizes to permit continuous natural regeneration. Selective cutting is one example of an uneven-aged management method.

**Ungulates –** Hoofed, plant-eating mammals such as elk, deer and cattle.

# V

**Viability –** In general, viability means the ability of a population of a plant or animal species to persist for some specified time into the future. For planning purposes, a *viable population* is one that has the estimated numbers and distribution of reproductive individuals to ensure that its continued existence will be well distributed in the planning area.

**Viable Population –** A population that is regarded as having the estimated numbers and distribution of reproductive individuals to ensure that its continued existence is well distributed in the project area.

**Visual Resources –** The visible physical features of a landscape.

# W

**Water Quality Limited –** A Clean Water Act classification for waters where application of best management practices or technology-based controls are not sufficient to achieve designated water quality standards.

**Watershed –** (1) The region draining into a river, river system, or body of water. (2) In this EIS, a watershed also refers specifically to a drainage area of approximately 50,000 to 100,000 acres, which is equivalent to a $5^{th}$-field Hydrologic Unit Code (HUC). Hierarchically, subwatersheds ($6^{th}$-field HUC) are contained within a watershed ($5^{th}$-field HUC), which in turn is contained within a subbasin ($4^{th}$-field HUC). This concept is shown graphically in Figure 2-1.

**Weed –** A plant considered undesirable, unattractive, or troublesome, usually introduced and growing without intentional cultivation.

**Wetland –** In general, an area soaked by surface or groundwater frequently enough to support vegetation that requires saturated soil conditions for growth and reproduction; generally includes swamps, marshes, springs, seeps, bogs, wet meadows, mudflats, natural ponds, and other similar areas.

**Wildfire –** A human or naturally caused fire that does not meet land management objectives.

**Woody –** Composed of wood or woody fibers.

# Appendix H – List of EIS Recipients

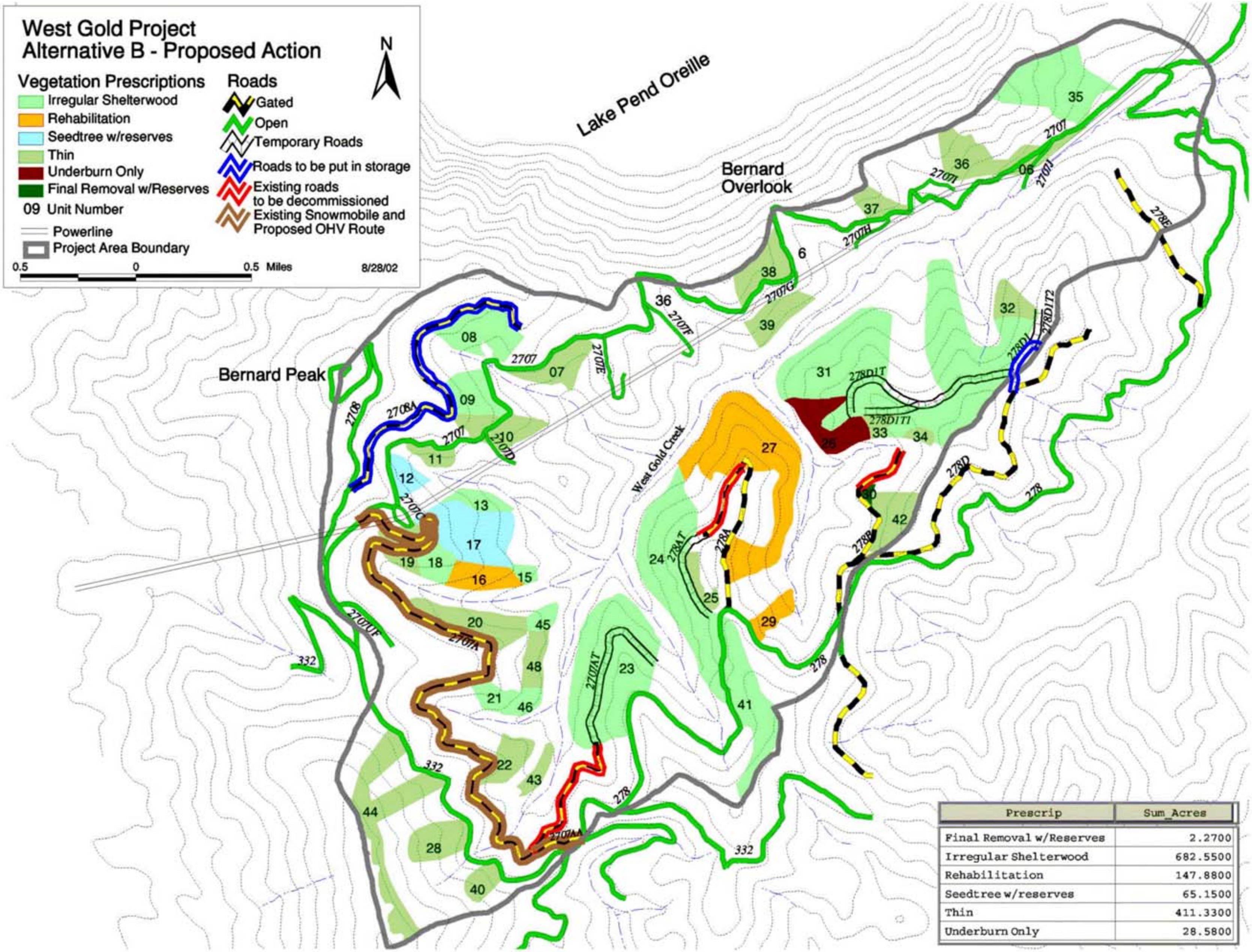
The following agencies, organizations and individuals were mailed a copy of this Final EIS in paper or compact disc format, received only the Summary as requested, or planned to view the document on the Idaho Panhandle National Forests internet website.

| Organization | Last Name | First Name |
|---|---|---|
| AMERICAN WILDLANDS | BAILEY | GUY |
| | KMON | DEBORAH |
| AVISTA UTILITIES | VORE | SHARON |
| BACKCOUNTRY ATV ASSOCIATION | LAMBERT | RICHARD |
| | MORRIS | HAROLD |
| BONNER COUNTY DAILY BEE | | |
| BONNER COUNTY ROAD AND BRIDGE DEPT | | |
| BONNEVILLE POWER ADMINISTRATION | MURPHY | TOM |
| COEUR D'ALENE SNOWMOBILE CLUB | KIMBALL | KAREN |
| CROWN PACIFIC | BRADETICH | DOUG |
| DEFENDERS OF WILDLIFE | CARLTON | KATHERINE |
| DONNELL TRUST | STREET | DONALD AND NELLIE |
| ECOSYSTEM DEFENSE PROGRAM | ALLIANCE FOR THE WILD ROCKIES | |
| ENVIRONMENTAL PROTECTION AGENCY | | EIS REVIEW COORDINATOR |
| EVERGREEN HELICOPTERS | BACHMAN | BILL |
| FRIENDS OF THE POND | PAULSON | STEVE |
| IDAHO CONSERVATION LEAGUE | PONOZZO | KRISTI |
| IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY | BERGQUIST | JUNE |
| | RILEY | DIANE |
| IDAHO FISH AND GAME | TOURTLOTTE | GREG |
| IDAHO NATIVE PLANT SOCIETY | O'REILLY | MOLLY |
| IDAHO SPORTING CONGRESS | MITCHELL | RON |
| KOOTENAI ENVIRONMENTAL ALLIANCE | MIHELICH | MIKE |
| KOOTENAI TRIBE OF IDAHO | SOULTS | SCOTT |
| KSPT/KPND | BROWN | MIKE |
| LAKEVIEW TOWNSITE ASSOCIATION | BUROKER | MARILYN |
| NORTHWEST ACCESS ALLIANCE | VIG | DAVID |
| NORTHWEST MACHINE | WEATHERLY | DICK |
| OFFICE OF CIVIL RIGHTS | POLICY AND PLANNING DIVISION | USDA |
| OFFICE OF ENVIRONMENTAL AFFAIRS | DEPARTMENT OF INTERIOR | |
| SPOKESMAN REVIEW | DRUMHELLER | SUSAN |
| THE ECOLOGY CENTER | JUEL | JEFF |
| THE LANDS COUNCIL | ATTEMANN | REIN |
| TROUT UNLIMITED | TVRDY | TROY |
| UPPER COLUMBIA RIVER GROUP SIERRA CLUB | ROWE | HAL |
| US ENVIRONMENTAL PROTECTION AGENCY | EIS FILING SECTION | OFFICE OF FEDERAL ACTIVITIES |
| USDA FOREST SERVICE | ECOSYSTEM MANAGEMENT COORDINATOR | |
| USDA NATL AGRIGULTURAL LIBRARY | | HEAD ACQ & SERIALS BRANCH |
| USDI FISH AND WILDLIFE SERVICE | MARTIN | SUSAN |
| | ARMSTRONG | JOEL |

| Organization | Last Name | First Name |
|---|---|---|
| | BEAUCHENE | AL & JANICE |
| | BUBNIS | WILLIAM |
| | CAPELLAN | JUDY |
| | COBB | FIELDS |
| | CRAIG | BARBARA AND JOHN |
| | CRIMMINS | TOM |
| | DANFORTH | RON |
| | DANKE | VIRGINIA |
| | GENTRY | CLIFFORD AND GWENDOLYN |
| | HIGBIE | JON |
| | INKPEN | GEOFFREY AND CAROL |
| | MOSSIER | JERE |
| | JOHNSON | BARRY |
| | LANG | BUD |
| | LEE | MIKE |
| | LITTLEFIELD | JAMES AND NORENE |
| | MACE | DAWN |
| | MARTIN | CARL |
| | MCKINNEY | MARY C |
| | MERKELEY | DON |
| | SCHASER | HELOISE |
| | SCHILL | KAREN |
| | SCHROEDER | CHRIS |
| | SEDLER | LIZ |
| | SEXTON | WILLIAM AND ELIZABETH |
| | STOLP | EDWIN |
| | SYRJALA | EDWARD |

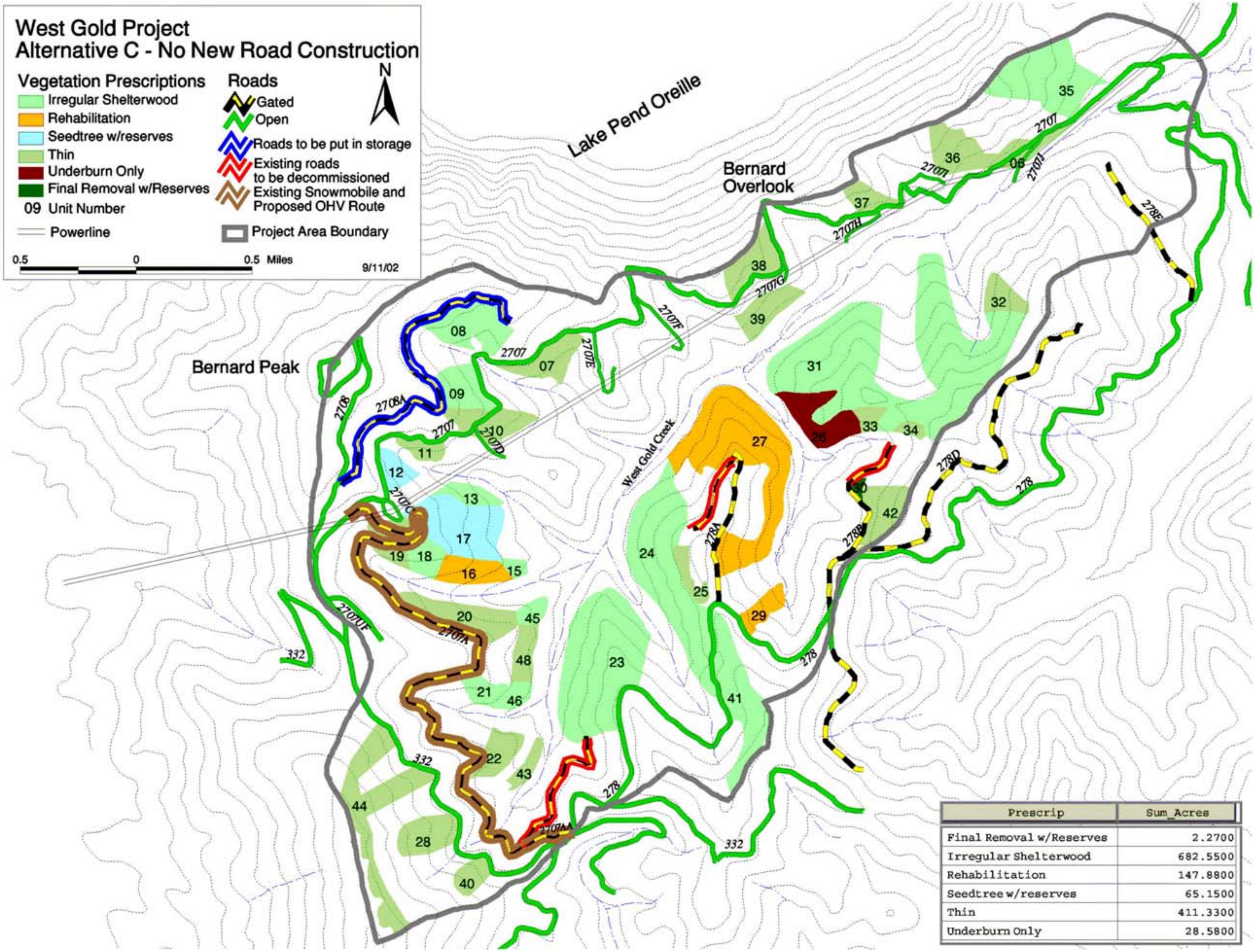
# Appendix I - Color Maps and Graphics

For ease of production and collation, only the color maps and graphics are located in this section. All other figures are located in the main document. See the Table of Figures at the beginning of the Draft EIS.



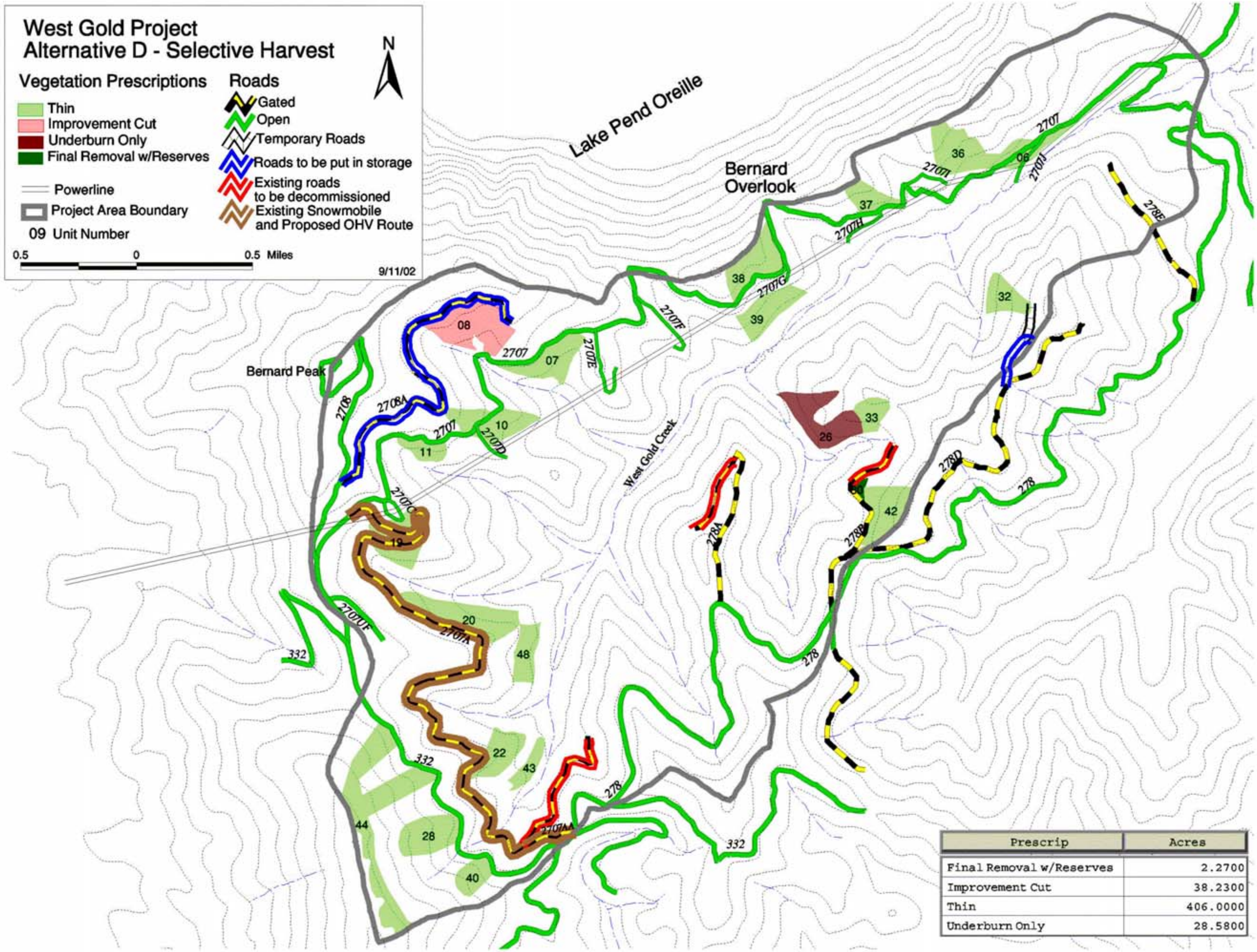

| Prescrip | Sum_Acres |
|---|---|
| Final Removal w/Reserves | 2.2700 |
| Irregular Shelterwood | 682.5500 |
| Rehabilitation | 147.8800 |
| Seedtree w/reserves | 65.1500 |
| Thin | 411.3300 |
| Underburn Only | 28.5800 |

**Figure 3. Proposed road construction, decommissioning, and vegetation prescriptions in Alternative B. Thinning is a selective cutting prescription. All other prescriptions except underburning are regeneration cutting prescriptions.**




| Prescrip | Sum_Acres |
|---|---|
| Final Removal w/Reserves | 2.2700 |
| Irregular Shelterwood | 682.5500 |
| Rehabilitation | 147.8800 |
| Seedtree w/reserves | 65.1500 |
| Thin | 411.3300 |
| Underburn Only | 28.5800 |

**Figure 4. Proposed road decommissioning and vegetation treatment in Alternative C. Thinning is a selective cutting prescription. All other prescriptions except underburning are regeneration cutting prescriptions.**




| Prescrip | Acres |
|---|---|
| Final Removal w/Reserves | 2.2700 |
| Improvement Cut | 38.2300 |
| Thin | 406.0000 |
| Underburn Only | 28.5800 |

**Figure 5. Proposed road construction, decommissioning, and vegetation prescriptions in Alternative D. Final removal with Reserves is the only regeneration cutting proposed.**

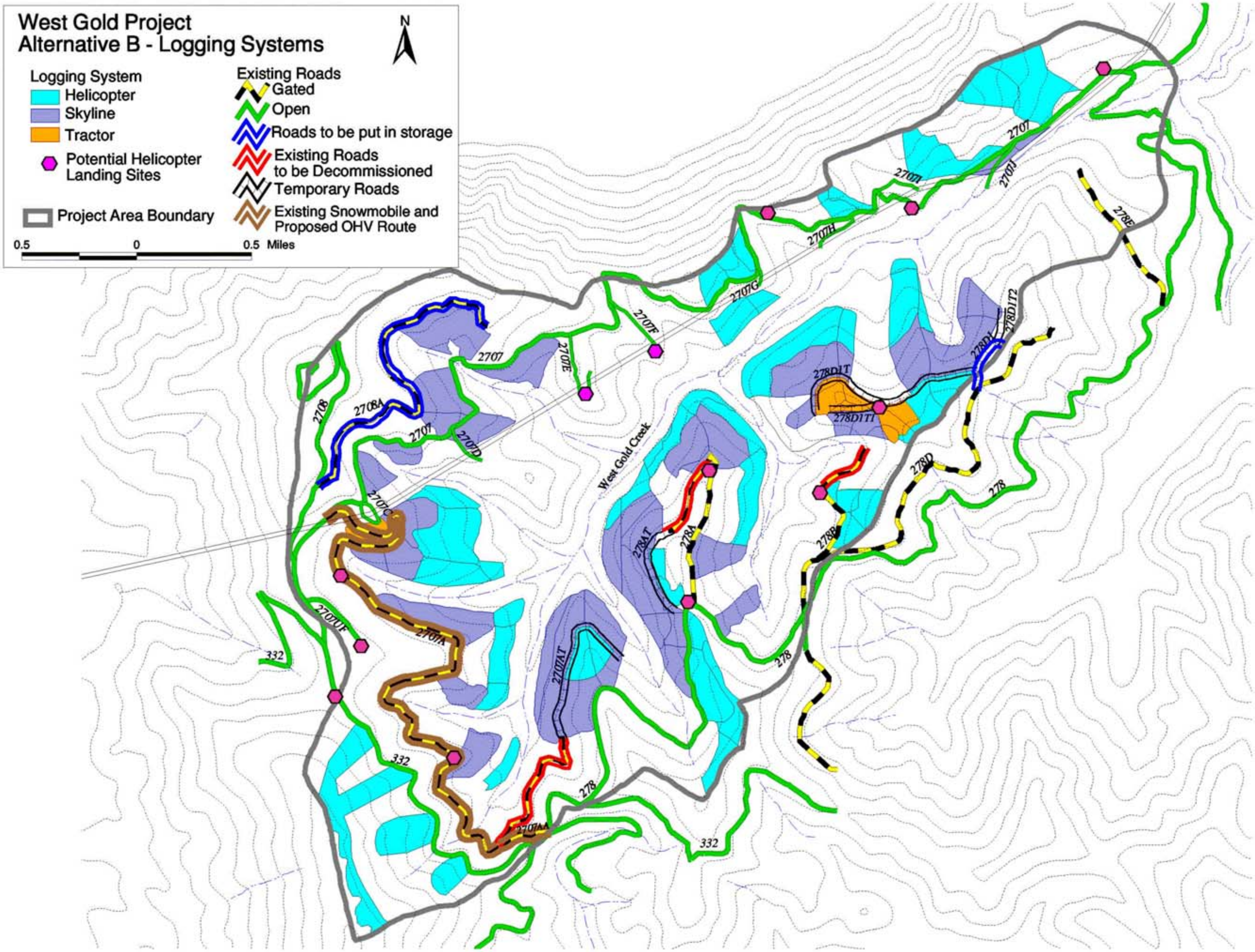



**Figure 6. Alternative B - Logging Systems**

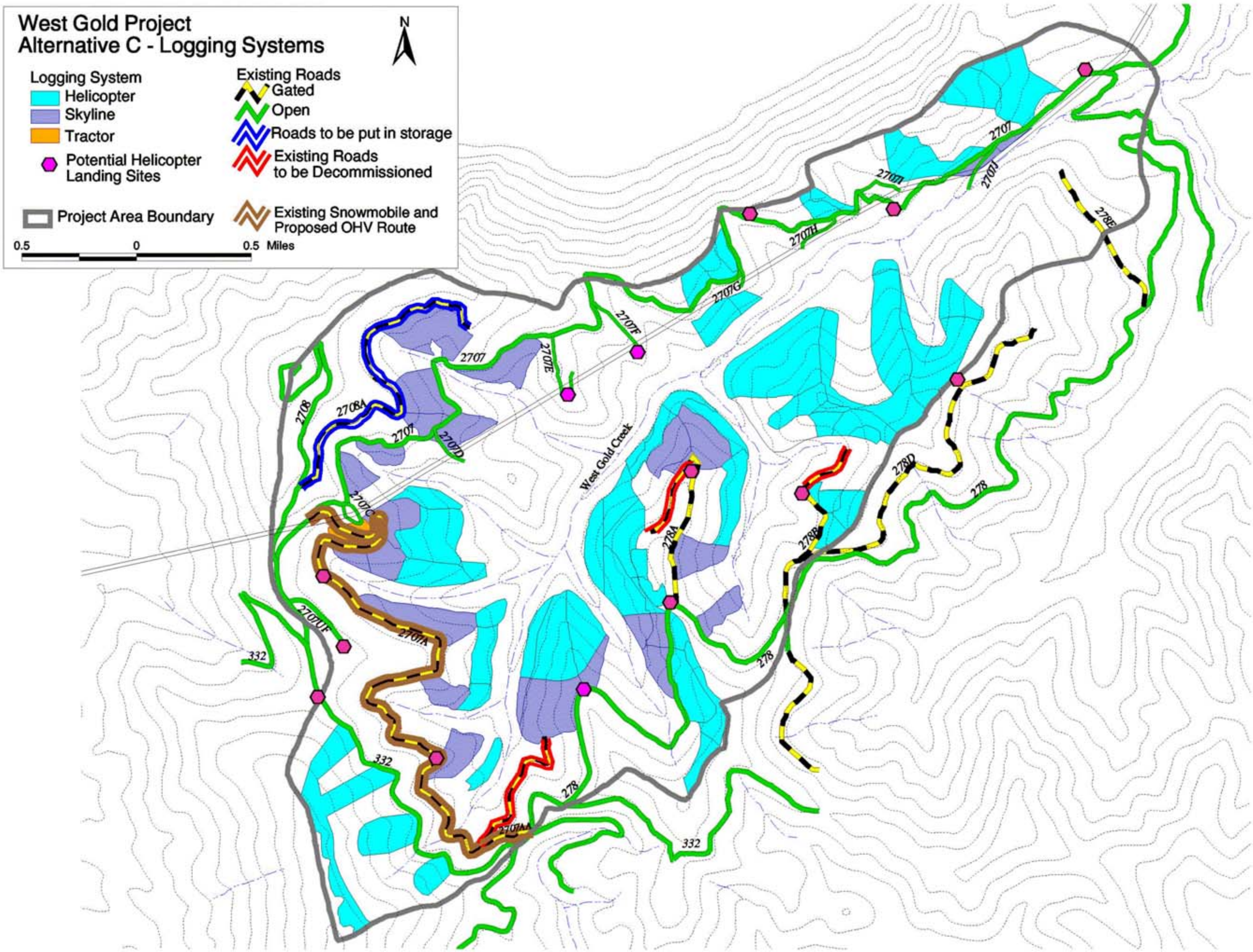



**Figure 7. Alternative C - Logging Systems.**

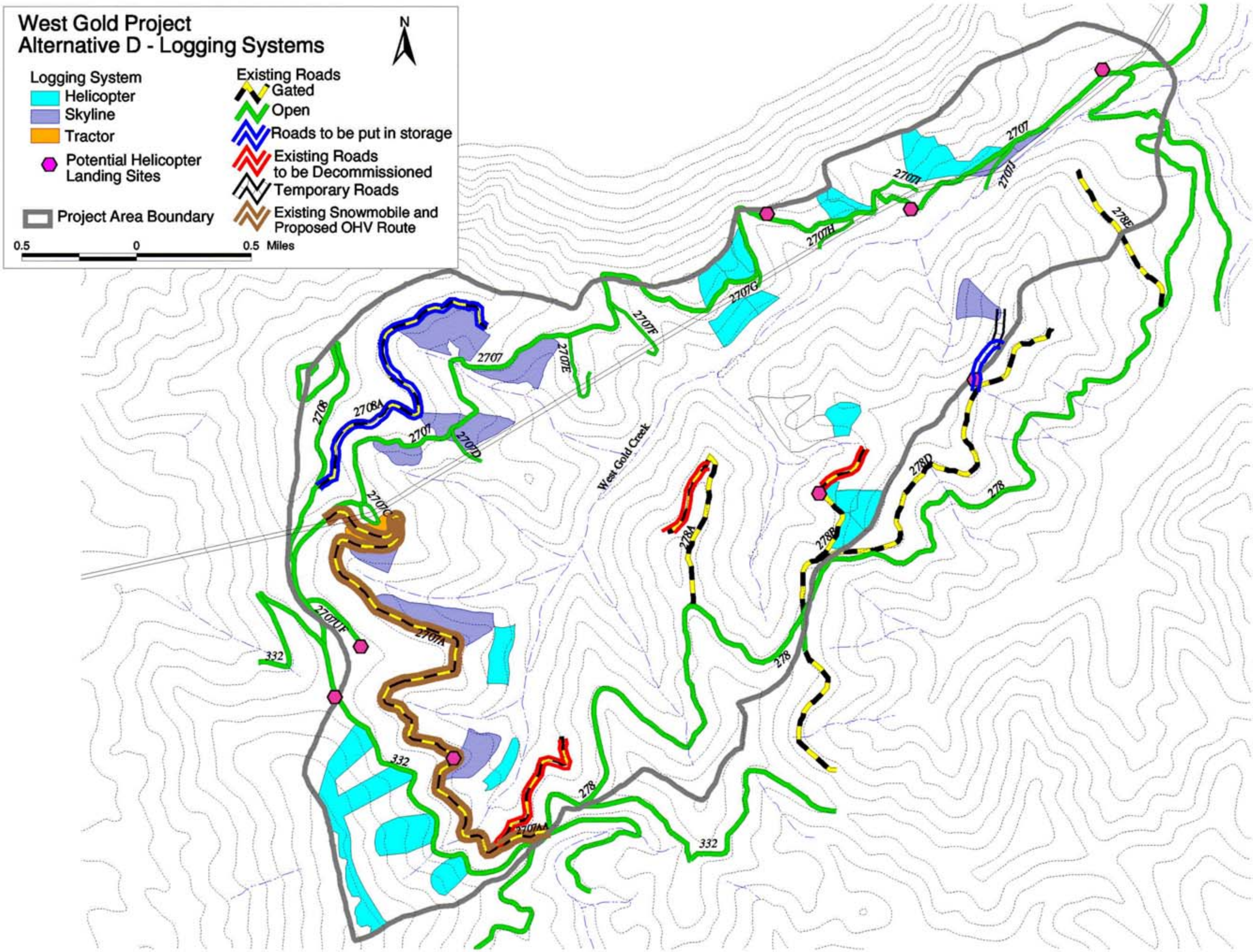
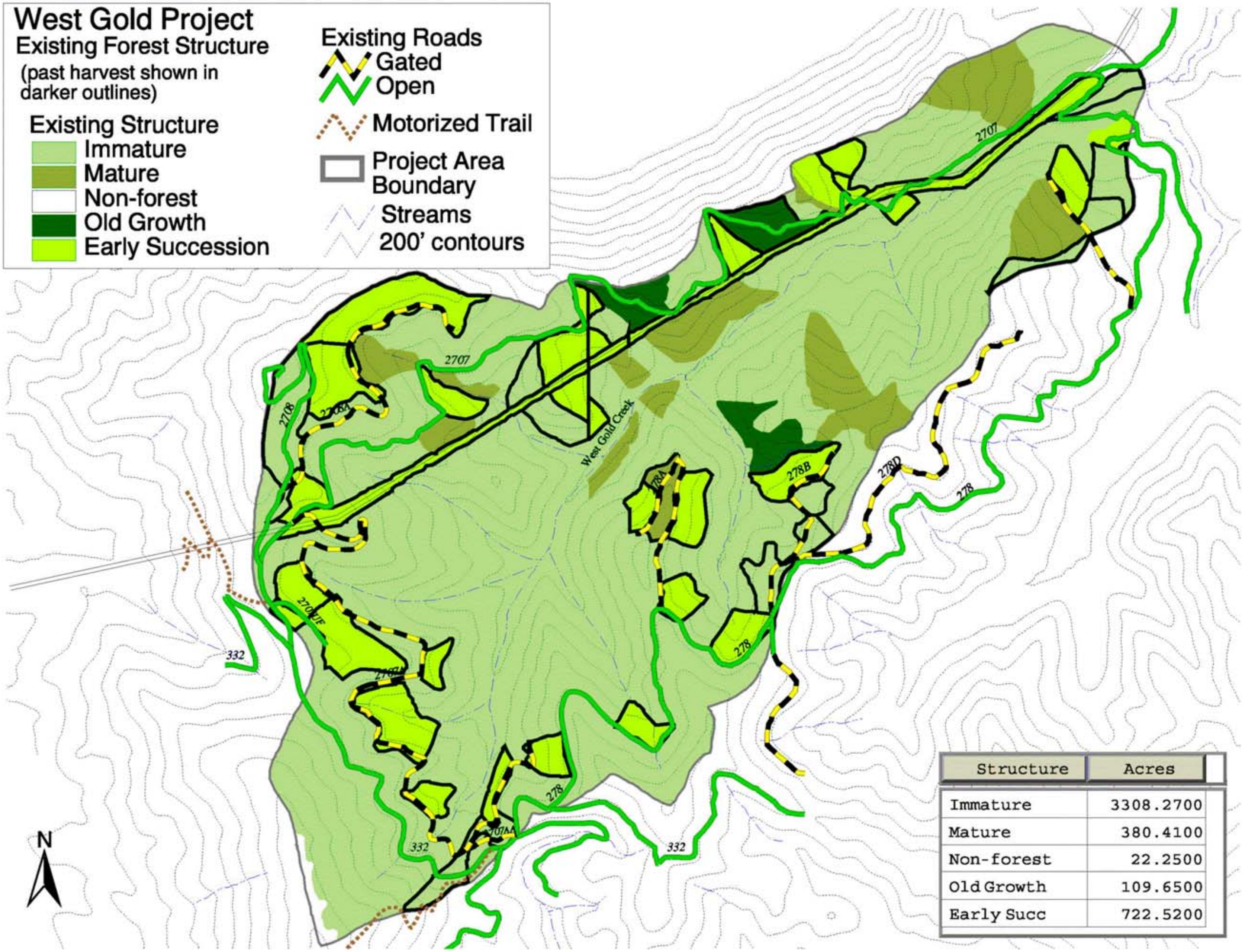
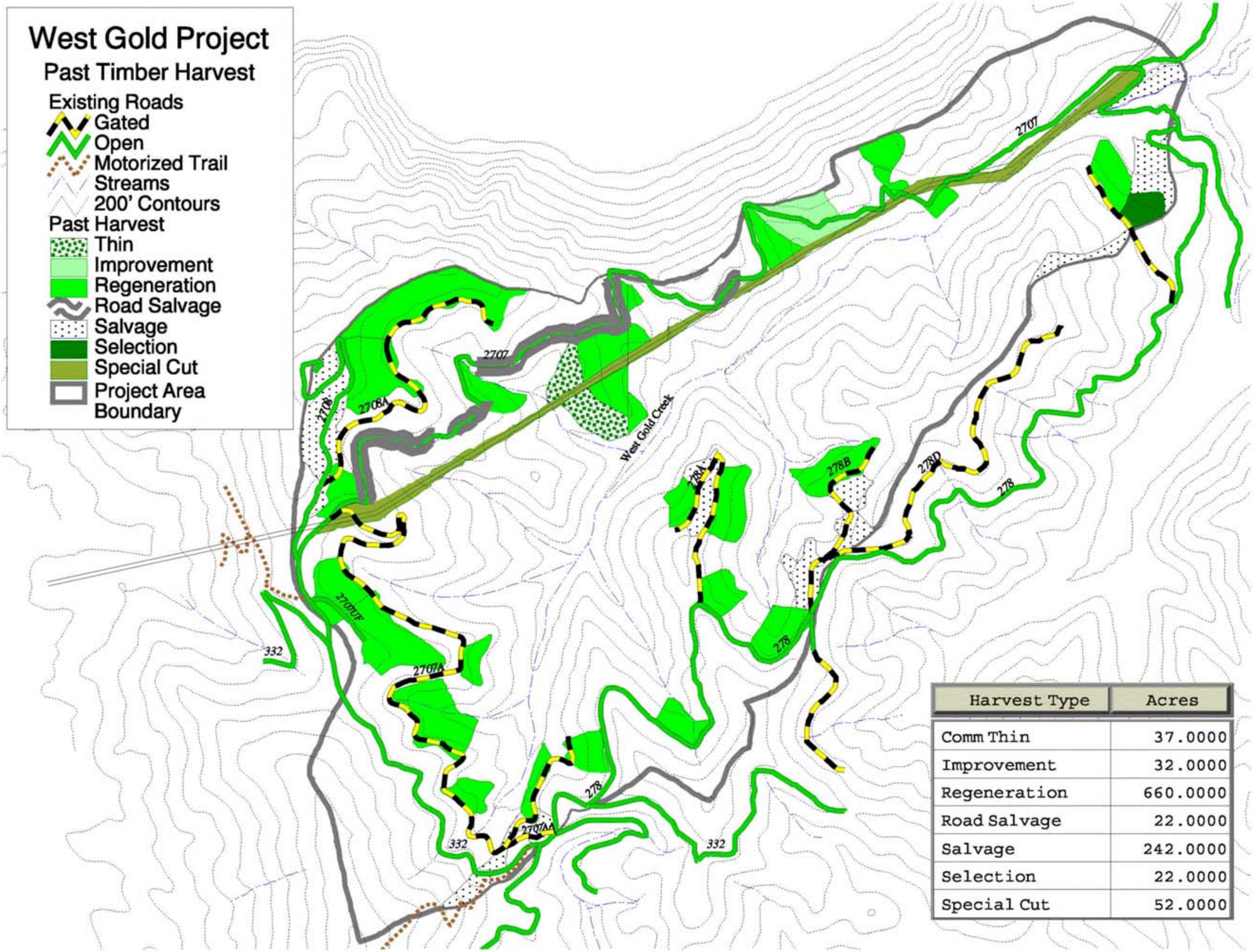



**Figure 8. Alternative D Logging Systems.**



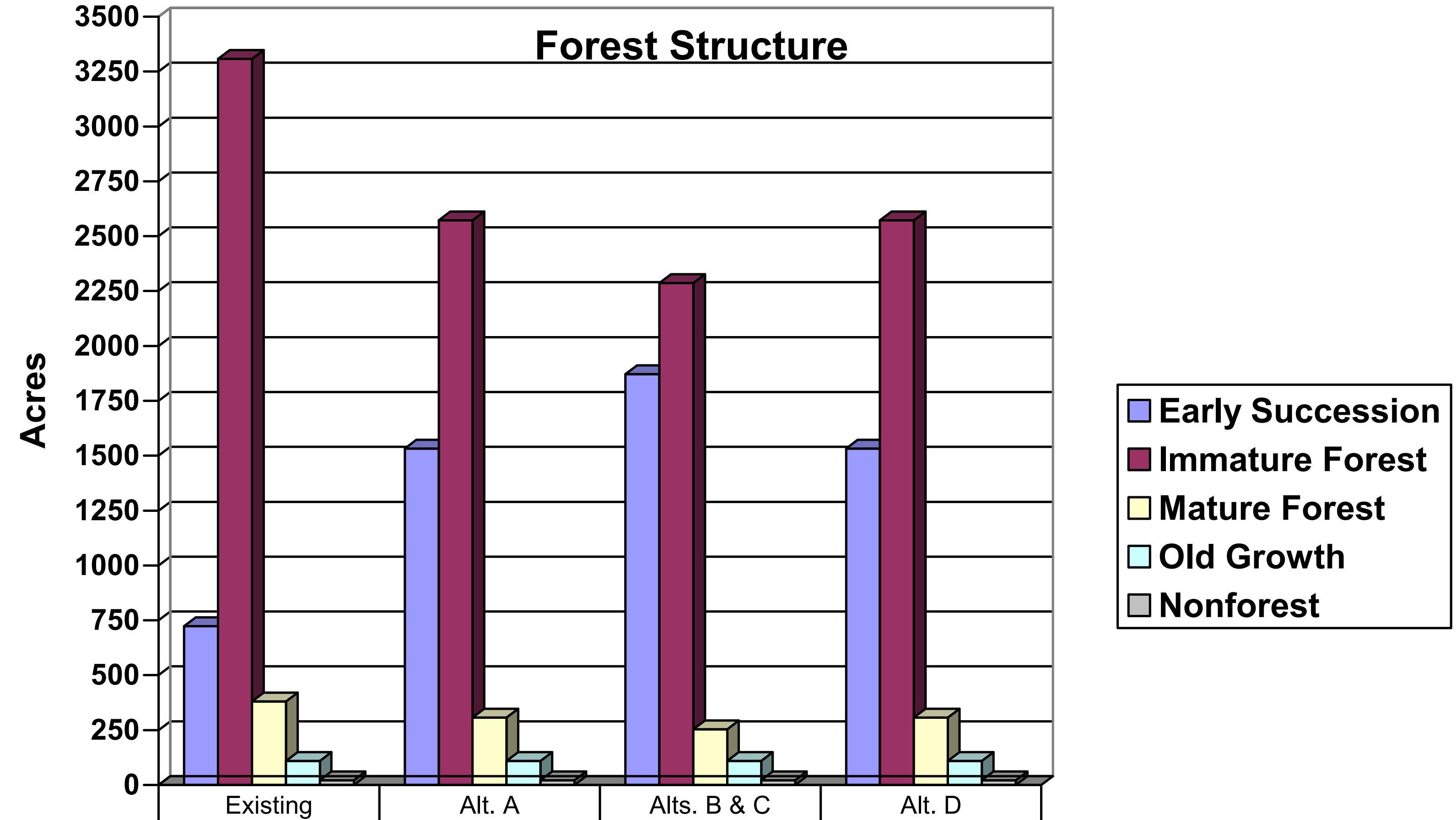

| Structure | Acres |
|---|---|
| Immature | 3308.2700 |
| Mature | 380.4100 |
| Non-forest | 22.2500 |
| Old Growth | 109.6500 |
| Early Succ | 722.5200 |

**Figure 10. Existing forest structure in the West Gold project area. Structure of past harvest is outlined in black.**



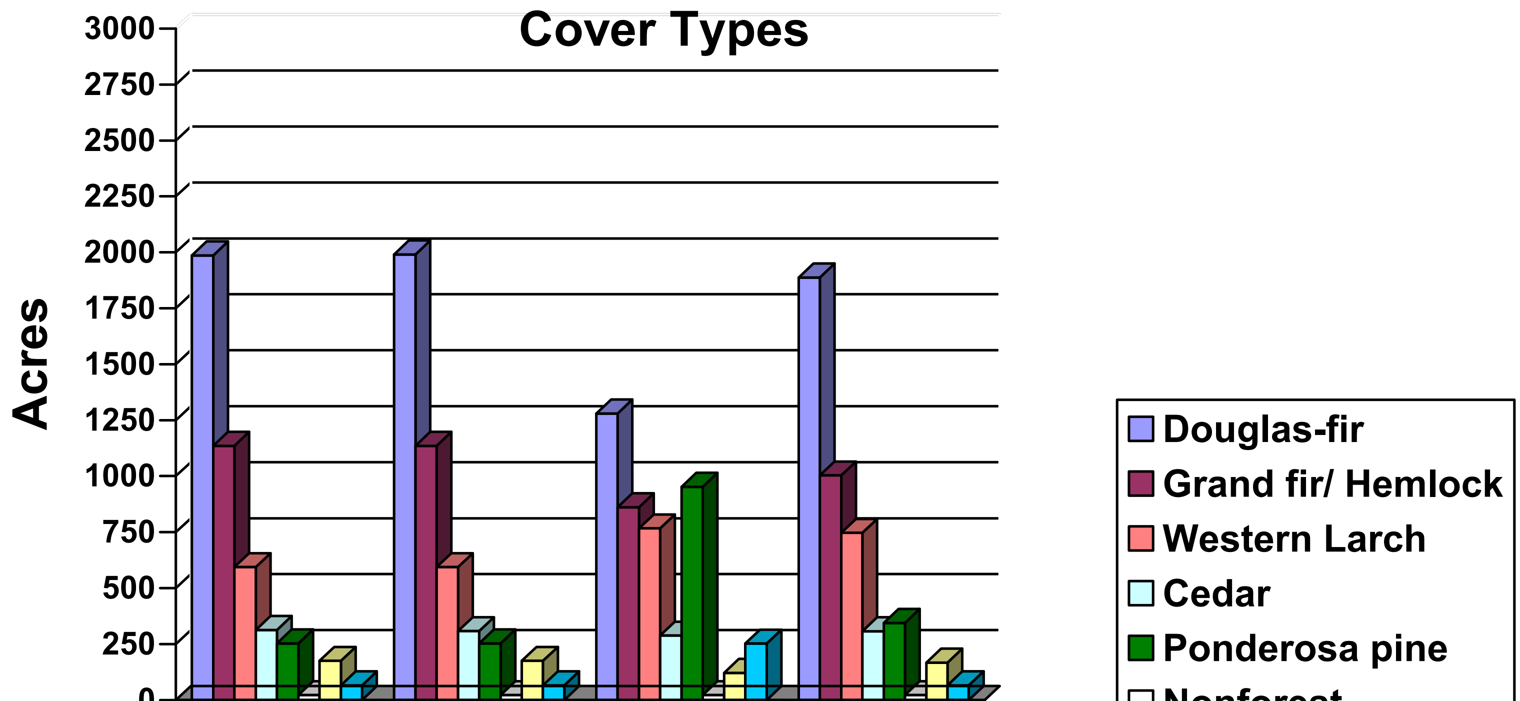

| Harvest Type | Acres |
|---|---|
| Comm Thin | 37.0000 |
| Improvement | 32.0000 |
| Regeneration | 660.0000 |
| Road Salvage | 22.0000 |
| Salvage | 242.0000 |
| Selection | 22.0000 |
| Special Cut | 52.0000 |

**Figure 11. Past National Forest timber harvest. Refer to figure 10 to see current stand structure of these past harvests.**




| | Existing | Alt. A | Alts. B & C | Alt. D |
|---|---|---|---|---|
| Early Succession | 723 | 1,532 | 1,871 | 1,532 |
| Immature Forest | 3,308 | 2,572 | 2,287 | 2,572 |
| Mature Forest | 380 | 307 | 253 | 307 |
| Old Growth | 110 | 110 | 110 | 110 |
| Nonforest | 22 | 22 | 22 | 22 |

**Figure 12. A comparison between acres of existing forest structure in the project area and resulting forest structure with each alternative.**




| | Existing | Alt A | Alts B & C | Alt D |
|---|---|---|---|---|
| Douglas-fir | 1,986 | 1,991 | 1,280 | 1,888 |
| Grand fir/ Hemlock | 1,135 | 1,135 | 861 | 1,003 |
| Western Larch | 594 | 594 | 767 | 747 |
| Cedar | 313 | 308 | 288 | 307 |
| Ponderosa pine | 253 | 253 | 952 | 344 |
| Nonforest | 22 | 22 | 22 | 22 |
| Lodgepole pine | 175 | 175 | 121 | 167 |
| White Pine | 65 | 65 | 252 | 65 |

**Figure 13. A comparison between acres of existing forest cover types in the project area and resulting forest cover types with each alternative.**

# Appendix J – Response To Public Comments and Agency Letters Received

## Response to Public Comments

### Introduction

This appendix 1) lists the names of individuals, agencies and organizations that commented, 2) explains how public comments were received, processed and evaluated, 3) shows the individual comments received and our responses to them, and 4) provides entire copies of the federal and state agency letters we received. Public involvement activities to date are described in Chapter II, Public Involvement.

### Processing and Evaluating Public Comments

We received 120 comment letters on the DEIS. Of these, 4 were from environmental groups, 4 were from Federal and State agencies and 112 were from OHV users. Of the 112 letters, 108 were identical form letters.

All respondents are identified by a mailing list identification number, which is generated by our computerized mailing list program. Since the comments from individuals that submitted the same letter are all similar, they were given one identification number. The names of all respondents and their identification numbers are listed below.

Content Analysis is the method we used to categorize all substantive comments, issues and ideas. As comment letters were received, they were date-stamped and copies were distributed to the decision maker and the interdisciplinary team for review. The letters were then prepared for the content analysis process--substantive comments were coded, then grouped into categories by subject and entered into a computer database system. Substantive comments are those comments that express a specific concern relating to the proposed project. Statements contributing extraneous information or issues not specific to the project were not considered. Comments received that had to do with forest plan and forest plan monitoring revision issues not relevant to the West Gold project were deemed outside the scope of this project and were also not considered.

Once entered into the computer program, all the comments were sorted by category so that specialists could identify similar comments and easily respond to comments pertaining to their expertise. Similar comments said by several people or comments that were extremely lengthy were summarized (as per FSH 1909.15 section 24.1). The comments we received provided the basis for changing features of the original alternatives presented in the DEIS, adding and changing designs and analyses, and making clarifications in the FEIS.

# List of Respondents

The following individuals, groups, and agencies submitted comments on the West Gold DEIS. The number next to each name corresponds to the respondent's mailing list identification number. These numbers help identify who submitted each comment.

1916 U.S. Environmental Protection Agency
4596 U.S. Department of the Interior
391 Idaho Department of Fish and Game
3764 Idaho Department of Environmental Quality
219 Jeff Juel, The Ecology Center
6104 Steve Paulson, Friends of the Pond
5200 Mike Mihelich, Kootenai Environmental Alliance
6116 Rein Attemann, The Lands Council
3558 Al Beauchene
6373 Carl E. Martin
1428 Dave H. Vig, Northwest Access Alliance
6374 Richard Lambert, Backcountry ATV Assoc.
6375 Individuals who sent a form letter (108 total - names may not be exactly correct since they were often deciphered from signatures):

Richard Haakenson
Donald and Dianna Hull
Larry Vig
Kathy Spellman
John Spellman
David Spellman
B. Widgren
Bud Johnson
Tim Johnson
Sallie Mittendorf
Kevin W. Davis
Ron Nixon
Amy McDonald
Barbara McDonald
Patrick M. McDonald
Alana Foeller
Chuck Kempton
Pat Arel
Mike Chapman
Kevin McMahon
Stan Holecek
Jeremy Hester
John W. Fitzmorris
Dan Fitzmorris

Brandon Clary
Les Jumper
Katherine Hallaren
Harry Laughary
Kraig Watson
Clifford H. Hohnwaldt
Susan Bourguignon
Glenice Moore
Leroy Hudson
Chalayna Crandall
Paul Whitmore
Sue Phillips
Donald P.Townsend
Patricia M. Townsend
Julia M. Townsend
Dave Ewing
Jeanne Ewing
Thomas P. Ewing
Dean Burley
William Jendon
Shelley Carpenter
John Hancock
Shirley Schulze
Timothy Scrahan

Dino and Dean Burley, Jr.
Shawn Mosey
Mike Close
David Wilson
Doug Reed
Donnie Stutz
S Gibbs & L. Nordgaarden
William M. Payne
S. Mott
Kelly A. Wilson
Ken Glasp
Casey McNelly
Marc McNelly
Lawrence R. Miller
Patricia Vig
Roxanne M. Woods
Doug Billingsly
Jim Moore
David Z. Vig
Judith C. Wiles
William Hamly
Teri Valois
**38 letters had illegible signatures**

# Responses to Comments

Comments are displayed in italics and organized by Subject in alphabetical order. All responses are in bold type. Letters from State and Federal agencies are included in their entirety later in this section as required. Responses to comments from these letters are included with other comments below.

## *Air Quality*

*1916 The Air Quality section would be improved by explaining how prescribed burning will be conducted consistent with the Interim Air Quality Policy on Wildland and Prescribed Fires. This national policy developed with the Department of Agriculture and other Federal land management agencies describes how Federal land managers will maintain clean air and still allow for prescribed burning. Bolster the discussion on air quality by explaining the Interim Air Policy and how the project is consistent with this national direction. Please refer to our scoping letter of September 27, 2000 for more information. Attached is an overview of the Interim Air Policy for your information that was not included in the scoping letter.*

**RESPONSE: This information has been added to the FEIS in the Air Quality section under Regulatory Framework and Consistency with the Forest Plan and Other Regulatory Direction.**

## *Alternatives*

*391 The abstract describes Alternative B as the "Proposed Action" but states that there is no preferred alternative at this time. Although it is not clear what the difference might be, it seems clear to us that the DEIS does not support selection of Alternative B. In fact, we are surprised that the Forest Service would propose Alternative B instead of the less environmentally impacting Alternative C.*

**RESPONSE: All projects start with a "proposed action"—a plan that is put forth to the public to best achieve our objectives or "purpose and need." It is not until we receive comments back from the public on that proposed action that we determine what issues or concerns the public has. These comments lead us to develop alternatives to the proposed action, which provide the basis for comparing effects.**

**When we designed the proposed action for the West Gold project, we designed it to include temporary roads that we believed would have little impact on the watershed, and would achieve our objectives more efficiently and economically than not having new roads and requiring more use of helicopter logging. Alternative C, which essentially is the same as the proposed action but without the temporary road construction, was developed upon receiving comments concerned with the effects of road construction on the watershed. Although we knew prior to analysis that Alternative C would likely have fewer effects than B, we didn't know what the *magnitude* of effects would be until we conducted our analysis. The proposed action should not be confused with the "preferred alternative"—the alternative that is preferable once all alternatives are analyzed and considered.**

*219 The range of alternatives is too narrow to respond to the expressed "purpose and need", and furthermore data is lacking to support some of the objectives on I-1.*

**RESPONSE: The range of alternatives considered in the EIS is adequate and fully responds to the purpose and need for the project while addressing the significant issues identified through scoping (see Purpose and Need description Chapter I and the Alternative development process in Chapter II). NEPA does not require that an infinite or unreasonable number of alternatives be analyzed. Rather, the range of alternatives that must be considered need not extend beyond those reasonably related to the purpose of the project. In addition to the four alternatives we analyzed in detail, we also considered seven other alternatives as described in Chapter II under "Alternatives Considered but Eliminated. You did not say in your comments what data are lacking to support some of the objectives on I-1 of the DEIS and which objectives you were referring to. All of the objectives listed in the purpose and need are supported by the information following that section, which contains references to broad scale and more site-specific data and information. In addition, the affected environment sections of each resource discussed in Chapter III further supports our Purpose and Need.**

## *Environmental Analysis*

*6116, 219 We incorporate the Ecology Center's January 25, 2000 letter to the IPNF Forest Supervisor, as comments on the West Gold DEIS.*

**RESPONSE: Forest Supervisor Ranotta McNair and her predecessor Dave Wright have consistently sent responses to your letter of January 25, 2000 and your prior April 14, 1998 letter, both of which provided broad comments intended to be applied to every project that is analyzed under the National Environmental Policy Act (see project file, Public Involvement). These responses have stated that your generic letters contain issues that are more appropriately addressed at the Forest plan or broader scales and that we have requested that you respond to each project individually with site-specific substantive comments, as we do not maintain generic issue letters in our project files.**

*6116 The DEIS cumulative effects analysis, direct and indirect of Future Salvage Opportunities in the DEIS, does not meet the NEPA requirements at 40 CFR 1508.7 and 1508.8. For nearly every issue analyzed, the determination of the future salvage opportunities within the same cutting units after the area has just been logged is "negligible, will not have a significant effect, or note measurably change". How can this be determined? Furthermore, if any connected actions were to occur immediately after completion of the project, they are subject to a separate EA or EIS as required by NEPA. Future Salvage Opportunities can not be except if it meet the following ten criteria as outlined in the DEIS (p.II-14).*

*219 The DEIS claims to disclose the impacts of "Future Salvage of Dead and Dying Trees" but in reality, to the degree it does not provide specific temporal and spatial details and the intensity of such operations, it is unable to do so.*

**RESPONSE: Because we cannot anticipate where and when trees may die due to storm events or an insect outbreak, we have established very conservative criteria to ensure effects from such salvage opportunities would be negligible. In addition, the DEIS states that if a potential salvage situation arises, the interdisciplinary team must meet to discuss it, ensure**

**that it meets all the applicable criteria, and determine that anticipated effects would not be**

**supplemental analysis is necessary when there is new information. Each resource section has analyzed this potential future activity and, given the strict criteria under which it could occur, predicted effects should be minimal.**

*219 The DEIS does not present adequate analysis of impacts of land uses on private land in the Gold Creek watershed, nor of motorized vehicle use off roads.*

**RESPONSE: We believe we did present adequate analysis of land uses on private lands. It was addressed in the DEIS in the Vegetation analysis (p. III-18), the Fire and Fuels analysis (p. III-47), and in the watershed section (p. III-11). Motorized vehicle use off roads in the project area has not been a substantial problem, primarily because of the steep topography of the land and the location of the roads. Please note that we have added an analysis section entitled Roads and Access Management to Chapter III of the FEIS.**

*219 The DEIS incorporates a Forest Plan that is out-of-date in terms of its consideration of fire ecology, as ICBEMP research indicates.*

**RESPONSE: Although fire ecology philosophies have changed since the Forest Plan was published, the standards and guidelines are not irrelevant. The DEIS discusses compliance with the Forest Plan on page III-48. Fire ecology will likely be addressed as an issue in the Forest Plan revision process, which is currently underway.**

*219 The DEIS lists past, ongoing, and some foreseeable activities in cumulative effects areas, but fails to adequately disclose impacts.*

**RESPONSE: Each resource section in the DEIS evaluated the cumulative effects of those specific activities that could potentially be additive in their effects to the resource in question. Not all past, present and reasonably foreseeable activities were deemed to have cumulative effects to every resource. Each resource analysis section discusses which of the activities listed in Chapter I are likely to affect that resource. Some of the resource sections have strengthened cumulative effects discussions in the FEIS where needed.**

*219 The DEIS does not disclose the likelihood of obtaining funding for each of the separate West Gold project activities.*

**RESPONSE: The likelihood of obtaining funding for activities in this project was not information necessary for the decisionmaker to make an informed decision. This comment is often raised when the ability to accomplish projects such as watershed improvement work is compromised by the availability of funding that may be generated from the sale of timber. Since the West Gold watershed is a high priority watershed for aquatic habitat maintenance and improvement, acquiring funding to accomplish road improvement work that will benefit the watershed, as well as other restoration projects, is not a concern.**

*219 The DEIS takes much of its purpose and need and allegedly, data from documents that have not been subject to public reviews as NEPA requires. This includes the Gold EAWS and the draft Pend Oreille Basin documents. This does not comply with NEPA's disclosure requirements for EISs and stands count[er] to recent federal court decisions regarding the appropriateness of* *tiering to other documents. The Roads Analysis (I-8) is another example of what belongs in the EIS.*

**RESPONSE: The documents listed above are not decision documents. They have been developed to identify project opportunities and to explain how the specific project fits into the broader picture. These types of documents are frequently described as stage-setting documents; documents prepared prior to NEPA decision documents. Generally, these documents describe the conditions that currently exist in the area being described and then identify recommendations of potential management actions that could occur on that area. These documents make no decision and implement no project on the ground. They merely set the stage for the NEPA decision document to follow. The use of non-NEPA documents in an Environmental Impact Statement is an acceptable practice (40 CFR 1502.21). The use of the documents referenced above for the purpose and need for this project is in compliance with NEPA.**

**The Gold EAWS states specifically "While this document provides management recommendations, it is not a decision document. No direct changes in management of the resources in this watershed will occur without separate documentation, public involvement, and further analysis" (USDA 2002, p.1). This EIS provides that "separate documentation, public involvement, and further analysis."**

## *Finances*

*6116, 219 The Forest Service did not disclose the costs of the proposed action and therefore failed to complete an adequate cost-benefit analysis as described above. Costs of conducting the NEPA process, administering the timber sale, road construction, road maintenance, mitigation, monitoring, and any other cost incurred by the Forest Service in association with the proposal should have been disclosed in the DEIS. Because this important data was left out of the economic analysis, the Forest Service has failed [to] meet the requirements of the NFMA and the NEPA outlined above.*

**RESPONSE: As directed in Economic Analysis for Forest Plan Implementation (USDA 1989), "The focus of analysis should be on providing only that information that is useful in the decision process. No more, no less." Our decisionmaker knows that the cost of NEPA is high, and since it is a factor that would remain constant with any alternative, it does not provide good comparative information. The Finances section in Chapter III explains which costs are included in the analysis. We used a cost effectiveness analysis to provide the decisionmaker information on the viability of selling the timber that would be generated as a byproduct of accomplishing the vegetation treatments. The decisionmaker will look at this information along with a variety of other comparative features displayed in the FEIS to arrive at her final decision.**

*6116 The West Gold DEIS fails to disclose the amount of mmbf this project intends to log. Without this value it is impossible for the public to understand the magnitude, whether large or small, of the proposed action, keeping the public from making informed comments. How can the DEIS calculate the net economic analysis to generated the worth in dollars without disclosing projected output of mmbf?*

**RESPONSE: The amount of board feet predicted to result from proposed vegetation treatments in each alternative was disclosed in the DEIS on page III-123 in table 24. This information is still in the FEIS, in what is now table 25.**

## *Fire and Fuels*

*6116 Will the FS permit natural fire and natural disturbance events to be restored in this area, regardless of whether they are planned or naturally occurring? What does the IPNF's Fire Plan and IPNF Management Plan say about fire suppression and natural disturbance events? Are these disturbance events likely to be allowed to occur on any scale or will they be cut short either (1.) by design or (2.) in the haste of the moment? How is fire and natural disturbance different from logging, roadbuilding and other habitat manipulation existing or proposed here?*

**RESPONSE: Under the current Forest Plan and Fire Management Plan, the Idaho Panhandle National Forests (IPNF) fire protection direction does not include any areas where the appropriate management response to a fire is anything other then full suppression. The current Forest Plan is up for revision and when revised may include some areas where fire will be allowed to play its historic ecological role when naturally ignited under certain prescription and geographic area parameters. As stated on page III-43 of the DEIS, the West Gold area is not a likely candidate for any management response other then aggressive suppression due to its proximity to private land.**

**Fire has been the dominant natural disturbance in the project area over time. Since wildfires generally occur during the hottest and driest times of the year, existing stand conditions in this area could cause an ignition to quickly become a stand-replacing fire. Given the proximity of the project area to the town of Lakeview and the utility corridor, letting a fire of this magnitude burn is not socially acceptable. Logging and prescribed fires allow us to treat the vegetation and fuels in controlled situations (i.e. burning when moisture levels help reduce sterilizing effects to soils). Natural disturbance and human-caused disturbance both have effects, but they differ in their impacts to the environment. Which impacts are most acceptable to society is a question that continues to be debated.**

*219 The DEIS does not consider any alternative but all out suppression of wildfires, because the IPNF is lacking a fire plan that has undergone NEPA review. Forest Service research (Cohen 1999 and Cohen 2000) provides strong guidance that the only real place that fuel treatment can work to protect homes is within 100 meters or less of the structure itself. Such insights are lacking in the DEIS… The DEIS partly justifies overly aggressive thinning on the grounds that it will reduce the likelihood of a crown fire in the thinned areas (III-46). But if the recommendations by the Forest Service's expert (see Cohen, 1999 and Cohen, 2000) are followed, then the need to fight a fire is not there. Increasingly in recent years, safety factors have made it less likely that fire will be fought in dangerous conditions--conditions that may have more to do with weather conditions rather than vegetation.*

**RESPONSE: Not all fuels treatments are done with the protection of homes as its focal point. The purpose and need for the West Gold project area is to restore fire as an ecological process and reduce the risk of destructive wildfire to the resources and social values in and next to the project area. There are benefits to creating stand conditions that reduce the potential for stand-replacing crown fires and make future suppression efforts more successful and possibly less costly. One benefit is reducing the threat of ignitions from**

**firebrands originating from wildland fires, which may threaten homes immediately downwind of the project area. To reduce threat of ignition from firebrands, fuels needs to be reduced both near and at some distance from the structure. Firebrands can originate from wildland fires that are a distance of 1 kilometer or more (Cohen 1999).**

*6116 Commercial logging reduces the "overstory" tree canopy which moderates the "microclimate" of the forest floor. Logging trees is focusing on the removal of the wrong forest fuel which is the least flammable of the forest fuels. The DEIS even admits that treatments on these lands focuses on the "highest economic value, which are often the largest" that "removes the large fire resistant seral species" (p. III-42). Fuel treatment should be focusing on the most flammable of the forest fuels, such as brush, weeds, and the lower branches of the ladder fuel trees. High grading large economical trees is occurring on nearby private lands as well, as indicated in the DEIS (p.42), thus increasing the wildfire risk in the entire area more so. The cumulative effects analysis in this DEIS is inadequate when relating fire risk from logged private land to logged federal land.*

**RESPONSE: The objectives of the vegetation treatment are not directly intended to remove hazardous fuels, however, removing dead and dying Douglas-fir and grand fir trees (the "ladder fuel trees" you mention) with the objective of replacing them with more resilient larch, white pine or ponderosa pine, will make our fuels treatments easier and safer. The quote you reference about removing "large fire-resistant species" was taken out of context—it was referring to logging practices that typically occur on private lands. In the West Gold project, we propose to retain those large trees (larch and ponderosa pine).**

**There is always a risk of fire coming from private lands to Federal land but as stated in the DEIS on page III-48, the town of Lakeview is northeast of the project area. The general climate patterns create a prevailing wind out of the southwest, which would most likely cause a fire to move from the south to the northeast.**

*219 The DEIS fails to disclose the degree to which cutting activities will actually increase the risk of later fire spread.*

*6116 As stated in the DEIS, the proposed timber harvest converts unavailable aerial fuels into available surface fuels (DEIS p. III-46). Thus the risk of crown fire may be reduced while the risk of surface fire can be increased by adding fuel to the ground. In the short term there would be an increase in surface fuel loading in order to decrease long-term fuel loading. An increased fire hazard and risk of ignition from timber harvest may result… How will the risk of wildlife increase in the short term fair with local landowners, especially with the potential increase in urban and residential.*

**RESPONSE: As mentioned in the DEIS on page III-46 there is a time lag of one to two seasons between the completion of timber cutting and fuels reduction treatments. Before treatment there is a time period when ground fire intensities can be increased with logging slash. This is a risk, but with the low to moderate predicted slash accumulations after harvest and the elimination of the small tress and other ladder fuels, this will be a fairly low risk. Many of the stands identified for treatment contain high levels of standing dead and down trees and ladder fuels, which can easily carry a ground fire into the crowns of the larger trees. A fire of this magnitude would burn much hotter than a ground fire in the logging slash that would be generated by this project. The majority of the existing fuels and**

**those created by the vegetation treatment by this project will be reduced by prescribed burns that will be conducted in the years following the harvest. The benefits far outweigh the risks in the long term, by creating stand conditions that will greatly reduce the potential for a large-stand replacing fire and by making future suppression efforts more successful.**

**The focus with the prescribed treatment is to remove the smallest diameter understory trees and to leave the large diameter, fire-resistant species. While logging does remove the green bole of the tree, this is the only effective way to remove the limbs (ladder fuels) from the understory trees. As a follow-up to the logging, a combination of slashing and burning will be done to eliminate the ladder fuels associated with the unmerchantable trees and brush.**

*6116 Burned forests create ideal growing conditions for morel mushrooms, and provide generous revenue to mushroom pickers the spring following a fire. This activity has not been mentioned in the DEIS. Why not?*

**issue before now. For these reasons, this activity is not analyzed in this EIS.**

*6116 Nowhere in the DEIS does it state how many tons per acre will be left behind in order to meet Forest Plan standards. What is the planned amount of tons/acre to be left behind?*

**RESPONSE: This information was located on page II-22 of the DEIS. Management of coarse woody debris and organic matter in cutting units would follow the research guidelines contained in Graham et al (1994). These guidelines specify leaving 7 to 14 tons/acre of coarse woody debris on Douglas-fir/grand fir sites and 17 to 33 tons/acre on hemlock /cedar sites.**

219 *What is the mean and standard deviation of the fire return intervals of the specific "moderately dry forests" (III-7) found in the project area?*

**cited reference Fire Ecology of the Habitat Types of North Idaho (Smith and Fischer 1997. p. 57). There are mean and standard deviations for each representative location but that level of detail was not needed for our analysis.**

*219 The DEIS does not disclose the methods and their costs, ecologically nor economically, of maintaining the fuel break conditions in the "treated" areas.*

**not analyze for the costs of such activities.**

*suppression activities.*

*6116 We request the Forest Service review the issues presented in Tiedemann et. al. (2000) in order to improve your understanding of and the DEIS's analyses of the impacts of the proposed prescribed fire, since there is no reference in the DEIS to Tiedemann*

**RESPONSE: The project fuels specialist reviewed and considered the information in the reference "Solution of forest health problems with prescribed fire are forest productivity and wildlife at risk?" (Tiedemann, Arthur R., James O. Klemmedson, and Evelyn L. Bull 2000). The paper examines large-scale conversion of forests in the Blue Mountains of Oregon and Washington to seral conditions that emulate those assumed to exist before European settlement. The authors question how well pre-settlement conditions are understood as well as the feasibility and desirability of conversion to a seral state that represents those conditions. They also question the use of large-scale, frequent prescribed fire and its effects on productivity and wildlife. The West Gold Project proposes the use of four fuel treatments: underburn, limb and lop, yard tops and grapple pile and burn. These are minimal treatments, not large scale or frequent prescribed fire use as questioned in the reference. The impacts on site productivity and wildlife are covered in Chapter 3 under soils and wildlife.**

*219 The DEIS failed to incorporate essential information from the Federal Wildland Fire Management Policy and Program Review. The DEIS fails to justify or analyze the ecological and economic impacts of continued fire suppression. The DEIS contains no scientifically valid information that demonstrates significant impact from past fire suppression on all forest types to be logged. The DEIS contains inadequate information on historic fuels levels.*

**RESPONSE: An overview of the Federal Wildland Management policy can be found on p. III-37 of the DEIS. All policies and principles from the Federal Wildland Fire Management Policy and Program Review applicable to this project are addressed in the Fire and Fuels section of the EIS. The policy includes all aspects of fire management including prevention, suppression, and fire use. The Secretaries of Agricultural and Interior understand that not all aspects of the Policy can be implemented everywhere.**

**The EIS assumes that regular administrative activities will continue to occur in the project area. This includes continued fire suppression in the area as stated on p III-43 of the DEIS. Aggressive suppression will continue due to significant threats to human life and property by wildfire in the area. The intent of the project in regards to fire include burning to reduce fuels, improve growing conditions, and restore fire as an ecological process, not analyzing or proposing changes to the suppression policy.**

**The effects of past fire suppression on the Habitat Type Groups to be logged can be found on p. III-7 of the DEIS.**

**The known historic fuel levels and vegetation are discussed in both the Fire and Fuels section in Chapter III of the EIS and in the Forest Vegetation section of Chapter III of the DEIS.**

*219 Please explain how the BEHAVE model consider moisture level differences in closed canopy vs. open canopy forests. How does the BEHAVE model consider rate of fire spread?*

**RESPONSE: The BEHAVE program does not address open vs. closed canopy. However, canopy closure does have a direct effect on two of the variables used in BEHAVE, fine dead**

**fuel moisture and mid flame wind speed. After harvest, the fuel moisture should be lower and the wind speed higher. These changes were made to the BEHAVE runs in the FEIS due to the following reasons:**

**Fine Dead Fuel Moisture - Closed stands are considered fully shaded, open stands are partially shaded. In open stands, more solar radiation results in lower fine dead fuel moisture. Conversely, when precipitation occurs, moisture penetrates the canopy faster in open stands so fine dead fuel moisture increases more rapidly than in closed stands. This is a trade off. Changes were made to the post treatment BEHAVE run inputs in the FEIS to reflect lower fine dead fuel moistures in open stands representing general summertime conditions.**

**Mid-Flame Wind Speed - Depending on position on the slope, closed stands are usually fully sheltered and open stands are usually considered partially sheltered. This difference has a direct effect on the amount of 20-foot wind speed that penetrates a stand to become mid-flame wind speed. In the FEIS mid-flame windspeed inputs for post-treatment BEHAVE runs were increased to reflect a more open stand condition.**

**Rate of fire spread is one of the outputs of the BEHAVE program not a consideration. Rates of spread are calculated in BEHAVE from user provided inputs. These inputs include fuel model, 1-hour fuel moisture, 10-hour fuel moisture, 100-hour fuel moisture, live herbaceous fuel moisture (if applicable to the fuel model), percent slope, direction of wind vector and direction of spread calculation. These inputs produce following outputs. It produces the rate of spread in chains per hour.**

*6116 Current fire spread models including BEHAVE which the West Gold DEIS relies on, do not even consider fuels greater than three inches in diameter because it is mainly the fine-sized surface fuels that allows fire spread. The current BEHAVE interface is old and outdated. Crown fire models and other available models are not included. Commercial logging operations remove large-diameter fuels that are naturally fire resistant and moist, and leave behind an increased amount of fire-prone small-diameter fuels. So how can the DEIS justify logging to reduce fuel risk?*

**RESPONSE: The BEHAVE program is a very valuable and valid tool in the analysis of comparing flame length and fire intensities in the project area both before and after treatment. Newer models such as RERAP and FARSITE use the same surface fire spread calculations as BEHAVE. The results generated from the BEHAVE model show a substantial decrease in flame lengths and fire intensities. In addition, there are several scientists that show how stand treatments can be effective at reducing fire intensity and severity (Fiedler, et al. 2001, Omi and Martinson 2002, Graham et al. 1999a, Jimerson and Jones 2000).**

*6116 Stating that logging operations in the West Gold drainage in the 1970's and 1980's were "insignificant and have no effect on fire risk today" is unfounded (DEIS p. 42)*

*6116 The West Gold Project DEIS must reconcile the vast discrepancies between its claims of fire risk impacts reduction by logging and the position of so many other government scientists. Please tell us why the DEIS stands in such stark contradiction to the government's own scientists on the issue of fire and logging?*

**RESPONSE: Your assertion that "the DEIS stands in such stark contradiction to the government's own scientists on the issue of fire and logging" is your opinion. As with many natural resource issues there are differences of opinion both inside and outside agency. Two of the references you cite are documents from the Interior Columbia Basin Scientific Assessment (Quigley and Arbelbide 1997, and Quigley, Haynes, and Graham 1996), documents that we also cite, which support our objectives. We don't disagree with the statements made in these documents regarding the high rate of human caused fires being associated with roaded areas, or that fire intensities have increased and frequencies have decreased. We also don't disagree that some logging methods have increased fire risks on some sites, or that logging slash can temporarily increase fire risk (we discuss this in the DEIS on page III-46). There are several scientists that show how stand treatments can be effective at reducing fire intensity and severity (Fiedler, et al. 2001, Omi and Martinson 2002, Graham 1999a, Jimerson and Jones 2000). We believe our proposed vegetation and fuels treatments will be successful at accomplishing our purpose and need.**

*6116 Will National Fire Plan monies be used to reintroduce fire into the ecosystem with prescribed fire? If so, what is the anticipated amount of money? And will this project meet the National Fire Plan objectives?*

**RESPONSE: As stated in Chapter I of the West Gold DEIS page I-10, this project proposes fuels reduction activities and would meet some of the objectives outlined in the National Fire Plan (NFP). This project was not identified as a priority project within the NFP program. We did, however, receive $40,000 in supplemental funding for planning purposes.**

## *Fisheries*

*6116, 219 The failure of the DEIS is that while it acknowledges that sediment is detrimental to bull trout and further acknowledges that all action alternatives will result in detrimental sediment production in to Gold and West Gold Creeks, the DEIS fails to adequately address how these scientifically accepted negative impacts do not result in a 'likely to adversely affect' determination. The explanation offered in the DEIS does not provide a scientific explanation for how sediment can be dumped into bull trout habitat without creating adverse impacts, DEIS III-107…The DEIS's explanation of how sediment will manage to move through but not affect bull trout habitat is in direct conflict with other statements made in the DEIS. Page III-13 acknowledges that sediment is currently being deposited into the stream channel of both Gold and West Gold Creek…The DEIS explains that sediment will continue to be deposited in Gold and West Gold Creek until peak flows reach a high enough level to flush them. This contradicts the Forest Service's explanation of why sediment will not adversely impact bull trout. The DEIS must discuss what this peak flow level is and when it is likely to occur. The Forest Service would have to disclose the amount, in tons, of sediment that will be moving through Gold and West Gold Creek; a discussion of why the gradient of the creeks should be expected to move all of that sediment; and a discussion of what level of flow will be required to keep that much sediment suspended until it enters Lake Pend Oreille.*

**RESPONSE: Additional *fine sediment* (≤ 6.35 mm) delivery would likely settle out at the nearest low gradient area downstream from the source. Bull trout use only the lowest reach of West Gold Creek and primarily spawn in Gold Creek below its confluence with West Gold. This area is dominated by bedrock intrusions, which need gravel deposition to be used for spawning. Since all ground disturbing activities would occur outside of RHCAs, the risk of any sediment generated by logging activities actually reaching a live channel is very low (Belt et al. 1992). By using timing restrictions, onsite direction, and BMPs, sediment delivery to occupied fish habitat associated with culvert removals and upgrades would be minimized.**

**Since the identified culverts are located high in the drainage, the likelihood that any escaped sediment would be transported into the lowest reaches of West Gold and Gold Creek below the confluence is very low. In addition, repair of the Kickbush slide and other sediment-reducing projects (mine cleanup, road maintenance activities) will cumulatively result in a large-scale net reduction of sediment delivery when considered with the delivery predictions from the West Gold project (DEIS III-114). Additional discussion on effects of sediment delivery is included in the FEIS.**

*6116, 219 The DEIS fails to adequately disclose and evaluate the impacts of the West Gold alternatives on bull trout and their habitat in this critical area. The DEIS does not provide sufficient information to support the "No Likely to Adversely Affect" determination; the DEIS fails to consider the likelihood that Gold and West Gold Creeks will be designated as critical habitat in October of 2003 by the USFWS and therefore fails to demonstrate compliance with Section 7of the ESA; the DEIS fails to actually disclose the impacts of each alternative on bull trout as mandated by the NEPA.*

**RESPONSE: Effects to bull trout and bull trout habitat are addressed in the DEIS on pages III-103 to III-115. In addition, rationale for the "Not Likely to Adversely Affect" determination is included in the Biological Assessment. The discussion on effects of sediment delivery to fish has been expanded in the FEIS.**

*6116, 219 We assert that the imminent designation of bull trout critical habitat in Gold and West Gold Creeks requires that the West Gold DEIS demonstrate compliance with Section 7 of the ESA.*

**RESPONSE: Compliance with Section 7 of ESA requires consulting with the USFWS on federal projects that "may affect" listed species, such as this project which "may affect" bull trout. Critical habitat for bull trout has not been designated. Regardless, we are required to consult on the project and are in the process of doing so. No decision will be signed unless we receive concurrence on our determination of effects from the USFWS.**

*6116, 219 the DEIS discloses that the West Gold proposal will indeed create adverse effects to bull trout and their habitat. Page III-124 of the DEIS describes the "Adverse Effects Which Cannot be Avoided". This statement in the DEIS makes it very clear, the West Gold proposal will likely adversely impact bull trout habitat. Sediment production due to road building, logging, and mining is already dumping 90% more sediment than occurred naturally into the Gold Creek watershed and all of the action alternatives will add to this scenario. The West Gold action alternatives will harm and therefore 'take' bull trout by contributing detrimental sediment to their spawning and feeding habitat. The West Gold DEIS fails to demonstrate compliance with the Section 9 requirements of the Endangered Species Act.*

**RESPONSE: The discussion of sediment has been expanded in the FEIS and better explains the relationship between past, present and reasonably foreseeable sediment contributions and our effects determination. The DEIS on page III-114 states that, cumulatively, there will be a net decrease in sediment (including Kick Bush Slide restoration, which will be completed in 2002). Since all ground disturbing activities would occur outside of RHCAs, the risk of any sediment generated by logging activities actually reaching a live channel is very low (Belt et al. 1992). By using timing restrictions, onsite direction, and BMPs, sediment delivery to occupied fish habitat associated with culvert removals and upgrades would be minimized.**

**Since the identified culverts are located high in the drainage, the likelihood that any escaped sediment would be transported into the lowest reaches of West Gold and Gold Creek below the confluence is very low. The higher-gradient channel types present in West Gold Creek would likely carry any sediment to the nearest low gradient area where it would settle out. Similarly, sands and gravels would be deposited on gravel bars or other energy reducing features. In-channel sediment levels have remained relatively stable since 1955 and would continue to remain that way in the short term. Risk of sediment delivery would be immediately reduced from culvert upgrades and removals and the sediment levels would trend back toward baseline in the long term with any action alternative.**

*5200 The Fisheries analysis in the FEIS should supply findings that the waters in the analysis area currently meet the CWA fisheries requirements.*

**RESPONSE: The DEIS on page III-116 discusses compliance of the project with the Clean Water Act, including risks to beneficial uses (cold water biota and salmonid spawning).**

*6116, 219 The DEIS must disclose sediment levels in the terms used above in order for the decision maker to understand how significant the impacts of sediment [on fish] will be.*

**RESPONSE: The discussion of sediment has been expanded in the FEIS and better explains the relationship between past, present and reasonably foreseeable sediment contributions and our effects determination. The DEIS on page III-114 states that, cumulatively, there will be a net decrease in sediment (including Kickbush Slide restoration, which will be completed in 2002). Since all ground disturbing activities would occur outside of RHCAs, the risk of any sediment generated by logging activities actually reaching a live channel is very low (Belt et al., 1992). By using timing restrictions, onsite direction, and BMPs, sediment delivery to occupied fish habitat associated with culvert removals and upgrades would be minimized.**

**Since the identified culverts are located high in the drainage, the likelihood that any escaped sediment would be transported into the lowest reaches of West Gold and Gold Creek below the confluence is very low. The higher-gradient channel types present in West Gold Creek would likely carry any fine sediment (≤6.35 mm) to the nearest low gradient area where it would settle out. Similarly, sands and gravels (>6.4 mm) would be deposited on gravel bars or other energy reducing features. In-channel fine sediment levels have remained relatively stable since 1955 and would continue to remain that way in the short term. Risk of sediment delivery would be immediately reduced from culvert upgrades and removals, and the sediment levels would trend back toward baseline in the long term with any action alternative.**

*6116, 219 The West Gold DEIS failed to adequately disclose and consider the cumulative impacts on bull trout in the analysis area…The FSH requires that the cumulative effects analysis describe the impact that the West Gold will have on the environment when added to other past, present, and reasonably foreseeable actions. In this case, the West Gold proposal will only add more sediment to Gold and West Gold Creeks in the short-term than that which is being contributed by the other sources. However, the DEIS failed to do this…the DEIS failed to adequately explain how the short-term increase in sediment from the West Gold proposal, when considered with all of the other past, current, and future sediment contributions does not equate to a "likely to adversely affect" determination. We assert that the West gold DEIS failed to take the required "hard look" at the cumulative effects of this proposal.*

**RESPONSE: Cumulative effects were analyzed on pages III-113 though III-115 in the DEIS and in the Biological Assessment. The discussion of sediment has been expanded in the FEIS and better explains the relationship between past, present and reasonably foreseeable sediment contributions and our effects determination. The DEIS on page III-114 states that, cumulatively, there will be a net decrease in sediment (including Kick Bush Slide restoration, which will be completed in 2002).**

*219 The DEIS does not disclose the current values and objective levels of Riparian Management Objectives, as set by the Forest Plan as amended in INFISH.*

**RESPONSE: Riparian Management Objectives are described in the INFS document (USDA 1995; Appendix A), which was cited in the DEIS (Appendix B) as well as this FEIS.**

*6116 The deficiencies in forest practices are manifold, but one of the primary defects is inadequate riparian protection. The riparian protections from INFISH and in state forest practices are inadequate to protect streams from sediment delivery.*

**RESPONSE: The Environmental Assessment for the Inland Native Fish Strategy addresses widths of interim Riparian Habitat Conservation Areas (RHCAs) on page E-5 (USDA 1995). Interim widths are used for RHCAs in the West Gold Project. Based on scientific literature (there are fifteen citations on page E-5), INFS states that non-channelized flow rarely travels more than 300 feet, and that 200-300 foot riparian “filter strips” are generally effective at protecting streams from non-channelized flows.**

**The Biological Opinion (BO) on effects to bull trout from continued implementation of Forest Plans, as amended by INFS (USDA 1995), states that while interim RHCAs would buffer streams from sediment and pollutants carried in unchannelized flows in most situations, they may not effectively protect streams from sediment produced in upslope areas and carried in channelized flows, such as culverts (Belt *et al* 1992). The West Gold Project will not increase channelized flow because no crossings will be constructed.**

*391 Neither an increase in deposition of fine sediments in Lake Pend Oreille nor depositions of sand or gravel within the creeks should be considered acceptable outcomes of the project. Deposition of sediments near the mouth of Gold Creek has been a chronic problem, threatening fish access to the creek from the lake… Depositions of sand or gravel in the creek may affect spawning areas and stream morphology. The DEIS infers that these impacts are not significant and would not impact fish at the population level and, therefore, are acceptable consequences of the project. However, adequate details about expected sediment loads and composition, areas of* *deposition etc. are not provided to support this claim or permit adequate review.* [This comment continued with recommendations to better describe sediment yield, transport and deposition in the EIS, impacts of this on critical fish habitat, and better assess cumulative effects of activities in Gold Creek.]

**RESPONSE: The discussion of sediment has been expanded in the FEIS and better explains the relationship between past, present and reasonably foreseeable sediment contributions and our effects determination. The DEIS on page III-114 states that, cumulatively, there will be a net decrease in sediment (including KickBush Slide restoration, which will be completed in 2002). Since all ground disturbing activities would occur outside of RHCAs, the risk of any sediment generated by logging activities actually reaching a live channel is very low (Belt et al., 1992). By using timing restrictions, onsite direction, and BMPs, sediment delivery to occupied fish habitat associated with culvert removals and upgrades would be minimized.**

**Since the identified culverts are located high in the drainage, the likelihood that any escaped sediment would be transported into the lowest reaches of West Gold and Gold Creek below the confluence is very low. The higher-gradient channel types present in West Gold Creek would likely carry any sediment to the nearest low gradient area where it would settle out. Similarly, sands and gravels would be deposited on gravel bars or other energy reducing features. In-channel sediment levels have remained relatively stable since 1955 and would continue to remain that way in the short term. Risk of sediment delivery would be immediately reduced from culvert upgrades and removals and the sediment levels would trend back toward baseline in the long term with any action alternative.**

*5200 The Fisheries analysis on page 97 described the habitat degradation in the lower Gold Creek and West Gold Creek as being relatively minor. The fisheries discussion on page 107 included the following sentence "Given the higher-gradient channel types present in West Gold Creek, the predicted increase in sediment delivery would likely be transported through the system". This statement appears to be contradicted by the following statement on page 95 "Sediment accumulates for centuries within these channels before being transported or "flushed" downstream by episodic events from with large increases in water yield (Kirchner et al 2001)" The FEIS must .... indicate which statement is factually correct.*

**RESPONSE: This discussion has been clarified in the FEIS.**

*5200 The Fisheries analysis in the FEIS also needs to supply analysis and information regarding fisheries surveys that have been performed to gather information regarding effects to fisheries in West Gold Creek and Gold Creek from r-o-s events that occurred after 1980 within and/or adjacent to the analysis area.*

**RESPONSE: The fisheries surveys and pertinent information can be found in the Watershed and Fisheries Affected Environment section (under Fisheries; Fish Populations). Effects of rain-on-snow events are discussed two pages prior to that section. As discussed in the Affected Environment section, the greatest impacts observed from rain-on-snow events occur when culverts become plugged from resulting floods and debris flows. By improving or removing the high-risk culverts, the risk to a road failure is significantly reduced and net associated risk of sediment delivery would drop by at least 1,752 tons and potentially 2,572 tons.**

*219 The DEIS states that "Currently the indicator used as a surrogate of fry-to-smolt survival is stream habitat characteristics" (B-7). Does that mean you've substituted measures of "stream habitat characteristics" in place of measures of fry emergence and/or fry-to-smolt survival? If so, please explain what you are actually measuring, where it's being measured, how frequently, how you are reporting the results, and how the monitoring is able to actually determine the impacts of Forest Plan implementation (your management activities).*

**RESPONSE: We have not substituted stream habitat characteristics for fry emergence. It means that since fry emergence is difficult to measure and is a poor monitoring tool (as described in the next paragraph on B-7), habitat condition as described by stream habitat characteristics that can be measured is a surrogate (e.g., higher fry survival would be expected where habitat is in good condition versus habitat in poor condition). Monitoring results are reported in the annual Forest Plan Evaluation and Monitoring Report.**

*391…We believe that you agreed that long-term monitoring is needed to evaluate the success of the Project, as well as to validate predictions made with the sediment model. You indicated that current resources would prevent intense monitoring over the long term, but that it was your intention to repeat fisheries surveys and repeat stream characterization surveys in the future, although no repeat monitoring schedule had been set to help answer questions about West Gold Project impacts. We suggested a commitment in the FEIS to repeat a fish survey and to reassess stream morphology in key reaches of West Gold and lower Gold Creek on a 5-year schedule, if not more frequently. We believe such surveys of the fishery and stream morphology would provide valuable, easily obtainable data to compare before and after impacts of the Project over the long term. Our understanding was that you would consider incorporating these elements into your long-range fisheries and hydrology work plans and identify that effort in the Final EIS.*

**RESPONSE: As we explained to you on our field trip, we have listed in our monitoring section (Chapter II) watershed monitoring using permanent stream channel cross sections. This monitoring is planned to occur annually and it would help us monitor the stream morphology, which serves as an indicator for habitat condition. As you are aware, Idaho Fish and Game conducts annual redd counts in the Gold watershed, which provides us information for monitoring fish populations.**

## Forest Vegetation

*6104 You claim that the pine and larch can't rebound by itself (given all the shade created by the fir) and would continue to decline in numbers, yet the terrible insects and disease will take-out large and unacceptable portions of the fir.*

**RESPONSE: Please review the DEIS Summary page 1 (Historic Forest Conditions) and page 3 (Why is a Changing Ecosystem a problem?). Across the West Gold watershed and in many of the proposed units there has been a reduction in desired species of ponderosa pine, white pine and western larch (DEIS page III-12). Because these species are present in small quantities and in some areas do not even exist, they are less likely to reseed themselves through natural regeneration as disturbance occurs (DEIS page III-13). Ponderosa pine and western larch naturally regenerate best and dominate in areas that have seed beds prepared during fire when soils are more exposed and other vegetation competition is reduced. Additional references support this statement (Shearer and Schmidt 1992) (Graham et al. 1992) (Heidman 1988).**

**As insect and disease kill Douglas-fir and grand fir in stands where there are pine and larch, there is a temporary increase in the growing space available for the remaining trees, and over the short-term 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 (DEIS page III-15, Alternative A).**

*6116 We request a thorough description of the size, species, and distribution of trees that will be cut and disclosure of the impacts.*

**RESPONSE: The EIS describes the issue indicators for the effects of project activities on forest vegetation (DEIS page II-3). The EIS does not incorporate a detailed description of the size of trees to be cut because there is no analysis need for this information. The EIS does describe the species composition and structures that include a size and age range (DEIS page III-11). The EIS also describes the desired species and structures we are striving for by retaining or planting these species, and the vegetation treatments we are proposing to create these desired conditions (see Vegetation Treatment Definitions, Features Designed to Protect Wildlife Habitat, Timber Stand Improvement, and Future Salvage Opportunities - all located in Chapter II). A disclosure of the effects of these treatments can be found in the Forest Vegetation, Environmental Consequences section in Chapter III.**

**If an action alternative is selected, the project silviculturist will prepare detailed prescriptions and marking guidelines to specify criteria for the types of trees to be left or cut and on-the-ground conditions warranting the amounts and groupings.**

**The Recommendations to increase Forest Health and Productivity in the Terrestrial Environment have been brought forward from the Gold Creek Watershed Assessment into the FEIS to help the reader understand the treatment needs. These are located at the end of the Forest Vegetation, Affected Environment section.**

*5200 The FEIS needs to supply accurate data that will indicate the number of acres in the Immature Forest classification in the West Gold subwatershed, and Gold Watershed that have trees with a dbh of 15" and larger. Information should also be supplied that will indicate the particular database(s) i.e. R1 Edit, FS-VEG, that contain data regarding tree size in dbh for trees in individual stands within the analysis area.*

**RESPONSE: The DEIS on page III-11 and figure 10 in Appendix I display the existing condition of the forest vegetation structures in the West Gold subwatershed and Gold Watershed. This information is derived from stand examinations of varying intensities. These data are accumulated in the TSMRS database. Individual tree data are housed in R1 Edit/FS-VEG. The data for the vegetation structures have been retrieved from all three of these sources, which can be found in the project file (Vegetation: Database Assumptions and IMSA stands with component > 14" dbh).**

**Note: The EIS describes the issue indicators of the effects of project activities on forest vegetation (DEIS pg II-3). The EIS does not incorporate a detailed description of the size of trees to be cut because there is no analysis need for this information.**

*219 The DEIS does not credibly explain why the stands to be treated must incur damage from log skidding to meet the stated purpose to reduce stand density and fuels, which could be done without log skidding.*

**RESPONSE: The DEIS explains the need for treatment and proposed methods for achieving these in Purpose and Need statements and the Proposed Action in Chapter I of the DEIS. More detailed descriptions are given in the Alternative descriptions in Chapter II. During scoping, alternatives to "Treat the Ecosystem Without Logging" were suggested and considered but eliminated. These can be found in the EIS in Chapter II. They give a credible explanation why most stands cannot be treated without logging to achieve the Purpose and Need of the project.**

*6116 The FS states that 74% of the project area contains relatively moist forests. Are such moist forests seriously at risk for forest fires?*

**RESPONSE: Both the dry and moist habitat types are at increasing risk of stand replacement fire. The risk for forest fires and their potential effects were described in the DEIS in Chapter III on pages III-13, III-40, 41, and 42.**

*6116 Was adequate current survey information used? What are the potential shortfalls with using database derived information such as that used in the DEIS (DEIS III-8)?*

**RESPONSE: There was adequate information available to support the analysis and determination of environmental consequences. The database information was supplemented by ground reviews done by the project silviculturist within the last five years (see the Vegetation project file - Database Assumptions and notes of silviculturist).**

*6116 What fire suppression activities, habitat alteration and anthropomorphic activities had already occurred by the time the 1916 Pend Oreille NF surveys were conducted?*

**RESPONSE: We do not have a detailed record of the fire suppression activities prior to 1916. We do know that, following the large fires of 1910 in North Idaho and Montana, fire suppression activities were greatly increased. In addition to the information provided in the FEIS on human activities and disturbance, the Gold Creek Ecosystem Analysis at the Watershed Scale (EAWS) (USDA 2002), which was referenced in the DEIS, gives a more detailed description of known human activities in the West Gold and Gold Creek drainages. In this document, there is a picture of the Marshall Ranger Station in 1912 located at the confluence of Gold Creek and Chloride Gulch. Fire suppression was one of the duties of the rangers there at that time.**

*219 Please provide substantiation to the 1,532 acres for Alternative A, Early Succession (III-16).*

**RESPONSE: This is explained in the Forest Vegetation, Affected Environment section (Disturbance processes, Insects and Disease), and in the analysis of the No Action Alternative (Environmental Consequences section). The acreage is based on stand data derived from stand exams, field verification and predictions of stand progress over time under the No Action Alternative. The project file under the Vegetation section gives an explanation in the document "Mortality under the No Action Alternative". This shows that a change in some stands to early succession structure is expected to occur during a ten-year time frame, even**

**in the absence of treatment. This is the difference between the existing condition and not treating the stands.**

*219 Have you ever monitored the effects of the "double and triple burns...once common on (III-8) nearly three-fourths of the West Gold watershed?*

**RESPONSE: The effects of "double and triple burns" are described in the reference Smith and Fischer (1997). We have reviewed the timber vegetation in the West Gold subwatershed and the Gold watershed following successive burns. These were described in the DEIS on page II-3 and in the Gold Creek EAWS (USDA 2002).**

*219 The DEIS proposes to make open, dry-site stands out of areas of "invading" Douglas-fir and grand fir, even though the open, dry-site stands were not as extensive as the amount of proposed cutting assumes.*

**RESPONSE: A description of the dry and moist habitat type groups is displayed on pages III-7 and III-8 of the DEIS and is also in the FEIS. These descriptions talk about the species capable of growing on these sites, the natural disturbance regimes and the general species composition of these habitat types. Page III-8 and III-9 of the DEI,S along with information found in the Vegetation portion of the project file, show the forest cover types in West Gold in comparison to historic conditions of like habitat type groups of the Pend Oreille Subbasin. There is a dramatic difference in forest cover types of the West Gold and Gold watersheds compared to the historic conditions. The proposed action as described in Chapter II of the FEIS proposes cutting in both the dry and moist groups to trend stands toward historic and desired species compositions.**

*219 The DEIS does not support the claim that "there is a risk of significant tree mortality within the next 10 to 20 years" (II-7), used to justify the proposed logging of healthy trees.*

**RESPONSE: Based on your comments, additional references have been incorporated into the Final EIS in the Forest Vegetation section of Chapter III under the section entitled "Insects and Disease." The project area is encompassed within an area that is described nationally as "Forest Lands Most at Risk to Insect and Disease" (Lewis draft in progress). The DEIS on page III-4 (Insects and Disease) describes the mortality that is currently taking place and that will continue to take place in the West Gold drainage. Field trip reports from forest pathologists (Byler and James 1997) and the Forest soil scientist (Niehoff 1997) describe current mortality as well as future predicted mortality. An added reference (Schwandt 1996) describes an area adjacent to the West Gold drainage that is in a similar situation. The Forest Health Protection Aerial Detection Survey Maps from 1997-2001 and silviculturist field reviews (project file) support the predictions, observations, and analysis of the pathologists (Hagle 2000, Rockwell 1917, USDA draft in progress).**

*219 The DEIS does not disclose what the FS is relying on to determine that Douglas-fir and grand fir are "invading" (III-4) rather than entirely natural in their present conditions in the West Gold watershed.*

**RESPONSE: The DEIS and FEIS reference the ICBEMP Scientific Assessment (Quigley and Arbelbide 1997), the Northern Region Overview (USDA 1998), the Pend Oreille Subbasin Assessment (USDA draft in progress), the Gold Creek Ecosystem Assessment and**

**the West Gold data for the comparison of the historic and current conditions of vegetation. These analyses show that Douglas-fir and grand fir have dramatically increased in the larger scale assessment areas as well as in the West Gold watershed. These analyses also have determined that the composition of these species is not within the historic range described in these assessments.**

*219 What is the basis for claiming that "timber harvests over the past 20 years have begun to change the species composition toward long-lived seral tree species" (Id.)? Why does the FS assume that without management, larger trees will not develop?*

**RESPONSE: Some of the timber harvest in the past 20 years has been regeneration cutting followed by planting of the potentially longer-lived seral tree species (white pine, ponderosa pine and western larch). This has changed the composition of these stands toward the desired species. Some selective harvests in the past 20 years have removed much of the Douglas-fir, grand fir and other species in stands that have longer-lived seral species. This has changed the composition of those stands to being dominated by the longer-lived seral trees. The desired longer-lived seral trees cannot develop into larger trees if they are not present in the stands or if they are being outcompeted for sunlight, water and nutrients. Most of the project area is still dominated by Douglas-fir, which is generally a shorter-lived, early seral tree species in northern Idaho (the word "generally" has been added to the FEIS to provide clarification that not all Douglas-fir trees will die at less than 150 years of age). Much of this Douglas-fir is now being killed or is at risk of being killed by root disease and insect infestation.**

*6104 I find it hard to believe that you can log off the shade tolerant species of trees and, at the same time, increase the proportion of white pine in the area. And, allegedly, you can log off the shade tolerant species without decreasing the percentages of cedar. Are you not planning to take out more than a few cedar trees?*

**RESPONSE: The analysis for the change in species composition is done by "Cover Types" (the dominant tree vegetation; see DEIS page III-8). On DEIS page III-16, table 10 displays the changes in cover type by species, by alternative. As shown, the cedar cover type would decrease in the action alternatives by less than 1 %. In other stands where cedar is present but is not the dominant cover type, some cedar may be removed or killed along with other shade tolerant tree species during logging and fuel treatment. The proportion of white pine would be increased by planting this species in areas that have been regeneration harvested.**

*391 We believe the DEIS should include a far more detailed description of the harvest prescription and the residual stands that will result from harvest than has been presented for review. We recommend the prescription include:*

*-No harvest or very restrictive harvest of those species the project is attempting to favor (i.e. white pine, western larch, ponderosa pine).*
*-Retention of mature (20" or greater DBH) Douglas-fir within the stands. Large diameter Douglas-fir was a component of natural ponderosa pine stands. Restoration should attempt to recreate the ponderosa pine/Douglas-fir mosaic created by naturally occurring fires.*
*-Reserve stand densities consistent with Fiedler (1996) which recommended a reserve basal area of 40-60 square feet/acre in young even-aged stands to ensure regeneration of ponderosa pine.*

*Fiedler also suggested higher basal areas of 60-100 square feet/acre could be maintained in old growth patches.*

**RESPONSE: The DEIS describes the issue indicators of the effects of project activities on forest vegetation on page II-3. The DEIS does not incorporate a detailed description of the trees to be harvested because there is no analysis need for this information. The DEIS does describe the existing species composition and structures (which include a size and age range) on page III-11. The DEIS also describes the desired species and structures we are striving for by retaining or planting those species and the vegetation treatments we are proposing to create the desired conditions (see Vegetation Treatment Definitions, Features Designed to Protect Wildlife Habitat, Timber Stand Improvement, and Future Salvage Opportunities all located in Chapter II). A disclosure of the effects of these treatments can be found in the Forest Vegetation, Environmental Consequences section in Chapter III.**

**If an action alternative is selected, the project silviculturist will prepare detailed prescriptions and marking guidelines to specify criteria for the types of trees to be left or cut and on-the-ground conditions warranting the amounts and groupings.**

[**In their follow-up letter, Idaho Fish and Game stated the following regarding the above comment: "*Based on the information you provided us during the site visit, and on examination of recent-past similar harvest sites, we are satisfied that the harvest prescription would meet each of these recommendations wherever existing conditions allow. We believe that the intended harvest is consistent with the goal of restoring a more natural forest composition.*"]**

*391 Except for a description of snag density and a sidebar on page II-7 that says that retention will be generally less than 30% of existing trees left on regeneration areas, we found neither a quantitative or qualitative description of the structure of the stands that will remain following harvest. As described, the regeneration harvests include "openings" of from 5 to up to several hundred acres; 16 stands will have opening of 40+ acres…the DEIS does not describe the nature or potential impacts that approval of [exceeding the 40-acre openings limit] would have on the proposed project. Although request to exceed the 40-acre openings limit was opened for public comment (in 1998), approval of this request apparently has implications that relate directly to this DEIS. Since the 1998 request could no have been evaluated with respect to actions proposed and information presented in the DEIS, the DEIS should contain a detailed description of the request and a discussion of the impacts and the implications of approving the request on the proposed action.*

**RESPONSE: Forest Service Regional policy related to the National Forest Management Act specifies that exceeding the 40-acre opening limit requires a 60-day public review and Regional Forester approval. We initiated the public review period in 1998, however, Regional Fforester approval was not requested until the DEIS was completed in May 2002. The Regional Forester received a copy of the DEIS along with documented rationale for creating openings greater than 40 acres in each of the 16 stands. Our request has been approved and the document is located in our project files. There is no information in the documented rationale to the Regional Forester for exceeding the 40-acre limit related to effects of approving the request. All that information is contained in the DEIS under the Environmental Consequences sections of each resource that would be potentially affected by the vegetation treatments.**

**It is important to note that the definition of "openings" in this project does not refer to an area completely devoid of trees. The stands proposed to exceed the 40-acre opening limit consist of large areas proposed for regeneration cutting. Regeneration cutting does not equal clearcutting. On page II-7 in the "Vegetation Treatment Definitions," the resulting stand of regeneration cutting is described:**

> "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 there would be less than 30% of the trees remaining on these areas. The resulting view would be an open stand with scattered standing trees and patches of trees." A picture of an example of regeneration cutting can be found in the document summary.

**What has seemed to confuse many readers is the statement that says** "The size of open areas would range from approximately 5 acres to several hundred acres." **The intention was not to imply that there would be no trees on areas of up to several hundred acres, but to say that the regeneration cutting *units* would be in this size range. We have changed the wording in our definition to clarify this concept.**

*219 Openings greater than 40 acres were not generally contemplated in the Forest Plan to deal with such situations as the alleged vegetative imbalance. Because such Forest Service responses to alleged imbalances is a consistent pattern forestwide and beyond, it would violate NFMA (forest planning process and public involvement) and NEPA (cumulative effects and public review opportunity) to approve of such actions in the context of this project.*

**RESPONSE: The 40-acre limit imposed by the Resources Protection Act of 1974 and amended by the National Forest Management Act of 1976 states** "Ensure that timber will be harvested from National Forest System lands only where—(iv) there are established geographic areas, forest types, or other suitable classifications the maximum size limits for areas to be cut in one harvest operation, including provision to exceed the established limits after appropriate public notice and review by the responsible Forest Service officer one level above the Forest Service officer who normally would approve the harvest proposal…" **(16 USC 1604 section 6(f)(3)(E))**.

**The Forest Service manual for timber management in the Northern Region (FSM 2471.1) states "**For those situations which exceed the 40-acre limitation…Forest Supervisors will submit to the Regional office a recommendation for exceeding specified limits.**" As stated in the previous response, requirements to provide the public with a 60-day review period were initiated in 1998. The Idaho Panhandle National Forests Plan also say that exceeding the 40-acre limit** "must conform with current Regional guidelines regarding public notification, environmental analysis and approval" **(USDA 1987, p. II-32).**

## Old Growth

*5200 Chapter III, page 11 of DEIS includes discussion of old growth in the West Gold watershed* *considered short-lived species. There is no scientific information presented on {Chapter III} page 11 that described each of the reasons why Douglas-fir trees in the West Gold watershed and in the Pend Oreille Subbasin are genetically unable to reach an age of 150 years and older… The third paragraph on page 13 of Chapter III also includes a sentence that states Douglas-fir is a short-lived species in the West Gold watershed. The FEIS must supply …information that would confirm the accuracy of the cited sentence from page 13… The old growth analysis in the FEIS must supply accurate scientific analysis that will describe the scientific studies that have been completed by the Forest Service researchers, including researchers at the Pacific Northwest Research Station, that show the Douglas-fir species can accurately be listed as a short-lived species…. If there is historical data that indicates there have never been any Douglas-fir trees that lived to an age older than 120 years in the Pend Oreille Subbasin, the scientific findings, including literature citations should be included in the FEIS.*

**RESPONSE: Douglas-fir in different geographic areas vary in their longevity due to disturbance mechanisms. Some Douglas-fir trees in this area do reach ages exceeding 150 years (minimum old growth age), but we do not find extensive stands of these trees. Monitoring and observation of pathologists, ecologists, and foresters in our area indicates that the majority of Douglas-fir trees die before reaching the age of 150 years, usually succumbing to some combination of root pathogens and bark beetles. References to this condition can be found in the FEIS (Rockwell 1917, USDA draft in progress, Byler and James 1997, Schwandt 1996, and Lewis draft in progress). Douglas-fir trees in western Washington and Oregon are outside the scope of this analysis.**

*5200 The FEIS must also supply accurate scientific data that would indicate the typical life span of western larch, ponderosa pine, and white pine tree species that are mentioned on page 11 of Chapter III.*

**RESPONSE: The draft "Synthesis and Interpretation for Terrestrial Information in the draft Pend Oreille Geographic Assessment (USDA draft in progress) states "Under northern Idaho climate and natural disturbance regimes, these early seral, shade intolerant tree species (western larch, ponderosa pine, white pine, white bark pine) are potentially capable of dominating sites for centuries." Historic stands of each of these tree species indicate that the longevity of these species can be several hundred years. Based on your comments, additional references have been added to the FEIS (Fiedler and Lloyd 1992; Fins, Byler, et al. 1992; Arno 1996; USDA 1971). Also, see the project file for Vegetation including cover type and structure by habitat type and the old growth inventory in West Gold.**

*031, 032, 036, 037, 038, 040, 041, 042, and 048.*

*Stands 633-01-013, 025, and 034.*

**RESPONSE: This level of detail was not necessary to support the analysis and conclusions displayed in the FEIS. However, the information is included in the project file under the Vegetation section.**

*219 Please provide a comparison of each stand proposed for cutting with the numerical canopy*

*growth management units and forestwide*

Insects and Disease

*219 Some species of trees, native insects, and disease organisms are discussed in the DEIS as "invasive" or somehow bad for the ecosystem. The DEIS's contentions that conditions are somehow "unnatural" runs counter to more enlightened thinking on such matters.*

**RESPONSE: The EIS only refers to the word "invasive" in one location in the document. This is on page DEIS III-30 in relation to noxious weeds.**

**change from referenced conditions and describes the reasons why. A definition of ecological sustainability is "maintaining the composition, structure, and processes of a system." When species are at levels outside their natural ranges, ecosystems are at risk.**

*219 The DEIS fails to disclose the degree that logging activities will interact with native insect and tree disease processes to result in further tree mortality.*

**past harvesting in West Gold drainage are good examples of this (see project file).**

*insects or root disease. The FEIS must supply accurate scientific analysis and expert agency*

*structural stage.*

**usually succumbing to some combination of root pathogens and bark beetles. References to this condition can be found in Rockwell (1917), USDA draft in progress, Byler and James (1997), Schwandt (1996), and Lewis (draft in progress).**

*219 DEIS at III-15 and III-16: apparently under Alternatives B and C, there would be no root disease mortality.*

## Historic Range of Variability

*219 The DEIS is confusing, stating on one hand that the area is out of the historical range of variability because of early 20th Century wildland fire on one hand, and out of the historical range of variability because of fire suppression on the other hand.*

**statement, along with a description of the effects of suppressing fire, shows that this disturbance mechanism and the resulting effects have changed from historic conditions.**

**the historic range across the larger landscape. One of the causes for this condition in the West Gold and Gold watersheds is the repeated high intensity burns that occurred. The DEIS does not say that the fires that occurred in the West Gold and Gold watersheds were outside the historic range. Pages III-11 and II-12 of the DEIS describe historic fire regimes and resulting forest structures at the larger scale assessments (of which West Gold is a part).**

*6116 The FS has not demonstrated that logging, road building and other habitat manipulation activities (including some activities proposed in this NEPA document) are themselves within the historical range of variability these forests evolved with over time. Many of the studies cited in the DEIS covered a very broad area and could not have been expected to predict appropriate historical ranges of variability for areas as small as this project area and the immediate vicinity (DEIS III-2…. The FS should use appropriate temporal scales and geographic scales to evaluate whether the forest here is within or not within the historical range of variability. For example, this is an area that historically had large-scale fires and reburns (DEIS III-3). Over what intervals did these events occur (or could they have occurred)? Other cyclical events over longer time periods? This failure to disclose methodologies used for estimating the historic range of variability would undermine the scientific integrity of the entire environmental analysis. The FS makes numerous claims regarding the Historical Range of Variability, but refuses to disclose to the public the basis for these claims…If the project intends to bring the forest closer to historic conditions, the NEPA document should have adequately described how the historic range of variability was determined.*

**RESPONSE: A comparison of the current and reference conditions of vegetation and disturbance across the West Gold watershed has been done and can be found in the DEIS in Chapter III, (see Forest Health and Productivity and Fire and Fuels sections). The conclusions for these comparisons can be found on pages III-12 and III-13 of the DEIS and under Current Conditions of Fire Risk on page III-40. A comparison of the current and reference conditions of vegetation and disturbance in Gold Creek can be found in the referenced Gold EAWS (USDA 2002). A comparison of the current and reference conditions of vegetation and disturbance in the Pend Oreille subbasin can be found in the referenced Pend Oreille Subbasin Assessment (USDA draft in progress).**

**For analysis of historic vegetation in the Pend Oreille subbasin, groups of vegetation specialists examined trends over time across these different historical sources. They analyzed and compared the various sources to uncover any biases or special historical circumstances that might have influenced particular historical information, and compared the historical narratives and data to hard evidence like historic photos, records of large forest fires in the last 100 years, and fire history studies that go back over 450 years. Results of successional modeling were also compared to analysis of historic data to uncover potential discrepancies. The historic data presented by the Forest Service represent the most likely mean conditions and historic range of variability over the last few hundred years, in the judgment of the vegetation specialists that analyzed all these sources. The list of historic inventories is included in the project file along with other literature cited.**

## *Hydrology*

*5200 On page III-95 of Chapter III (Benda and Dunne 1997) are cited on two occasions and (Kirchner et al 2001) is also cited. In Appendix E ... these authors are not listed. The sentence* *that mentions (Kirchner et al 2001) is not clear regarding the language "...episodic events from with...". The FEIS needs to include the literature citations for each of the authors and clarify the sentence regarding (Kirchner et al 2001).*

**RESPONSE: These changes have been made in the text and in Appendix E.**

*5200 There is no information presented on page 96 regarding the year road 278 was constructed and no information regarding the number of miles of road 278 that are within the analysis area.*

**RESPONSE: The construction of Road 278 occurred in 1980 and 1.7 miles are within the project area. The DEIS did not mention this road since there were no pronounced elevated spikes of sediment delivery from the construction of this road, as depicted in figure 18.**

*219 Why does the DEIS assume that future "Road maintenance activities would occur on an annual basis" (III-105) when in fact the FS has insufficient funds to maintain the excessive road network on the IPNF?*

**RESPONSE: Timber sale contract provisions require that annual road maintenance activities must occur during the tenure of the project. Following all project activities, road maintenance activities will continue on an annual basis on roads receiving high levels of use and when needed on other less frequently used roads.**

*219 The DEIS does not discuss why the "default designations" of beneficial uses are appropriate in this Priority watershed.*

**RESPONSE: The State of Idaho, Department of Environmental Quality is responsible for determining beneficial uses for individual water bodies. It is the Forest Service's responsibility to identify the beneficial uses generated by the state and to make sure all project activities do not impair these uses.**

*219 The DEIS assumes that the impacts of peak flows caused by fires are qualitatively the same as the impacts caused by later management activities, without any data to support such assumptions. Interactions of peak flows with existing aggradation levels and fine and coarse sediment conditions in stream channels make the impacts of peak flow increases vary considerably. The existing aggradation due to mining (III-92) changed the way Gold Creek responds to peak flows, for one example. And when fine and coarse sediment from roads accumulate in pools, the peak flows have different impacts on aquatic habitats than previous to road sediment inputs.*

**RESPONSE: The DEIS on page III-94 and III-95 explains how the data were generated and discusses the differences in peak flows between historic fires and past logging activities. Figure 17 is a relative comparison for peak flow increases associated with all past activities that have occurred within the West Gold drainage. Other information is used throughout the DEIS to explain how these past levels in peak flows have influenced channel dynamics.**

**Your assumption that all roads contribute sediment and that the sediment is stored in pools is not consistent with the findings from the watershed and fish habitat data on page III-101.**

*219 "Hydrologically, West Gold Creek is currently within its natural range of variability (sediment and water yield levels are within historic ranges and the creek is in good condition)." (I-4). What are the specific, numerical "natural ranges" of both sediment and water yield? What* *methodologies were utilized to measure sediment and water yield in order to make these determinations?*

**RESPONSE: The DEIS explains the methodology and the historic ranges for water and sediment yields on pages III-94 through III-96.**

*219 The DEIS does not illustrate important spatial concepts of land management by using maps, such as for sensitive soils overlaid with cumulative management activities, and vegetation types, and visual quality. The Cumulative Effects Map (III-110) is very rough and hard to make out.*

**RESPONSE: The DEIS did not include a map of sensitive landtypes since there were very few of these landtypes in the project area. A map is now included in the FEIS. Design features to protect watershed and fisheries related to sensitive landtypes were explained on pages II-17 and II-18 of the DEIS. The cumulative effects area map has been modified and should be easier to view.**

*391 Page III-97, Beneficial Uses. According to the DEIS…Gold and West Gold Creeks have default support designations of agricultural water supply, irrigation, water supply, wildlife habitat and aesthetics. This is true, but misleading. All streams in the state are designated for those uses. However, all streams are also designated for support of any additional beneficial uses that are attainable. Since both Gold and West Gold Creeks currently maintain cold-water biota and support spawning of bull trout and westslope cutthroat trout, they would have a default designation for support of cold-water biota and salmonid spawning.*

**RESPONSE: Thank you for the clarification. The FEIS has made the appropriate adjustments.**

*3764 Because the proposed increase [in water yield] is less than that caused by stand replacing wildfires (90% vegetation removal), it is considered in the DEIS to be within the historic range of variability, thus acceptable. Potential changes to low flow periods were not discussed…Although West Gold Creek may be resilient to adverse consequences of peak flows, it is part of a watershed, which has been severely impacted due to a variety of human activities. Increasing peak flows and sediment loading may not be directly detectable but do contribute to the cumulative effects of all activities in the Gold Creek watershed. If West Gold were an isolated watershed, this approach of mimicking the natural processes would be more acceptable.*

**RESPONSE: A discussion on low flows has been added to the FEIS. The DEIS on pages III-109 through III-115 explains the cumulative effects analysis in detail. Sediment yield and peak flow are relative indicators of potential hydrologic responses within a watershed with a specified series of events (fire, logging, road construction, etc). The percent change estimates are relative to the expected "natural" sediment and peak flows in watersheds with similar geology, climate and land uses. The approach to mimicking natural events within West Gold would show the same results within Gold Creek, since the historic 1880 fires burned the entire watershed (summary, pages 1 and 2). The cumulative effects analysis combines all the past, present and reasonably foreseeable activities that have occurred and are to occur within the Gold Creek watershed and compares that information to the proposed alternatives. Therefore, the approach does consider effects within the Gold Creek drainage.**

## WATSED Model

*219 The watershed analysis reflects extreme confusion on the part of the FS. Models such as*

*are not reconciled anywhere, making the analysis incomprehensible.*

**measuring sediment generated and reduced from the project. The measured effects for each alternative are summarized on page II-35.**

*5200 The FEIS must supply high quality information that will indicate the sediment routing modifications that are found in the WATSED model that have replaced the sediment routing flaws noted on pages 15 and 16 of the WATBAL Technical User Guide.*

**RESPONSE: The DEIS did use high quality information and will use the same information in the FEIS. The WATBAL model was not used as an analysis tool for this project.**

*channel responses that occur from peak flow events.*

**on pages III-88 and III-89.**

*watershed.*

**RESPONSE: Long-term monitoring stations are located in the lower reaches of West Gold and lower Gold Creek. These sites are on a map in the project file.**

*5200 The FEIS must indicate the State of Idaho BMPs that specifically relate to calibration of model and the year these BMPs were established.*

**practices are applied to all proposed activities within the scope of the project. When the effects analysis or model is run or calibrated, it incorporates these design features. The DEIS on pages III-88 and III-89 explains this quite thoroughly.**

*5200 The FEIS should indicate whether there have been any instances when the model {WATSED} significantly underestimated the amount of sediment loads that would be released as a result of logging and road building activities. The FEIS should also include information that will indicate whether it is possible for the model to significantly underestimate sediment yields.*

*6116 The WATSED model, used to estimate streamflow effects, consistently under estimates the effects of logging and roads on peakflows. The DEIS concedes that the Forest's own data indicate that WATSED consistently underestimates monthly peakflows. The DEIS fails to incorporate this in its discussion of likely effects on flows within the project area and downstream. In fact, the model's consistent underestimation of monthly peakflows is never discussed in the context of the alternatives' effects on channel conditions and processes and WCT habitat and populations… the DEIS fails to take into account the model's consistent bias toward underestimating peakflows in its analysis of cumulative effects on aquatic resources, including channel processes and conditions and downstream flooding... The WATSED model outputs are also inadequate to disclose the effects of the alternatives and cumulative effects on peakflows and resultant impacts on aquatic resources, because the model estimates changes in average monthly peakflow caused by logging and roads. The DEIS only discusses cumulative and alternative effects on these average monthly peakflows... The DEIS's discussion of the WATSED estimates of changes in average monthly peakflow further exacerbates the many significant defects in the model estimates. The DEIS fully fails to discuss the defects of these estimates in the discussion and disclosure of aquatic impacts that will be triggered by changes in peakflows caused by the project. The DEIS is devoid of a discussion of impacts of changes in peakflows on aquatic resources, based on the entirely reasonable assumption that: a) WATSED underestimates of effects on average monthly peakflows and b)?impacts on daily and instantaneous peakflows are likely to be greater than indicated by WATSED estimates. The DEIS compounds these defects by asserting that since the changes in monthly average peakflow are likely to be small, they will be immeasurable and, hence, of limited concern. This is a significant defect.*

**RESPONSE: The DEIS on pages III-88 and III-89 completely describes the assumptions and limitations of the WATSED model. Also, page III-104 references how recent validation runs have overestimated sediment loads and accurately estimated water yields. In addition, it is your assumption that WATSED underestimates peak flows without providing any valid studies or further information that leads you to this claim. The DEIS on pages III-107 through III-109 completely analyzes peak flow increases caused by the project on aquatic resources.**

**WATSED is an analysis tool that models watershed response relationships as a result of forest practices. The estimated responses are combined with other sources of information and analyses to determine the findings of probable effects.**

**The West Gold FEIS supplies the results by alternative for changes in sediment yield and peak flows. WATSED is not the only tool for estimating alternative effects in this project. Relative bed stability measurements, restoration activities and mitigation measures are also used to track changes.**

**Sediment yield and peak flow are relative indicators of potential hydrologic responses within a watershed with a specified series of events (fire, logging, road construction, etc). The percent change estimates are relative to the expected "natural" sediment and peak flows in watersheds with similar geology, climate and land uses.**

**Models such as WATSED are designed to address and integrate a number of conditions and organize the evaluation according to rule sets. For WATSED, rule sets were based on research, and data and analysis collected locally. The model also includes simplifying assumptions and does not include all possible controlling factors. Therefore, the use of the model is to provide one set of information that, when combined with knowledge of the model and its limitations, other models, data analyses, experience and judgment, must integrate all those sources to make the appropriate findings and conclusions.**

*5200 There is no information supplied on page 94 that described the historical flow information that was used as part of the modeling process ... the discussion did not describe the processes used to determine water yields or explain how they were calculated starting in the year 1848 ... If flow data from gauging stations has been acquired, the FEIS should indicate the years where flow data has been acquired. The FEIS must ... describe the process that was used to calculate peak flows starting in 1848 in the subwatershed for the years where actual flow data is unknown. The FEIS must also supply ... accurate data that describes the process used to calculate the sediment yield displayed in Figure 18 on page 96.*

**RESPONSE: To determine water yield and peak flows, the WATSED model requires estimates of average monthly flows. The values used for this analysis were derived based on variables associated with the West Gold and Gold Creek watersheds. They included drainage area, elevation, annual precipitation levels and watershed location. These values are part of the model and are referenced in the WATSED manual.**

*6116 The DEIS has several severe defects in its analysis and disclosure of cumulative effects on peakflows and resultant impacts on aquatic resources…DEIS is fundamentally flawed with respect to the analysis and disclosure of the alternatives individual and cumulative effects on peakflows. These defects are so serious that the analyses that are dependent on the peakflow analysis are also flawed.*

**RESPONSE: We disagree. Cumulative effects were well documented and disclosed on pages III-113 through III-116 in relationship to alternatives and resulting impacts to aquatic resources.**

*6116 The DEIS's analysis of cumulative effects on average monthly peakflows is further flawed because it does not include the effects of grazing. The DEIS fails to identify or even analyze grazing in the project area. The DEIS does not include any indication that grazing was factored into estimates of the cumulative impacts on peakflows. This is a fatal flaw.*

**RESPONSE: The DEIS did not cover cumulative impacts on peak flows from grazing activities because there is no grazing that occurs within the Gold Creek watershed. If you were to visit the project area, you would have recognized this.**

*6116 The DEIS fails to disclose that small headwater channels are especially vulnerable to increased erosion and sediment transport to downstream habitats caused by increased peakflows*

*(King,1989). The DEIS fails to adequately disclose that these impacts can be extremely significant, even if they are immeasurable.*

**RESPONSE: The DEIS on pages III-101 and III-102 describes the habitat conditions of West Gold Creek and headwater tributaries. Additional information from past effects are also discussed in the DEIS on page III-103 where past cutting units in the headwaters of West Gold Creek did not have protection buffers and the units were clearcut across the channels. These channels were surveyed and found to be in stable condition. Also, on pages III-107 and III-108, potential effects from water yield increases are discussed in detail and are adequately disclosed.**

*6116 WATSED estimates of peakflow changes do not address changes in daily and instantaneous peakflows from rain-on-snow events caused by logging and roads.*

**RESPONSE: Correct, we stated this in the DEIS on page III-88 and on page III-98. To clarify your comment, logging and roads do not cause rain-on-snow events. If you read the section on rain-on-snow on page III-98, this is explained.**

*6116 The DEIS also wholly ignores and fails to disclose the USFS's own research (King, 1989) on the accuracy of a peakflow model, similar to WATSED, in estimating increases in peakflows from logging and roads in Northern Idaho... The DEIS fails to disclose that King (1989) clearly noted that estimates of average monthly peakflows triggered by logging and roads are not adequate for estimating likely changes in channel conditions and sediment transport caused by logging and roads… Although the DEIS completely fails to disclose or discuss these important conclusions from the USFS's own research which are directly relevant to the project's likely impacts, King (1989) clearly indicates that the DEIS's estimates of effects on average monthly peakflows is inadequate for determining the effects of the alternatives and cumulative effects on peakflows and resultant impacts on channel erosion, bedload transport, sedimentation, bank erosion, WCT habitat, WCT survival, and downstream flooding impacts.*

**RESPONSE: The King 1989 report is not referenced in the DEIS because the findings from this report do not relate to the methodology used to measure peak flow increases for this project. This project used WATSED and local precipitation and streamflow records. The report summarizes findings on the Equivalent Clearcut Area or ECA methodology, which was not used for this project.**

## Sediment

*5200 The FEIS needs to define the term "diversion potential" as it relates to sediment production and movement in the West Gold subwatershed. The FEIS also needs to supply ... the sources of sediment that would be diverted.*

**RESPONSE: The FEIS better clarifies the term "diversion potential". The sources of sediment are associated with the road fill material (throughfill), which is explained on page III-99 in the DEIS.**

*5200 There is no high quality information or accurate scientific analysis on page 35 in Chapter II {chapter III?} that supports the contention all culverts would fail at the same time and therefore release 2,572 tons of sediment.*

**RESPONSE: It is not assumed in the DEIS that all culverts would fail at once. Thus, the issue indicator is the *risk* of failure in terms of tons of sediment, not tons/year. If all culverts were to fail over a period of time, there could be at least 2,572 tons of sediment contributed to stream channels. There could be the potential for additional road fill material to contribute sediment if a flood were diverted down a road.**

*5200 There is no information presented on pages 99 and 100 that describe the net associated risk calculations that resulted in a risk of 522.6 tons per year of sediment from one culvert failure at road crossing 278-1. The figure ... appears to be contradicted on page 96 where it is stated that the 6.4 miles of spur road off Road 278 resulted in a sediment yield of 32 tons per year ... the 32 tons per year is a significant reduction from 522.6 tons per year. The FEIS should also indicate whether a significant portion of the figure of 522.6 tons per year of sediment has been classified as being waste rock and spoil material from mining activities.*

**RESPONSE: The DEIS on pages III-98 and III-99 explains how sediment risks associated with drainage structures were calculated and determined. This information was not used in figure 18 nor in any estimates of sediment yields from past activities. Figure 18 depicts the estimated amounts of sediment yield from past activities within the West Gold drainage.**

*5200 The FEIS needs to supply ... tons of sediment that has been released from in previous years due to a culvert failure at road crossing 278-1.*

**RESPONSE: There is no documentation that culvert 278-1 has previously failed.**

*5200 It is stated on page 113 that over the long term, the stabilization of the cutslope would result in a substantial decrease in sediment delivery to the entire Gold Creek watershed. There is no information on the two pages regarding the year FSR 278 was constructed and no information supplied regarding the number of years the Slide has resulted in sediment entering Kick Bush Gulch and Gold Creek. ... FEIS needs to supply information regarding the year FSR 278 was constructed, the number of years the Slide has contributed sediment to Kick Bush and Gold Creek, and the estimated number of tons per year that has been released from the Slide.*

**RESPONSE: The FEIS now documents the estimated tons per year of sediment reduction with the stabilization of the Kick Bush slide.**

*219 The DEIS pretends that the impacts of roads are significantly reduced if they are "temporary" but ignores the fact that the biggest pulse of watershed damage occurs during the right after the road is built. Furthermore, it is impossible to tell within even two years when any road segments will be built.*

**RESPONSE: We disagree. The DEIS does not state that impacts of roads are significantly reduced if they are temporary. The DEIS explains on pages III-104 and 105, that the effects of sediment from temporary road construction would be lower than other roads within the watershed, due to the temporary road location, the design criteria required to construct the roads and the estimates of sediment delivery if roads were constructed. Figure 19 on page III-104 depicts the pulse of sediment that is attributed to the different action alternatives.**

*391 Table 5 presents the net associated risk of sediment delivery from road drainage crossings in tons of sediment (per year?) for Alternative A. The table indicates that Alternative B, C and D will result in reductions of sediment but no quantitative value is provided for comparison.*

*Presenting the tons of sediment expected from the other Alternatives would be helpful for comparing those Alternatives with No Action.*

**RESPONSE: The FEIS includes these adjustments.**

*5200 Nowhere in the DEIS is there any information that describes or displays the actual calculations that are required to be performed as part of the net associated risk assessment process. No information is supplied in the DEIS regarding where and when this process has been previously used on the IPNF. No information is provided in the DEIS that indicates the net associated sediment risk process has been shown to consistently supply high quality and accurate information for the actual amount of sediment reductions that occurred after culvert removal programs were completed on the Sandpoint Ranger District or the IPNF.*

**RESPONSE: The DEIS states on page III-89 that all calculations, data and information used to estimate net associated risk of sediment are located in the project file. The process has been used on other projects on the Idaho Panhandle National Forests, including the Myrtle-Cascade EA and the Douglas Fir Beetle EIS. The DEIS explains the methodology of the protocol on page III-89 and on pages III-98 and III-99. The process has been developed and peer reviewed by technical specialists within the scientific arena (Flanagan et al 1998). The process requires extensive field data gathering to estimate fill volumes, ditch lengths and diversion distances. It is a proactive tool that helps identify high-risk culverts that are poised for failure.**

*5200 The FEIS needs to ... explain how Alternative A's lack of improvements to the at-risk culverts conforms to the IFPA road regulations that require water quality and fish habitat to be maintained.*

**RESPONSE: According to the Idaho Forest Practices Act, (Title 38, Chapter 13, Rule 040, section 04a) we are conforming to the act under road maintenance activities in that the law only requires culverts to be functional. In general, additional Federal laws and mandates discussed on page III-86 and III-87 of the DEIS are stricter than the IFPA.**

*5200 The FEIS needs to supply information that would indicate whether culverts at any of the four high-risk crossings have been replaced with larger sized culverts as a result of r-o-s events that occurred in the analysis area after 1970.*

**RESPONSE: Adding this information to the FEIS would be irrelevant to the effects analysis and is not necessary for an informed decision. The data collected on the culverts is in the project file.**

### Rain-on-snow

*219 The DEIS does not adequately disclose the relationship of cumulative management activities to impacts of rain-on-snow events. Graphs such as Figure 17 are entirely devoid of rain-on-snow considerations.*

*6116 The West Gold DEIS failed to include an assessment to determine whether the proposed action would increase the potential for rain-on-snow event and what affects such events could have on the project area.*

**RESPONSE: The DEIS states on page III-94 and III-95 the relationship to water yield increase and the frequency and duration of rain-on-snow events. The discussion explains with references the dynamics of these events within the project area. The DEIS further explains on page III-98 the relationship between rain-on-snow events and watershed responses. If rain-on-snow events were modeled and depicted on figure 17, the spikes would probably be higher, which would result in higher peak flows, higher HRV and greater capacities and thresholds for stream channels to adjust to these events.**

### Best Management Practices (BMPs)

*6116 The DEIS fails to disclose whether the effectiveness of the proposed BMPs has been assessed and proven on the soil types and conditions similar to those within the project area. The DEIS has failed to adequately support that project mitigation measures will be capable of allowing for compliance with the Forest Plan, NEPA, and NFMA. Recent regional assessments have concluded that there is no reliable empirical evidence that the application of BMPs can reduce the impacts of logging, grazing, and road construction at the watershed scale to an ecologically insignificant level. Kattelmann (1996) concluded that BMPs do not eliminate the aquatic impacts of stream crossings. Megahan et al., (1992) and USFS and USBLM (1997c) stated that it was not possible to conduct logging activities without generating sediment to streams, no matter how carefully the activities where implemented.*

**RESPONSE: The DEIS on pages II-13 through II-22 describes in detail with literature and effectiveness ratings what BMPs have been assessed and proven to work for this project. These are even further discussed in appendices A and B, which go into greater detail on BMPs, Forest Plan Consistency and INFS standards and guidelines. Furthermore, on page III-104, figure 19 depicts that there would be a sediment increase from logging, temporary road construction and decommissioning and explained this throughout the entire effects analysis. The DEIS never stated that the project was going to eliminate sediment.**

*391 The DEIS does not describe what actions may be taken, if any, when BMPs are found to not be effective…The DEIS should clearly specify what water quality and other environmental standards will serve as criteria for evaluating the effectiveness of BMPs and what specific thresholds will be used to determine when additional environmental protections are warranted…No alternative BMPs are provided in case the currently identified BMPs prove ineffective. We recommend that you identify alternative, more stringent BMPs that will be used if protective thresholds are exceeded. We also recommend that you include in the BMPs a provision for a stop-work order for project activities when environmental controls fail to meet standards.*

**RESPONSE: The BMPs and design criteria described in the DEIS on pages II-13 through II-18 and appendices A and B have been evaluated and proven to be effective. Effectiveness monitoring conducted in the Idaho Panhandle National Forests and research studies referenced in the document verify their effectiveness. If they should fail or are improperly implemented, there are numerous checkpoints or inspections during the project that allow us to improve or remedy the situation. Timber sale contract provisions allow us to issue stop work orders or make modifications and adjustments to specific items associated with the project.**

**[In their follow-up letter, Idaho Fish and Game stated the following in reference to the comment above: *"As you explained in the field, USFS environmental and forestry staff will closely monitor***

***harvest operations to ensure that BMPs are adequate and properly maintained to meet water quality standards, as well as INFS and other protocols. Staff can immediately halt work and order corrections, including more stringent BMPs, whenever merited. We believe that, under these conditions, BMPs will be effective."*]**

## TMDL (Total Maximum Daily Load)

*219 The DEIS does not disclose how the proposed management actions are consistent with the TMDL. In fact, the TMDL isn't even described.*

*1916 The EIS states that Gold Creek is currently listed as impaired under Section 303(d) Clean Water Act for sediment and heavy metals. There is an approved TMDL (Total Maximum Daily Load) but the Forest Service still needs to develop an implementation plan for its portion of the TMDL. In the interim the Forest Service will design all activities to substantially reduce pollutants of concern, where feasible…. Please provide information on the status and schedule for developing this implementation plan. As you develop the implementation plan, we suggest following the approach and format for a Water Quality Restoration Plan as described in the Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters.*

*5200 The CWA discussion on page 87 included the following sentence "In the interim, any activities we undertake or permit on NFS lands will be designed to substantially reduce pollutants of concern, where feasible." The discussion of the FEIS of TMDL issues needs to have a more complete discussion of what is meant by the phrase "where feasible" as it applies to TMDL regulations… The FEIS should describe the enforcement provisions of the CWA that apply to TMDL implementation plans.*

*3764…The DEIS indicates that there would be a net sediment increase to West Gold Creek as a result of any action alternative. Although the proposed mitigation would reduce the potential for sediment delivery to the stream, it does not reduce the existing sediment load. DEQ supports this preventative maintenance type of work; however, our standards require that the existing load must remain the same or be reduced…In section 3.72c, other reasonably foreseeable actions in the watershed include mine site remediation and slide repair. Both activities would significantly reduce current sediment loading to the system. There may be an opportunity for pollutant trading if the USFS would like to consider that option. Requirements for pollutant trading are the that the sediment reduction project(s) must be completed and successful in sediment reduction, prior to the start of the sediment generating project…. To develop the pollutant trading option in the DEIS, a sediment budget must be developed which itemizes all expected sediment increases, both short term (5 years or less) and long term, along with realized or expected decreases and their timeframes.*

*391 The DEIS should include necessary conditions under which approvals may be requested/obtained from Idaho [DEQ] for the proposed increases in sediment for each proposed alternative. As we understand the TMDL process, justifiable short-term increases in sediment can be approved by IDEQ within clearly defined operational conditions and strict time frames. The DEIS should provide compelling evidence that the proposed increases in sediment are warranted.*

**RESPONSE: The DEIS on page III-87 describes the current status of the TMDL for Gold Creek and on page III-116 describes how the proposed management activities would meet the requirements of the TMDL.**

**The FEIS has included more discussion on the current status of the TMDL, recommendations from the watershed analysis and how they can be part of the implementation plan, and a sediment budget showing how we plan to use the Kick Bush Slide restoration project as pollutant trading within the Gold Creek watershed.**

### Monitoring

*5200 No monitoring information is supplied in the DEIS that confirms measurable sediment reductions occurred from previous culvert removal projects.*

**RESPONSE: The FEIS provides both internal and external references on the sediment reduction benefits of culvert removal.**

*5200 The monitoring discussion in the FEIS should describe the mandatory IPNF Forest Plan requirements that were to be performed for effects to fisheries and watersheds after completion of the timber sales that took place after 1987 in the analysis area. The monitoring discussion should also indicate whether mandatory Forest Plan monitoring requirements include the production of written Evaluations of monitoring data. The monitoring discussion should also include information to indicate the year when monitoring the Kick Bush Slide began and describe the number of written Evaluations that have been produced as a result of the monitoring the Slide area.*

**RESPONSE: The IPNF Forest Plan does not require that monitoring be performed after every timber sale. Monitoring is conducted on a sample basis. For watershed and fisheries, the plan shows on page IV-11 and 12what items are to be monitored and how often (items G-1 through G-4). This monitoring has been occurring and has been reported in various Forest Plan Monitoring and Evaluation Reports over the years.**

*391 We urge you to make a commitment to conduct long-term monitoring of these criteria [vegetation regeneration success, decommissioned roads, sediment erosion control success, and stream morphology]. In addition, we recommend that you add flow measurements to the criteria to be assessed so changes in base and peak flow resulting from the project can be evaluated. Because monitoring is critical to evaluate both immediate and long-term effects of the project in one of the most important bull trout strongholds in the Pend Oreille system, we recommend that an adequate portion of the funds generated from the sale be dedicated to long-term monitoring or that other sources of funding be committed to long-term monitoring before the project is approved.*

**RESPONSE: The DEIS on page II-25 through II-26 describes the long term monitoring planned for this project. The FEIS provides more details and explanations of the monitoring protocols and objectives.**

## *Motorized Recreation*

**Several people and the signers of the 106 form letters provided the following comments or similar comments regarding allowing ATV use on Road 2707A:**

*1428, 6375 We support seasonal limitations that allow use during the dry season and do not allow use when the route is excessively wet and would be damaged by ATV use. We strongly oppose the arbitrary use of dates to determine the closure periods. Since conditions in North Idaho vary greatly from year to year the closure should be based on the actual trail conditions and be varied as necessary to allow use whenever the trail is in a condition to sustain use… In addition, we oppose the closure of the route [2702A] at the end of August and believe that the route should remain available to ATV use as long as seasonal conditions permit. If this route is closed during hunting season, riders will be forced to use the main Bunco road which will also be experiencing increased use by hunters. This will significantly increase the potential for accidents and other safety related issues. This proposed closure will also significantly restrict the ability of unlicensed youth to access the area for hunting or other recreational pursuits.*

*6374 We would like to have the 2707A road open for ATV usage year round.*

*6373 I recommend that the 2707[A] road be gated to exclude full-size vehicles with pass-around for other-motorized traffic. I recommend not planning for a "shortcut trail" from the upper parking area to 2707[A] road. I recommend that the 2707[A] remain open for bypass travel as long as the Bunco Road is open. Since the hunting season increases both the full-size and the off-road vehicle traffic, the value of the bypass as a safety concern is even greater.*

**RESPONSE: As a result of these comments and further analysis, we dropped the timing restrictions on the proposed OHV route and propose to close it only during soft roadbed conditions. We've revised our analysis to reflect this change and it shows that, although there would be an effect to elk security, it would be so minor it would not compromise our predicted elk habitat effectiveness predictions (see the Wildlife Section in Chapter III). The soft roadbed closures, in addition to road maintenance activities that would occur with project activities would ensure that OHV use would not likely be erosive to the roads.**

*6375 I strongly support the proposal to allow the use of roads 2707A and 2707AA by ATVs. I believe that this alternative greatly enhances the ATV experience by providing an alternative route to the existing Bunco Road. This improves rider safety and allows parents to take their children on family rides since use of the routes will not require drivers licenses.*

*6373 The safety concerns of travel for motorcycles and ATV's on the Bunco Road is indeed a major concern. Any effort to provide or enhance safe and satisfying routes for off-road vehicles is a major concern. It appears that the 2707[A] road does have significant value in that area.*

**RESPONSE: As stated previously, our intent when putting forth this proposal was to accommodate the increasing OHV use in this area.**

*6373 In order to make viable and objective reviews of a potential trail it is necessary to first review that trail/road. The categorical closures of trails and roads makes that impossible because they are not open for review and study. Certainly we cannot expect the District to make persons of Larry Elliot's expertise available to the extent necessary for an aggressive review of the road/trail system…I would encourage the Forest Service to make some arrangements for permits for the purpose of individuals and organized groups to use some of the trails and roads to assist in developing a trail/road system that enhances the "ATV experience".*

**RESPONSE: Road Manager Larry Elliot attended the review of Road 2707A with your group so he could talk with you and be able to answer questions your group might have. We do provide temporary road use permits to individuals and groups to have access behind gates for purposes relating to Forest Service management activities when the use does not conflict with specific management restrictions of the area (e.g. use of gated roads in grizzly bear management or quality hunt areas). It is not a requirement that a Forest Service employee accompany the permit holders; however, arranging for the permit and key requires contact with the Forest Service and ensures we are aware of the reasons and necessity of use.**

*6374 We would like a trail whereby we can ride from Lakeview to Clark Fork and return to Lakeview on another trail.*

**RESPONSE: This is an issue that is outside the scope of this project and better addressed in discussions with the District. We encourage you to meet with us in the future about possible OHV opportunities.**

*391 We do not agree that opening Roads 2707A and 2707AA will achieve the desired goal of curtailing illegal use and in fact, may have the opposite effect of increasing wildlife vulnerability and disturbance. Also, ongoing and increasing illegal use in the area indicates that enforcement of current restrictions has been unsuccessful. It is reasonable to assume therefore, that illegal trails will be pioneered from Roads 2707A and 2707AA. These pioneered trails may be accessible from other access points and will increase wildlife disturbances and vulnerability. We recommend that… provisions should also be included in the project to make it a violation for ATV users to travel off designated roads anywhere within the Gold and West Gold Creek drainages. The proposal should also include provisions for adequate enforcement to ensure compliance, not only with any new year-round signs information ATV and snowmobile users of seasonal use limitations and restrictions on designated access roads/trails.*

**RESPONSE: As we explained to you the day we toured the project area, the illegal use that has been occurring has largely been from people driving smaller vehicles around gates. There is also an old logging road above Road 2707A that OHV users have been traveling down to get to the road. We have not seen evidence in the project area of pioneered trails, probably because opportunities to do so are limited by the steep topography in the area and the nature of the road locations. We are proposing to decommission the section of old logging road that the OHV riders have been using to illegally access Road 2707A and plan to place better barriers at the gates that would prevent people from driving around. In addition, we are planning to monitor the road once this new use begins to determine whether any type of illegal use is occurring. This additional monitoring item has been added to Chapter II.**

**[In their follow-up letter, Idaho Fish and Game stated the following in reference to the above comment: *"Based on observations of terrain surrounding the proposed road openings made during our site visit and by your commitment to continue to monitor use and restrict pioneering off designated trails, we concur with your assessment that the proposed road openings are not likely to have a significant impact on wildlife."*]**

*219 The DEIS does not explain why you can't fully analyze an alternative that would provide more law enforcement to curb illegal off-road vehicle and snowmobile use to deal with the perceived access problems.*

**RESPONSE: No public comments were received regarding law enforcement and illegal OHV use prior to releasing the DEIS. Although we mentioned that there is some illegal use occurring in the watershed, the use consists primarily of people riding OHVs around gates onto existing roads, and use of an old logging road above Road 2707A. The level of illegal use was not very clear in the DEIS and this has been revised. OHV use in this area south of Lake Pend Oreille has been increasing at a steady rate while law enforcement funding and staffing remains the same. Our objective in providing OHV access on Road 2707A was to provide an opportunity to accommodate the increased motorized use in this area since so many areas north of the lake are closed to protect Threatened and Endangered species.**

*6116 Motorized recreation is occurring in this area. In fact, the FS states that it is proposing to "accommodate increased ORV use"(DEIS I-5). We are concerned about illegal, improper and environmentally destructive use of motorized access routes that can occur here, as in other places where studies have occurred. The FS should analyze the impacts of motorized vehicles, roads and motorized use in the project area and analyze the potential for this project to contribute to future impacts from motorized vehicles, roads and motorized use…How are wildlife, water quality, soils, and recreational users likely to be affected by road density levels and motorized route densities facilitated by projects like these? There is not a section in the EIS for the evaluation of recreation. The FS should fully consider the adverse impacts of motorized recreation on other resources… What are the impacts of this logging, roadwork and other activities associated with this project on recreation, the recreational experience, the non-motorized recreational user, hunting, fishing or the economics of recreation? What are the direct, indirect, cumulative effects and connected activities associated with this project?*

**RESPONSE: There was no section in the EIS on recreation because it was not a substantive issue brought up during scoping. In addition, the West Gold project area is not a major recreation destination. The primary uses are hunting, berry picking, and access to a trailhead outside of the project area. Most visitors to the project area are passing through to other destinations. Logging and road work would likely be an inconvenience to those passing through, and would likely temporarily displace hunters and berry pickers that regularly use the area. For these reasons, recreation was not an issue fully analyzed. We have explained this in Chapter II under Issues Eliminated From Detailed Analysis.**

**The potential impacts of the new OHV route on other resources were considered in those resource sections of the DEIS that were relevant—primarily watershed and wildlife. We have also added a section on Roads and Access Management to better address the issue of changes in road management.**

*6116 What are the impacts of this project on road densities? Do these include all motorized routes that are being used or potentially being used? What are route density levels if these are taken into consideration?*

**RESPONSE: Road densities were considered in both the wildlife and watershed analyses. We also have discussed the miles of all roads and types of road access in the Roads and Access Management section that has been added to the FEIS. If any of the action**

**alternatives is selected, non-motorized road miles would be reduced by 1.4 miles. One new segment proposed for permanent use would be put into storage behind a locked gate—this segment amounts to no more than 0.3 mile.**

## *Noxious Weeds*

*219 We are unaware of any instances where logging projects have resulted in less noxious weed invasions – as far as we are aware, the opposite is what happens. Please cite any instances where the FS accomplished less, rather than more, noxious weeds from a logging project on the IPNF, if one exists.*

**RESPONSE: The DEIS does not state that logging would result in fewer weed invasions. The DEIS proposes ecosystem management activities that, because tree canopy removal and ground disturbance would occur, would at least temporarily increase the risk of noxious weed invasion (III-32 and III-33). Design features that are common to all action alternatives would be implemented to reduce the risk of new weed invaders becoming established and to reduce the risk of weed spread (II-23 and II-24). As desirable species seeded in disturbed areas fill their respective ecological niches, the risk of weed infestation would reduce overtime (III-32 and III-33).**

**The DEIS refers to results of weed surveys of recent timber sales where prevention measures of seeding and fertilization were successful at reducing the spread of existing weed infestations (II-24). As the DEIS states, the survey results are in the project file.**

*219 Given the present management regime in the area (assuming present levels of staffing and funding), what will be the likely noxious weed scenario in the West Gold project area in five years? In ten years? In 20 years? In 50 years? The FS simply does not have enough monitoring of its noxious weed treatment strategies to assume anything but out-of-control weed populations over the long term.*

**RESPONSE: Past treatment of Forest roads by contract included open roads in the project area. Areas treated in 2001 were seeded and fertilized as a follow-up treatment. Currently gated roads in the project area are planned for treatment in 2002. Because of the past investment in weed treatment in roads in the project area, weed management activities in the project area are likely to continue regardless of which alternative of the West Gold Project is implemented (including No Action).**

**Implementation of an action alternative would provide for the possibility of using KV funds for current weed management efforts. All action alternatives would require weed prevention measures to be implemented as part of the proposed activities. Records of past treatment in the project area are available at the Sandpoint District office. Funding levels for noxious weed management have increased since 1998 (as stated in the DEIS, this information is in the project file).**

**The time frame for measuring cumulative effects of proposed activities is ten years. The disclosure of the time frame for cumulative effects of project activities with regard to noxious weeds was unintentionally omitted in the DEIS. It has been included in the FEIS.**

*6116 The FS just throws up its hands and accepts that they will be carrying out management activities that inevitably cause more spread of weeds, disingenuously accepting the halfway* *mitigation measures in the DEIS a "prevention" strategy! …all prevention strategies assume weeds will invade, then prescribe expensive control methods of unknown efficacy after the fact.*

**RESPONSE: We disagree that all prevention strategies assume weeds will invade. While certain proposed activities carry with them a risk of weed spread, the mitigation measures specified in the DEIS (II-23 and II-24) are designed to prevent the introduction and establishment of new weed invaders while reducing the risk that existing infestations will spread into uninfested areas. Regarding the "unknown efficacy" of control methods, on page III-35 the DEIS refers the reader to the discussion on the effectiveness of weed treatment methods, as documented in peer-reviewed scientific literature, in the Sandpoint Noxious Weed Control Project FEIS (USDA 1998c). The DEIS incorporates that document by reference.**

*6116 …the analysis of the alternatives' impacts on invasive plants ignores everything except temporary road construction (DEIS III-32). Why is this?*

**RESPONSE: The DEIS discloses the impacts on invasive plants with regard to ground disturbance and canopy removal under Alternative B in Direct and Indirect Effects Common to Alternatives B and C and Direct and Indirect Effects Common to Alternatives B, C and D (DEIS III-32). Effects common to two or more alternatives are discussed together to avoid unnecessary repetition.**

*6116 The DEIS also assumes that the "risk of weed spread would decrease to present level" under the mitigation scenario outline in the DEIS (DEIS III-31). What is the scientific basis for stating this? Under all foreseeable conditions?*

**RESPONSE: The risk of weed introduction and spread into recently disturbed areas is greatest immediately after the disturbance occurs. As desired native and non-native species are established through seeding and fertilizing and natural regeneration, the ecological niches of available moisture and nutrients become filled, reducing the area available for invasion by weeds. The Sandpoint Noxious Weed Control Project FEIS (USDA 1998c), to which the DEIS tiers, states that an integrated approach to noxious weed management, including preventive seeding and appropriate herbicide use, is the most effective approach (USDA 1998c, p. IV-5). That FEIS provides peer reviewed literature to support the statement.**

*6116 On DEIS p. III-33, how is it determined what is a very low level, a low level, a moderate level or a high level? What are these levels in a quantitative sense? What monitoring or studies are the basis for these? How can effects be predicted with any reliability? What levels are acceptable? Can an invasive species outbreak move from a low level to a much higher level? Under what time frame or conditions?*

**RESPONSE: The discussion of cumulative effects related to noxious weeds is generally qualitative rather than quantitative. The definitions of the levels are provided on page III-33 of the DEIS; the terms very low, low, moderate and high are used to describe the predicted response of weed infestations to the proposed activities when implemented in conjunction with design criteria.**

**The determination of cumulative effects is based on knowledge of existing weed infestations in the project area, past and ongoing treatment efforts in the project area, results of weed surveys of recent timber sales in which similar prevention measures were implemented (the DEIS states these are included in the project file), findings presented in the Sandpoint Noxious Weed Control Project FEIS (USDA 1998c), and professional judgment.**

*6116 The EIS should analyze cumulative effects, not merely list them (DEIS III-134). Where, when and to what overall extent will they occur? How do the types of facilities and cumulative activities listed here lead to other cumulative activities, some ongoing, that are not listed here, such as improper motorized use or grazing in cutting units? What are the cumulative effects of any herbicide spraying that may result from any invasive species promoting activities planned here?*

**RESPONSE: The DEIS discusses cumulative effects with regard to past activities and events, current and ongoing activities and reasonably foreseeable actions on III-34 and III-35, below where they are listed. Incidences of improper motorized use in the project area cannot be predicted (regardless of the alternative that may be selected) and, therefore, cannot be analyzed in a meaningful way. Grazing in cutting units is not a reasonably foreseeable action and was therefore not discussed. Cumulative effects of herbicide spraying were addressed in the Sandpoint Noxious Weed Control Project FEIS (USDA 1998c) under the Adaptive Strategy for the Selected Alternative, Alternative C.**

*6116 How much of the monitoring and mitigation for invasive species is dependent on funding? How will the effectiveness of these activities be impacted under various funding scenarios? What is the IPNFs record of monitoring, mitigating and preventing the impacts of invasive species in the past?*

**RESPONSE: The DEIS states on pages III-31 and III-34 that weed management in the project area would likely continue regardless of which Alternative is selected (including the No Action Alternative). If an action alternative were implemented, those activities to be performed by the purchaser (DEIS II-24) would be required by contract clause, and the timber sale administrator would verify completion of the activity (DEIS II-26).**

**Before 1998, the Sandpoint Ranger District did not have a comprehensive weed management program. Since that time, appropriated funding has increased, and the number of acres treated has also increased (as the DEIS states, information on the increase in funding for noxious weed management is in the project file).**

## *Roads*

*1428 We believe that, in many cases, temporary roads can provide access opportunities for future recreation and management uses. Roads should be stabilized at the completion of the activity but we do not feel that complete recontouring of the road is always necessary. Road storage may be more appropriate. We would like to see more discussion on the existing condition of these routes… The proposed road storage also appears to be reasonable in this case. However, we would like to see a more detailed analysis of why these decisions are being made. We were unable to find any discussion whether these routes could be designated as trails for motorized or non-motorized access. These routes could be converted to trails and still meet the desired water* *quality objectives. We believe that all road decommissioning or storage decisions should include an analysis of the potential conversion of the route to a trail for multiple use access.*

**RESPONSE: Based on the large number of comments we received on roads and access issues we have added a section on Roads and Access Management to the FEIS. This section discusses the management and uses of roads in the watershed and provides the reasons for keeping roads open or closed. When newly constructed roads are decommissioned, the reason is typically because the road is no longer needed for future management, so decommissioning it eliminates maintenance costs and resource risks, and it begins to restore the productivity and hydrologic processes that were interrupted when the road was built. To convert it to a trail would mean adding another trail to a system that already has a tremendous backlog of other trails needing work and maintenance.**

*219 [t]he DEIS fails to disclose when these 27.9 miles of roads will need their drainage structure and surfaces fixed again, what it will cost, and where the money will come from.*

**RESPONSE: A roads analysis was completed for this project as is required by Forest Service Manual 7700, and it provided the information necessary to support the proposed road work in this project. The roads analysis is not part of National Environmental Policy Act requirements and for that reason was not included in the DEIS. As stated on page I-8 of the DEIS, the analysis is done** "to help ensure that additions to the National Forest network of roads are those deemed essential for resource management and use; that, construction, reconstruction, and maintenance of roads minimize adverse environmental impacts; and finally, that unneeded roads are decommissioned and restoration of ecological processes are initiated" (36 CFR Part 212). **For the existing roads, the analysis identified the factors mentioned above for each road, including recommendations for decommissioning the segments proposed. Culverts that are scheduled to be replaced should not need to be replaced for several decades. Most of the maintenance scheduled is to prepare the roads for the larger truck traffic; otherwise, most of these roads are in good shape and not in need of a lot of continuous maintenance.**

*391 We recommend that you consider decommissioning and removal of the roads as soon as they are no longer needed, rather than waiting until the end of the project…we recommend that the roads be decommissioned as soon as activities related to the project have been completed in each unit. We also recommend scheduling all project activities to minimize the duration of the project impacts.*

**RESPONSE: We included designs to decommission roads as soon as they are no longer needed in Chapter II of the DEIS (see the paragraphs titled Features Related to Timing of Activities in the section Features Common to Alternatives B, C and D).**

## *Soils*

*6116 What are the current soil conditions in the project area?*

**RESPONSE: The current soil conditions were described in the DEIS and are also in the FEIS in the Affected Environment section.**

*6116 What are the potassium levels?*

**RESPONSE: The potassium levels were not measured. Based on potassium deficiencies found in similar geologic formations in the Idaho Panhandle National Forests, we are assuming that potassium levels are deficient and therefore are proposing mitigation measures recommended by the Intermountain Forest Tree Nutrition Cooperative to retain as much potassium on the site as possible (see Chapter II, Features Designed to Protect Soil and Site Productivity.**

*219 A major deficiency of the DEIS is that it fails to disclose the total number of acres within the Project Area or within any other logically defined cumulative effects area that have detrimental soil damage caused by poor past logging practices.*

**RESPONSE: This information was not included in the DEIS because it was not relevant to our analysis. We stated on page III-60 of the DEIS, "Since direct and indirect effects from soils do not extend beyond areas actually impacted, the cumulative effects analysis area for the soils resource consists of the areas proposed for soil-disturbing activities within the project area where previous management activities have occurred."**

*6116 What is the compaction percent of the West Gold Creek and Gold Creek areas from logging in the 1970's, 1980's and 1990's? Does that figure meet FSM guidelines and IPNF Forest Plan Standards? What are the mitigation measures that are designed to meet these guidelines?*

*219 The DEIS discloses there has been extensive logging and mining activities in the Gold Creek watershed. So it is unreasonable and illogical to assume, as the DEIS does, that the previous logging activities have resulted in no damage with only silviculturist walk-thru surveys.*

**RESPONSE: Information on past logging in areas where treatment is not proposed was not queried for the West Gold soils analysis because it was not relevant. As stated in the soils analysis, detrimental impacts of past harvest activities were considered where proposed activities are occurring in the same activity area so that cumulative effects can be determined. Only one unit proposed for treatment, Unit 30, has been previously logged. The cumulative effects of our proposed activities in that unit were included in the DEIS and are also in this FEIS.**

**The soils characterization in the Pend Oreille Geographic Assessment (USDA draft in progress) shows that the amount of the West Gold drainage that is currently detrimentally disturbed is 3 %. That figure for the entire Gold Creek Watershed is estimated to be 4 %. FSM and Forest Plan standards and guidelines are discussed in the Soils Regulatory Framework section. Again—requirements specify that impacts be measured per "activity area."**

*6116 The DEIS indicates that the project area has been logged before, presumably leaving detrimental soil conditions and possibly decreased soil productivity but only calculates "six acres of past activities" into the spreadsheet that was used to for soil disturbance (DEIS p. III-65). It is hard to believe that only six acres have been previously logged within three decades in this area.*

**RESPONSE: The six acres of past activities is the only location within the project area where past logging and proposed treatments are in the same activity area. Although past**

**logging has occurred in the drainage, all other stands proposed for treatment have not been logged previously.**

*6116 Alternative B proposed 11 helicopter landings which is equivalent to 11 acres of irretrievable impacts. This is quite contrary to the DEIS's claim that helicopter logging systems have no detrimental effects to soils.*

**RESPONSE: Although the map in Appendix I shows 11 helicopter landings for Alternative B, we stated on page III-63 of the DEIS that these are all potential locations "placed on each map for planning and analysis purposes; however, about a third of those shown would likely not be constructed." We do this so we can analyze for the greatest potential effect. The statement regarding helicopter yarding having no detrimental impacts was in relation to impacts within units. Although we did analyze the impacts of helicopter landings occurring outside of units, it was an oversight to not discuss those impacts within the overall context of helicopter yarding systems. We have reworded our analysis of helicopter logging I the FEIS to reflect these concerns.**

*219 The DEIS also fails to cite monitoring results showing the FS is correctly implementing the Graham et al. 1994 coarse woody debris guidelines in the IPNF.*

**RESPONSE: This information has been corrected in Chapter II under Features Designed to Protect Soil and Site Productivity. Monitoring results from 1998, 1999 and 2000 monitoring reports show that coarse woody debris guidelines are being met on about half of the units monitored. In the 1998 report, an area not yet logged in the Priest Lake District showed proposed units lacked the recommended amounts of coarse woody debris prior to logging. This was due to the area experiencing past wildfires and very hot reburns that consumed material that would otherwise have remained. The Idaho Panhandle National Forests has held workshops on coarse woody debris retention and we are striving to improve in this area.**

*219 The DEIS does not disclose the efficacy of the mitigation measures proposed for implementation where logging in sensitive soils, steep soils, and those with high mass wasting potential.*

**RESPONSE: We are unsure of the mitigation measures you are referring to. As described on page III-58 of the DEIS, there is only one unit (unit 6) that shows high potential for mass failure and moderate potential for surface erosion. The landtype map unit for this area is 106 - glaciated stream breaklands and metasedimentary belt geology. Recommendations for timber management on this landtype call for helicopter or cable (skyline) yarding systems (see Landtype Unit Descriptions, project file). Proposed Unit 6 is planned for selective harvest (thinning) using skyline yarding. In addition, no new road construction is planned on sensitive landtypes. For these reasons, there are no specific mitigation measures proposed.**

*219 The FS often claims that helicopter yarding will cause no damage to the soil. But since several logs are lifted at once, before they clear the ground they drag. And when they drag, they cause soil compaction and displacement, and disturb and damage other vegetation. The DEIS states that skyline yarding will result in 2% or less detrimental impacts, but this differs* *substantially from other research. Alexander and Poff (1985) researched literature and found that as much as 10% to 22% of a logged area disturbed by skyline logging.*

**detrimental impacts comes from our own monitoring of skyline (also known as "cable") systems sampled on the Idaho Panhandle National Forests since 1990. These samples resulted in 0% to 2% detrimental impacts for skyline and helicopter systems; the 2% resulting from when logging occurs in conjunction with fall burning.**

*6116 We also note that the roads, skid trails and helicopter landings that lace the area are not to be included in the analysis. The failure to disclose this information about the site-specific condition of the soils violates the Idaho Panhandle Forest Plan.*

**were recorded to be about 11% in that unit. There are no helicopter landings in the West Gold area because this area has never been helicopter logged before.**

*6116 How was your "field surveys" done (DEIS p. III-55)?*

**noted in the FEIS.**

*somehow the FS assumes under the logging alternatives that such impacts would never occur.*

**RESPONSE: The discussion about the effects of wildland fires is listed under "Effect Common to <u>All</u> Alternatives" on page III-60.**

*219 Under 2.46j on II-21, what specific monitoring is the FS relying upon to determine the effectiveness of the mitigation measures [for tractor logging]?*

**has been changed to reference Niehoff 2002, which provides a more comprehensive list of monitoring of detrimental disturbance. You received this reference recently through your Freedom of Information Act request.**

*6116 Will soil compaction from heavy machinery further compact existing conditions?*

**RESPONSE: Compaction is anticipated to occur on areas such as roads, tractor logged units and landings, but only one area has been previously logged and it is proposed for helicopter logging. As a result, we don't anticipate there being cumulative effects of compaction there or anywhere else in the project area.**

*219 Nowhere does the DEIS disclose a numerical estimate of the cumulative percent of detrimental soil impacts the logging, burning, and road building activities would cause in each specific treatment unit (Activity Area), and including past impacts.*

*6116 The DEIS completely fails to fully, or even partially analysis current soil conditions and cumulative effects of the activities proposed in each alternative.*

**include a column for cumulative effects.**

*satisfactory condition. This will not be met when section 3.53d states that "soil disturbing management practices would strive to maintain at least 15% of the activity area in a condition of acceptable productivity" (DEIS p. III-65).*

**RESPONSE: This section was written incorrectly and has been corrected. It was intended to state that soil disturbing management practices would not exceed 15% detrimental conditions and strive to maintain 85% of the activity area in a condition of acceptable productivity.**

*making the EA's soil analysis fall far short of that required by NEPA. Also, no private activities in the watershed are discussed, a major and serious omission.*

**RESPONSE: On page III-59 of the DEIS, we described the methodology for our effects analysis. Anticipated effects are described starting on III-60. Effects of ongoing and reasonably foreseeable activities are discussed on page III-65. Private activities in the watershed are not discussed because there is no private land in the project area.**

## *Threatened, Endangered and Sensitive Plants*

*6116 The FS used "guilds" for several groups of plant species (DEIS II-22). What species are included in each guild? Does the use of guilds in any way arbitrarily gloss over variations in species, habitat requirements, sensitivity to disturbance or other factors that may be relevant to* *this analysis? Are all species in each guild representative of the habitat conditions described in the EIS?*

**RESPONSE: The DEIS states that a list of TES plant species and Forest species of concern and habitat guild descriptions is included in the project file (DEIS III-21). Sensitivity to disturbance is not one of the factors used in assigning species to habitat guilds. The list of rare species includes the habitat guild (or guilds) considered to be suitable habitat for the individual species. The DEIS also states that rare moonworts have a broader habitat range than other moist forest species (DEIS III-24).**

*219 What are the "moist forest guild" (III-22) Sensitive plant species that the DEIS does not discuss?*

**RESPONSE: As disclosed in the DEIS on page III-21, the list of moist forest guild species is included in the project file. It includes deerfern, maidenhair spleenwort and ground pine, as well as sensitive moonworts.**

*219 The DEIS inadequately tiers to previous NEPA documents in terms of the ongoing herbicide use on the IPNF…The DEIS does not state whether or not herbicide spraying will be preceded by Sensitive plant surveys…Therefore the cumulative effects on the viability of Sensitive plant species in the West Gold project area were not analyzed.*

**RESPONSE: On page II-23 of the DEIS, under Features Designed to Protect Threatened, Endangered Sensitive and Rare Plants, we state "TES plant surveys would be conducted as needed prior to weed treatment activities." The requirements for sensitive plant surveys and protection of sensitive plant populations from weed treatment activities are described in the Sandpoint Noxious Weed Control FEIS (USDA 1998c). The DEIS references that document on page III-27.**

*219 The DEIS does not indicate that Sensitive plant surveys would be undertaken by qualified individuals at the proper timing in all areas to be disturbed by project activities.*

**RESPONSE: The DEIS discloses that sensitive plant surveys were conducted in areas proposed for treatment that contain suitable habitat for rare plants (DEIS III-21). As stated in the DEIS, the results of these surveys are in the project file (DEIS III-21). A professional botanist conducted the surveys. Her name is included among the list of preparers in the Final EIS.**

*219 The DEIS does not provide support for its assumption that Sensitive plant populations impacted by project activities or other management actions will remain viable.*

**RESPONSE: All documented sensitive plant occurrences would be buffered from project activities (DEIS III-24). As stated in the DEIS, impacts to undetected moonworts may occur in marginal habitat for the species (DEIS III-24 to III-25). The "may impact individuals" determination is a conservative one that addresses the *occasional* occurrence of sensitive forest moonworts in marginal habitat and highly disturbed sites such as maintained roads (DEIS III-24 and III-25). The DEIS further states that negative survey results reduce the risk of populations going undetected, based on past monitoring (DEIS III-25). As stated in the DEIS, areas proposed for treatment in general have low potential as sensitive plant habitat (DEIS III-21).**

*6116 Please provide supporting documentation to any conclusion of how the project will fail to affect TES and MI [plant] species.*

**RESPONSE: There are no plants designated as MI (Management Indicator) species. The DEIS states that no federally listed Endangered plant species are known or suspected to occur in the IPNF (DEIS III-20). It was determined that no suitable habitat for any Threatened plant species occurred in the project area (DEIS III-20). The DEIS does not state that the project will not affect sensitive species (III-27). Only sensitive moonworts have been found in the project area, none in proposed harvest units (DEIS III-21). The DEIS states that all known sensitive moonwort occurrences would be buffered from project activities (DEIS III-24). More detailed information is presented in the TES plants report in the project file, as stated by the DEIS on page III-22.**

*6116 Thorough plant surveys, over an appropriate period of time, should take place…The analysis should disclose whether any factors could have affected the ability of surveyors to detect applicable species and should disclose whether any species could have been present, but may have been undetected.*

**RESPONSE: The DEIS discloses that sensitive plant surveys were conducted in areas that contain suitable habitat for rare plants, including such areas proposed for treatment (DEIS III-21). As stated in the DEIS, the results of these surveys are in the project file (DEIS III-21). A professional botanist conducted the surveys. Her name is included among the list of preparers in the Final EIS. The DEIS states that sensitive moonworts may have been overlooked due to their small stature and the fact that individuals may not appear aboveground every year (III-24). The DEIS further discloses that, based on past monitoring (Penny 1995), moonwort populations are generally represented by at least some aboveground plants every year (III-25).**

*6116 The FS states that a combination of methods were used to ascertain impacts to rare plants (DEIS III-21). How site-specific were these? How thorough? Were all methods up-to-date?*

**RESPONSE: Prefield review was conducted using the most up-to-date information, including the Idaho Conservation Data Center's (ICDC) most recent Element Observation Records for the West Gold area. The records are updated annually and are based on rare plant observation forms submitted by various state, federal and other botanists. Since the DEIS states that analysis was conducted using results of surveys conducted for the project (DEIS III-23), the analysis was site-specific. Given the stated overall low potential of most proposed harvest units to support sensitive plants (DEIS III-21), the analysis was thorough in addressing in detail only those species known to occur or with known suitable habitat in the project area as verified by the field surveys.**

*6116 The DEIS states that " no detailed discussion and analysis is necessary" for several species listed on DEIS III-22, and limits detailed discussion of these species. Why? Does the FS consider microhabitat conditions in the project area in which some of these species could be found?*

**RESPONSE: The DEIS states that rationale for no further analysis for species or habitat presumed not to be present within the affected area is included in the project file (DEIS III-22). The presumption was based on pre-field review and on field survey results.**

*6116 In addition, the FS eliminated several other groups of species because a "supporting rationale" is provided (DEIS III-22). Are scientifically based rationales provided in all of these cases? Are possible micro-habitat conditions in all portions of the project area considered? The DEIS never states that moonwort species can't exist in the project area or cutting units (DEIS III-23), but fails to fully consider them. What are the effects of the project on these species?*

**RESPONSE: Only one other group of species (the aquatic habitat guild) was eliminated from detailed discussion, with supporting rationale presented on page III-22 of the DEIS. Field surveys confirmed that there was no other aquatic guild habitat in the project area apart from that identified in the pre-field review.**

**The DEIS discloses that sensitive moonworts *were* found in the project area, but not in any areas proposed for treatment (DEIS III-21). The DEIS analyzes the effects of all alternatives on sensitive moonworts on pages III-24 to III-27.**

*6116 The DEIS implies that aquatic habitat is protected (DEIS III-22 & 24). Is this true if once all activities associated with this project and all subsequent activities that could occur as a result of this project are considered?*

**RESPONSE: Yes. The DEIS discloses that aquatic guild habitat, as defined in the habitat guild descriptions in the project file, would be protected from all activities associated with the action alternatives (DEIS III-22).**

*6116 The DEIS should analyze the effects of invasive plants on the viability of TES species that could be potentially found in the area.*

**RESPONSE: Because no disturbance activities are planned in or adjacent to any known sensitive plant populations, there would be little risk of weed infestation in those populations resulting from implementation of any of the action alternatives. This clarification is now included in the FEIS.**

*6116 On DEIS p. III-26 et seq., how is it determined what is a very low level, a low level, a moderate level or a high level? What are these levels in a quantitative sense? What monitoring or studies are the basis for these? How can effects be predicted with any reliability? What levels are acceptable?*

**RESPONSE: The determination of levels of cumulative effects to TES plants is generally qualitatively rather than quantitatively derived. The definitions of the levels are provided on page III-26 of the DEIS; the terms very low, low, moderate and high are used to describe the predicted response of rare plant populations to the proposed activities when implemented in conjunction with design criteria. As stated in the DEIS on page III- 23, 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.**

**Monitoring of known rare plant populations would normally only be conducted when treatment activities would occur within those populations or if treatment activities would have a high potential for indirect effects to the populations. As disclosed in the DEIS, no sensitive plants were detected in proposed treatment areas during the surveys, and proposed treatment areas contain low to marginal potential to support any rare species. All**

**documented sensitive plant populations would be buffered from project activities (DEIS II-23 and III-24).**

## *Visual Quality*

*6116 All sensitivity level 1 and 2 viewpoints and corridors should have been identified and effects to these areas should have been clearly analyzed using on-the-ground analysis and other techniques. How does existing aesthetic quality and the proposed activities effect the experience of people who visit this area? Was the FS's Scenery Management System incorporated into this analysis? How?*

**RESPONSE: Sensitivity level 1 and 2 viewpoints were described in the Draft EIS on page III-119 and in the Final EIS. The effects of alternative implementation are described on pages III-119 through III-121 of the Draft EIS. As far as visual quality aesthetics go, we are making an attempt to rehabilitate those areas that do not currently meet VQOs (square clearcuts) and achieving the VQOs elsewhere. The FS Scenery Management System was used as described on page III-117 and 118 of the Draft EIS.**

*6116 The DEIS should have discussed the impacts of other types of aesthetic quality in addition to visual quality. For example, the project could affect noise levels, but these are not analyzed.*

**RESPONSE: Noise was not an issue brought up during our scoping process. None of the closest landowners mentioned this as a concern despite the fact that there has been recent logging in the Gold Watershed from the Packsaddle project.**

*6116 We are concerned that rehabilitation and modification VQOs in the project area may not conform with NFMA. The FS needs to demonstrate that visual quality in the project area conform with the IPNF Plan and NFMA before undertaking more activities that may negatively affect VQOs.*

**RESPONSE: The IPNF Forest Plan identified the Visual Quality Objectives for the West Gold project area as partial retention and modification. The IPNF Forest Plan Visual Standard stated on page II-25 directs us to "*Meet adopted visual quality objectives. Exceptions to this may occur in unusual situations; these will be identified through the project planning process involving an ID team. Examples of some exceptions are those areas where past management practices make it impractical to meet the adopted visual quality objectives (VQO), and large areas where the mortality rate for timber is very high.*" Since the existing square clearcuts within the project area do not meet the adopted visual quality objective and adjacent areas contain high mortality, rehabilitation has been temporarily assigned to these areas. It is important to note that rehabilitation is not a VQO but a short-term management alternative used to restore landscapes until the assigned VQO can be achieved.**

*6116 The DEIS does not document what areas have partial retention, retention and other VQOs and does not analyze the site-specific impacts of the project (and cumulative effects) on aesthetic quality (DEIS III-116 to 122). What is rehabilitation (DEIS III-118)? What is the FS's basis for providing a rehabilitation VQO here? Where and how is rehabilitation defined in terms of aesthetic quality? What authority does the FS have to conduct such management? How are you going to assure that the project will achieve the stated objectives?…Where is rehabilitation described in the Alternatives description section? Does it fall under selective cutting (DEIS II-7)* *or under regeneration cutting, which removes most of the trees in the cutting unit (DEIS II-7). The DEIS is unclear about the impacts of rehabilitation treatments. Impacts on aesthetic quality cannot be ascertained.*

**RESPONSE: The IPNF Forest Plan does not identify any visual quality objectives of retention within the West Gold project area. A map identifying the VQOs is located in the project files. This map identifies site-specific areas of partial retention and modification that have been identified by the IPNF Forest Plan. Aesthetics as related to scenery management has been analyzed and the impacts are discussed in Chapter III of both the FEIS and DEIS. The bottom line is that we intend to meet the VQO objectives for areas of partial retention and modification. In the area of rehabilitation we intend to move towards restoring the IPNF visual quality objective of partial retention and modification. Rehabilitation is described on page III-118 of the DEIS as well as the Final EIS. The reason for giving a rehabilitation management alternative to a given area is discussed in 3.82b Existing Condition. Specifically the existing power transmission corridors, towers, and square clearcuts do not meet the assigned VQOs.**

**As discussed in a previous response, the term "rehabilitation" is not a VQO but a short-term management alternative used to restore landscapes until the assigned VQO can be achieved. Both types of cuttings you mention (selective and regeneration) can be used to achieve the desired results over time. The type of past management practices that make it impractical to meet the adopted visual quality objectives (VQO), or large areas where the mortality rate for timber is very high would dictate the type of cutting needed to move the area toward the assigned VQO. In the case of West Gold, regeneration cutting is the vegetative prescription that is prescribed to help move those areas not meeting VQOs to their assigned VQO. Monitoring will be the tool used to ensure that VQOs are achieved. Past monitoring on the Sandpoint Ranger District has demonstrated our ability to consistently meet visual quality objectives.**

**Alternative effects are described on page III-119 to 121 of the Draft EIS. Paragraph 4 under Section 3.83c in the DEIS discusses the variety of cutting prescriptions that could be used and their potential effects. The Final EIS has removed the term "rehabilitation cutting" from this paragraph since the term was used incorrectly.**

*6116 We do not understand why road construction is considered to have a short term effect on visual quality. How is this demonstrated? (DEIS III-121). What adverse effects would occur? What of the impacts of skid trails, helicopter landings, log landings, and other logging infrastructure?*

**RESPONSE: The effects of road building are discussed on page III-121 of the Draft EIS as well as in the Final EIS. Included in this discussion is an explanation of why these temporary roads would have a short-term effect on visual quality. Section 3.83c 2, states "The roads as proposed would not be visible to any sensitivity level 1 or 2 viewpoints except for two small areas in units 23 and 24 as seen from Road 278. These two roads are scheduled to be decommissioned and would meet the short-term and long-term VQOs assigned". What we are saying is that for the most part these roads are not visible from the identified viewpoints, which is how our determination of effects is made. Landings and skid trails are incorporated into our visual quality analysis.**

*6116 How does the FS ensure that cutting units "would repeat the form, line, color, and texture of natural occurrences common to the surrounding areas "or would otherwise not have significant adverse affects to aesthetic quality (DEIS III-120)? Who is making these judgments? What adverse effects would occur?*

**RESPONSE: Our visual resource team member, who has completed and is certified in our visual resource management program, makes these determinations. He's had this certification since 1985 and has been heavily involved in our planning and on the ground management since that time. We have been monitoring our planned versus implemented visual quality objectives since 1988. Forest Plan monitoring reports since 1988 demonstrate the Sandpoint Ranger District has successfully implemented Forest Plan visual quality objectives.**

**It is important to recognize that the cutting units are designed to meet the given VQO. For those areas that have been assigned the goal of visual rehabilitation it may not be possible to achieve the prescribed VQO immediately. The objective is to move them in the direction to meet the assigned VQO. We do not expect any adverse effects. As we mentioned above, we design all cutting units to meet the Forest Plan visual quality objectives.**

*6116 The FS does not explain what constitutes an "undesirable visual impact" (DEIS III-118), how this is objectively defined, how the project will affect this objective, or what other steps the FS will need to take to assure that the project achieves a natural appearing landscape.*

**RESPONSE: We have clarified our discussion of "undesirable visual impact" in the Final EIS. As discussed in the previous comments we have monitored all our sales for VQO Forest Plan Consistency and have demonstrated our ability to meet these objectives.**

## *Wildlife*

*6116 The DEIS neglects to provide the kind of detailed analysis NEPA requires for neotropical migrant birds. The DEIS must incorporate a detailed analysis for these birds.*

**RESPONSE: Forest land birds (including neotropical migrant birds) represent a wide variety of species with varying habitat associations. Some species are associated with older forests while others are associated with younger forests; some species prefer moist forest habitats, while others prefer drier habitats. The most prudent approach to manage for forest land birds is to maintain a diversity of habitats and to place particular emphasis on protecting and enhancing those habitats and species which are currently under-represented and/or declining. Because forest treatments would alter habitat conditions and afford varied habitat associations, forest land birds will be carried forward into the Environmental Consequences section.**

*6116 The DEIS presents insufficient rationale for failing to analyze project impacts on northern goshawk habitat and population viability. The DEIS fails to even commit to surveys for goshawks in the treatment units, and if one were found protecting active nest trees and stands in the areas to be logged or burned. The DEIS completely fails to assure protection of breeding goshawks in the project area. Crocker-Bedford, 1990 found that northern goshawk breeding success declined significantly following logging in the home range.*

**RESPONSE: Due to the small amount of suitable Goshawk habitat in the project area and**

**73 and III-74 of the DEIS and are still included in the FEIS.**

*black-backed woodpeckers.*

**approach that we use is to assume presence based on forest structure and habitat characteristics, regardless of whether species were detected with surveys. Using such an approach we can protect habitat that exists and provide habitat where it is needed.**

*219 The DEIS mentions "recent studies" (II-19) regarding retention of snags and green tree replacements--which studies are these?*

**sentence referring to the "recent studies" for clarification.**

*219 The DEIS provides no plan as to how viable populations of old growth and cavity nesting species will be maintained on the landscape, while logging trees that would otherwise provide for such species.*

**(e.g. chipping sparrow, Williamson's sapsucker, hairy woodpecker, pine siskin).**

*219 The DEIS does not indicate what keeps grizzly bears, fishers and other ESAs listed, MIS, and sensitive species from using the habitat in this area--well within their historical ranges.*

**ecological processes. The expectation would be to contribute to the distribution of species by promoting favorable habitat conditions (see flammulated owl, black-backed woodpecker and pileated woodpecker discussions).**

*219 While the DEIS acknowledges that old and mature forest in the West Gold watershed is below the historical range, it fails to discuss how project activities that further increase fragmentation and edge effect of such habitat is consistent with applicable Forest Plan Standards.*

**RESPONSE: Implementation of the project would stabilize vegetative conditions and promote development of old growth conditions in the future. There are no Forest Plan standards that address fragmentation and edge effect.**

*219 The DEIS fails to disclose cumulative impacts that affect viability of all INPF Forest Plan management indicator species.*

**RESPONSE: The DEIS is only obligated to disclose cumulative effects for species affected by the proposed actions. There are no cumulative effects to species not affected by the proposed actions. The FEIS will provide a conclusion of effects for all sensitive species and management indicator species.**

*219 The DEIS does not provide adequate biological basis for assuming the Sensitive white-headed woodpecker is "represented" by the flammulated owl analysis.*

**RESPONSE: The flammulated owl, as well as the white-headed woodpecker, depends on drier habitats that consist of open grown conditions of ponderosa pine and Douglas-fir. The DEIS shows that the existing ponderosa pine cover type represents less than 20 percent of its historic occurrence (DEIS, pg. III-9). An objective of this project is to restore desired forest cover, structure, pattern and species composition across the landscape where they are outside natural or accepted ranges (DEIS, pg. I-1). Restoration objectives for dry site ecosystems address the needs for the flammulated owl, white-headed woodpecker and other species that share similar habitat requirements. Consequently, the analysis for white-headed woodpecker would be no different than for the flammulated owl.**

*219 The DEIS fails to adequately disclose the presently existing forest structure in the area, providing no data on the average size of trees in the overstory, no data on the number of snags of a size usable by cavity nesting species, and no data on the large wood debris component that is necessary for many species of wildlife.*

**RESPONSE: Past fires have shaped the landscape and laid the foundation for today's vegetation structure and patterns. As a result of these fires, most of the forested landscape within the West Gold project area is in the pole and immature size class (DEIS, pg. III-66). Consequently, there are few large snags available in the project area (DEIS, pg. III-70). The DEIS also discloses that areas that experience higher incidences of insect and disease result in higher levels of tree mortality. However, these snags are smaller (due to the size class of the stands) and degenerate more quickly than snags for longer-lived, seral trees (DEIS, pg. III 70-71). Regardless of how many snags exist outside treatment areas, the DEIS prescribes the retention of snags and snag recruitments at suggested levels to maintain populations of cavity nesters; these prescriptions exceed Forest Plan standards. These snags will also contribute to future down woody component.**

*5200 The cumulative effects analysis regarding action alternative and elk, page 85 and a portion of page 86 does not contain any mention of the adjacent Iron Honey project area ... There is no analysis of the cumulative effects to elk populations within a true cumulative effects analysis area that includes elk populations that could be impacted from the combined Iron Honey and West Gold logging operations ... The logging of 1,338 acres with Alternatives B or C combined with the logging of 1,400 acres in the Iron Honey area would result in a cumulatively significant impact to elk populations and elk security from the logging of over 2,700 acres. .... The FEIS must include a true cumulative effects analysis ... regarding the detrimental impacts to elk populations and elk security from the logging that would take place from both timber sale projects.*

**RESPONSE: The DEIS uses Evaluating and Managing Summer Elk Habitat in Northern Idaho (Leege 1984) as the basis for analyzing elk. It recommends not making an evaluation area larger than 5,000 acres because the effects of a proposed action may be significantly diluted. The West Gold Elk Analysis Area represents this philosophy. It covers approximately 5,800 acres, and is delineated by natural (watershed) boundaries. As such, it represents the recommended cumulative effects analysis area for elk. Extending the analysis to the Gold Creek Watershed (approximately 14,000 acres) shows that the Elk Habitat Effectiveness rating is maintained above 50 percent, suggesting that there is displacement habitat available in the neighboring Chloride, Gold, and Kick Bush sub-drainages.**

**Similarly, there are several large security areas south of the divide, which are adjacent to the Iron Honey project area and could provide displacement habitat for elk. While the two project areas are adjacent to one another, each provides alternate security areas for elk to use while activities are ongoing.**

*5200 The cumulative effects analysis on pages 76 and 77 concerning forest land birds also did not discuss the planned logging in the Iron Honey area ... The discussion on page 83 concerning reasonably foreseeable actions also did not discuss the planned logging that would be associated with the Iron Honey timber sale project.*

**RESPONSE: The DEIS selected reasonable cumulative effects analysis areas based on a species' relative home range size in relation to its available habitat, topographic features that influence movement and utilization of their home range, and boundaries that represent points of diminishing effects (pg. III-76).**

*6116 Once again the cumulative effects of Future Salvage Opportunities are not even considered for discussion for elk, violating NEPA regulations to take into account any foreseeable action.*

**RESPONSE: The DEIS states that there are no ongoing and reasonably foreseeable actions that are considered relevant in a cumulative effects discussion for elk (DEIS, pg. III-86). Future salvage opportunities is listed as a reasonably foreseeable action on page I-7, DEIS. However, future salvage opportunities are not expected to have cumulative effects on elk. No new roads would be constructed for future salvage under this EIS. All salvage would be confined to proposed harvest areas (Chapter 2). In addition, salvage opportunities would not impact the adequacy of security areas.**

*219 How would a biologist determine if harlequin duck breeding habitat is "unoccupied or inactive" (II-21)?*

**RESPONSE: Through the use of on-site breeding surveys.**

## Snags

*6104 You claim that the terrible insect and disease will create too many snags, and you claim that one purpose and need for the timber sale is "Providing for wildlife habitat diversity"*

**RESPONSE: The DEIS states that snags being produced and perpetuated by insect and disease are lower quality, smaller, and short-lived. The West Gold sub-drainage lacks the vegetative diversity to produce the higher quality, larger, longer-lived snags. Our objective to "restore desired forest cover, structure, pattern and species composition across the landscape" will promote these higher quality snags and a more diverse habitat for a variety of wildlife species.**

*6116 The black-backed woodpecker nests and roosts in cavities in large diameter (20 inches diameter or greater) live or dead trees. Current conditions in the project area are not meeting MIS habitat needs, "snag production is shifting from large, longer-lived species to the smaller, shorter-lived species" (DEIS, p. III-71.). It is noted that small diameter (<12") snags are abundant in the area and that the black-backed woodpeckers typically select smaller trees for nesting (DEISp.70-71). However, the proposed action would decrease the immature and mature forest stand as defined in Table 9 (DEIS p. 11) by 25% as indicated in Table 5 (DEIS p II-30). Together with the previously 24% harvested area in previous years would cumulatively effect immature and mature forest structure. The sensitive black-backed woodpecker and MIS pileated woodpecker are species considered present and potentially affected by the proposed action and is a species that tens to flourish in early post-fire habitat (Hutto 1995) and following insect and disease outbreaks that create snags. By removing diseased and insect infested trees, the FS would be depriving snag dependent species of this critical component. Those that would be left standing from the regeneration harvest as snags would be more vulnerable to wind, causing them to fall sooner than snags surrounded by live trees.*

**RESPONSE: Bull et al. (1997) refers to a study by Saab and Dudley (1997) that states black-backed woodpeckers use relatively small, hard snags in areas with stand-replacing fires. The pileated woodpecker is not a species that flourishes in early post-fire habitat. While, timber harvesting would remove small snags, and subsequent stand conditions would result in lower levels of small snag recruitment, areas outside of proposed treatment areas would continue to be susceptible in insect and disease, thereby, perpetuating small snag habitat for black-backed woodpeckers (approximately 47 percent of the West Gold project area would remain unaffected by past and proposed harvesting). However, these areas are not expected to contribute to quality and quantity of large snag habitat required by pileated woodpeckers.**

*6116 The DEIS reports that snag habitat is in decline for species associated with large snag as a result of vegetation succession (timber harvesting most likely) and natural stand replacing fires in late 1800s and early 1900s fire and more recently the suppression of fire events, logging and road building (DEIS p. III-70). Is it due to harvesting large dbh sized trees that are on the verge of becoming prime snags? Would these trees be infected by disease or insects and are removed before their extractive "timber value" is lost?*

**RESPONSE: Due to large stand-replacing fires, there has been a major shift in forest**

**than past harvesting.**

*dependent on snags and down woody debris for food, nesting, and protection. While the DEIS constantly acknowledges that snags provide denning habitat, there is no discussion on the importance of snags providing foraging opportunities.*

**acknowledges (pg. III-69) that snags are vital components to a forest ecosystem and that many forest-dwelling animals use these structures for nesting, *foraging*, denning and roosting.**

*219 "...some snags would be represented on every 25 acres of treatment,..." Does the FS intend to included unlogged areas in these total areas of "treatment"?*

**uniform spacing pattern.**

*later recruitment of these important habitat structures.*

**stability and persistence of large snag habitat in the West Gold drainage.**

*219 Please cite the scientific basis for the "concentrations" of snags necessary to support nesting pileated woodpeckers (III-83).*

**RESPONSE: The best habitat for pileated woodpeckers is mature or old growth forests that produce large trees. Minimum nest tree diameter is about 21 inches (Bull 1987, Warren 1990). Thomas, tech. ed. (1979) in Bull (1987)…Ecology of the Pileated Woodpecker in Northeastern Oregon…recommended a territory size of 120 ha, with 45 dead trees of**

**appropriate size. The point here is that pileated woodpeckers excavate new nests annually and usually use a different tree each year. There needs to be enough large trees/snags within a nesting territory to accommodate this behavior.**

*219 Why does the FS assume that "most snags available to firewood cutting activities would be in the smaller size class" (III-82)?*

**RESPONSE: Ninety percent of the West Gold vegetation structure consists of immature forests or smaller.**

*219 The DEIS does not even recognize the Northern Region Snag Management Protocol (USDA 2000a)*

**RESPONSE: It is an optional retention guide to replace the Upper Columbia River interim standard (USDI and USDA 1997). Prescribed retention objectives in the West Gold DEIS are consistent with the Northern Region Snag Management Protocol (USDA 2000a) and the Upper Columbia River Basin DEIS (USDI and USDA 1997).**

*219 The DEIS's discussion of "short-term" and "long-term" snag habitat (III-80) is meaningless without full explanation of those terms.*

**RESPONSE: Long-term refers to the time it would take to begin recruiting large diameter snags into the landscape (about 80-100 years). Short-term refers to the interim period when the stands are healthy and growing.**

## Elk

*1428 6375 The proposed route [2707A] generally parallels the existing Bunco Road. Allowing use of the road during the elk season should not have a significant detrimental effect on elk security.*

**RESPONSE: You are correct in saying that use of the road during elk season should not have a significant detrimental effect on elk security, but it would have a small effect of increasing elk vulnerability from increased use in this area. However, our analysis shows that any decrease caused by the increased motorized use in this area would not change our long-term elk habitat effectiveness estimates. As a result, we have decided to remove all timing restrictions and allow OHV use anytime conditions allow with the exception of during soft roadbed conditions.**

*6116 In analyzing for Elk Habitat Effectiveness, the DEIS admits that a 2% reduction in EHE would result under Alternative B in the projects area, dropping the percentage to 47% during a 5-year activity period. Therefore, the Forest Service needs to close more roads while the project is underway and especially when the Purpose and Need states that the project will open more miles of road for motorized access during the mid to late summer months.*

**RESPONSE: The 2% loss in EHE represents a permanent loss from existing condition. However, the resulting EHE (53%) will exceed the IDFG recommendation of 50%, and the project will result in an improvement in elk forage (which is likely underrepresented in the project area). Additionally, the conversion of Road 2707A to a motorized trail would not take place until project activities cease.**

**EHE would not drop to 47% during the activity period; in fact, it is highly unlikely that the EHE would drop below 50% at any time during the activity period. As stated in the DEIS (p. III-85), this analysis assumes that: 1) all activities throughout the project area are conducted simultaneously, 2) all haul routes will have active truck traffic during the same season, 3) regeneration cutting units will all have been completely harvested while the haul routes are still active, and 4) shelterwood units will provide no hiding cover for elk regardless of the size of the unit and distance from roads. We made these assumptions in the interest of full disclosure of potential effects, but actual on-the-ground effects would be less than modeled. Specifically, there would be design features in place that limit activity to specific subdivisions throughout the activity period (p. II-15 of the DEIS).**

**To clarify the assumptions above:**

**1) Activities are spread throughout a 5 to 8-year period, with most or all activities ceasing in one subdivision before work begins in the next. This assures that elk will have secure areas within the project area even while project activities are ongoing.**

**2) Haul routes would only be active in the subdivision where harvest is taking place. Designated haul routes in inactive subdivisions would remain closed to all motorized traffic. Individual haul routes would likely be active for only 2-3 years during the project, so once again the impacts would be spread out both temporally and spatially across different years and subdivisions.**

**3) Within a subdivision, treatment units would be in various states of activity (ranging from harvest completion to no activity) as the sale progresses. Some scheduled units would continue to provide elk hiding cover until the last few weeks of activity within a subdivision. Only haul routes accessing active units would receive motorized traffic at any given time. The dispersal of effects across subdivisions and through different years of the sale assures that the impacts would not be felt all at once (as modeled).**

**4) Because of the variability in shelterwood prescriptions, the amount of post-harvest hiding cover in these units is difficult to predict. Therefore, we took a conservative approach and assumed that these units provide no hiding cover for elk, when in fact irregular shelterwood prescriptions would result in groups of leave trees that would provide a patchy network of potential cover throughout these units.**

*219 How is reduction in Elk Habitat Effectiveness below recommended levels consistent with the Forest Plan?*

**RESPONSE: There are no Forest Plan standards/guidelines for elk habitat effectiveness on the Sandpoint Ranger District. Elk and EHE are discussed and analyzed because elk are a social/economic issue. The DEIS uses Idaho Department of Fish and Game's recommendations for managing developed standard elk range.**

*219 The proposal to make access more likely on 27.9 miles of road runs counter to the need to reduce road density (access) for elk and other wildlife species.*

**RESPONSE: There would be a net decrease in permanent road density in the project area. The DEIS shows on page II-11 that *road maintenance* would occur on 27.9 miles of road to accomplish project activities. Only 3.5 miles of road that currently allows snowmobile use**

**would become available to ATV use. Meanwhile, the project proposes to remove 1.7 miles of road completely from the landscape, and maintains all other existing gates and restrictions.**

**RESPONSE: Good point! This figure was inadvertently left out of the DEIS and has been included in the FEIS.**

# Federal and State Agency Letters

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 10**
1200 Sixth Avenue
Seattle, Washington 98101

Reply To
Attn Of: ECO-088

[Date Stamped, JUL 10 2002]

Ranotta McNair, Forest Supervisor
Idaho Panhandle National Forests
3815 Schreiber Way
Coeur d'Alene, ID 83815

Dear Ms. McNair:

We reviewed the draft environmental impact statement (EIS) for the **West Gold Project** in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act (CAA). Section 309, independent of NEPA, specifically directs EPA to review and comment in writing on the environmental impacts associated with all major federal actions and a document's adequacy in meeting NEPA requirements. For further explanation of our EIS review responsibility, please refer to *EPA's Section 309 Review: The Clean Air Act and NEPA* that was attached to our September 27, 2000 scoping letter.

Based upon our review and the design of Alternative B, the proposed alternative, EPA has no significant concerns with the West Gold Project and has rated it LO, Lack of Objection. However, we have suggestions to refine the EIS.

The EIS states that Gold Creek is currently listed as impaired under Section 303(d) Clean Water Act for sediment and heavy metals. There is an approved TMDL (Total Maximum Daily Load) but the Forest Service still needs to develop an implementation plan for its portion of the TMDL. In the interim the Forest Service will design all activities to substantially reduce pollutants of concern, where feasible.

Please provide information on the status and schedule for developing this implementation plan. As you develop the implementation plan, we suggest following the approach and format for a Water Quality Restoration Plan as described in the *Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters*.

The Air Quality section would be improved by explaining how prescribed burning will be conducted consistent with the *Interim Air Quality Policy on Wildland and Prescribed Fires*. This national policy developed with the Department of Agriculture and other Federal land management agencies describes how Federal land managers will maintain clean air and still allow for prescribed burning. Bolster the discussion on air quality by explaining the *Interim Air Policy* and how the project is consistent with this national direction. Please refer to our scoping letter of

September 27, 2000 for more information. Attached is an overview of the *Interim Air Policy* for your information that was not included in the scoping letter **[attachment located in public involvement project file]**.

We thank you for the opportunity to review and offer comments on this project. If you have questions, please contact me at (206) 553-6911 or Andy Smith at (206) 553-1750.

Sincerely,

/s/ Judith Leckrone Lee, Manager

Geographic Unit

00-032-AFS

CEQ # 020173

**IDAHO FISH & GAME**

PANHANDLE REGION
2750 Kathleen Avenue
Coeur d'Alene, Idaho 83815

Dirk Kempthorne/Governor
SteveM.Huffaker/Director

July 4, 2002

Ms. Judy York
Sandpoint Ranger District
US Forest Service
1500 US Highway 2, Suite 110
Sandpoint, Idaho 83864

Dear Ms. York:

REFEFENCE: WEST GOLD PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

IDFG has reviewed the Draft Environmental Impact Statement (DEIS) for the West Gold Project. Thank you for allowing us some extra time to complete our comments on this project.

The West Gold Project involves timber harvest and fuels treatment, including controlled burning, as well as reforestation. The stated primary goal of the harvest is to promote growth and productivity of a more natural and healthy forest composition, including white pine, western larch and ponderosa pine; provide wildlife habitat diversity; and restore fire as an ecological process. The project also includes improvements to drainage and stream crossings of existing roads to reduce sediment risks to aquatic habitat, as well as building temporary roads, decommissioning unneeded existing road segments and putting some road segments into "storage" for future use. Another aspect of the project is to allow limited, dry season, off-road vehicle use on Roads 2707A and 2707AA.

Four Alternatives are included in the DEIS. Alternative A is then no action alternative, which defers any activities not part of current management in the area. Alternative B would continue vegetative restoration, restore ecological benefits of fire, and reduce hazardous fuels in currently affected stands. Alternative B would also construct temporary roads and decommission most of them, and would repair or remove associated roads that pose a risk to wildlife or aquatic habitats. Alternative B also includes an action to allow limited, dry season, off-road vehicle use on Roads 2707A and 2707AA. Alternative C differs from Alternative B in the method of harvest used, which would eliminate new road construction. Alternative D would use mostly selective harvest to achieve vegetative restoration goals.

IDFG agrees, for the most part, with the project goals and objectives. We fully support actions that will improve habitat diversity for wildlife and restore our forests to a natural and healthy species composition. However, we believe a number of concerns and questions about this project and potential impacts should be resolved before an Alternative is selected or the project moves forward. Our concerns relate to the potential impacts of the project on fisheries and aquatic habitat in both West Gold and Gold Creeks, as well as to potential impacts on wildlife habitat.

*Harvest prescriptions.* Except for a description of snag density and a sidebar on Page 11-7 that says that retention will be generally less than 30% of existing trees left on regeneration areas, we found neither a quantitative or qualitative description of the structure of the stands that will remain following harvest. As described, the regeneration harvests include "openings" of from 5 to up to several hundred acres; 16 stands will have openings of 40+ acres. Future salvage logging of weather, fire or insect damaged may also be allowed in the harvest units, at the discretion of the USFS interdisciplinary Team.

Ms. Judy York- Page 2
July 4, 2002

Although we find provisions for snag retention adequate, we find it difficult to reconcile a snag retention goal of 4-6 snags/acre and a live tree retention goal of 6-12 trees/acre in openings of up to several hundred acres with the stated purpose of restoring the forest to its natural composition. Based on the harvest prescription in the DEIS, we would characterize the proposed regeneration harvest prescription as clear cuts.

We believe the DEIS should include a far more detailed description of the harvest prescription and the residual stands that will result from harvest than has been presented for review. We recommend the prescription include:

- No harvest or very restrictive harvest of those species the project is attempting to favor (i.e., white pine Western larch, ponderosa pine). If the regeneration cuts are intended to restore forest composition to mimic conditions following naturally occurring fires, as stated in the DEIS, the cuts should retain remnant white pine, western larch and ponderosa pine across the project area. Protection of' mature ponderosa pine should he the highest priority, regardless of the tree's condition. Trees that are undesirable from a commercial perspective are often the most valuable wildlife trees. However, protection of white pine and western larch would also appear to be necessary to meet stated restoration goals.
- Retention of mature (20" or greater DBH) Douglas fir within the stands. Large diameter Douglas fir was a component of natural ponderosa pine stands. Restoration should attempt to recreate the ponderosa pine/Douglas fir mosaic created by naturally occurring fires.
- Reserve stand densities consistent with Fiedler (1996), which recommended a reserve basal area of 40-60 square feet/acre in young even-aged stands to ensure regeneration of ponderosa pine. Fiedler (1996) also suggested a higher basal areas of 60-100 square feet/acre could be maintained in old growth patches.

The DEIS states that Cuttings of 16 units would result in contiguous openings of greater than 40 acres in size. A request for approval by the Regional Forester to exceed the 40-acre openings has been submitted. According to the DEIS, approval of the request would follow review DEIS. However, the DEIS does not describe the nature or potential impacts that approval of this request would have on the proposed project. Although request to exceed the 40-acre openings limit was opened for public comment (in 1998), approval of this request apparently has implications that relate directly to this DEIS. Since the 1998 request could not have been evaluated with respect to actions proposed and information presented in the DEIS, the DEIS should contain a detailed description of the request and a discussion of the impacts and the implications of approving the request on the proposed action.

*Off-road vehicle use:* Included in the project is a proposal to modify Roads 2707A and 2707AA to accommodate use by motorized vehicles less than 50" wide during the dry season, which is defined as from July I to three days prior to the start of the elk archery hunting season (currently late August). This action is described as meeting the project goal of "managing current and additional motorized recreation opportunities while protecting resource values such as wildlife and water." This action is justified, according to the EIS, because of increased off-road vehicle and snowmobile use in the project area resulting from use restrictions elsewhere. This action also recommended to help stem resource damage from illegal motorized use; the EIS states that illegal use of off-road vehicles and snowmobiles is a current problem in the West Gold watershed.

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We do not object to off-road vehicle use on these toads during the season described. However, we do not agree that opening Roads 2707A and 2707AA will achieve the desired goal of curtailing illegal use and, in fact, may have the opposite effect of increasing wildlife vulnerability and disturbance. Also, on going and increasing illegal use in the area indicates that enforcement of current restrictions has been unsuccessful. It is reasonable to assume, therefore, that illegal trails will be pioneered from Roads 2707A and 2707AA. These pioneered trails may be accessible from other access points and will increase wildlife disturbances and vulnerability. The timber harvest will itself increase wildlife vulnerability; it will also make pioneering new trails easier, potentially compounding the problem.

We recommend that, if additional access via Roads 2707A and 2707AA is retained as part of the West Gold Project, provisions should also be included in the project to make it a violation for ATV users to travel off designated roads anywhere within the Gold and West Gold Creek drainages. The proposal should also include provisions for adequate enforcement to ensure compliance, not only with any new access restrictions but also to comply with restrictions already in place. We also recommend maintaining year-round signs informing ATV and snowmobile users of seasonal use limitations and restrictions on designated access roads/trails

*Fisheries and Water Quality*: The DEIS clearly states the high importance of West Gold Creek and potentially impacted segments of Gold Creek to ESA-listed bull trout and to westslope cutthroat trout. The DEIS also clearly summarizes adverse impacts that increases in sediment can have on fish health and survival as well as critical fish habitat. The DEIS indicated that legacy impacts of mining, road building and logging are likely depressing bull trout and cutthroat trout spawning and fry emergence, though populations have remained fairly stable over the past decade. Therefore, we were surprised by the USFS's apparent willingness to propose an increase in sediment loads in both Gold and West Gold Creeks that would begin during and persist for years following the West Gold Project completion.

Prior to project approval, we believe that the potential for increased sediment impacts to W. Gold and Gold Creek spawning, rearing and holding areas for bull trout and westslope cutthroat trout deserve more consideration that has been provided in this analysis. The current analysis is not adequate. We also believe that project monitoring and implementation of BMPs should be bolstered to better reflect both the importance of the fishery and the intended purposes of the project. Finally, the project must meet Clean Water Act requirements and State water quality standards. Based on information in the DEIS, the project will not meet those requirements.

Chapter III of the DEIS does a good job of summarizing potential impacts of sediment on fish habitat and the importance of minimizing increased sediment impacts (Page 111-107). However, this section then states that impacts from increases in sediment front the project will be insignificant, in part because a portion of the increased sediment load is likely to be transported through the system to Lake Pend Oreille, and because sands and gravel would be deposited on gravel bars or other energy reducing features in West Gold or lower Gold Creek.

Neither an increase in deposition of fine sediments in Lake Pend Oreille nor depositions of sand or gravel within the creeks should be considered acceptable outcomes of the project. Deposition of sediments near the mouth of Gold Creek has been a chronic problem, threatening fish access to the creek from the lake and requiring repeated maintenance dredging for a marina there. Depositions of sand or gravel in the creek may affect spawning areas and stream morphology. The DEIS infers that these impacts are not significant and would not impact fish at the population level and, therefore, are acceptable consequences of the project. However, adequate details about expected sediment loads and composition, areas of deposition, etc. are not provided to support this claim or permit adequate review.

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- We recommend that the DEIS be revised to describe sediment yield and sediment transport that would result from each Alternative. The DEIS should also identify expected depositional areas and examine potential impacts to fish and habitat in West Gold Creek, Gold Creek and Lake Pend Oreille for each Alternative.

- The DEIS should fully assess the impacts of expected sediment deposition on critical fish habitat and potential spawning and rearing habitat in Gold Creek and West Cold Creek.

- The West Gold Creek Project impacts will add to impacts associated with past activities as well as current and planned management in the Gold Creek watershed (e.g., Kick Bush slide repairs, Lakeview Mine and other restoration projects). Therefore, predictions of impacts (models, etc.) from the West Gold Project should incorporate and examine impacts from activities in the Gold Creek drainage in a review of cumulative impacts from the West Gold Project on Gold Creek.

- Sediment yields in West Gold have remained above natural conditions (sediment yields have remained static at about 2 times background since 1988) and are expected to remain above natural conditions for some time even if the project is not implemented, according to the DEIS. Therefore, West Gold Project sediment impacts should be calculated and evaluated as an additive impact to existing conditions.

According to the DEIS, Gold Creek is a Clean Water Act, Section 303(d) listed water quality limited segment from the headwaters to Lake Pend Oreille (Page 111-87). The pollutants of concern include sediment. A TMDL has been approved and an implementation plan is pending. The Forest Service will develop an implementation plan for its portion of the TMDL in Gold Creek. Therefore, under the current status, there should be no net increase In sediment through management activities in Gold Creek or its tributaries. However, it is clear that all but the No Action Alternative will increase sediment In West Gold Creek and, as a result, in lower Gold Creek. Thus, the West Gold Project will not meet TMDL requirements for Gold Creek.

- The DEIS should include necessary conditions under which approvals may be requested/obtained from Idaho Department of Environmental Quality for the proposed increases in sediment for each proposed Alternative. As we understand the TMDL process, justifiable short-term increases in sediment can be approved by IDEQ, within clearly defined operational conditions and strict time frames. The DEIS should provide compelling evidence that the proposed increases in sediment are warranted.

*Best Management Practices:* The DEIS states that the West Gold Project will be designed to substantially reduce pollutants of concern, where feasible." A key element of this design is implementation of current BMPs and monitoring for effectiveness described in Chapter 11 (Section 2.4h and 2.47) We fully support use of BMPs to protect water quality and fish habitat. Effective BMPs will be essential for protecting the very valuable habitat and fisheries in West Gold and Gold Creeks.

Effectiveness of BMPs implemented as a condition of the timber harvest sales contract will he closely monitored, according to the DEIS. However, the DEIS does not describe what actions may be taken, if any, when BMPs are found to not be effective. Nor does the DEIS define thresholds at which more stringent controls would he required.

- The DEIS should clearly specify what water quality and other environmental standards will serve as criteria for evaluating the effectiveness of BMPs and what specific thresholds will be used to determine when additional environmental protections are warranted.

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The current proposal and impact assessment assumes that implementation of the BMPs outlined in Appendix A will be entirely effective at protecting water quality and the fishery in Gold and West Gold Creeks. Monitoring is planned to ensure that those protections are effective. However, no alternative BMPs are provided in case the currently identified BMPs prove ineffective. We recommend that you identify alternative, more stringent BMPs that will he used if protective thresholds are exceeded. We also recommend that you include in the BMPs a provision for a stop-work order for project activities when environmental controls fail to meet standards.

*Monitoring:* Chapter 11, Section 2.47 (a) describes the monitoring intended for the project. We are concerned because the current monitoring plan restricts monitoring to the duration of the project and because monitoring will be dependent on the availability of funds and other resources (Page II-25). Both short- and long-term monitoring should be an integral part of this project, the effectiveness of which may not be measurable for a decade or more. Short-term (i.e., for the duration) monitoring will tell us little about long-term effectiveness of the project and BMPs and will not test the validity of models used to predict sediment loads, stream stability, and so on.

- Several of the monitoring items, including vegetation regeneration success, decommissioned roads sediment erosion control success, and stream morphology are critical measures of effectiveness of the proposed project that can be effectively measured only over the long-term. Currently, these items would be measured only during the duration of the project. We urge you to make a commitment to conduct long-term monitoring of these criteria. In addition, we recommend that you add flow measurements to the criteria to be assessed so changes in base and peak flow resulting from the project can be evaluated.

- · Because monitoring is critical to evaluate both immediate and long-term effects of the project in one of the most important bull trout strongholds in the Pend Oreille system, we recommend that an adequate portion of the funds generated from the sale be dedicated to long-term monitoring or that other sources of funding be committed to long-term monitoring before the project is approved.

*Miscellaneous*

- Road Design. Page II-12. States temporary roads will be decommissioned and removed from the forest transportation system at the end of the project. We recommend that you consider decommissioning and removal of the roads as soon as they are no longer needed, rather than waiting until the end of the project.

- Timing of Road Decommissioning. Page II-16. Road segments needed for post-harvest activities like burning or planting should be decommissioned within two to five years of cutting. Because the timing of harvest, etc. may vary in different units and extend overall duration of the project, we recommend that the roads be decommissioned as soon as activities related to the project have been completed in each unit. We also recommend scheduling all project activities to minimize the duration of the project impacts.

- Table 5 presents the net associated risk of sediment delivery from road drainage crossings in tons of sediment (per year?) for Alternative A. The table indicates that Alternative B, C and D will result in reductions of sediment, but no quantitative value is provided for comparison. Presenting the tons of sediment expected from the other Alternatives would be helpful for comparing those Alternatives with No Action.

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- Page III-97, Beneficial Uses. This section states that Idaho DEQ designates beneficial uses to be protected for each waterbody in the state, but that Gold Creek and West Gold Creek do not currently have a designation for aquatic life. According to the DEIS, therefore, Gold and West Gold Creeks have default support designations of agricultural water supply, irrigation water supply, wildlife habitat and aesthetics. This is true, but misleading. All streams in the state are designated for those uses. However, all streams are also designated for support of any additional beneficial uses that are attainable. Since both Gold and West Gold Creeks currently maintain cold-water biota and support spawning of bull trout and westslope cutthroat trout, they would have a default designation for support of cold-water biota and salmonid spawning.

*Preferred Alternative:* The Abstract describes Alternative B as the "Proposed Action" but states that there is no "preferred alternative" at this time. Although it is not clear what the difference might be, it seems clear to us that the DEIS does not support selection of Alternative B. In fact, we are surprised that the Forest Service would propose Alternative B instead of the less environmentally impacting Alternative C. Though both Alternative B and C meet the desired Purpose and Needs, the Forest Service has opted for the Alternative with markedly greater and longer-duration environmental impacts. Although we understand that Alternative B will generate more revenue due to cost savings, generation of revenue was not identified in the Purpose and Needs statement and should not be a primary reason for selecting an alternative. In addition, we offer that the cost savings per Table 5 (approximately $268,000) are minor when compared to differences in environmental protection. We also wonder whether Alternatives B or C can be considered viable in light of Clean Water Act TMDL requirements.

IDFG cannot recommend a Preferred Alternative or support any of the Alternatives offered in the West Gold Project DEIS. Although we fully support restoration of healthy native forest vegetation, we feel the Alternatives presented and the impacts analyzed for each are insufficient to make au informed recommendation, or even to adequately compare the Alternatives provided. More detail must be provided about the harvest prescriptions and the residual stands that will result from the harvest, as well as about water quality and impacts to aquatic habitat.

We would like to suggest, however, that you to develop an additional Alternative that will meet both your Purpose and Needs and have less environmental impact than you projected for Alternatives B and C. Perhaps a compromise between the regeneration cuts described for Alternatives B and C and the largely selective cuts described in Alternative D might offer an effective means to achieve your Purpose and Needs while affording considerably greater environmental protection.

We urge you to delay approval of the project until more information is developed for further review and additional alternatives are considered.

I thank you for the opportunity to comment.

Sincerely,

Greg Tourtlotte
Regional Supervisor

GlT:RH:DL:kh

C: Tracev Trent, NRPB Boise
Bryan Helmich, IDFG, Cd'A
Dave Leptich, IDFG, Cd'A

## After a field trip to the project area on July 25, 2002 with the director and two members of Idaho Fish and Game, they sent the following letter:

**IDAHO FISH & GAME**
PANHANDLE REGION
2750 Kathleen Avenue
Coeur d'Alene, Idaho 83815

Dirk Kempthorne/Governor
Steven M. Huffaker/Director

October 3, 2002

Mr. Richard Cramer
Sandpoint Ranger District
US Forest Service
1500 US Highway 2, Suite 110
Sandpoint, Idaho 83864
Dear Mr. Cramer:

REFERENCE: SITE VISIT AND REVISED, COMMENTS RE: WEST GOLD PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Thanks to you and your USFS Sandpoint Office staff who spent the better part of a day with me, Ray Hennekey and Dave Leptich visiting the West Gold Project site. The visit was an outcome of concerns about the Project DEIS that we expressed in a letter dated July 4, 2002. The site visit and ensuing discussions about the project gave us all a clearer understanding of details of the Project than were provided in the DEIS. Based on the additional insights we gained during the site visit, we would like to revise our comments on the West Gold Project. Our revisions follow the format used in our original comments.

As we previously stated, IDFG agrees with and supports the Project goals and objectives to restore our forests to a more natural and healthy species composition.

*Harvest prescriptions:* In our original comments we expressed a concern that the DEIS did not adequately describe the harvest prescription and the composition of the residual stands that would result from harvest. In fact, we remarked that the prescriptions in the DEIS appeared to describe clear cuts. We recommended that the DEIS should include a far more detailed description of the harvest prescription and the residual stands that will result from harvest than has been presented for review. We also recommended that the prescription include:

- No harvest or very restrictive harvest of those species the project is attempting to favor *(i.e.,* white pine, western larch, ponderosa pine).
- Retention of mature (20" or greater DBH) Douglas fir within the stands to attempt to recreate the ponderosa pine/Douglas fir mosaic created by naturally occurring fires.
- Reserve stand densities consistent with Fiedler (1996), which recommended a reserve basal area of 40-60 square feet/acre in young even-aged stands to ensure regeneration of ponderosa pine.

Based on the information you provided us during the site visit, and on examination of recent-past similar harvest sites, we are satisfied that the harvest prescription would meet each of these recommendations wherever existing conditions allow. We believe that the intended harvest is consistent with the goal of restoring a more natural forest composition.

*Off-road vehicle use:* Included in the Project is a proposal to modify Roads 2707A and 2707AA to accommodate use by motorized vehicles less than 50" wide during the dry season, which is defined as from July l to three days prior to the start of the elk archery hunting season. We had no objections to off-road vehicle use on these roads

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during the season described. However, we had concerns that opening Roads 2707A and 2707AA might increase illegal activity and increase wildlife vulnerability and disturbance. Based on observations of terrain surrounding the proposed road openings made during our site visit and by your commitment to continue to monitor use and restrict pioneering off designated trails, we concur with your assessment that the proposed road openings are not likely to have a significant impact on wildlife.

*Fisheries and Water Quality:* During the West Gold Project site visit, USFS reaffirmed its agreement with IDFG that it is imperative to protect West Gold Creek and potentially impacted segments of Gold Creek, both of which support ESA-listed bull trout as well as westslope cutthroat trout. The DEIS clearly summarized adverse impacts that increases in sediment can have on fish health and survival as well as critical fish habitat. The DEIS also explained that legacy impacts that mining, road building and logging have depressed bull trout and cutthroat trout spawning and fry emergence. Therefore, in our previous comments, we expressed surprise with USFS's apparent willingness to propose an increase in sediment loads in both Gold and West Gold Creeks that would begin during and persist for years following the West Gold Project completion.

During the field visit, we further discussed our concerns about the modeled potential sediment increases from the restoration harvests. We now better understand and acknowledge the considerable effort USFS expended in determining stream characteristics and morphology and in obtaining data to calculate the models for West Gold sediment balance, potential increases in sediment load and time to recovery from the Project perturbations. Based on our discussions with Chris and others on the site visit, we believe that you employed the best data available and attainable within your resource constraints to develop the models. We also understand that you recognize the uncertainty of predicting impacts from such a broad-scale project and that your predicted impacts were intentionally conservative to protect the fishery.

Despite our increased understanding of the project and our appreciation for the difficulty of predicting impacts, we believe that DEQ, IDFG and USFS all continue to share concerns about the uncertainties of predicting impacts and the potential for the project to increase sediment loads in West Gold and lower Gold Creek. On this premise, as we recommended in our original comments on the DEIS, we again advise you to select the Alternative that is most protective of the fishery and can still meet your restoration objectives, perhaps even to develop additional harvest prescriptions that would be more protective.

*Best Management Practices:* We discussed our recommendations regarding BMPs during the site visit. We originally recommended that the DEIS specify what water quality and other environmental standards will serve as criteria for evaluating the effectiveness of BMPs and what specific thresholds will be used to determine when additional environmental protections are warranted. We also recommended that you identify alternative, more stringent BMPs that will be used if protective thresholds are exceeded, including a stop-work order for project activities when environmental controls fail to meet standards. As you explained in the field, USFS environmental and forestry staff will closely monitor harvest operations to ensure that BMPs are adequate and properly maintained to meet water quality standards, as well as INFS and other protocols. Staff can immediately halt work and order corrections, including more stringent BMPs, whenever merited. We believe that, under these conditions, BMPs will be effective.

*Monitoring:* As stated in our original comments and discussed during our tour, we firmly believe that long-term monitoring is critical to evaluate effectiveness of the model and effects of the project on fisheries. Only monitoring will confirm your conclusions that the Project will not have a significant impact on the West Gold or Gold Creek bull trout or westslope cutthroat trout populations. We also originally expressed concern about limiting monitoring to the duration of the project and the dependence of

Mr. Richard Cramer - Page 3
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monitoring on the availability of funds and other resources. We discussed these concerns with you during the site visit.

We believe that you agreed that long-term monitoring is needed to evaluate the success of the Project, as well as to validate predictions made with the sediment model. You indicated that current resources would prevent intense monitoring over the long term, but that it was your intention to repeat fisheries surveys and repeat stream characterization surveys in the future, although no repeat monitoring schedule had been set to help answer questions about West Gold Project impacts. We suggested a commitment in the FEIS to repeat a fish survey and to reassess stream morphology in key reaches of West Gold and lower Gold Creek on a 5-year schedule, if not more frequently. We believe such surveys of the fishery and stream morphology would provide valuable, easily obtainable data to compare before and after impacts of the Project over the long term. Our understanding was that you would consider incorporating these elements into your long-range fisheries and hydrology work plans and identify that effort in the Final EIS.

*Preferred Alternative:* Of the alternatives put forward in the DEIS, Alternative C would cause a smaller increase in sediment and for a shorter duration than would Alternative B. Although Alternative D would potentially have less impact than either Alternative B or C, we agree with your assessment that it would not meet your restoration goals within a reasonable time and, thus, has the potential to exacerbate disease problems and increase the potential for uncontrolled fire. Therefore, of the Alternatives presented, in light of our increased understanding of the project and your calculation of potential impacts, we could support Alternative C.

IDFG appreciates the considerable extra time and effort that you and your staff put in to educate us about the West Gold Project. We have a much fuller understanding and appreciation of the Project goals and objectives. More importantly, the site visit and frank discussions gave us an opportunity to renew communication between our agencies. We commit to work toward making communications even better in the future. We look forward to continuing to work closely with you on this and coming projects.

Sincerely,

Greg Tourtlotte
Regional Supervisor

GIT:RH:DL:kh

C: Tracey Trent, NRPB Boise
Bryan Helmich, IDFG, Cd'A
Dave Leptich, IDFG, Cd'A

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY
2110 Ironwood Parkway · Coeur d'Alene, Idaho 83814-2648 . (208) 769-1422

Dirk Kempthorne, Governor
C. Stephen Allred, Director

July 17, 2002

Judy York
West Gold Project Draft EIS
Sandpoint Ranger District
1500 Hwy 2, Suite 110
Sandpoint, ID 83864

Dear Ms. York:

Thank you for allowing us to comment on this draft environmental impact statement to harvest timber in 30% of the West Gold Creek watershed for a proposed removal of 9,832 MBF (thousand board feet) of timber. In conjunction with this harvest, the proposed action would construct three miles of road and decommission 1.7 miles of road (Alt. B). All action alternatives would increase sediment yield over a period of 6 years to 11 years and increase peak flows 2 to 5% over existing conditions (alternatives D and B respectively). Sediment reductions as a result of road decommissioning work were not quantified, we assume because the roads to be decommissioned are presently not a significant source of sediment.

The Idaho Department of Environmental Quality administers the Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02). The most applicable sections of the standards for these proposed actions are the provisions of the antidegradation policy (58.01.02.051.) water quality limited waters and TMDLs (58.01.02.054.) and surface water criteria for aquatic life use designations (58.01.02.250.). The latter includes a turbidity and temperature standard for the protection of cold water aquatic life. West Gold Creek is an undesignated waterbody and therefore, existing beneficial uses are protected by the Water Quality Standards.

Existing beneficial uses of Gold Creek are identified in DEQ's *"Clark Fork/Pend Oreille Sub-Basin Assessment and Total Maximum Daily Loads. "* They include domestic water supply, cold water aquatic life, salmonid spawning and primary and secondary contact recreation. Gold Creek is also the second most important bull trout spawning stream in the Pend Oreille watershed. Excess bedload is considered to be the single greatest limiting factor to bull trout habitat in this watershed. *Governor Batt's Bull Trout Conservation Plan* emphasizes meeting the goal of protecting and maintaining the species.

Presently, the mainstem of Gold Creek has an EPA approved TMDL for sediment pollution. It was estimated that yearly sediment transport to the stream exceeds natural background by 2,255.3 tons/yr. Prior to the development of an implementation plan for the TMDL, impaired waters are regulated under IDAPA 58.01.02.054, which requires that the total sediment load decrease or remain constant within the watershed. [For a more detailed description of this section please refer to the attached information sheet.]

With these factors in mind we have the following comments:

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1. The DEIS indicates that there would be a net sediment increase to West Gold Creek as a result of any action alternative (Figure 19). Although the proposed mitigation would reduce the potential for sediment delivery to the stream, it does not reduce the existing sediment load. DEQ supports this preventative maintenance type of work; however, our standards require that the existing load must remain the same or be reduced. Unfortunately, none of the action alternatives, as presented in the DEIS, meet this loading requirement.

2. In section 3.72c, other reasonably foreseeable actions in the watershed include mine site remediation and slide repair. Both activities would significantly reduce current sediment loading to the system. There may be an opportunity for pollutant trading if the USFS would like to consider that option. Requirements for pollutant trading are that the sediment reduction project(s) must be completed and successful in sediment reduction, prior to the start of the sediment generating project. The sediment reduction must also occur within the watershed of concern.

We are closely involved in the mine tailings removal action proposed by the USFS and strongly support its implementation. DEQ feels that a significant sediment load reduction can be achieved based upon review of the preliminary design plans. The Kick Bush slide is also a chronic source of sediment to the stream and its repair would also reduce sediment loading. Also, mentioned in the DEIS is USFS's assumption of road maintenance responsibilities from the County along road 278. Although no details are provided, this action may also reduce current sediment loading.

To develop the pollutant trading option in the DEIS, a sediment **budget must be** developed which itemizes all expected sediment increases, both short term (5 years or less) and long term, along with realized or expected decreases and their timeframes. This sediment budget must include contributions resulting from the mitigation/remediation work as well as its anticipated long-term benefits.

Although the above two items are the most critical issues we wanted to share with you, other comments we have on the DEIS which we hope will be helpful, are as follows:

(a) Page II-32 Table 5. Under Alternative B the risk of crown fire would be reduced by 29% of the project area. It would be helpful to know how much of the project area is at risk for a crown fire and what is included in the "project area." Is **this the entire** West Gold watershed? Also in this table it would be useful to mention the previous1,074 acres of timber sales in the West Gold Creek drainage and the fire risk from those acres. Were these sales successful in reducing potential fire severity?

(b) Page II-34 Table 5. It would be helpful to state the number of years when the concept of "short term" is mentioned in the DEIS in this table and elsewhere. "Short term" was also used in relation to sediment increases to West Gold Creek, which referred to impacts over an 11 year period. When DEQ examines "short term" increases, our timeline is considerably shorter.

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(c) Page II-14, *Future Salvage Opportunities.* This section states that, "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 cutting units only for approximately six years after the timber sale contract is completed." We were wondering if the water yield and sediment load estimates for each alternative took into account this anticipated sale? Is this sale part of the proposed action?

(d) Page II-103, Environmental Consequences. The action alternatives would increase peak flows from 2-5% over existing levels, which are at 6% over background presently, with recovery time estimated to be around 28 years. A 5% increase moves the peak water yield to 13%, which is 4% less than the peak water yield caused by the 1850 and 1896 wildfires. Because the proposed increase is less than that caused by stand replacing wildfires (90% vegetation removal), it is considered in the DEIS to be within the historic range of variability, thus acceptable. Potential changes to low flow periods were not discussed.

The above concept of the acceptability of increasing peak flows to mimic natural fluctuations is not often part of a proposed action. Most often the goal is to prolong the retention of water in the watershed to insure that base flows are maintained, to reduce the erosive forces that may disturb bed and banks, to protect morphological features such as pools and large woody debris distribution, and enhance the fisheries. Although West Gold Creek may be resilient to adverse consequences of peak flows, it is part of a watershed, which has been severely impacted due to a variety of human activities. Increasing peak flows and sediment loading may not be directly detectable, but do contribute to the cumulative effects of all activities in the Gold Creek watershed. If West Gold were an isolated watershed, this approach of mimicking the natural processes would be more acceptable.

(e) Hanging over all these issues is the concern of a stand replacing wildfire in the West Gold watershed. To evaluate this risk from a water quality standpoint, we examined the following information:

Based on the late 1800's stand replacing wildfires, a similar fire has the potential to increase water yield approximately 4% beyond the proposed action level (from 13% to 17%), and to increase sediment yield 9% beyond the proposed action level (from 11% to 20%). Recovery time back to baseline conditions for the late 1 800's wildfires were within 4 years for sediment and 50 years for peak water yields. This contrasts with the proposed action alternative, which has an estimated 11 year recovery for sediment and a 28 year recovery period for water yield. The proposed action would reduce the chance of a stand replacing wildfire on 29% of the watershed due to an increased ability to suppress fire starts. Other variables are the chance of a wildfire occurrence, the increasing fire resistance of Douglas firs as they continue to mature, the rate of tree loss due to insect damage and increased fire danger as trees die.

It is difficult to evaluate these data since each good consequence of the alternatives also carries a negative consequence. Therefore, rather than selecting a preferred alternative DEQ could support, we must just require that the action you pursue meet water quality standards, as discussed above. We would be happy to discuss the pollutant trading option with you and your staff, if that is

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something you would like to pursue. Additionally, DEQ will soon begin soliciting input for the development of an implementation plan for the Gold Creek watershed. We look forward to utilizing new data and information the USFS has developed since the TMDL was written. Thank you again for the opportunity to comment on this proposed action.

Sincerely,
June Bergquist
Regional Water Quality Compliance Officer

cc: IDFG-Ray Hennekey
ACOE-Mike Doherty
IDL-Jim Brady
USFWS-Rick Donaldson

# Waters of the State - Their Support Status and Related Rules

The term "support status" describes what beneficial uses are or are not supported by that waterbody. Waters of the State can be grouped into four categories when describing their support status:

**1. Full Support Waters:**
Meet Idaho Forest Practice Rules

**2. Waters on the 303(d) List Prior To TMDL Approval by EPA:**
Follow IDAPA 58.01.02.054.04 and 054.05. Which are as follows:

*04. High Priority Provisions. Until a TMDL or equivalent process is completed for a high priority water quality limited water body, new or increased discharge of pollutants which have caused the water quality limited listing may be allowed if interim changes, such as pollutant trading; or some other approach for the pollutant(s) of concern are implemented and the total load remains constant or decreases within the watershed. Interim changes shall maximize the use of cost effective measures to cap or decrease controllable human-caused discharges from point and nonpoint sources. Once the TMDL or equivalent process is completed, any new or increased discharge of causative pollutants will be allowed only if consistent with the approved TMDL. Nothing in this section shall be interpreted as requiring best management practices for agricultural operations which are not adopted on a voluntary basis.*

*05. Medium And Low Priority Provisions. Until TMDLs or equivalent processes are developed for water quality limited water bodies identified as medium or low priority, the Department shall require interim changes in permitted discharges from point sources and best management practices for non point sources deemed necessary to prohibit further impairment of the designated or existing beneficial uses. Nothing in this section shall be interpreted as requiring best management practices for agricultural operations which are not adopted on a voluntary basis.*

*a In determining the necessity for interim changes to existing activities and limitations upon proposed activities, the Department, in consultation with basin and watershed advisory groups, shall evaluate the water quality impacts caused by past regulated and unregulated activities in the affected watershed.*

*b. Consideration of interim changes shall maximize the use of cost-effective and timely measures to ensure no further impairment of designated or existing uses.*

3. **Waters with Approved TMDLs Prior to Development of an Implementation Plan:**
IDAPA 58.01.02.054.04 applies to all waters in this status.

4. **Waters with Approved TMDLs and Implementation Plans:** (none as yet in CdA Region as of 1/08/01)
Follow implementation plan.

# United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance

500 NE Multnomah Street, Suite 356
Portland, Oregon 97232-2036

June 25,2002

ER 02/426

Ms. Ranotta McNair, Forest Supervisor
Idaho Panhandle National Forests
3815 Schreiber Way
Coeur. d'Alene, ID 83815

Dear Ms. McNair:

The Department of the Interior reviewed the Draft Environmental Impact Statement for the West Gold Project, Idaho Panhandle National Forests, Bonner County, Idaho. The Department does not have any comments to offer.

We appreciated the opportunity to comment.

Sincerely,

Preston A. Sleeger
Regional Environmental Officer

# Appendix K – Biological Assessments and Evaluations

**File Code: 2670** **Date: October 25, 2002**

**Subject:** Biological Assessment, Threatened and Endangered Plants
West Gold Environmental Impact Statement
Sandpoint Ranger District

**To:** District Ranger

## I. Introduction

The purpose of this assessment is to evaluate and describe potential effects of Alternative C (the preferred alternative), as modified in the Record of Decision, of the West Gold Environmental Impact Statement (EIS) on threatened or endangered plant species, and to determine whether any such species or habitat is likely to be affected by the proposed action. This assessment was prepared in accordance with USDA Forest Service policy (FSM 2672.4).

On October 2, 2002 the US Fish and Wildlife Service (USFWS) provided the Idaho Panhandle National Forests with a listing of species (FWS 1-9-03-SP-002) (USDI 2002) that may be present in the Sandpoint Ranger District. The threatened species water howellia (*Howellia aquatilis* A. Gray), Ute ladies'-tresses (*Spiranthes diluvialis* Sheviak) and Spalding’s catchfly (*Silene spaldingii* Wats.) are suspected to occur in the district. There are no endangered plant species known or suspected to occur in the district.

## II. Preferred Alternative

The USDA Forest Service proposes several activities on National Forest lands in the Sandpoint Ranger District.

Maps showing the location of proposed treatment units are included in the West Gold EIS. **A copy of the EIS accompanies the Biological Assessment.**

The following treatments are proposed:

<u>Selective timber harvest</u> would occur on approximately 411 acres:

- In stands where significant numbers of healthy desired species are present and are in need on thinning to retain this health,
- In stands estimated not to experience significant mortality within the next 10-20 years but are in need of harvesting to retain healthy, wind-firm trees of desired species for future seed and shelter,
- In stands where dead and dying trees may 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 898 acres:

- In stands where there is significant mortality or risk of significant mortality within the next 10-20 years

Fuels treatment would occur as follows: prescribed burning would occur on 948 acres, slashing and burning would occur on 129 acres, about 223 acres would be limb and lopped, about 28 acres would be grapple piled and approximately 10 acres yarded with limbs and tops attached.

Road construction, decommissioning and maintenance: Approximately 450 feet of new road construction would occur; 15 miles of maintenance on existing roads would occur. Approximately 1.6 miles of existing road would be decommissioned and 1.6 miles put into storage.

**III. Listed Threatened Plant Species**

Water howellia (*Howellia aquatilis*) - a member of the family Campanulaceae, is suspected to occur in the Pend Oreille sub-basin ecosystem. According to the Conservation Strategy for *Howellia aquatilis* - Flathead National Forest (USDA 1994), there are currently 110 known occurrences of the species; most occurrences are in Montana and Washington, with only one known occurrence in Idaho.

Water howellia is an annual aquatic species restricted to small pothole ponds or the quiet water of abandoned river oxbows. It occurs at elevations from 10 feet in Washington to 4,420 feet in Montana. The species reproduces only by seed; germination occurs in October, presuming the plant's habitat has dried sufficiently to expose the seeds to oxygen. Because of this restrictive habitat requirement, population numbers in a given year are directly influenced by the extent of pond drawdown at the end of the previous growing season (USDA 1994).

Botanists from the US Forest Service, State of Idaho Department of Lands and Idaho Fish and Game Conservation Data Center have conducted floristic surveys of many wetlands in the Pend Oreille subbasin ecosystem over the past decade, but have not located any occurrences of the species. An 1892 sighting approximately 10 miles northwest of the Decision Area has not been relocated (Shelly and Moseley 1988).

No potentially suitable habitat for water howellia occurs in the Decision Area.

Ute ladies'-tresses (*Spiranthes diluvialis*) - a member of the plant family Orchidaceae, is a Great Basin species. In north Idaho, the steppe zone of the Palouse Prairie, Rathdrum Prairie and canyon grasslands are considered potentially suitable habitat (Moseley 1999, Jankovsky-Jones and Graham 2001). Montane coniferous forest, subalpine coniferous forest and alpine zones are not likely places to find Ute ladies'-tresses (Moseley 1999). Its potential habitat in the Priest, Pend Oreille and Kootenai River sub-basins is considered restricted to low-elevation, low-gradient streams and rivers and open, broad alluvial valleys dominated by mixed conifer/cottonwood, shrub and wet meadow grass and forb communities (Moseley 1999). Most such habitat in the Pend Oreille ecosystem is under private or other ownership.

Although lower elevation riparian habitats in the Decision Area may possess some geophysical characteristics considered to represent high potential habitat for the species, these habitats are generally characterized by conifer-dominated plant communities which have low potential to support the species. In addition, as elevation within the Decision Area increases, most streams generally become moderate- to high-gradient. They have narrow riparian influence and abrupt transition from riparian to upland plant communities. Such conditions generally hold low potential to support Ute ladies'-tresses (Moseley 1999).

Ute ladies'-tresses, a perennial terrestrial species, is currently known from Colorado, Idaho, Montana, Nebraska, Utah, Washington and Wyoming; total population for the species is approximately 25,000 to 30,000 individuals (Moseley 1999).

There is no potentially suitable habitat for Ute ladies'-tresses in the Decision Area.

<u>Spalding's catchfly</u> – a member of the plant family Caryophyllaceae, occurs in dry grassland habitats and grassland inclusions in ponderosa pine and Douglas-fir forest. Suitable habitat for this species is typically dominated by fescues (*Festuca* species) and other bunchgrasses, but also has a high density of forbs. Soil types on which it has been found include loam, silty loam, granitic, loamy basaltic and loess (USDI 2000).

This long-lived perennial forb often exhibits periods of dormancy (both within a growing season and over several growing seasons), which can render habitat clearance surveys problematic (Lesica 1997). Periodic dormancy may allow individuals to persist below ground during drought years (Lesica 1997).

Potential threats to its habitat include conversion to agricultural, residential or other uses; overgrazing; soil compaction and other ground disturbance; exotic species invasion; herbicide use; and activities that would negatively impact the species' pollinators (Lichthardt 1997). Wildfire and prescribed fire may also be detrimental to individualss, although fires may benefit the species by burning off heavy accumulations of duff and litter which impede germination and seedling growth (Lesica 1999).

Because habitat for Spalding's catchfly cannot be accurately determined using Timber Stand Database information, a Forest-wide habitat analysis was conducted using Satellite Imagery Landtype Classification (SILC). This reflection of the species' habitat occurrence and distribution is an approximation and serves as a coarse filter for habitat suitability. Further review of areas identified by SILC, such as aerial photograph interpretation and field verification, is necessary to determine the true extent of suitable habitat for Spalding's catchfly.

Based on evaluation of SILC and aerial photographs of the Decision Area, habitat for Spalding's catchfly in the Decision Area is low.

## IV. On-site Inspection

Floristic surveys of the Decision Area were conducted in May and June of 2000. All plant species encountered were recorded during the surveys. The surveys targeted areas proposed for harvest activities. No listed plant species were identified, and the Decision Area was confirmed as having no suitable habitat for any listed plant species.

## V. Analysis of Effects

Water howellia - There is no suitable habitat for water howellia in the Decision Area. No direct, indirect or cumulative effects would occur from project implementation.

Ute ladies'-tresses - Habitat potential for Ute ladies'-tresses in the Decision Area was determined to be low. This species has yet to be found in the Pend Oreille subbasin ecosystem. No direct, indirect or cumulative effects would occur from project implementation.

Spalding's catchfly – No suitable habitat for this species occurs in the Decision Area. There is low potential for occurrence of Spalding's catchfly in the Pend Oreille subbasin. No direct, indirect or cumulative effects to the species or suitable habitat would occur from project implementation.

## VI. Determination of Effects

No sightings of water howellia, Ute ladies'-tresses or Spalding's catchfly have been documented in the Decision Area. The Decision Area has no suitable habitat for these species.

Based on the above considerations, implementation of Alternative C as modified by the Record of Decision would have **no effect** on water howellia, Ute ladies'-tresses or Spalding's catchfly or their habitats.

Prepared by:

/s/Anna E. Hammet
IPNF North Zone Botanist

# SENSITIVE SPECIES BIOLOGICAL EVALUATION FOR PLANTS SUMMARY OF CONCLUSION OF EFFECTS**

**Project Name:** West Gold
**Alternative:** C, as Modified by the Record of Decision

| Species | No Impact | May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Toward Federal Listing Or Loss Of Viability To The Population Or Species | Will Impact Individuals Or Habitat With A Consequence That The Action May Contribute To A Trend Toward Federal Listing Or Cause A Loss Of Viability To The Population Or Species* | Beneficial Impact |
|---|---|---|---|---|
| 1. Aquatic species | X | | | |
| 2. Deciduous Riparian species | X | | | |
| 3. Moist Forest species | | X | | |
| 4. Wet Forest species | X | | | |
| 5. Dry Forest species | X | | | |
| 6. Peatland species | X | | | |
| 7. Subalpine species | X | | | |
| 8. Cold Forest species | X | | | |

**Comments:** Rationale is contained within the NEPA document; a detailed sensitive plants report and a description of habitat guilds are located in the Project File. Note that the determination for effects to Moist Forest species, other than *Botrychium* species, refers to impact on suitable habitat for those species. As disclosed in the NEPA document, no other sensitive species were found in the project area.

Prepared by: /s/ Anna E. Hammet Date: October 25, 2002
IPNF North Zone Botanist

*Considered a trigger for a significant action in NEPA
**Note: The rationale for the conclusion of effects is contained the NEPA document

Form 1 (R1/4/6-2670-95)

**KANIKSU THREATENED, SENSITIVE AND FOREST SPECIES OF CONCERN, BY HABITAT GUILD.**

| Status and Species | Common Name | Rare Plant Guild |
|---|---|---|
| **Threatened*** | | |
| *Howellia aquatilis* | water howellia | Aquatic |
| *Spiranthes diluvialis* | Ute ladies'-tresses | Deciduous Riparian |
| *Silene spaldingii* | Spalding's catchfly | Dry Forest (grassland inclusion) |
| **Sensitive**** | | |
| *Andromeda polifolia* | bog rosemary | Peatland |
| *Asplenium trichomanes* | maidenhair spleenwort | Rock seeps in Moist / Wet Forest |
| *Aster junciformis* | rush aster | Peatland |
| *Astragalus microcystis* | least bladdery milkvetch | Dry Forest |
| *Betula pumila* | dwarf birch | Peatland / Deciduous Riparian |
| *Blechnum spicant* | deerfern | Wet Forest / Moist Forest |
| *Botrychium ascendens* | upswept moonwort | Wet Forest |
| *Botrychium crenulatum* | dainty moonwort | Wet Forest |
| *Botrychium lanceolatum* | triangle moonwort | Wet Forest / Moist Forest |
| *Botrychium minganense* | Mingan moonwort | Wet Forest / Moist Forest |
| *Botrychium montanum* | western goblin | Wet Forest |
| *Botrychium paradoxum* | peculiar moonwort | Wet Forest / Moist Forest |
| *Botrychium pedunculosum* | stalked moonwort | Wet Forest |
| *Botrychium pinnatum* | northwestern moonwort | Wet Forest / Moist Forest |
| *Botrychium simplex* | least moonwort | Wet Forest / Moist Forest |
| *Buxbaumia aphylla* | leafless bug-on-a-stick | Subalpine |
| *Buxbaumia viridis* | green bug-on-a-stick | Wet Forest |
| *Carex buxbaumii* | Buxbaum's sedge | Peatland |
| *Carex chordorrhiza* | string-root sedge | Peatland |
| *Carex comosa* | bristly sedge | Peatland |
| *Carex flava* | yellow sedge | Peatland |
| *Carex leptalea* | bristle-stalked sedge | Peatland |
| *Carex livida* | pale sedge | Peatland |
| *Carex paupercula* | poor sedge | Peatland |
| *Carex xerantica* | dryland sedge | Subalpine |
| *Cetraria subalpina* | Iceland-moss lichen | Cold Forest/Subalpine |
| *Cicuta bulbifera* | bulb-bearing water hemlock | Aquatic / Peatland |
| *Collema curtisporum* | short-spored jelly lichen | Deciduous Riparian |
| *Cypripedium parviflorum* | yellow lady's slipper | Peatland / Deciduous Riparian |
| *Drosera intermedia* | spoon-leaved sundew | Peatland |
| *Dryopteris cristata* | crested shield fern | Peatland |
| *Epilobium palustre* | swamp willow-weed | Peatland |
| *Epipactis gigantea* | giant helleborine | Peatland / Seeps |
| *Eriophorum viridicarinatum* | green-keeled cotton grass | Peatland |
| *Gaultheria hispidula* | creeping snowberry | Wet Forest / Peatland |
| *Hookeria lucens* | clear moss | Wet Forest |
| *Hypericum majus* | large Canadian St. John's wort | Peatland |
| *Iris versicolor* | blue flag iris | Peatland |
| *Lycopodiella inundata* | northern bog clubmoss | Peatland |
| *Lycopodium dendroideum* | ground pine | Wet/Moist/Cold Forest / Deciduous Riparian |
| *Meesia longiseta* | meesia | Peatland |
| *Muhlenbergia racemosa* | green muhly | Peatland |
| *Petasites sagittatus* | arrowleaf coltsfoot | Peatland |

| Status and Species | Common Name | Rare Plant Guild |
|---|---|---|
| *Phegopteris connectilis* | northern beechfern | Wet Forest |
| *Polystichum braunii* | Braun's holly fern | Wet Forest |
| *Rhynchospora alba* | white beakrush | Peatland |
| *Salix candida* | hoary willow | Peatland / Deciduous Riparian |
| *Salix pedicellaris* | bog willow | Peatland |
| *Scheuchzeria palustris* | pod grass | Peatland |
| *Scirpus hudsonianus* | Hudson's bay bulrush | Peatland |
| *Scirpus subterminalis* | water clubrush | Aquatic |
| *Sphagnum mendocinum* | Mendocine peatmoss | Peatland |
| *Streptopus streptopoides* | krushea | Wet Forest / Cold Forest |
| *Triantha occidentalis* | short-styled sticky Tofieldia | Peatland |
| *Trientalis arctica* | northern starflower | Peatland |
| *Vaccinium oxycoccos* | bog cranberry | Peatland |
| **Forest Species of Concern*** ** | | |
| *Adiantum aleuticum* (subalpine ecotype) | subalpine maidenhair fern | Subalpine |
| *Arnica alpina var. tomentosa* | alpine arnica | Subalpine |
| *Botrychium lineare* (Candidate for Federal listing 10/01) | linear-leaved moonwort | Wet Forest |
| *Botrychium lunaria* | moonwort | Wet Forest |
| *Cetraria sepincola* | bog birch lichen | Peatland |
| *Cladonia imbricarica* | imbricate lichen | Wet Forest |
| *Collema subtile* | jelly lichen | Wet Forest |
| *Collema furfuraceum* | scurffy jelly lichen | Wet Forest |
| *Diphasiastrum sitchense* | Sitka clubmoss | Subalpine / Cold Forest |
| *Ivesia tweedyi* | Tweedy's ivesia | Subalpine |
| *Lobaria hallii* | Hall's lung wort | Deciduous Riparian / Peatland |
| *Maianthemum dilatatum* | beadruby | Peatland |
| *Nymphaea liebergii* | pygmy waterlily | Aquatic |
| *Oxalis trilliifolia* | trillium-leaved wood-sorrel | Wet Forest |
| *Pentagramma triangularis* | goldback fern | Wet Forest |
| *Romanzoffia sitchensis* | Sitka mistmaiden | Subalpine |
| *Rubus spectabilis* | salmonberry | Wet Forest |
| *Sanicula marilandica* | black snakeroot | Wet Forest / Moist Forest / Peatland |
| *Tellima grandiflora* | fringecup | Wet Forest |
| *Utricularia intermedia* | mountain bladderwort | Aquatic |

** based on US Fish and Wildlife Service Biannual Forest-wide Species List FWS 1-9-03-SP-002 (105.0000)*
*** based on Northern Regional Forester's Sensitive Species List, March 1999*
**** As directed by the Species of Concern Protocol (Region One Planning Peer Group, Task Group 19, March 1997), species of concern are considered to be secure at the global, Regional and state levels, but may be at risk at the Forest planning level.*

**File Code:** 2670 **Date:** October 28, 2002

Ref: Biological Assessment, *wildlife*, West Gold Project

To: District Ranger

**Introduction**
Threatened and Endangered species are managed under authority of the Federal Endangered Species Act (36 U.S.C. 1531-1544) and the National Forest Management Act (16 U.S.C. 1600-1614). The Endangered Species Act requires Federal agencies to make certain that all actions they "authorize, fund, or carry out" will not likely jeopardize the continued existence of any threatened or endangered species.

USDA Forest Service Policy (FSM 2670) requires a review of programs and activities, through a biological assessment, to determine whether any threatened or endangered species is likely to be affected by the purposed action(s). The purpose of this biological assessment is to evaluate the potential effects of the West Gold project.

**Proposed Action**
Treatment of vegetation would occur on about 29% or 1,338 acres of a 4,543-acre project area. Vegetation prescriptions are designed to trend the project area forests toward conditions historically created by non-lethal (low-intensity) and mixed-severity fires, rather than lethal (stand-replacing) fires. Techniques would include selective and regeneration cutting, followed by fuels treatments and planting. Methods of removing cut trees would likely be by tractor, skyline or helicopter. There would be no new classified or temporary roads constructed (see West Gold FEIS for a more detailed description).

- **Selective cutting** would occur on approximately 411 acres to reduce competition and increase tree growth within stands. These are 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. The silvicultural prescriptions may include treatments such as thinning, improvement cutting and thinning with group selection.

- **Regeneration cutting and reforestation** (see definitions) would occur on approximately 898 acres to remove undesirable trees, trees susceptible to or infested with root disease, or trees at risk of being killed by insects. Many of these are stands where there is significant tree mortality occurring or where there is *risk* of significant tree mortality within the next 10 to 20 years. Following cutting, these stands would be burned and reforested with desired longer-lived species less susceptible to root disease. The silvicultural prescriptions would include irregular shelterwood, seedtree with reserves, and final removal with reserves. Rehabilitation and reforestation would be used in areas where there are already large openings.

**Listed Species**
On October 2, 2002 the U.S. Fish and Wildlife Service provided the Idaho Panhandle National Forests with a list of threatened and endangered species that may be present within the evaluation area (FWS Reference #1-9-03-SP-002). These species include the grizzly bear (*Ursus arctos horribilis*), woodland caribou *(Ranqifer tarandus caribou),* gray wolf *(Canis lupus),* bald eagle *(Haliaeetus leucocephalus),* and Canada lynx *(Lynx canadensis).*

Listed species were screened for their applicability or relevancy to the project. Relevancy is determined if there is evidence of species or habitat present within the affected area, and whether any such species or habitat could potentially be affected by the proposed action. Review of this list, combined with known species distribution and habitat availability, indicates that there are no threatened or endangered species likely to be affected by the proposed action.

**Summary of Conclusion of Effects, Listed Species**

| Species | Species or Habitat Present | Species or Habitat Potentially Affected? | Requiring a More Detailed Discussion? | Determination Of Effects? |
|---|---|---|---|---|
| **Grizzly Bear** | No | No | No | No Effect |
| **Woodland Caribou** | No | No | No | No Effect |
| **Gray Wolf** | Yes | No | No | No Effect |
| **Bald Eagle** | No | No | No | No Effect |
| **Canada Lynx** | No | No | No | No Effect |

**Rationale and Determinations**

## Grizzly Bear

Contiguous, relatively undisturbed mountainous habitat having a high level of topographic and vegetative diversity characterizes most areas where the species remains. Grizzly bears are considered habitat generalists, having a broad of habitat tolerance (USDI 1993). Use patterns are usually dictated by food distribution and availability combined with a secure environment. Grizzlies commonly choose riparian areas and other low elevation areas with wet meadows during the spring and generally are found at higher elevation meadows, ridges, and open brush fields during the summer.

*Reference Condition:* The grizzly bear was listed as threatened in 1975. It was originally distributed in various habitats throughout western North America. Today, it is confined to less than 2 percent of its original range and represented in five or six population centers south of Canada, including Cabinet-Yaak and Selkirk ecosystems that are located in northeastern Washington, northern Idaho and northwestern Montana. Habitat loss and direct and indirect human-caused mortality is related to its decline (USDI 1993).

*Existing Condition:* The proposed project lies outside areas designated for grizzly bear recovery. Grizzly bear are not known to occur within the planning area and are not likely to occur within the planning area based on distribution of the species. No reliable sightings of grizzly bear have been documented in the area. Therefore, West Gold project would have ***no effect*** on grizzly bears or their habitat. No cumulative effects are expected. Therefore, No further analysis and discussion is necessary.

## Woodland Caribou

The population is generally found above 3000 feet elevation in the Selkirk Mountains in Engelmann spruce/subalpine fir and western red cedar/western hemlock forest types. They are highly adapted to upper elevation boreal forests and do not occur in drier low elevation habitats except as rare transients. Seasonal movements are complex and normally occur as altitudinal patterns, moving to traditional sites for different seasons. The population is threatened by habitat fragmentation and loss, and excessive mortality from predators and illegal human take (USDI 1993).

*Reference Condition:* The Selkirk caribou population was emergency listed as Endangered in 1983 and a final ruling of its status appeared in the Federal Register in 1984 (USDI 1993). The recovery area for the population resides in the Selkirk Mountains of northern Idaho, northeastern Washington and southern British Columbia, Canada.

As part of the plan for recovery, caribou were augmented into the ecosystem from source populations in British Columbia between 1987 and the present. By 1990, the population was increased to approximately 55 to 70 animals. The population remained somewhat stable through the early 1990's but a decline in numbers occurred in 1996 that was believed to be the result of increased rates of predation. Caribou numbers vary annually, and have been regularly followed with annual censuses and monitoring of radio-collared animals.

*Existing Condition:* The West Gold project does not provide any suitable habitat for woodland caribou and is well outside areas designated for its recovery. There have been no reported sightings of caribou in the vicinity of the project. Consequently, this project would have ***no effect*** on woodland caribou. No further analysis and discussion is warranted.

## Gray Wolf

Wolves are highly social animals with large home ranges that include a variety of habitat types. While conservation requirements for wolf populations are not fully understood, a sufficient, year-round prey base (primarily ungulates) and sufficient space with minimal human exposure are considered key components of wolf habitat (USDI 1987, Tucker et al. 1990). Wolf distribution is largely influenced by distance from human activity (wolves are highly susceptible to human-caused mortality). The density and distribution of open roads provides an indicator for the level of risk to human-caused mortality.

*Reference Condition:* The northern Rocky Mountain wolf (a subspecies of the gray wolf) was listed as Endangered in 1973. However, based on enforcement problems and a trend to recognize fewer subspecies of wolves, the entire species was listed as Endangered throughout the entire lower 48 states, except Minnesota, in 1978 (USDI 1987). In the past, substantial declines in numbers of wolves resulted from control efforts to reduce livestock and big game depredations. By the 1940s, the Rocky Mountain wolf was essentially eradicated from its range.

In 1994, final rules in the Federal register made a distinction between wolves that occur north of Interstate 90 and wolves that occur south of Interstate 90, in Idaho. Gray wolves occurring north of Interstate 90 are federally listed as endangered species while wolves south of Interstate 90 are listed as part of a nonessential, experimental population with special regulations defining their protection and management.

*Existing Condition:* The West Gold project occurs north of Interstate 90 and is within the region where wolves are federally listed as endangered. The project also lies within the northwest Montana Recovery Area (Mack and Laudon 1998). Occasional sightings have been reported on National Forest lands. However, there have been no recent sightings (within five years) reported in the vicinity of the project.

Sightings in north Idaho seem to indicate transient individuals or lone wolves, unattached from a resident pack. There is no evidence of resident wolf packs (i.e. den sites, and rendezvous sites, reproduction success) in the area.

On the Sandpoint Ranger District, available prey include white-tailed deer, elk and moose. Although no specific population numbers are available, deer and elk are common enough in the project area to provide food for the occasional wolf that may visit the area. The proposed action is not expected to meaningfully impact these ungulate populations (see white-tailed deer and Rocky Mountain elk and discussions in the West Gold EIS). No cumulative effects are expected. For these reasons the West Gold project would have ***no effect*** on gray wolves or their habitat. No further analysis and discussion is necessary.

## Bald Eagle

Bald eagles are winter visitors and yearlong residents of northern Idaho. They are attracted to the area's larger lakes and rivers, which provide most of their foraging opportunities (e.g. fish, waterfowl). Accordingly, bald eagles select isolated shoreline areas with larger trees to pursue such activities as nesting, feeding, loafing, etc. Nesting habitat usually includes dominant trees that are in close proximity to a sufficient food supply and within line-of-sight of a large body of water (usually within 0.25 mile of water). Nest trees typically are large ponderosa pine, Douglas-fir, western larch or cottonwood trees with open crowns in areas that are relatively free from human disturbance (Montana Bald Eagle Working Group 1991).

During migration and at wintering sites, eagles tend to concentrate on locally abundant food and tend to roost communally. Roost sites are usually located in stands of mature or old growth conifers that provide protection from inclement weather.

*Reference Condition:* All of the area covered by this EIS is included in Zone 7 as designated in the Pacific States Bald Eagle Recovery Plan. At the time of federal listing, bald eagles were uncommon in this zone. Originally, there was a target of two additional territories over and above the existing two territories associated with the Pend Oreille Lake/River area. Today, there are at least 12 territories within this area.

Winter roosts are relatively uncommon in the Idaho Panhandle. The majority of wintering eagles leaves their nesting areas and congregates on unfrozen open water such as Lake Pend Oreille, Pend Oreille River and the Clark Fork River. Only a limited number of winter roost sites are known in this entire area, despite annual aerial winter counts. All three know winter roost sites associated with Lake Pend Oreille, are within 0.1 mile from the shoreline (Crenshaw 1987).

*Existing Condition:* The West Gold project area is outside the normal range and use patterns of the bald eagles. The area is separated from water by high relief slopes that drop into Lake Pend Oreille. Consequently, primary use areas (i.e. shoreline areas of Lake Pend Oreille) are adequately buffered from any proposed action.

There are no known nesting territories or winter roost sites in close proximity to the project area. The nearest known nesting territory is at about seven miles to the north @ Whiskey Rock. The nearest winter roost lies on the south end of Lake Pend Oreille, on a north-facing slope near Echo Bay (Crenshaw 1987). Nearby shorelines are heavily vegetated, providing sufficient nesting and winter roost opportunities for bald eagles. Consequently, it is unlikely that eagles would move inland from Lake Pend Oreille to nest or roost in the West Gold drainage. For these reasons, the West Gold project would have ***no effect*** on bald eagles or their habitat. No cumulative effects are expected. Therefore, No further analysis and discussion is warranted.

## Canada Lynx

Both snow conditions and vegetation types are important factors to consider in defining lynx habitat. In North America, the distribution of lynx is nearly coincident with that of the snowshoe hare, its primary prey. Lynx occur in boreal, sub-boreal and western Montane forests and are uncommon or absent from the wet coastal forests of North America. Lynx habitat quality is believed to be lower in the southern periphery of its range because landscapes are more heterogeneous in terms of topography, climate, and vegetation (Ruediger et al. 2000).

Lynx are considered low-density species with home ranges averaging 24 square miles, depending on prey abundance. In northern Idaho and northwestern Montana, lynx generally occur in moist, cold habitat types above 4,000 feet elevation (Koehler and Brittell 1990). Primary habitat that contributes to lynx habitat is higher elevation lodgepole pine, subalpine fir, and Engelmann spruce habitats. Secondary vegetation, when interspersed with subalpine forests, includes cool, moist Douglas-fir, grand fir, western larch and aspen forests (Ruediger et al. 2000).

Lynx use both ends of the forest successional spectrum; young-aged stands where they hunt for snowshoe hares, and mature stands where they have their kittens. Ideally, quality lynx habitat would include a mosaic of the vegetative patterns across the landscape, providing sustainable forage in juxtaposition to denning habitat.

As a specialized predator, lynx have stratified or separated themselves from other competitors by unique adaptations. Their large feet and long legs permit lynx to move easily over the snow, enabling them to find a niche at higher elevations where snow persists much of the year, thereby, giving them a competitive advantage with other competitors.

*Reference Condition:* Lynx populations in Alaska and most of Canada are generally considered stable to slightly dropping. The conservation of lynx populations is of concern in the western mountains of United States because of the peninsular and disjunct distribution of suitable habitat at the southern periphery of the species' range. Both historic and recent lynx records are scarce, which makes identifying range reductions and determining the historical distribution of populations in the region difficult (Koehler and Aubrey in Ruggiero et al. 1994).

*Existing Condition:* The Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000) directs agencies to delineate lynx analysis units (LAUs) to evaluate and analyze effects of planned and on-going projects on lynx and their habitat, and provide guidance for addressing these risk factors. Both snow conditions (influenced by elevation and aspect) and vegetation types are important factors to consider in defining lynx habitat. Because the West Gold drainage is characterized as moderate to high relief slopes within a mid-elevational zone (2,000 to 4,500 feet) and comprises a high proportion of dry habitats, it is not part of a designated LAU. According the Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000) dry forest types do not provide lynx habitat, and most lynx occurrences are within 5,000-6,500 feet elevation zone.

For these reasons, the West Gold project would have ***no effect*** on lynx or their habitat. No further analysis and discussion is necessary. No cumulative effects are expected.

## Conservation Measures to Reduce or Avoid Adverse Effects

None

## Prepared by

/s/David J. Roberts

DAVID J. ROBERTS
North Zone Wildlife Biologist

# Sensitive Species Biological Evaluation for Wildlife
# Summary of Conclusion of Effects**

**Project Name: West Gold Project**

**Preferred Alternative: Alternative C (as modified by the Decision)**

| Species | No Impact | 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 | Will impact individuals or habitat with a consequence that the action may contribute to a trend towards Federal listing or cause a loss of viability to the population or species* | Beneficial Impact |
|---|---|---|---|---|
| **Northern Goshawk** <br> *Accipiter gentilis* | ✓ | --- | --- | --- |
| **Common Loon** <br> *Gavia immer* | ✓ | --- | --- | --- |
| **Harlequin Duck** <br> *Histrionicus histrionicus* | ✓ | --- | --- | --- |
| **Flammulated Owl** <br> *Otus flammeolus* | --- | --- | --- | ✓ |
| **White-headed Woodpecker** <br> *Picoides alboiarvatus* | --- | | --- | ✓ |
| **Black-Backed Woodpecker** <br> *Picoides artcusi* | --- | ✓ | --- | --- |
| **Fisher** <br> *Martes pennanti* | ✓ | --- | --- | --- |
| **Wolverine** <br> *Gulo gulo* | ✓ | --- | --- | --- |
| **Townsend's Big-Eared Bat** <br> *Plecotus townsendi* | ✓ | --- | --- | --- |
| **Northern Bog Lemming** <br> *Synaptomys borealis* | ✓ | --- | --- | --- |
| **Boreal Toad** <br> *Bufo boreas boreas* | ✓ | --- | --- | --- |
| **Northern Leopard Frog** <br> *Rana pipens* | ✓ | --- | --- | --- |
| **Coeur d' Alene Salamander** <br> *Pethodon vandyei idahoensis* | ✓ | --- | --- | --- |
| **Peregrine Falcon** <br> *Falco peregrinus anatum* | ✓ | --- | --- | --- |

Comments: determinations are based on the known distribution of the species, the habitat conditions required of the species, and the current habitat conditions within the evaluation area.

/s/David J. Roberts
Wildlife Biologist

Date: 10/29/02

* Considered a significant action in NEPA
** The rationale for the conclusion of effects is contained in the EIS document and Project File

Form 1 (R1/4/6-2670-95)

# Biological Assessment and Bull Trout Matrix

| | | | |
|---|---|---|---|
| **File Code:** | 2672.4 | **Date:** | November 12, 2002 |
| **Route To:** | West Gold Project File | | |

**Subject:** Biological Assessment for West Gold Project

**To:** Ranotta McNair, Forest Supervisor

## Introduction

The U. S. Fish and Wildlife Service (USFWS) lists two fish species that occur, potentially occur, and/or habitat exists within the Kaniksu portion of the Idaho Panhandle National Forests as endangered or threatened under the Endangered Species Act (ESA) of 1973 (USDI, 2000). The Kootenai River population of white sturgeon (*Acipenser transmontanus*) is listed as "endangered" (USDI, 1994) and the Columbia River Distinct Population Segment of bull trout (*Salvelinus confluentus*) is listed as "threatened" (USDI, 1998).

The purpose of this document is to analyze the effects of Alternative C (the preferred alternative), as modified in the Record of Decision, on these two fish species. It was prepared in accordance with Section 7(c) of ESA, and manual direction to review all Forest Service activities to ensure that such activities do not contribute to a downward trend in population numbers or density of sensitive species and/or a downward trend in habitat capability (FSM 2672.1 and 2672.4).

## Summary of Activity

The proposal is designed 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.
- Maintaining or improving West Gold Creek's aquatic habitat by reducing existing and potential sediment risks.

Approximately 1338 acres of the 4543-acre project area would be treated (Table 1).

**Table 1. Activities proposed in Alternative C (the preferred alternative), as modified in the Record of Decision.**

| Activities | Alternative C |
|---|---|
| **Vegetation Treatments (Acres)** | |
| **Selective Cutting** | |
| Thin | 411 |
| Improvement Cut | 0 |
| **Regeneration Cutting** | |
| Irregular Shelterwood | 683 |
| Rehabilitation | 148 |
| Seedtree w/Reserves | 65 |
| Final Removal w/Reserves | 2 |
| **Underburn Only** | 29 |
| **Total Stand Treatment Acres** | **1,338** |
| **Logging Systems (Acres)** | |
| Helicopter | 891 |
| Skyline | 405 |
| Tractor | 13 |
| **Road Work (Miles)** | |
| Road Construction | 0.16 |
| New Road Storage | 0.16 |
| Existing Classified Road Decommissioning | 1.4 |
| Existing Road Storage | 1.7 |
| Road Maintenance | 27.9 |
| **Fuel Treatments (Acres)** | |
| Underburn (includes 29 acre underburn shown above) | 1,077 |
| Limb and Lop | 223 |
| Grapple Pile | 28 |
| Whole Tree Yard | 10 |
| Burn landing debris | 9 |
| **Total Fuels Treatment*** | **1,347** |

** The number of total fuel treatment acres exceeds cut acres by the burn landings acreage*

Harvest techniques include:

- Selective Harvest 411 acres
- Regeneration Harvest[1] 898 acres

[1] **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 there would be less than 30% of the trees remaining 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 regeneration cut units would range from approximately 5 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 in a timely manner (within 5 years).

Road construction, decommissioning and maintenance include:
- Approximately 0.2 miles of new road construction
- 27.9 miles of maintenance on existing roads
- 1.4 miles of existing roads will be decommissioned
- 1.7 miles of existing roads will be put into storage.

No commercial harvest will take place within Riparian Habitat Conservation Areas (RHCAs). Activities within RHCAs are limited to those that are expected to benefit fish habitat and watershed health. Road drainage improvements are planned for Forest Roads 2707, 278, 332, 2708, 2708A, 2707A, 2707AA, 2707UF, 278A, 278B, and 278D. Such road improvements include graded rolling dips, additional relief pipes, and spot graveling. In addition, six culverts rated as having moderate to moderately high risk of failure will be improved or removed. Three of these culverts (on FSR 2707A) will be removed. Excess fill on two other culverts on the same road will be removed. One culvert on FSR278 will be upgraded.

Location: Harvest units are located in the West Gold Creek drainage, which is part of the Pend Oreille River sub-basin. West Gold Creek is the only fish-bearing stream in the project area. The legal description of the project area is: All or portions of Sections 13, 14, 23, 24, 25, 26, 35, and 36 in Township 53 North, Range 2 West; and Sections 8, 9, 10, 16, 17, 20, 21, and 29 in Township 53 North, Range 1 West, Boise Meridian, Bonner County, Idaho (see Figure 1).

Duration: The project is expected to take 7 years to complete.

Time period: The project is expected to begin in 2004 and all activities should be completed by 2010.

**Prefield/Field Review**

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 (IDF&G), the United States Fish and Wildlife Service (USFWS), electrofishing data from the Idaho Division of Environmental Quality (DEQ) and comprehensive knowledge of the fisheries resources in the Pend Oreille River Basin. Descriptions are limited to historic natural (i.e., wildfire) and human-caused (i.e., timber harvest and roading) disturbances, overall conditions, and habitat connectivity (migration barriers).

All roads and streams within the project area were surveyed during the 2000 field season. Road drainage crossings were inventoried to assess erosional hazards and risks to aquatic ecosystems, using the *Methods for Inventory and Environmental Risk Assessment of Road Drainage Crossings* (Flanagan et al 1998). Information on road-stream crossings that included fill volumes, culvert sizes, erosional features, and other variables was gathered, and then each crossing was ranked for treatment.

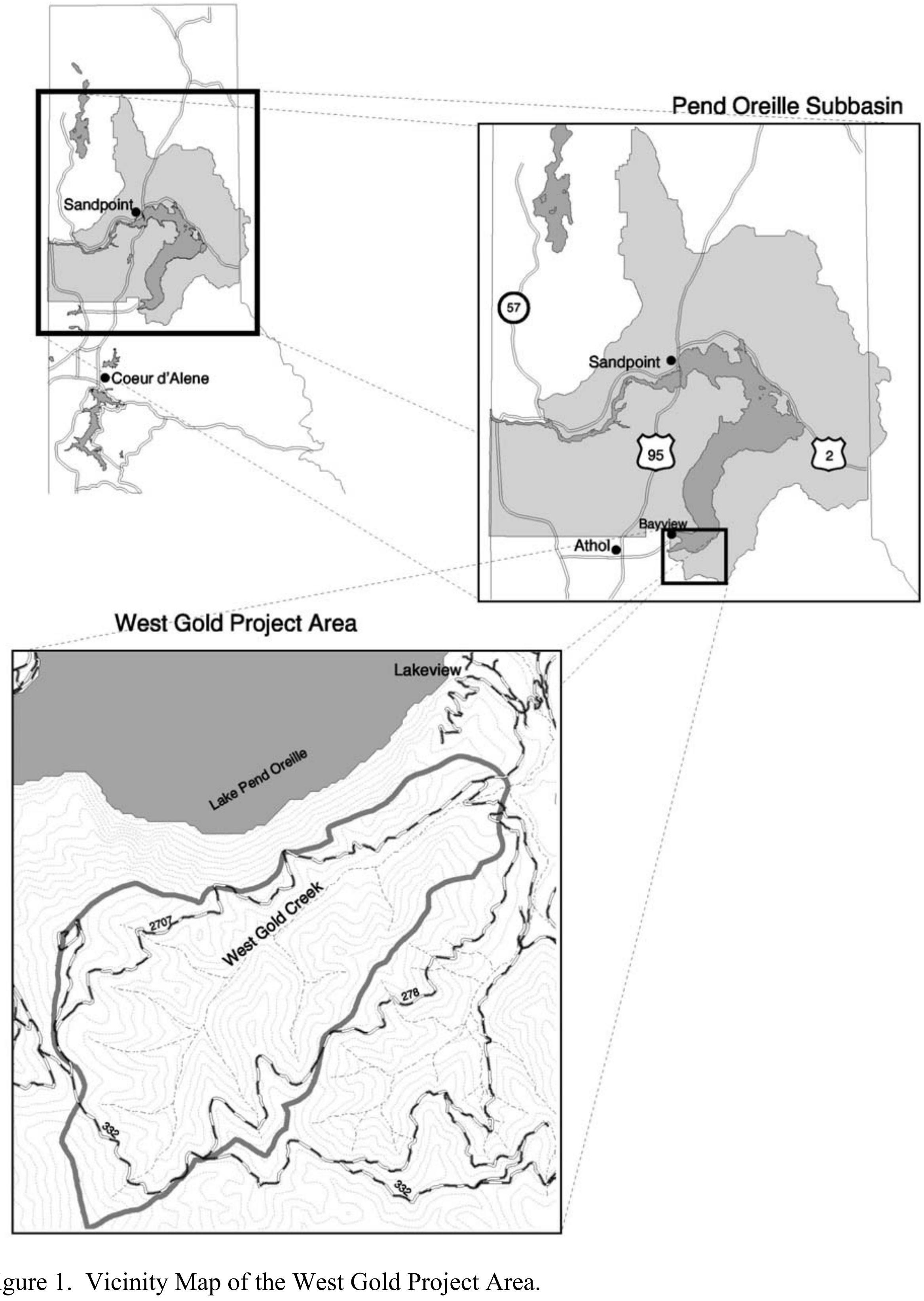


Figure 1. Vicinity Map of the West Gold Project Area.

A modified version of the R1/R4 fish and fish habitat inventory (Overton et al 1997) was conducted along West Gold Creek and some of its tributaries during the 2000 field season. Additional stream information was collected to determine stream channel types, cross sectional profiles, woody debris composition and stream temperature. Existing and potential in-channel and stream-bank erosion sites were also documented with this survey.

**Existing Habitat Condition:**

The following are general descriptions of the watersheds within the analysis area. The West Gold project area encompasses the entire West Gold drainage. For detailed descriptions of existing conditions of bull trout populations and habitat conditions for Gold Creek refer to the attached matrix.

The West Gold drainage is approximately 4,543 acres and is one of five subwatersheds within the 13,900-acre Gold Creek watershed. The watershed is within Lake Pend Oreille Sub-basin, which is a high priority sub-basin for restoration and protection of aquatic resources, especially bull trout (State of Idaho 1996). Gold Creek is also the second most important tributary for bull trout spawning within the Lake Pend Oreille Subbasin (PBTTAT 1998).

Since West Gold Creek drains into Gold Creek, and the majority of bull trout spawning and rearing is in Gold Creek, with incidental use of the lowest reach of West Gold Creek, the following paragraphs focus on conditions in the Gold Creek watershed (the cumulative effects area for the watershed and fisheries analysis).

The Bull Trout Problem Assessment states that excess bedload in stream channels from past mining disturbance is the single greatest limiting factor for bull trout in the Gold Creek Watershed and has caused fragmentation and decreased available spawning and rearing habitat for bull trout and other aquatic species. The assessment also mentions how the mine waste has added material to the delta at the mouth of Gold Creek and threatens to block access between Gold Creek and Lake Pend Oreille at low flows in some years. Besides excess bedload, testing on waste rock at the mines showed heavy metal concentrations in various segments of Gold Creek, although the degree to which it is affecting downstream water quality is not clear[2]. Bedload effects from past mining were estimated to cause 70% of the threats to bull trout in the Gold Creek Watershed (PBTTAT 1998). Efforts to clean up these mine sites is underway; rehabilitation efforts are scheduled to begin in 2003 and will continue for several years.

Roads, the powerline corridor, past timber harvest, and illegal fish harvest are additional continuing threats to bull trout in the Gold Creek watershed. The Kick Bush Slide, a very steep road cut on Road 278 has a history of failures that contribute fine sediment to Gold Creek. During fall rains, sediment from the road enters Gold Creek and is deposited on bull trout redds. This road is currently being repaired (August 2002).

The powerline corridor has caused site-specific effects to fish habitat, most notably the lack of large woody debris in channel segments where the corridor parallels or crosses the stream;

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[2] *Surface water tests for heavy metals were performed in the summers of 1996 and 1997 and results are only representative of the conditions occuring at time of testing, not a constant level.*

however, recent data shows the effects have not been as detrimental as previously thought, especially in West Gold Creek. Past timber harvest has led to loss of long-term woody debris recruitment in some headwater tributaries. Poaching of adult bull trout occurs in lower Gold Creek (PBTTAT 1998). Through continuing funding from the Cabinet Gorge and Noxon dams re-licensing agreement, the Idaho Department of Fish and Game has increased law enforcement efforts in the Lake Pend Oreille area to reduce poaching.

Other, relatively minor, threats to bull trout in the Gold Creek Watershed include past severe wildfires (streams are still recovering), urbanization (residential home sites along lower Gold Creek), and dams (lake level fluctuations from Albeni Falls dam may hinder migration of spawning fish between Gold Creek and Lake Pend Oreille (PBTTAT 1998).

Physical attributes of fish habitat are mainly defined by stream channel condition. The bedrock-controlled nature of the lower Gold Creek and West Gold Creek channels have made them resilient to natural and human-caused disturbances over time. As a result, habitat degradation in these streams is relatively minor.

The historic distribution of bull trout in the Gold Creek Watershed is unknown. Their current distribution is limited to lower Gold Creek and lower West Gold Creek; they cannot access habitat in upper Gold Creek or Chloride Gulch. It is possible that more habitat was historically available to bull trout; however, it is unlikely that upper Gold and Chloride Gulch historically flowed year round.

Nearly two decades of redd counts indicate a stable bull trout population trend; however, it is unknown how these numbers compare with historic populations. No known population data exist from the pre-mining era. It appears that bull trout are currently using much of the available spawning habitat in lower Gold Creek, yet continuing effects from past mining and other disturbances (e.g. sediment from Kick Bush Slide) are likely depressing spawning and fry emergence success (Everest et al 1987; Bjornn and Reiser 1991; Nelson et al 1991).

**Analysis of Effects**

| Species | Habitat Present | Habitat Absent | Species Present | Species Absent |
|---|---|---|---|---|
| ***Endangered:*** | | | | |
| White sturgeon<br>*Acipenser transmontanus* | | X | | X |
| ***Threatened:*** | | | | |
| Bull trout<br>*Salvelinus confluentus* | X | | X | |

Further explanations for above table:

- White sturgeon are found only in the main Kootenai River, outside of the cumulative effects areas for this project.
- Bull trout currently inhabit the Gold Creek watershed.

*Riparian Habitat Conservation Areas*
In this project, Standard Widths Defining Riparian Habitat Conservation Areas (RHCAs) as outlined in the Inland Native Fish Strategy (USDA Forest Service 1995) will be applied. No commercial harvest will take place in riparian areas. Ground-disturbing activities within the RHCA are limited to those that are expected to benefit fish resources and watershed health (e.g., road maintenance activities, culvert removals and upgrades, and site prep for burning followed by planting of long lived tree species).

**Direct/Indirect Effects (General):**

### Vegetation Treatments

***Timber Harvest:***
Activities occurring on sensitive landtypes consist only of vegetation prescriptions and logging activities. One thinning prescription in unit 6 is categorized to have high mass failure potential and high sediment delivery potential. The prescription for this unit is to thin approximately 11 acres of the stand with a skyline yarding logging system. Treatments on this landtype recommend minimal soil disturbance and timing restrictions (project file). Skyline logging will be appropriate on this landtype and harvest activities will be restricted to the summer months when soils are not saturated.

Additional activities proposed on sensitive landtypes include vegetation prescriptions and logging on high and moderate sediment delivery potential landtypes. Sediment delivery rates from the proposed harvest activities on these landtypes are reflected in the WATSED sediment runs. Since the majority of these units are going to be helicopter logged and there would be no logging within the RHCAs, the risk of any actual sediment delivery from these activities to a stream channel is very low. Research studies and monitoring results conducted on the Idaho Panhandle National Forest verify that when RHCAs or buffer strips are incorporated into timber sales, sediment delivery to stream channels is not measurable or is negligible (USDA Forest Service 2000, 1999, 1998, 1997, Belt et al 1992, Reid and Hilton 1998).

***Reforestation and Riparian Planting:***
Planting would be done by hand crews and would be accessed from existing system roads. This activity would reduce the amount of time needed for vegetative and hydrologic recovery following regeneration harvesting, which would reduce potential for sediment production and delivery. There would be no direct or indirect effects to fisheries or other cold-water biota from this activity.

***Noxious Weed Control:***
This activity would follow guidelines established in the Sandpoint Noxious Weeds Control Project EIS (USDA Forest Service 1998b). Effects to aquatic resources were analyzed in that document and its adaptive strategy. No additional effects to watershed or fisheries are expected to occur.

### Watershed Restoration Activities

Ground-disturbing activities in the RHCAs are restricted to watershed restoration and may include the following (see Table 1; not all of these activities will occur in RHCAs):

*Decommission* includes removal and recontour of all stream crossings and, as needed, recontour of unstable fill slopes, cut slope stabilization, ripping the road tread, installation of no-maintenance cross ditches, and revegetation. Decommissioning also includes some kind of road closure method such as an earthen berm. Approximately 1.4 miles of existing road will be decommissioned.

*Road storage* includes removing all stream crossings and drainage culverts. Waterbars that do not require periodic maintenance will be installed. Roadbeds will be scarified and seeded with a weed-free seed mix. The remaining roads will be closed to traffic by recontouring a portion of the road near the beginning of the road section. Approximately 1.7 miles will be put into long-term storage.

*Roadwork* will be a critical part of this project in order to comply with BMPs and the Forest Plan related to road maintenance and water quality protection. Road work includes reconstruction which includes installation of additional relief culverts (to more frequently cross drain the road), spot gravelling (to reduce surface erosion), installing graded rolling dips, drivable dips, or drivable waterbars (to cross drain surface water), brushing, blading, shaping, and ditch cleaning (to maintain drainage). Approximately 27.9 miles of roads will be treated.

#### *Sediment Risk Associated with Drainage Structures*

Alternative C proposes replacing or removing drainage structures at risk and therefore would reduce potential for road crossing failures. Increasing the size of the culvert or removing the drainage structure would reduce the chance failure, as a result of reduced capacity. The crossings along the 2707A road would either be upgraded or removed with the decommissioning of the last 0.7-mile of this road. The crossing on the 278 road would also be upgraded. By making these improvements, the likelihood that culverts would fail in the event of a flash flood or debris flow triggered by a large stand-replacing fire followed by high-intensity rain or rain-on-snow event is greatly reduced, as opposed to taking no action. These improvements would reduce the net associated risk of sediment delivery to West Gold Creek by 2,572 tons/year.

Direct and indirect effects from watershed restoration activities include short-term increases in sediment delivery to streams during culvert and road removals, as well as culvert upgrades. However, with timing restrictions, onsite direction, and BMPs, sediment input would be limited and there will also be an immediate reduction in risk of sediment delivery from crossing failures.

#### *Road Construction/Landing Construction*

Approximately 500 feet of road construction is proposed outside the project area boundary and within the Chloride Gulch drainage (and within the cumulative effects area). The road, 278 D1, would take off the 278D road to the ridge and then split off in two separate roads. This road will not be constructed on any sensitive land types, will not cross any intermittent or perennial stream channels, and incorporates design features described in Chapter II of the EIS. Therefore, the risk of sediment delivery from the construction of this road is low. This road will be put into storage at the end of this project.

All landings will be outside of RHCAs.

## Fuels Treatments

***Prescribed Burning for Fuel Reduction:***

On the south-facing dry site units, the prescribed burns would be done in the spring when fuel and soil moisture would not result in a severe burn that could produce hydrophobic soils or eliminate the soil duff layer. Firelines, where needed, would be frequently waterbarred to prevent erosion. The proposed burns are located on slopes with a low potential for sediment production and delivery with the use of riparian buffers (USDA 1995) on prescribed burn units.

Direct and indirect effects from prescribed burning activities include a low potential of sediment from firelines, released nutrients, or water foaming agents would be delivered to streams and tributaries. A reduction in risk of severe fire within treated areas is expected from this type of fuel reduction activity.

Prescribed burns may include some understory slashing and burning within the RHCAs, but outside of the riparian area. There would be no removal of the overstory canopy. These activities are designed to reduce competition among tree species. Following these activities with planting of long-lived tree species would expedite desirable tree growth in these areas, resulting in long-term increases in LWD recruitment potential for West Gold Creek and its tributaries.

***Mechanical Slash Disposal and Site Preparation:***

Proposed units for grapple piling will be accessed from existing roads, skid trails, and firelines. Only areas that can be reasonably accessed will be treated. Erosion from these treatments is not anticipated. The proposed grapple piles are located on slopes with a low potential for sediment production and delivery with the use of riparian buffers on grapple pile units.

## Effects to Water Yield:

***The WATSED Model***

The anticipated sediment and water yield runoff modification for the West Gold subwatershed were estimated from the methods documented in the R1/R4 Sediment Guides (USDA Forest Service 1981) and the WATBAL Technical User Guide (Patten 1989). The version calibrated for the Idaho Panhandle National Forests, known as WATSED, is an analysis tool that spatially and temporally organizes typical watershed response relationships as a result of forest practices. The estimated responses are combined with other sources of information and analyses to help determine the findings of probable effects.

WATSED estimates a series of anticipated annual values over a period of years. The model predicts an estimate of most likely mean annual sediment loads (reported as tons per square mile per year), and the expected sediment load modifications over time. The estimate of additional loading is expressed as a percent of the “natural” (i.e., historic mean load prior to significant development activities) sediment load, which is based on the history of disturbances and average climate patterns in the watershed. In this analysis, the existing condition represents the year 2002, which is prior to any anticipated disturbances related to the proposed activities.

The estimates of sediment and peak flow reflect how watersheds with similar conditions and landtypes have responded over time to a similar history of disturbance. WATSED is not intended nor designed to model event-based processes and functions, or specific in-channel responses. It does, however, incorporate the results of those processes in the calibration of its driving coefficients. WATSED does not evaluate increases in sediment and peak flows specifically resulting from "rain-on-snow" events or other stochastic events, nor does it attempt to estimate in-channel and stream-bank erosion. The Idaho Panhandle National Forests (IPNF) frequently validates the WATSED coefficients and estimates using long-term water quality monitoring networks on the IPNF (USDA Forest Service, 2000, 1999, and 1998).

The forest management activities used to calibrate the model include standard BMPs and Soil and Water Conservation Practices; therefore, standard BMPs and Soil and Water Conservation Practices are necessary requirements for maintaining an effective confidence level in the model's use. Non-standard BMPs, management or natural disturbances not related to forest practices, and site-specific non-standard BMPs must be integrated into the final analysis to fully determine watershed response.

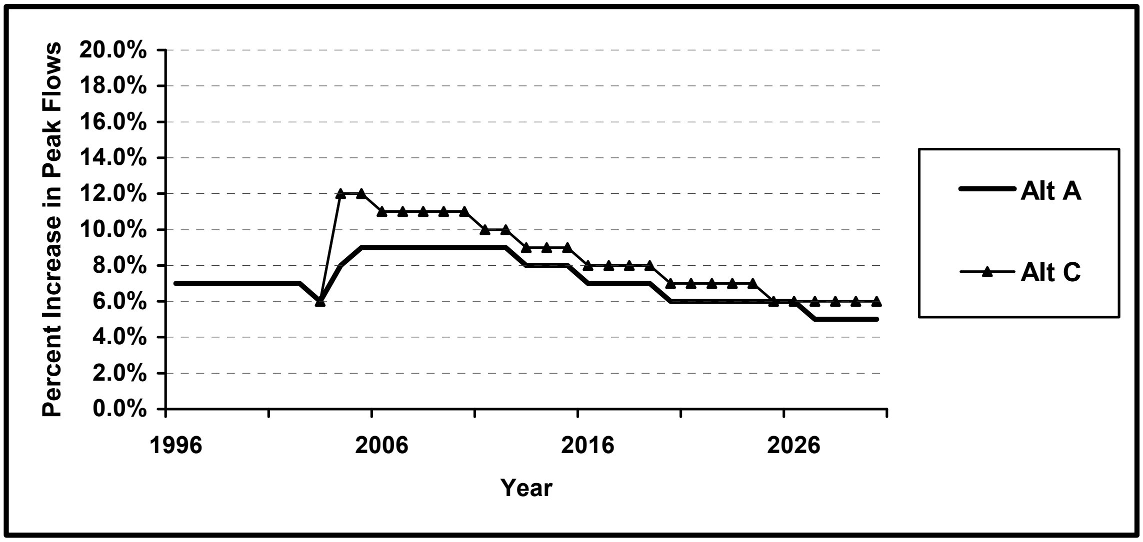
WATSED was designed to address and integrate a vast and complex array of landtypes and disturbances within the context of a watershed and organize the evaluation according to rule sets established by the author and cooperators. In the case of WATSED, the rule sets reflect watershed processes and functions based on research, data, and analyses collected locally and regionally. Forest Plan monitoring reports (USDA Forest Service 2000, 1999, and 1998) describe how the calibration and validation of WATSED has been an annual process on the forest and where changes have been made. The model, however, also includes simplifying assumptions, and does not include all possible controlling factors. Therefore, the use of models is to provide one set of information to the technical user, who, along with a knowledge of the model and its limitations, other models, data, analysis, experience and judgment must integrate all those sources to make the appropriate findings and conclusions.

#### *Effects of the Project*

Figure 2 compares the percent increase in water yield values to the Alternative A (the "no action" alternative, which is also the existing condition). Alternative C (the preferred alternative) raises water yield to 12 percent, a 4 percent increase over the existing condition. Increases in water yield under this alternative would probably not be detectable in the main West Gold channel and could not be differentiated from normal climatic fluctuations.

Alternative C is within the historic range of variability (HRV). The maximum HRV was measured at 17 percent, which is 5 percent higher than Alternative C. This alternative also mimics the recovery pattern from what occurred naturally following fires of the late 1880s. From the fires, it was estimated that recovery gradually occurred over 20 years. This is apparent in figure 1 with recovery occurring in 2030 for Alternative C. Since any change in water yield associated with this project would likely be undetectable in West Gold Creek or downstream in Gold Creek, additional bedload scour during high flows would not be expected. Redds existing in the cumulative effects area would not be affected by the expected increase in water yield.

**Figure 2. Alternative comparisons in water yield increases for West Gold Creek.**




## Effects to Sediment Delivery:

Increases in sediment delivery can affect fish habitat by filling in the interstitial spaces in spawning gravels. This results in decreased water flow through the gravels that is imperative for oxygen delivery to the incubating eggs and removing wastes. Filling of interstitial spaces can also displace macroinvertebrates, thereby reducing an important food source for fishes. High amounts of sediment can fill in pools and reduce rearing habitat for juvenile fishes.

Since all ground disturbing activities will occur outside of RHCAs and the majority of units will be helicopter logged, the risk of any sediment generated by logging activities actually reaching a live channel is very low. By utilizing timing restrictions, onsite direction, and BMPs, sediment delivery associated with culvert removals and upgrades would be minimized. Removing or upgrading these culverts will result in an immediate reduction in the risk of sediment delivery from crossing failures. Since the identified culverts are located high in the drainage, the likelihood that any escaped sediment would be transported into the lowest reaches of West Gold and Gold Creek below the confluence is very low. The higher-gradient channel types present in West Gold Creek would likely carry any sediment to the nearest low gradient area where it would settle out. Sands and gravels would likely be deposited on the nearest gravel bars or other energy reducing features.

## Cumulative Effects

### Federal Activities

#### *Kick Bush Slide Road Repair*

The Kick Bush Slide is an eroding cut-slope along road FSR 278. The site is a chronic sediment source to Kick Bush Gulch and Gold Creek. The stabilization of the cut-slope is scheduled in 2002 and should be completed in 2003. The estimated sediment reduction from the Kick Bush slide is approximately 193.6 tons per year. Any short-term sediment delivery increases from this project would be much lower than what the existing condition is generating. Plus, with the implementation of best management practices, there should not be any sediment delivery to Kick Bush Gulch. Over the long term, there will be a substantial decrease in sediment delivery to the entire Gold Creek watershed.

#### *Gold Creek and Chloride Mine Clean Up*

Extensive mine reclamation work is scheduled to occur over the next ten years within both Gold Creek and Chloride Gulch drainages. The Idaho Lakeview and Conjecture Mines have been identified as the top two priority cleanup sites within the watershed. Alternatives in how the cleanup will occur and design criteria for the repository site are still being considered. Current planning efforts entail the cleanup of a tailings pile at the Idaho Lakeview Mine and the construction of a 0.2-acre repository site near the junction of Forest Roads 1180 and 278. The restoration of Chloride Gulch at the Idaho Lakeview Mine is also proposed. This would restore about 400 feet of the stream channel back to its natural pattern, profile and dimensions. All these activities are scheduled to start in 2003.

All mine cleanup activities will adhere to about twenty federal and state standards designed to protect surface and subsurface water quality, endangered species, wetlands, and floodplains (Idaho Lakeview Mine Tailings Operable Unit, 2002). Federal and state laws mandate these standards and also provide design features and best management practices. Similar cleanup activities that have occurred in the Idaho Panhandle National Forests and within the Northern Region of the Forest Service where similar reclamation practices have been used have been successful (project file).

With the restoration of Chloride Gulch, there would be short-term (two to three year) increases in sediment. Between the removal of deposited heavy metal tailings and the reestablishing of natural stream channel characteristics, sedimentation is likely to occur. Mitigation measures such as sediment detention ponds, diverting stream flows and timing of restoration activities, would keep sediment levels much below current levels. Once the mine cleanup is complete, sediment delivery will be greatly reduced from current levels and bedload transport rates would return to background levels. This will enhance aquatic habitat and reduce heavy metal concentrations in Gold Creek and Chloride Gulch.

### Activities on Private Lands within the Gold Creek Watershed

Private land consists of 7 percent of the Gold Creek watershed, with the majority of the land within or near the town of Lakeview. The private lands around Lakeview primarily consist of summer homes and a year round hotel. Some of the private roads accessing these homes have delivered sediment to Gold Creek from road fill failures and road surface runoff. Sediment delivery levels from these private roads are based on the level of road maintenance activities.

The other portions of private lands are the abandoned and active mine claims and parcels scattered in the Upper Gold Creek and Chloride drainages. Idaho Department of Lands has received a permit for harvesting trees near the headwaters of Chloride Gulch (project file). According to the permit information, timber harvesting would occur on slopes greater than 45% and near class II streams (headwater streams). Timber harvest activities must follow the rules and best management practices set by the Idaho Forest Practices Act (Idaho Forest Practices Act, Title 38, Chapter 13, Idaho Code). These rules and BMPs are designed to prevent sediment delivery to stream channels and to prevent any cumulative watershed effects.

## Cumulative Effects to Sediment Yield

By evaluating the direct and indirect effects of the proposed alternatives with present and ongoing activities, there would not be any cumulative effects from increases in sediment yield to West Gold and Gold Creek. Alternative C will improve and/or remove the high-risk culverts, thus reducing the net associated risk of sediment delivery by an estimated 2,572 tons. The decommissioning of 1.4 miles of existing roads would also reduce sediment yields over the long term.

Studies have discussed that when disturbance patterns created by timber harvesting are used to mimic natural disturbances, activities should be concentrated in a drainage rather than dispersed, that riparian areas need protection, and that harvest rotations should require longer intervals (Reeves et al 1995). Alternative C best addresses these criteria by concentrating all activities within West Gold, incorporating riparian habitat conservation areas, and prescribing vegetation treatments that are needed throughout the West Gold Subwatershed.

Within Gold Creek, the ongoing activities, such as restoration of the Kick Bush Slide, the mine cleanup in Gold Creek and Chloride Gulch, and acquiring road maintenance work along FSR 278 will greatly reduce the majority of sediment that is contributed to this watershed. The likelihood of sediment delivery from the West Gold project is very small both in risk and associated potential quantity when compared to the current sediment levels that the mines and the Kick Bush slide are currently delivering.

With the combination of the West Gold project and the other activities within the Gold Creek watershed, there would be a net decrease in risk of sediment delivery. Over the tenure of the project, this alternative would generate an estimated 52 tons of sediment (project file). Overall, there would be a net decrease of 1,700 tons of sediment yield when considering the difference between the removal of the at-risk culverts and road decommissioning activities to the generated sediment from the proposed activities. Therefore, this project would not impair beneficial uses within Gold Creek and would meet the intent of the Gold Creek TMDL. Alternative C would provide the greatest cumulative benefit in reducing short and long-term sediment yields, since no temporary roads are constructed and it treats the greatest amount of acres.

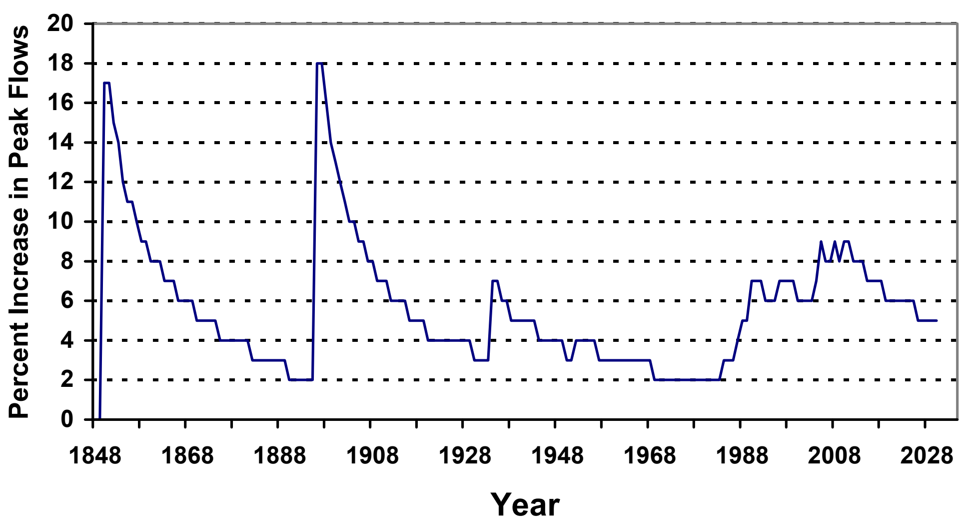
The estimated maximum increase in sediment yield, while actual delivery to bull trout habitat is unlikely, is within the HRV; sediment delivery levels have remained relatively stable since 1955, and would continue to remain at approximately 90% above natural conditions in the short term. Within Gold Creek, the ongoing activities such as restoration of the Kick Bush Slide, the mine cleanup in Gold Creek and Chloride Gulch, and acquiring road maintenance work along FSR 278 will greatly reduce the majority of sediment that is contributed to this watershed. The estimated sediment increases from the West Gold project are inconsequential when compared to the current sediment levels that the mines and the Kick Bush slide are currently delivering.

In the Watershed Restoration Activities section of this biological assessment, drainage structure improvements would reduce the net associated risk of sediment delivery to West Gold Creek by 2,572 tons/year. Routine annual road maintenance, mine reclamation activities, and repair of the Kick Bush slide on FSR 278, will reduce sediment delivery to the entire Gold Creek watershed dramatically as is discussed in the Cumulative Effects section on pages 11-15 of this biological assessment. With the combination of the West Gold project and the other activities within the Gold Creek watershed, there would be a net decrease in sediment delivery. Therefore, this project would not impair beneficial uses within Gold Creek and would meet the intent of the Gold Creek TMDL. Alternative C would provide the greatest cumulative benefit in reducing short and long-term sediment yields, since no temporary roads are constructed and it treats the greatest amount of acres. Any increase in sediment delivery directly associated with this project will be mainly attributable to the crossing upgrades and may affect bull trout individuals but is not likely to have an effect on the overall bull trout population in Gold Creek.

### Cumulative Effects to Water Yield: Increases in Peak Flows

When combining the direct and indirect effects with the imminent activities on private lands, there would not be any cumulative effects to West Gold and Gold Creek due to increases in peak flows with this project. Water yield increases are within the magnitude, intensity and duration when comparing the historic range of variability from past natural events. The historic fires modeled in West Gold burned much of the Gold Creek watershed (USDA 2002), therefore, it can be assumed that the magnitude, intensity and duration of the water yield increases associated with these fires were very similar to each other and much larger than increases expected from this project (see Figure 3). Since the proposed harvest activities only account for 9 percent of the total area within the watershed and the reasonably foreseeable activities would not significantly increase peak flows, the increases in flows from West Gold would increase peak flows in Gold Creek, to a much smaller degree.

**Figure 3. Historic and existing condition of percent increase in peak flows within the West Gold Subwatershed.**




### Cumulative Effects to Peak Flows from Rain-On-Snow Events

In the event of a rain-on-snow event, peak flow increases would not cause any cumulative effects to West Gold and Gold Creek. These events are natural processes that occur episodically in time and space. Vegetation prescriptions would trend vegetation towards conditions and patterns, which would be similar to those formed by past disturbance events. The greatest impacts observed from rain-on-snow events occur when culverts become plugged from resulting floods and debris flows. By improving or removing the high-risk culverts, the risk to a road failure is significantly reduced and net associated risk of sediment delivery would drop by 2,572 tons.

### Cumulative Effects to Stream Channel Morphology

Estimated peak flow increases would also not affect channel incision nor stream bank erosion. The existing condition of West Gold and Lower Gold Creek are such that they are well armored with bedrock and large substrate, have excellent stream vegetation, and are stable and resilient. Stream survey data from the summer of 2000 indicates that woody debris recruitment levels are high, except where boulders and bedrock dominate the stream substrate and where powerline runs adjacent to West Gold Creek (project file). These pool formative features and beaver dams also dissipate stream energy. West Gold and its tributaries are not alluvial channels. The dominant stream bank material is primarily composed of boulders, cobbles and bedrock outcrops that are not easily erodible. In addition, the channels are well confined and entrenched, which allow sediment and debris to be easily transported. A maximum increase in water yield of 5 percent over the existing condition would likely result in some elevated flows in the headwaters, but would be undetectable in West Gold Creek.

Overall, stream channel morphology to West Gold and Lower Gold Creek will be maintained and improved since known sediment delivery sources are being rehabilitated. This includes the reduction of 193 tons of sediment from the Kick Bush slide; the removal and upgrades of at risk culverts; the work associated with the mine cleanup and stream channel restoration work at the Lakeview Operable Unit; and acquiring road maintenance work along FSR 278.

### Cumulative Effects to Fisheries

The West Gold project, in conjunction with ongoing activities, may cause a slight amount of sediment yield in the short term, but will result in an overall reduction in sediment delivery and risk of sediment delivery in the long term. The short-term increase in sediment yield from the West Gold project is very small compared to the overall reduction in sediment yield and risk of sediment delivery resulting from the culvert upgrades, the Kick Bush Slide repair, and the mine cleanup. The short-term increase in sediment may affect individual westslope cutthroat trout and torrent sculpin, if present, but would not lead toward a trend in federal listing. In the long term, the reduction in sediment yield is expected to benefit survival of individuals. Similarly, cumulative effects from the project and reasonably foreseeable actions may affect, but are not likely to adversely affect, federally listed bull trout, and are expected to benefit individual survival in the long term. Any increases in water yield would be localized and would not be measurable in fish-bearing channels.

## Determination of Effects on Species

<u>White sturgeon:</u> This project will have *no effect* on white sturgeon because there is no habitat within the effects area.

Bull trout: This project *may effect, but is not likely to adversely affect* bull trout. Bull trout currently inhabit the Gold Creek Watershed. Road related activities, including maintenance, obliteration, and culvert upgrades could produce a short-term increase in sediment delivery to streams in the watershed. However, these activities will reduce sediment delivery in the long term. Removal and upgrades of culverts will also immediately decrease the risk of sediment from crossing failures. Therefore, the long-term effects from the project are a net reduction in sediment and are a benefit to bull trout habitat.

**Conditions, Mandatory Conservation Requirements and Recommendations**

The Conditions of this Biological Assessment must be met to preserve the determination stated in this document unless otherwise agreed and documented by the appropriate personnel. They include:

1. BMPs (Best Management Practices):

   - BMPs for watershed resources will be adhered to (see Chapter II- Features Designed to Protect Water and Fish Habitat, and Appendix A in the EIS).

2. Timing:

   - Road work (e.g. replacement of culverts, installation of rolling dips, armoring of culverts) and road decommissioning within any live crossing will take place after July 15$^{th}$, to reduce risk of effects from sediment during spring runoff and to avoid effects to westslope cutthroat trout redds, and before September 15$^{th}$ to protect bull trout redds.

Recommendations of this Biological Assessment include fisheries enhancement opportunities that were identified during the assessment of the cumulative effects area. These opportunities do not need to be implemented to preserve the determination stated in this document.

**List of Preparers**

Prepared By: /s/ Chad T. BaconRind Date: November 12, 2002
Sandpoint Fisheries Biologist

Reviewed By: /s/ Shanda Fallau Dekome Date: November 12, 2002
Forest Fisheries Biologist

# CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS

Authorizing Agency: Bureau of Land Management/**US Forest Service** Management Unit(s): **Sandpoint RD**
Watershed: **Gold Creek** Subwatershed Name:
Action Type: Vegetation Treatment
Specific Actions (list):

| |
|---|
| **West Gold Project** |
| |
| |
| |

| Pathway | Indicators | Status of Baseline | Effects of the Action(s) | Basis for Rationale |
|---|---|---|---|---|
| Subpopulation Characteristics | Subpopulation Size | **FA**/FR/UR/? | R/**M**/D/NA | PJ and Pop. data; Strong bull trout population in Gold Creek. Redd count data shows second strongest spawning population in Pend Oreille Sub-Basin. Project implementation would not change this. |
| | Growth and Survival | **FA**/FR/UR/? | R/**M**/D/NA | PJ and Pop. data; Redd count data indicate fairly constant spawning runs. |
| | Life History Diversity and Isolation | **FA**/FR/UR/? | R/**M**/D/NA | PJ and Pop. Data. All life forms present in Gold Creek watershed. Population is connected to Pend Oreille. Some strong neighboring populations. |
| | Persistence and Genetic Integrity | **FA**/FR/UR/? | R/**M**/D/NA | PJ and Pop. data; Bull trout population persistence and genetic integrity high in Gold Creek Watershed and the Pend Oreille sub-basin. Redd count data from 1983 to 2001 indicates high probability of persistence. Brook trout are not known to inhabit Gold or West Gold creeks, therefore hybridization is not likely. |
| Water Quality . | Temperature | FA/**FR**/UR/? | R/**M**/D/NA | PJ and survey data; In the summers of 2000 and 2001, maximum temperatures were: 15°C in lower West Gold Creek above the confluence with Gold Creek, likely due to high number of springs in the area; 16.5°C above the powerline corridor. Bull trout only incidentally use the lowest reach of West Gold Creek. Temperatures may exceed 13° C during bull trout rearing, not meeting standards for bull trout rearing. No harvest planned within the RHCA, using INFISH buffers, temperatures not affected by project. |

| | | | | |
|---|---|---|---|---|
| Water Quality (cont.) | Sediment | FA/**FR**/UR/? | **R**/M/D/NA | PJ and survey data; WATSED model indicates that sediment delivery is approx 90% above normal in Gold and West Gold Creeks. Contributing factors include: roads/road crossings and past management activities. The West Gold Project includes road and drainage improvement. A reduction in short and long term risk of sediment delivery is expected as a result of removal of continual sources of sediment. Other activities, such as the repair of the Kick Bush Slide and mine reclamation efforts will decrease the long-term sediment delivery to the cumulative effects area. Fines stored behind old beaver dams and within pools would continue to route through the West Gold Creek system for some time. |
| | Chemical Contaminants/Nutrients | **FA**/FR/UR/? | R/**M**/D/NA | Not a 303 (d) stream for chemical contaminants or nutrients. |
| Habitat Access | Physical Barriers | **FA**/FR/UR/? | R/**M**/D/NA | PJ and survey data; there are no known man-made migration barriers on Gold or West Gold Creeks, however, excessive bedload from past mining activities have created a delta at the mouth of Gold Creek that is a barrier in some low water years. |
| Habitat Elements | Substrate Embed. | FA/**FR**/UR/? | **R**/M/D/NA | PJ and survey data; See sediment**.** An overall decrease in sediment delivery will result in lower substrate embeddeness in the long term. |
| | LWD | FA/**FR**/UR/? | R/**M**/D/NA | PJ and survey data. No harvest in RHCA- understory slashing and burning in some units within RHCA, but outside of riparian area, followed by planting with long lived tree species will result in a long-term increase in LWD from project. Survey data indicates that LWD frequency is moderate, except where West Gold is adjacent to the powerline corridor, where LWD recruitment is low. In the lower reaches of West Gold and Gold creeks, survey data indicates the majority of pools formed by boulders and bedrock intrusions |
| | Pool Frequency & Quality | FA/**FR**/UR/? | R/**M**/D/NA | PJ and survey data; Pool habitat in the lower reaches of West Gold and Gold creeks are primarily boulder/bedrock formed. Embeddedness of substrate as a result of fines has reduced quality if not to some degree quantity of pools. Surveys show 10 pools per 100 m in Reach 1 of West Gold. Pool quality and complexity exceeds all other reaches of West Gold. No harvest within RHCAs. The Wepp Road model predicts minimal sediment delivery from these sources. No change to pool quantity is anticipated from this project; possible improvement to quality as a result of long-term sediment reduction due to restoration activities. |
| | Off-channel habitat | **FA**/FR/UR/? | R/**M**/D/NA | PJ and survey data; little to no off channel habitat noted from stream surveys, very few braids or side-channels, appropriate for the major channel type (Rosgen B). No loss of off-channel habitat from project (FA.). |
| | Refugia | **FA**/FR/UR/? | R/**M**/D/NA | PJ; FA except in localized sections directly affected by mines. |
| Channel Condition and Dynamics | Width/Depth Ratio | **FA**/FR/UR/? | R/**M**/D/NA | PJ and survey data; W/D ratio from field surveys is what would be expected using Rosgen stream classifications and is good overall. No effect to w/d ratio from project (FA.) |

| | | | | |
|---|---|---|---|---|
| | Streambank Condition | FA/**FR**/UR/? | R/**M**/D/NA | PJ and survey data; Within the project area, streambanks are stable (FA.) Riparian vegetation was removed adjacent to the powerline corridor(UR.) |
| | Floodplain Connectivity | **FA**/FR/UR/? | R/**M**/D/NA | Survey data and PJ; Valley is highly confined and stream sinuosity is low/moderate. Floodplain is accessible. |
| Flow/ Hydrology | Change in Peak/Base Flows | **FA**/FR/UR/? | R/**M**/D/NA | Under Alternative C, due to the design of the prescriptions, percent water yield would increase to 12.0%, or 3.0 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**.** |
| | Increase in Drainage Networks | **FA**/FR/UR/? | R/**M**/D/NA | PJ and survey data; There is little evidence of increased channel length in Project Area channels. Proposed stream crossings will be designed so that ditchlines will not drain directly into stream channels. These crossings will also be obliterated after timber sale activities are completed. No increase in active channel length with project. |
| Watershed Conditions | Road Density and Location | FA/**FR**/UR/? | R/**M**/D/NA | PJ and survey data; Total road density of 3.6 mi/mi². Roads are high on the slopes, well outside of the RHCAs, except at the 2707 crossing of West Gold. |
| | Disturbance History | FA/**FR**/UR/? | R/**M**/D/NA | PJ and modeling. Early historical fires, timber harvest, powerline clearing, and road construction, are all disturbance factors. Though some disturbances in the project area are recovering, the powerline corridor and roads will continue to be maintained. |
| | Riparian Conservation Areas | FA/**FR**/UR/? | R/**M**/D/NA | PJ and survey data; Past timber harvesting in the RHCAs occurred in a few headwater locations in the project area. These clearcuts are recovering. Understory slashing and burning activities within RHCAs to prep site for planting long lived tree species will expedite LWD recruitment and thermal cover. |
| | Disturbance Regime | FA/**FR**/UR/? | R/**M**/D/NA | PJ and survey data. Overall, natural processes within the watershed are stable. Restoration activities will improve resiliency be reducing sediment delivery to stream channels. This will be accomplished through road decommissioning, |
| Integration of Species and Habitat Conditions | Habitat Quality and Connectivity | FA/**FR**/UR/? | R/**M**/D/NA | PJ. The proposed project will not change habitat quality and connectivity. |

**Status:** Functioning Appropriately - FA Functioning at Risk - FR Functioning at Unacceptable Risk - UR
**Effect:** R - Restore: the action will result in a positive change in the indicator evaluated
M - Maintain: the action will have no effect on the status of the indicator evaluated
D - Degrade: the action will result in a negative change in the indicator evaluated
**PJ:** Professional Judgment

## DICHOTOMOUS KEY DETERMINATION

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **Yes**/No

A "**No"**, results in a "**NO EFFECT**" determination and the evaluation is completed. If "**Yes**", move to question #2.

2. Are there naturally reproducing species listed or proposed for listing currently or historically present at any time of the year in riverine habitat directly or indirectly affected by the actions? **Yes**/No

If "**Yes**", continue with question #3 through #11. If "**No**", document the "**NO EFFECT"** determination and the evaluation is completed.

3. Can the action change the existing input of Large Woody Debris (LWD) into historic or occupied habitat? Yes/**No**/NA
4. Can the action affect stream morphology for historic or occupied habitat? Yes/**No**/NA
5. Can the action affect properly functioning condition of the riparian area for historic or occupied habitat? Yes/**No**/NA
6. Can the action affect water quality and/or quantity in historic or occupied habitat? Yes/**No**/NA
7. Can the action affect the water flow regime/annual hydrography in historic or occupied habitat? Yes/**No**/NA
8. Can the action affect juvenile or adult behavior related to survival or reproduction? Yes/**No**/NA
9. Will the action involve toxic and/or hazardous materials, which may reach, occupied habitat? Yes /**No**/NA
10. Can the action affect juvenile or adult access to habitat? Yes/**No**/NA

**11. Can the action affect substrate material? **Yes**/No/NA (**See rationale within BA – "Effects on Species")

"**No**" responses to question #3-11 would result in a **"NO AFFECT"** finding and should be documented in the action file.

A "**Yes**" to any of the questions #3-11, results in a "**MAY AFFECT**" determination; continue with questions #12-14.

12. Are the effects described in #3-11 inconsequential/temporary in nature? **Yes**/No/NA
13. Do the actions employ Best Management Practices (BMP's) designated to meet State water quality standards? **Yes**/No/NA
14. Is mitigation established that would preclude or reduce measurable effects on species and their habitat? **Yes**/No/NA

"**Yes**" responses to #12-14 results in a "**NOT LIKELY TO ADVERSELY AFFECT**" determination.

"**No**" responses to #12-14 results in a "**LIKELY TO ADVERSELY AFFECT**" determination. **If the project can't be mitigated to a "NOT LIKELY TO ADVERSELY AFFECT," go to Documentation of Expected Incidental Take.**

The following mitigation has been identified for projects to reverse any "**LIKELY TO ADVERSELY AFFECT**" determinations:

| Project | Mitigation |
|---|---|
| **West Gold Timber Sale** may affect, but is not likely to adversely affect bull trout due to the expected, short-term increase in sediment deliver associated with this project. | |

**DETERMINATION OF EFFECT BY PROJECT AND AGENCY**

**Agency: USFS**/BLM **Mgmt Unit:** Sandpoint RD

| ACTION | DETERMINATION |
|---|---|
| West Gold Project | May Affect, Not Likely to Adversely Effect |
| | |
| | |
| | |
| | |

Biologist Signature: /s Chad T. BaconRind

**Agency:** USFS/BLM **Mgmt Unit:**

| ACTION | DETERMINATION |
|---|---|
| | |
| | |
| | |
| | |
| | |

Biologist Signature: ____________________

# Sensitive Species Biological Evaluation for Fisheries
# Summary of Conclusion of Effects**

**Project Name: West Gold Project**

**Preferred Alternative: Alternative C (as modified by the Decision)**

| Species | No Effect | May Impact Individuals, but Will Not Likely Result in a Trend Toward Federal Listing or Reduced Viability for the Population or Species | Likely to Impact Individuals or Habitat with a Consequence that the Action May Contribute Towards Federal Listing or Reduced Viability for the Population or Species** | Beneficial Effect |
|---|---|---|---|---|
| Burbot *Lota lota* | X | | | |
| Interior redband trout *Oncorhynchus mykiss gairdneri* | X | | | |
| Westslope cutthroat trout *Oncorhynchus clarki lewisi* | | X | | |
| Torrent sculpin *Cottus rhotheus* | X | | | |

Comments: determinations are based on the known distribution of the species, the habitat conditions required of the species, and the current habitat conditions within the evaluation area.

/s/Chad T. BaconRind
Fisheries Biologist

Date: 10/29/02

* Considered a significant action in NEPA
** The rationale for the conclusion of effects is contained in the EIS document and Project File