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Idaho Panhandle National Forests
Coeur d'Alene River Ranger District

Hither and Yon Beetle Environmental Assessment

HITHER AND YON BEETLE
ENVIRONMENTAL ASSESSMENT
May 2002

Coeur d'Alene River Ranger District
Idaho Panhandle National Forests
Kootenai County, Idaho

Lead Agency: USDA Forest Service

Deciding Official: Joseph P. Stringer, District Ranger

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ABSTRACT

A small timber management project is being proposed in three areas of the Coeur d'Alene River Ranger District: Grassy Mountain (portions of T52N, R2E, and T51N, R2E); Grizzly Mountain (a portion of T50N, R3E), and Dobson Pass (portions of T49N, R4E, and T48N, R4E). This environmental assessment describes four alternatives to meet the purpose and need. Alternative 1 is the No-Action Alternative (there would be no change from the current approach). Under Alternative 2 (the proposed action), harvest would occur on approximately 184 acres, using a combination of harvest treatments. In addition to the harvest treatments proposed under Alternative 2, Alternative 3 would also implement 72 acres of understory removal in the Grizzly Mountain area, followed by prescribed burning within harvest units. Harvest treatment under Alternative 4 would be the same as Alternative 2, with 34 acres of ecoburning in the Grizzly Mountain area (unlike Alternative 3, no understory removal would occur within the ecoburn area under Alternative 4).

No new road construction would be considered under any alternative. Under all of the action alternatives, approximately one-tenth of a mile of road reconstruction would occur in the Grizzly Mountain area to access a suitable helicopter landing. This road had been ripped and barriered but has not brushed in. The roadway would be brushed and bladed to make it suitable for use.

Copies of this Environmental Assessment are available in paper format or on compact disk (CD) from the Coeur d'Alene River Ranger District at the address above, and on the Idaho Panhandle National Forests' internet website (www.fs.fed.us/ipnf/eco/manage/nepa/).

COEUR D'ALENE RIVER RANGER DISTRICT
HITHER AND YON BEETLE
ENVIRONMENTAL ASSESSMENT

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CHAPTER 1
PURPOSE AND NEED FOR ACTION

1.1. PURPOSE AND NEED

Over the past several years, a widespread Douglas-fir beetle infestation has caused significant mortality to Douglas-fir trees scattered throughout the Coeur d'Alene River Ranger District. The Douglas-fir beetle outbreak that began on the district in 1998 is on the decline. However, we are still discovering small pockets of recent bark beetle mortality scattered across the Ranger District. We have recently discovered areas located in the vicinity of Spyglass Peak, Grassy Mountain, Grizzly Mountain, and Dobson Pass. Figures 1-1 and 1-2 display examples of beetle killed timber in the Grizzly Mountain and Dobson Pass areas.

Figure 1-1. Beetle-killed timber in the Grizzly Mountain project area.

Timber mortality in these areas is primarily a result of Douglas-fir beetle attacks that occurred during the 1999 through 2001 seasons. The proposed activities are outside of the project areas considered under the previously completed Douglas-fir Beetle Environmental Impact Statement (USDA Forest Service, 1999) and Small Sales Environmental Impact Statement (USDA Forest Service, 2000). Beetle mortality occurred in the new project areas as a result of subsequent flights and was not visually apparent until the 2000 and 2001 field seasons. This assessment documents the effects of salvaging some of this beetle-kill for timber products, initiating fuels reduction treatment, and restoring ecosystems in areas of low residual stand stocking levels. Some salvage of ice-damage, understory trees, and thinning around larch and ponderosa pine trees would also occur in areas associated with beetle mortality.

Figure 1-2. Beetle-killed timber in the Dobson Pass project area.

During reconnaissance for this project, we identified a section of Road 260 (approximately 2.5 miles from Riley Saddle, north to the junction with Road 1564) where approximately 50-75 trees are encroaching along the running surface of the roadway. These trees are making it difficult to perform road maintenance and are difficult to negotiate during winter grooming of this established snowmobile route. The Hither and Yon Beetle proposal considers the effects of removing these trees as part of the proposed activities.

The Spyglass Peak area was originally considered for treatment under the Hither and Yon proposal, but was dropped from consideration. Other areas of beetle mortality have been identified in the West Fork of Steamboat, Flat Creek, and Miners Creek. These areas have been dropped from further consideration due to old growth and wildlife habitat concerns (please refer to Chapter 2, Section 2.3.4 and Appendix A, "Alternatives Considered But Eliminated From Further Consideration").

1.2. PROPOSED ACTION

The proposed action (represented by Alternative 2) is to:

1) *Harvest dead and dying trees in areas attacked by bark beetles, damaged by snow or ice, or opened by losses to root disease, using salvage and regeneration harvest methods;*
2) *reduce the long-term fire hazard through timber harvest and a combination of fuels treatment methods;*
3) *enhance historical ecosystems through western larch thinning, improvement harvests in ponderosa pine stands, and ecoburning activities; and*
4) *restore long-lived seral tree species such as white pine, western larch and ponderosa pine in areas where a substantial portion of the live basal area of the stand has been lost to bark beetle, snow or ice damage, and root disease through timber harvest, site preparation, and planting of seedlings.*

Under the Proposed Action, timber harvest and associated fuels treatments would occur on a total of approximately 52 acres in the Grassy Mountain area, 55 acres in the Grizzly Mountain area, and 77 acres in the Dobson Pass area (a total of 184 acres). For more specific information regarding activities that would occur under the Proposed Actin (such as acres of harvest by prescription, yarding methods, fuels treatments, etc.), please refer to Table 2-4, the alternative descriptions in this chapter, and the alternative maps for the three areas (Figures 2-1, 2-2 and 2-3).

1.3. SCOPE OF THE PROPOSAL

The scope of this environmental assessment was determined through public scoping and agency analysis, in accordance with the requirements of 40 CFR 1508.25. The scope of the actions to be addressed includes the proposed timber harvest, fuels treatment, and reforestation activities. This environmental assessment documents analysis of site-specific, on-the-ground activities. It is not a general management plan for the Coeur d'Alene River Basin.

1.4. DECISIONS TO BE MADE

This environmental assessment is not a decision document. This document discloses the environmental consequences of implementing the proposed action or alternatives to that action. The District Ranger for the Coeur d'Alene River Ranger District is the Deciding Official. His decision and the rationale for that decision will be stated in the Decision Notice. The District Ranger will select an alternative for implementation based on:

- *the extent to which each alternative addresses the purpose and need for action*
- *consistency with the goals and findings of Forest policy and legal mandates*
- *how well each alternative responds to environmental issues and concerns identified by the public, other agencies, and Forest Service resource specialists*
- *effects of the selected alternative in comparison to other alternatives considered*

1.5. ORGANIZATION OF THE DOCUMENT

This document is tiered to and references the Forest Plan for the Idaho Panhandle National Forests, which sets forth the direction for managing the resources of the Forest. For clarity, that document is referred to simply as the "Forest Plan."

Chapter 2 presents the key resource issues within the area and describes the alternatives considered. Chapter 3 describes the existing conditions of specific resources and the changes that would occur to each resource under implementation of each alternative. Direct, indirect and cumulative impacts are discussed.

A List of Preparers identifies the individuals who conducted the analyses and prepared the environmental assessment. A List of References provides the full citation for those references noted in the environmental assessment. A list of Acronyms used in the text is provided, and the Glossary defines terms used in the text that may be unfamiliar to the reader. A list of those who will receive copies of this environmental assessment is provided. However, it is likely that others will request and receive copies of the document.

The Appendices contain analytical reports and specific or supplemental information that further explain discussions in the main chapters. Many more reports and analyses documentation have been referenced or developed during the course of this project, but were not included in this document either because they were technical in nature or were of excessive length. Those items are referred to as being part of the "project files." All project files for the Hither and Yon Beetle Environmental Assessment (EA) are available for review by the public. To review the files, please contact the Project Team Leader or the NEPA Coordinator at the Fernan Office of the Coeur d'Alene River Ranger District, (208) 664-2318.

1.6. PUBLIC REVIEW AND COMMENT

Comments are invited on this environmental assessment. In accordance with 36 CFR 215, and to ensure consideration in making a decision, comments must be postmarked or received 30 days from the date of publication of the legal notice in the Spokesman-Review newspaper. Commenters should include their name, address, telephone number, and the organization they represent (if any); the title of the document on which the comment is being submitted; and facts and reasons specific to this proposal for the Deciding Official to consider.

Comments received on the proposed project (including names and addresses of those who comment) will be considered part of the public record and will be available for public inspection. We can accept and consider comments submitted anonymously; however, people who submit anonymous comments will not have standing to appeal the subsequent decision (36 CFR 215). Any person may request that we withhold submitted comments from the public record (pursuant to 7 CFR 1.27(d)) by showing how the Freedom of Information Act (FOIA) permits such confidentiality. However, confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. We will inform the requestor of the agency's decision regarding the request for confidentiality. If the request is denied, we will return the submitted comments and notify the requester that the comments may be resubmitted, with or without name and address, within a specified time.

District Ranger Joseph Stringer is the responsible official for this proposal. For further information, please contact Project Team Leader Bob Rehnborg at the Fernan Office of the Coeur d'Alene River Ranger District, (208) 664-2318.

CHAPTER 2
ALTERNATIVES

2.1. INTRODUCTION

This chapter describes the alternatives considered to achieve the purpose and need discussed in Chapter I. The National Environmental Policy Act (NEPA) requires federal agencies to "identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment" (40 CFR 1500.2(e)). This chapter discloses the sources of analysis direction and guidance, alternative development (including public involvement), features common to all alternatives (including monitoring and mitigation), comparison of alternatives and their effects, and alternatives considered but eliminated from further study.

2.2. ANALYSIS DIRECTION AND GUIDANCE

2.2.1. National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires analysis of projects to ensure the anticipated effects upon all resources within the project area are considered prior to project implementation (40 CFR 1502.16). The analysis for the Hither and Yon Beetle project followed the guidelines of NEPA as provided by the Council on Environmental Quality (CEQ).

2.2.2. Natural Resources Agenda

On March 2, 1998, Forest Service Chief Mike Dombeck announced the Forest Service Natural Resource Agenda. The Agenda provides the Chief's focus for the Forest Service, and identifies specific areas where there will be added emphasis, including:

- *watershed health and restoration*
- *forest road policy*
- *sustainable forest management*
- *recreation*

The activities proposed in the Hither and Yon project areas have been designed to be consistent with the goals and tentative direction provided under the Natural Resources Agenda to date.

2.2.3. National Fire Plan

In 2000, over 92,000 wildland fires burned more than 7.5 million acres of grass, brush and forested lands across the United States. In response, the Secretaries of Agriculture and the Interior developed an interagency approach to respond to severe wildland fires, reduce their impacts on rural communities, and assure sufficient firefighting capacity in the future. The "National Fire Plan" identifies five key program areas designed to respond to the severe wildfires of 2000, to reduce their impacts on rural communities, and to enhance firefighting capabilities in the future. In Idaho, a total of over $91.3 million has been allocated to these programs. Specific proposals were submitted by field units (such as Ranger Districts) for consideration. Although the Hither and Yon Beetle project would treat fuels as part of the proposed activities, it is not a National Fire Plan proposal. Therefore, there is no further discussion of the National Fire Plan in this document.

2.2.4. Forest Service Road Management and Transportation System Rule

On January 28, 1998, in an Advance Notice of Proposed Rulemaking (63 CFR 4350), the Forest Service announced its intent to revise regulations concerning management of the national forest transportation system. In January 2001, the Forest Service issued a Final Rule regarding specific revisions to the road system rules at 36 CFR part 212 and to Forest Service administrative directives governing transportation analysis and management. The roads policy provides basic procedural protection for inventoried roadless areas and contiguous unroaded areas from road building until the Roadless Area Conservation Rule (discussed below) becomes effective, and the Forest completes a forest-scale roads analysis and incorporates it into the Forest Plan.

One of the tools developed to meet objectives of the revised policy is an integrated, science-based roads analysis process that allows objective evaluation of the environmental, social and economic impacts of proposed road construction, reconstruction, maintenance, and decommissioning (USDA Forest Service, 1999, Misc. Rep. FS-643). The six-step process does not make decisions nor allocate lands for specific purposes. Rather, the analysis identifies and addresses a set of possible issues and applicable analysis questions that, when answered, produce information for forest line officers to consider about possible road construction, reconstruction, and decommissioning needs and opportunities.

Line officers must also choose the appropriate geographic scale or scales and how detailed the analysis will be. Selecting the appropriate scale for assessing roads opportunities depends on the issues being analyzed and how their effects are manifested; the extent and nature of linkages with other ecological, social, and economic systems; the nature of variables under the control of the decision process; the information availability and value in relation to the range of potential consequences; and budget and personnel constraints (Roads Analysis: Informing Decisions about the National Forest Transportation System, USDA Forest Service, 1999, pg. 4).

The small scope of this project did not warrant the need to do the level of road analysis represented by the 6-step process just discussed. Existing transportation features were considered in the analysis. No new road construction would be proposed and the existing transportation system was analyzed under previous larger scale assessments. Approximately 0.1 miles of system road currently in storage would be put back in service to access a helicopter landing location in the Grizzly Mountain area. This road does not have any stream channel crossings and was put into storage by ripping the roadbed and blocking the entrance. The road would be bladed and brushed to make suitable for use and would be returned to a hydrologically inert storage state after use. Previous sale area improvement plans such as, Drexsey and Little Elk timber sales in the Grassy Mountain area, Big Dewey Brown timber sale and the Grizzly Salvage assessment in the Grizzly Mountain area, and the Capitol Hill assessment in the Dobson Pass area, provided transportation planning and funding sources for the placement of roads into a hydrologically inert storage state. The Coeur d'Alene River Ranger District Access Management Assessment (USDA Forest Service, 2000) also provided assessment on the current road status in these areas. For additional information, please refer to the "Transportation Planning" discussion under "Issues Not Addressed in Detail in This EA," in Appendix A.

2.2.5. Roadless Area Conservation Rule

The Roadless Area Conservation Rule, restricting logging and road building activities in 58.5 million acres of National Forest System lands, was published in the Federal Register on January 12, 2001, with an effective date of March 13, 2001. This effective date was delayed until May 12, 2001, consistent with the Assistant to the President's memorandum of January 20, 2001. On May 4, 2001, Secretary Veneman announced that the USDA would implement the Roadless Area Conservation Rule. The U.S. District Court for the District of Idaho preliminarily enjoined the Department of Agriculture from implementing the Roadless Conservation Rule. This decision was appealed on May 21, 2001, to the Ninth Circuit Court of Appeals, which held a hearing on the merits on October 16, 2001. On June 7, 2001 in order to bring some stability to roadless area management given the legal uncertainties, Chief Bosworth informed top agency officials that he reserved unto himself with some exceptions, authority to approve road construction, road reconstruction and timber harvest project in inventoried roadless areas. Interim Directives were issued on July 27, 2001, and updated on December 14, 2001, formalizing this policy.

There are no lands in or adjacent to the Hither and Yon Project Areas identified as inventoried roadless. There would be no change to road access in relation to inventoried roadless areas under any alternative; therefore, there is no further discussion of the Roadless Area Conservation Rule in this document.

2.2.6. Interior Columbia Basin Ecosystem Management Project

The Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin (USDA Forest Service, 1996, Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin) was used as a basis for evaluating the conditions in the Missouri Bug analysis area. The assessment covered the Columbia River Basin in Washington and Oregon east of the crest of the Cascade Mountains, most of Idaho, and small portions of northern Nevada, western Montana and western Wyoming, for a total of 145 million acres. The scientific findings for the ICBEMP were released during the fall of 1996. At the Interior Columbia Basin scale, the findings for the river basins on the Idaho Panhandle National Forests show that the river basins have a low composite ecological integrity primarily due to past alterations (Integrated Scientific Assessment, page 113). In the assessment, the Hither and Yon Beetle Project Area is within an ecosystem type identified as Forest Cluster #4, with the following conclusion: "Fuel management is a priority for maintenance of hydrologic function in these subbasins. Aquatic integrity is judged low or moderate. Recovery of both aquatic and terrestrial ecosystems requires active and intensive restoration efforts. These subbasins have high restoration potential with much to gain and relatively little to lose."

A Final EIS for the Interior Columbia Basin project was released in December 2000, with a "proposed" decision. Once a Record of Decision is signed, National Forests and BLM Districts will begin implementing the new strategy. Although the scientific findings of the ICBEMP are not part of the Forest Plan for the Idaho Panhandle National Forests, they are expected to provide guidance for the revision of the Forest Plan. No decisions or guidelines for analysis were made exclusively on this information; however, the science behind the ICBEMP is used in the analyses for the Hither and Yon Beetle project. When available, information and direction provided in the ICBEMP Record of Decision will be reviewed to determine whether a correction, supplement, or revision to the Hither and Yon Beetle EA is necessary, in compliance with Forest Service Handbook 1909.15 (Chapter 18).

2.2.7. Northern Region Overview

The Northern Region Overview and Summary (USDA Forest Service, April 1999), which covers northern Idaho and Montana, focused on priorities within northern Idaho and Montana for restoring ecosystem health and availability of recreation opportunities. The assessment describes the changes in vegetation that are contributing to the current beetle infestation.

> *"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 disease and 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. When Douglas-fir dies in stands now, the result is an effective 50-150 year acceleration of succession to grand fir and hemlock. This condition with heavy root disease and ladder fuels promotes and increases risk of stand-replacement fire." (Northern Region Overview Detailed Report; USDA October, 1998, page 22)*

> *"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." (Northern Region Overview; USDA October, 1998, page 24)*

The Northern Region Overview Summary explores this Region's situation with regard to ecosystem health and recreation. Ecosystem health was once referred to by ecologist Aldo Leopold as the capacity of the land for self-renewal. Ecological integrity, as discussed in the Columbia Basin and step-down assessments, is the wholeness or completeness of an ecosystem, the degree to which it has all the parts and processes it needs to function properly (Northern Region Overview Summary, USDA April 1999, pages 3-6). Characteristics of ecosystems with high integrity are:

- *Resiliency (the ability to withstand fires and other disturbances)*
- *Supportive of native and desired non-native species diversity*
- *Consist of a mosaic of well-connected habitats.*
- *Have functions (such as seed dispersal and decay) and processes (such as nutrient and water cycles) that operate effectively*

The Northern Region Overview findings conclude that there are multiple areas of concern in the Northwest Zone of the Region, but that "this subregion holds the greatest opportunity for vegetation treatments and restoration with timber sales. From a social and economic standpoint, using timber harvest for ecological restoration would be a benefit to the many communities which still have a strong economic dependency, more so than in other zones in the Region. Aquatic restoration should be focused on specific needs based on the zone aquatic restoration strategy." 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. (Northern Region Overview Summary, USDA April 1999, page 9).

2.2.8. Forest Plan for the Idaho Panhandle National Forests

General management direction for the Idaho Panhandle National Forests is found in the Forest Plan, which provides Forest-wide goals and objectives (Forest Plan, Chapter II). The standards and guidelines for the Forest Plan (Forest Plan, Chapter II) apply throughout the Resource Area. In development of the alternatives, standards and guidelines of the Inland Native Fish Strategy were used specifically to protect water and aquatic biota within the Resource Area. The Inland Native Fish Strategy was prepared in July, 1995, to provide interim direction to protect habitat and populations of resident native fish outside of anadromous fish habitat in eastern Oregon, eastern Washington, Idaho, western Montana, and portions of Nevada (USDA Forest Service, 1995). Under the authority of 36 CFR 219.10(f), the decision amended Regional Guides for the Forest Service's Intermountain, Northern, and Pacific Northwest Regions and Forest Plans in the 22 affected Forests, including the Idaho Panhandle National Forests. In development of the alternatives, standards and guidelines of the Inland Native Fish Strategy were used specifically to protect water and aquatic biota within the project area. Please refer to the discussion under "Features Common to All Action Alternatives – Features Designed to Protect Aquatic Resources" in this chapter for more specific information.

2.2.9. Coeur d'Alene River Basin Geographic Assessment

The Geographic Assessment ("Toward an Ecosystem Approach: An Assessment of the Coeur d'Alene River Basin," USDA Forest Service, February 1998) provides information regarding the ecological conditions specific to the Coeur d'Alene River Basin. The recommendations and strategies presented in the Geographic Assessment were based on three major groups of findings: 1) social and economic, 2) landscape and terrestrial, and 3) aquatic. The findings of the assessment are consistent with the findings of the Upper Columbia River Basin findings at the next scale down. To identify the overall strategy for the Coeur d'Alene River Basin, the terrestrial, watershed, wildlife and recreation (sense of place) maps were overlaid. The highest priority for active restoration becomes 1) non-functioning watersheds with serious terrestrial problems; and 2) functioning-at-risk watersheds with serious terrestrial problems.

The action alternatives, though small in scope, propose to re-introduce seral species such as western white pine, ponderosa pine, and larch back into the ecosystem. The geographic assessment refers to the substantial reduction that has occurred to this ecosystem component and the need to restore this vegetative component.

2.2.10. Legal Mandates

In addition to compliance with the assessments and policies described above, each resource discussion in Chapter 3 identifies the laws and regulations ("Regulatory Framework") that applies to that particular resource, and addresses how well each alternative would meet applicable legal mandates ("Consistency With Forest Policy and Legal Mandates").

2.3. SCOPING AND ALTERNATIVE DEVELOPMENT

2.3.1. Scoping

The first step in environmental analysis is to determine what needs to be analyzed. To do this the NEPA outlines a process termed "scoping" (refer to 40 CFR 1501.7). This is an open process designed to determine the potential issues associated with a proposed action and then, from this list, to further identify those issues that are significant to the decision, and those which are not significant or which have been covered by prior environmental review and therefore should be eliminated from detailed analysis.

The public was notified of this project in several ways:

- *scoping letter (to those groups and organization that typically comment on our proposals and for those that requested additional information) dated December 26, 2001*
- *legal ad in the newspaper of record (Spokesman-Review) dated December 28, 2001*
- *"Quarterly Schedule of Proposed Actions" for the IPNFs (starting with the February 2002 issue)*

During scoping, letters were received from Bryan Bird (Forest Conservation Council - FCC), Ryan Shaffer (Alliance for the Wild Rockies - AWR), and Mike Mihelich (Kootenai Environmental Alliance - KEA). Copies of their letters and Forest Service response to comments are provided in Appendix A (Public Involvement). The team has considered concerns identified by the public and incorporated their ideas whenever possible. Refer to Appendix A for a detailed discussion of public involvement efforts, how public comments led to issues and alternatives, and how public concerns were addressed.

2.3.2. Issues

There are several issues considered as factors in the decision to be made. Some are of sufficient concern to drive development of alternatives to the extent feasible within the physical, biological, and legal limits of forest management. Others were not key in developing alternative concepts, but are important for their value in assessing specific protective measures. These protective measures become features of the alternatives and/or specific mitigation measures. They have been addressed in detail either because the effects will have a bearing on the decision to be made, or because these resources are of interest or concern to the public.

***Issue 1 – Forest Vegetation**: Concerns related to forest vegetation have been identified by the Forest Service and the public (Alliance for the Wild Rockies, Forest Conservation Council, and Kootenai Environmental Alliance).*

***Issue 2 – Fire/Fuels**: Of primary concern to the Forest Service are the long-term increase in fuel loading (the amount of combustible materials which contribute to the intensity of a fire) and the subsequent changes in fire intensity and severity that may occur. Comments from the public (Alliance for the Wild Rockies and Forest Conservation Council) identified concern with how fuel reduction activities are carried out.*

***Issue 3 – Economic Values (Finances)**: The proposed activities have associated costs as well as the potential to generate revenues. Public comments (from Forest Conservation Council and Kootenai Environmental Alliance) indicated concerns with the financial aspects of the proposal, specifically the concept of generating funds for restoration through timber harvest.*

***Issue 4 – Wildlife**: Section 7 of the Endangered Species Act directs federal agencies to ensure that their activities are not likely to jeopardize the continued existence of any Threatened or Endangered species or result in the destruction or adverse modification to their critical habitat. A number of species have been identified as Sensitive within the geographic area of the Idaho Panhandle National Forests. Other species of wildlife are used as indicators of how well their needs for certain types of habitat are being met. Public comments were received from the Alliance for the Wild Rockies and Forest Conservation Council identifying concerns related to protection of wildlife and associated habitat.*

In addition, all three environmental organizations emphasized the importance of the cumulative effects analysis, which is addressed through the documentation in Chapter 3, rather than as an issue.

Based on the assessment of effects and public comment, the agency determined that most other issues could be adequately mitigated or addressed by design features or other aspects of the proposed activities. A list of these issues and brief discussion of each of those issues is provided in Appendix A ("Issues Not Addressed in Detail in this Environmental Assessment").

2.3.3. Alternative Development and Modification

Development of alternatives was based on existing condition of resources in the project areas, issues and concerns identified by the project team and the public, and the purpose and need identified for the project. The "Federal Guide to Watershed Analysis - Environmental Analysis at the Watershed Scale" (USDA Forest Service, August 1995) is a process used to focus on proposed activity areas, describe current conditions, and identify possible treatment alternatives. This process was recently used for a project (the Burnt Cabin Heli Bug Project) very similar in size and scope to the Hither and Yon Beetle project, and was found to be quite lengthy and of limited value for such a small scale project. Therefore, the Hither and Yon Beetle project did not use this analysis development process, but did assess watershed conditions at that scale, as disclosed in Chapter 3, Water Resources.

2.3.4. Alternatives Considered But Eliminated From Further Study

During project development eight other proposals were analyzed but dismissed from further consideration:

- *Harvest treatment in the Spyglass Peak project area*
- *Reconstruction of 1.2 miles of system road in the Grizzly Mountain project area*
- *Utilize conventional yarding methods only*
- *Utilize regeneration treatments only*
- *Utilize salvage treatments only*
- *No-harvest vegetative restoration only treatments*
- *Ecoburn treatments in the Dobson Pass project area*
- *Watershed restoration only*

See Appendix A for more information on these alternatives and the rationale for why they were eliminated from further study.

2.4. REASONABLY FORESEEABLE ACTIVITIES

To address cumulative effects, activities have been identified and considered that have a reasonable chance of occurring within the following watersheds: Tepee Creek above Trail Creek, Grizzly Creek, and Beaver Creek. This helps to establish the appropriate geographic and temporal (time) boundaries for the cumulative effects analysis. The following tables display information about projects that are either ongoing or reasonably foreseeable (please refer also to the map in the Project Files, Reasonably Foreseeable Activities). The analysis of effects to resources incorporated the effects of these activities as appropriate (please refer to the cumulative effects discussions for each resource in Chapter 3). The tables do not include routine activities such as general fuelwood gathering, road maintenance, and existing special use permits. Past activities within the cumulative effects analysis boundaries for each resource is derived from the Timber Stand Management Records System (TSMRS). Information and maps of past harvest units within the project area are located in the Project Files – Vegetation.

Within the Hither and Yon Beetle cumulative effects area, there are no reasonably foreseeable recreation projects identified.

Table 2-1. Ongoing or Reasonably Foreseeable Timber Sale Projects on other Federal, State, and Private Ownership, and Estimated Duration.

Ownership	Activities	Watershed	Duration
Louisiana Pacific	1,900 acres individual tree salvage	Beaver Creek (Missoula and Carbon)	Possible annual treatment
Idaho/LA Mining and Milling	0.4 miles road construction, 1.0 mile reconstruction, 100 acres commercial thinning, line skidding	Beaver Creek (Missoula and Carbon)	2002
BLM	20 acres salvage of beetle-killed timber, 0.2 miles road construction	Beaver Creek (Keystone Gulch)	2004

Table 2-2. Ongoing Projects and Estimated Duration.

General Projects	Activities	Watershed	Est'd Duration
Access Management/ Travel Plan	Road and trail management	District-wide	Until next revision
Noxious Weeds	Integrated noxious weed treatment (338 acres)	76 sites	Until 2005
Timber Sale Projects	**Activities**	**Watershed**	**Est'd Duration**
East Side Heli Bug	Timber salvage (50 total acres), fuels treatment (23 acres jackpot burning, 7 acres underburning, 14 acres ecosystem burning), planting, one armored overflow, 2 culvert upgrades, noxious weed treatment	Beaver Creek	Timber salvage – July 2003 Other – 2008
Unknown King Bug	Timber salvage (40 total acres), fuels treatment (5 acres underburning, 7 acres jackpot burning), planting, 1.4 miles of road recontouring, noxious weed treatment	Beaver Creek	Timber salvage – July 2003 Other – 2008
Sale-related Projects	**Activities**	**Watershed**	**Est'd Duration**
Big Short	Brush disposal, planting, exams	Tepee Creek	Through 2007
Beaver Heli Bug	Brush disposal, planting, exams	Beaver Creek	Through 2007
Capitol Hill	Exams	Beaver Creek	Through 2005
King's Ridge	Planting, exams	Beaver Creek	Through 2005
Lower White	TSI exams	Beaver Creek	Through 2008
Unknown Pony	Planting, exams, installation of 50 bedload traps, 20 wood debris placement, 50 stream stepdowns, 4 road closures, browse burning on 190 acres	Beaver Creek	Through 2003, exams 2008
Recreation Projects	**Activities**	**Watershed**	**Est'd Duration**
Scott Gulch Trail	Maintenance	Beaver Creek	annual
Sunset Peak Trail	Maintenance	Beaver Creek	annual
Grazing Projects	**Activities**	**Watershed**	**Est'd Duration**
Beaver Pony	Pasture permit (9 cows – occasional use)	Beaver Creek	1 year - 2002
Minerals Projects	**Activities**	**Watershed**	**Est'd Duration**
Graffenberger	Placer-Gold Mine – exploration, several trenches on hillside	Beaver Creek (Potosi)	Ongoing
McPeak	Placer-Gold Mine – small production, less than 1 acre disturbance on hillside	Beaver Creek (Potosi)	Ongoing
Miller	Placer-Gold Mine – exploration, several trenches within 300 feet of stream	Beaver Creek (Potosi)	Ongoing
Stutzke	Placer-Gold Mine – production, less than 1 acre disturbance within 500 feet of stream	Beaver Creek (Potosi)	Ongoing
GPAA/Curtis	Placer-Gold Mine – exploration, trench/processing within 300 feet of stream	Beaver Creek (Pony Gulch)	Ongoing
Scobey	Placer-Gold – production, small dredge in intermittent stream	Beaver Creek (Potosi)	Ongoing
Hendricks	Placer-Gold – exploration, trench along road with no nearby streams	Beaver Creek (Potosi)	Ongoing

Table 2-3. Reasonably Foreseeable Projects and Estimated Duration.

General	Activities	Watershed	Duration
WWP secondary powerline	Hazard tree reduction (felling, no harvest)	Beaver Creek	2004
Timber Sales	**Activities**	**Watershed**	**Duration**
Missouri Heli Bug	Timber salvage (55 acres), no road construction, site prep burning, planting, noxious weed treatment	Beaver Creek	Timber – December 2003 Other - 2008
Small Sales EIS	Timber salvage (10 acres), no road construction	Beaver Creek	Timber 12/2003
Teratoid Tepee*	Vegetative, aquatics, and wildlife habitat restoration	Tepee Creek	2004-2010
Beaver Creek*	Vegetative, aquatics, and wildlife habitat restoration	Beaver Creek	2005-2011
Commercial Fuelwood Areas	**Activities**	**Watershed**	**Duration**
Unknown Gulch	Fuelwood gathering (Roads 3100 series, 3101, 3102, 3102A)	Beaver Creek	Summer 2003
Idaho Gulch	Fuelwood gathering (1505, 6328 roads)	Beaver Creek	Summer 2003
Grazing	**Activities**	**Watershed**	**Duration**
CDA Grazing Allotment EA	Analysis of existing grazing activities	Beaver Creek	2002
Minerals	**Activities**	**Watershed**	**Duration**
Numerous Mine Closure Projects	Safety closures of abandon mine sites	Beaver Creek	2002-2005
TSI (Thinning)	**Activities**	**Watershed**	**Duration**
First/Elk	57 acres of precommercial thinning	Tepee Creek	Through 2005

** These proposals are in the early stages, and there is little specific information available regarding the amount, location, and type of treatment activities. Effects of these projects will be analyzed under separate NEPA documentation once proposed treatment activities are identified, and will consider the cumulative effects of other past, ongoing (including the Hither and Yon Beetle project activities) and reasonably foreseeable activities at that time.*

2.5. OPPORTUNITIES

"Opportunities" are activities that could complement and improve resource conditions within the project area. Such projects are not considered mandatory for project implementation nor are they guaranteed to be implemented, but they may be accomplished if funding becomes available.

2.5.1. Opportunities for Aquatic Restoration

Due to the watershed improvement activities either already completed or ongoing (discussed in Chapter 3, Water Resources, "Watershed Restoration Accomplished in the Project Areas), there are limited high priority watershed projects or areas identified that would result in a good return on investment for the watershed in any of the three project areas. There is an opportunity to restore stream channel crossings on Road 1564 in the Grassy Mountain area. This road is located high on the slope. There are no major drainage crossings but there are several small ephemeral to intermittent side drainages with culverts. This opportunity could be implemented if the gate on Road 1564 is replaced with an earth barrier. It would be preferred to defer this opportunity until the larger landscape level assessment (Teratoid Tepee) is completed. There is also an opportunity to install some overflow pipes on Road 503 at the mouth of Grizzly Creek. This area is on National Forest System land but the road itself is under Shoshone County jurisdiction. There is currently a large squash pipe where Road 503 crosses Grizzly Creek. The remainder of the Grizzly Creek floodplain is diked by Road 503. It would be beneficial to the watershed to install several overflow pipes within the diked area to reduce the risk of road washout during high flows and flood events. Financing of this project would need to come from county funds or some form of cooperative funding.

2.5.2. Opportunities for Noxious Weed Treatment

Many areas affected by the proposed activities (especially road segments and landings) would likely be surveyed and monitored to assess the establishment and spread of noxious weeds. However, the full extent of surveying, monitoring and treatment, and the availability of funding is not known at this time, therefore these activities are classified as opportunities that could be accomplished if funding becomes available. Treatment would be conducted under the guidelines of the Noxious Weed EIS for the Coeur d'Alene River Ranger District (USDA Forest Service, 2000).

2.6. ALTERNATIVE DESCRIPTIONS

2.6.1. Description of the Alternatives

Comparing a range of alternatives can help determine which activities, if any, should occur under this project. The range of alternatives considered is reasonable given the characteristics of the areas, the current conditions, the purpose and need for action, the desired effects, the scope of the proposal, and the range of treatments considered but dismissed prior to analysis. The following table displays the amount of harvest by silvicultural prescription, fuels treatment, and yarding methods that would occur under each of the alternatives. In addition to other activities, the action alternatives include timber harvest practices designed to meet particular silvicultural goals. A detailed description of the features of various silvicultural systems and their effects is included in the Forest Plan (Forest Plan, Appendix A). No new road construction would occur under any alternative. For additional information, please refer to the alternative descriptions and maps that follow the table, and the Project Files.

Table 2-4. Summary of Proposed Activities, by alternative.

Feature	Alt. 1 (No Action)	Alt. 2 (Proposed Action)	Alt. 3	Alt. 4
Total proposed harvest (acres)	**0**	**184**	**256**	**184**
Salvage	0	62	62	62
Group Shelterwood (with planting)	0	59	59	59
Commercial thin		33	33	33
Improvement harvest	0	17	17	17
Understory removal	0	0	72	0
Fish Wood harvest (with planting)	0	9	9	9
Special harvest	0	4	4	4
Total proposed fuels treatment (acres)	**0**	**184**	**256**	**218**
Lop and scatter	0	97	97	97
Grapple pile	0	11	11	11
Jackpot	0	66	66	66
Underburning	0	10	10	10
Ecoburning	0	0	72	34
Total yarding systems (acres)	**0**	**184**	**256**	**184**
Cable	0	31	31	31
Skyline	0	64	64	64
Tractor	0	17	17	17
Helicopter	0	72	144	72
Road reconstruction (miles)	0	0.1	0.1	0.1
Estimated Harvest*1*				
Timber volume (CCF) 2	0	1,650	2,000	1,650
Timber volume (MBF) *3*	0	835	1,000	835

1 Wood removed for fish habitat improvement not included in this figure
2 CCF = 1 cunit (one hundred cubic feet)
3 MBF = thousand board feet

Alternative 1 (No Action)

The No-Action Alternative is required by NEPA and NFMA. Under this alternative, none of the proposed activities would occur at this time. There would be no change from current management direction or from the level of management intensity in the area. Implementation of the foreseeable activities identified earlier in this chapter would still occur. Because there would be no recovery of the economic value of damaged timber, no improvement in the vegetative resources, and no long-term reduction in risk of wildfire, this alternative would not meet any of the specific objectives of the Forest Plan and Geographic Assessment identified for this project. The No-Action Alternative was analyzed in detail to display the effects of not meeting these objectives, and to compare against the action alternatives.

Alternative 2 (Proposed Action)

From a vegetation standpoint, the objective of this alternative is to harvest dead and dying trees in areas attacked by Douglas-fir bark beetles, to salvage trees fading to root disease and other causal agents of mortality, to enhance historical ecosystem components, and to restore long-lived seral tree species such as white pine, western larch and ponderosa pine in stands where bark beetles, root disease, and other causal agents have killed a substantial portion of the basal area of the stand. The emphasis of the treatment will be to salvage dead and dying timber.

In stands where mortality is generally light (over 50% of live basal area remaining in the stand), individual tree selection harvest treatment would salvage trees killed by bark beetles (this includes trees that are attacked by beetles that have crown symptoms indicating the trees will die) and associated trees fading to root disease or other pathogens. Additional incidental green trees may need to be removed to allow for safe felling practices or removal of trees significantly damaged during the harvest operation. Fuels would be treated by lop and scattering with a minor amount of grapple piling and burning. Lop and scatter treatment would get this material on the ground where it will decompose quicker.

In stands where beetle, root disease and blister rust-related mortality is more severe (generally over 50% loss of overstory basal area), a regeneration harvest (group shelterwood) would be used to create conditions suitable for the planting and establishment of pines and larch regeneration. Most of these areas would have slash reduced using prescribed fire treatments (either jackpot or underburning). Approximately 9 acres would be grapple-piled and burned. Treated areas would then be planted to white pine, larch and ponderosa pine. The emphasis would be on retention of groups of large healthy overstory trees to maintain visual quality objectives on the sites. Smaller green trees that are not expected to survive prescribed fire treatments in these stands would be harvested unless retained for wildlife habitat. Generally, healthy Douglas-fir over 16 inches in diameter and grand fir over 18 inches in diameter would be retained on site. Regeneration harvest units would retain groups of trees and/or scattered individual trees that have been unaffected by the bark beetle infestation, root disease, or other pathogens. Generally, 20-30% of the stand basal area would be retained in shelterwood harvest prescriptions.

One group shelterwood treatment in the Grassy Mountain project area would utilize the wood that is removed for ongoing fish habitat improvement projects not associated with this proposal. This area contains considerable down material that is no longer usable for sawtimber products. Approximately 9 acres scheduled for harvest in the Grassy Mountain area would utilize the forest products for fish habitat enhancement work previously approved for Yellowdog Creek. These 9 acres would then be site prepared and planted.

Within the Dobson Pass project area, there are two units identified for improvement harvests. The objective of this treatment would be to improve the health and vigor of ponderosa pine and to restore a more open stand structure associated with historic disturbance regimes. Shade tolerant species, primarily Douglas-fir and grand fir, less than 16 inches in diameter within 25 feet of ponderosa pine would be harvested. This

"daylighting" treatment would only occur if the ponderosa pine have adequate crowns capable of responding to the improved light and moisture regimes. If western larch occurs in these areas, it would also be daylighted. Jackpot burning would be utilized in these areas to treat slash and enhance ecosystem conditions.

Also within the Dobson Pass project area are two units identified for commercial thinning. The objective of this treatment would be to improve the health and vigor of western larch in these stands. Approximately 1/3 of the existing basal area would be harvested. This harvest would focus on the removal of shade tolerant species such as Douglas-fir, grand fir, and western hemlock less than 16 inches in diameter within 20 feet of western larch trees. This treatment would reduce competition and improve tree vigor on the site. Larch with less than 20% live crown or with heavy mistletoe may also be removed if within 20 feet of an acceptable leave tree. Slash would be treated with lop and scatter treatments to get fuels on the ground so they will decompose more quickly.

There is a section of Road 260 from the Grassy Mountain project area down to Riley Saddle (the junction with Road 900) where approximately 50-75 trees (scattered along 2.5 miles of road) are growing along the lower edge of the running surface of the roadway. These trees are making it difficult to do routine road maintenance and snowmobile trail grooming during the winter months. Under this alternative, these "bumper trees" would be harvested to improve road maintenance and winter grooming. Stumps of the trees on the roadway would be ground down so that they do not interfer with surface blading operations. This special harvest treatment is estimated at approximately 4 acres based on the width of the road for 2.5 miles. Since these trees are widely scattered, logging slash would generally be scattered off the roadway.

Timber products produced by these treatments would be removed using tractor, cable, skyline, and helicopter yarding methods. No new road construction would be needed. Approximately 0.1 miles of system road would need to be brought out of storage in the Grizzly Mountain area to access a suitable helicopter landing. This road had been ripped and barriered but has not brushed in. This roadway would be put back in storage after completion of use. A preferred public firewood gathering opportunity would be considered in the Grassy Mountain area after harvest operations are completed.

Alternative 3

This alternative proposes to accomplish the same harvest treatments as described in Alternative 2. In addition, approximately 72 acres of selected ecoburning would also be implemented in the Grizzly Mountain area as ecosystem treatments and to provide logical burn boundaries for slash disposal treatments within harvest units. Understory removal harvest treatments would occur within the ecoburn areas prior to implementation of the burns. The understory removal harvest would remove smaller merchantable trees not expected to survive the ecoburn. Generally, this would involve trees less than 12 inches in diameter depending on the species. Fading trees from root disease, beetles, and other causal agents would also be salvaged in this operation. Older dead beetle mortality would be retained on site for wildlife habitat. Timber would removed from these ecoburn areas using helicopter yarding systems.

Alternative 4

This alternative would also accomplish the same harvest treatments as Alternative 2. In addition, approximately 34 acres of selected ecoburning would be implemented in the Grizzly Mountain area. No understory removal harvest treatments would occur within the ecoburn areas under this alternative.

Figure 2-1. Under all action alternatives, treatment in the Grassy Mountain area would include wood removal from this unit to be used for fish habitat improvement projects, and to create conditions for timber stand restoration using white pine and western larch.

The following tables and maps display the amount, type, and location of proposed activities in the three Hither and Yon project areas.

Table 2-5. Specific Unit Information for the Grassy Mountain Project Area, all alternatives.

Unit[1]	Acres	Treatment	Volume (mbf[2])	Yarding	Fuels Treatment	Planting
1	4	Sanitation/Salvage	20	Cable	Grapple pile lower half	Natural
2	4	Sanitation/Salvage	20	Skyline	Lop & Scatter	None
3	9	Sanitation/Salvage	30	Cable	Lop & Scatter	None
4	2	Sanitation/Salvage	5	Cable	Lop & Scatter	None
5	9	Roadside Salvage	25	Cable	Lop & Scatter	None
6	8	Sanitation/Salvage	25	Tractor	Lop & Scatter	None
7	3	Roadside Salvage	5	Cable	Lop & Scatter	None
9	9	Fish Wood	15 truck loads	Tractor	Grapple pile	White pine/ Larch
10	4	Special Harvest	10	Cable	Remove slash from roadway	None
Total	**52**		**140**			

[1] *Unit 8 was dropped under all alternatives due to concerns for wildlife habitat.*
[2] *mbf = thousand board feet*

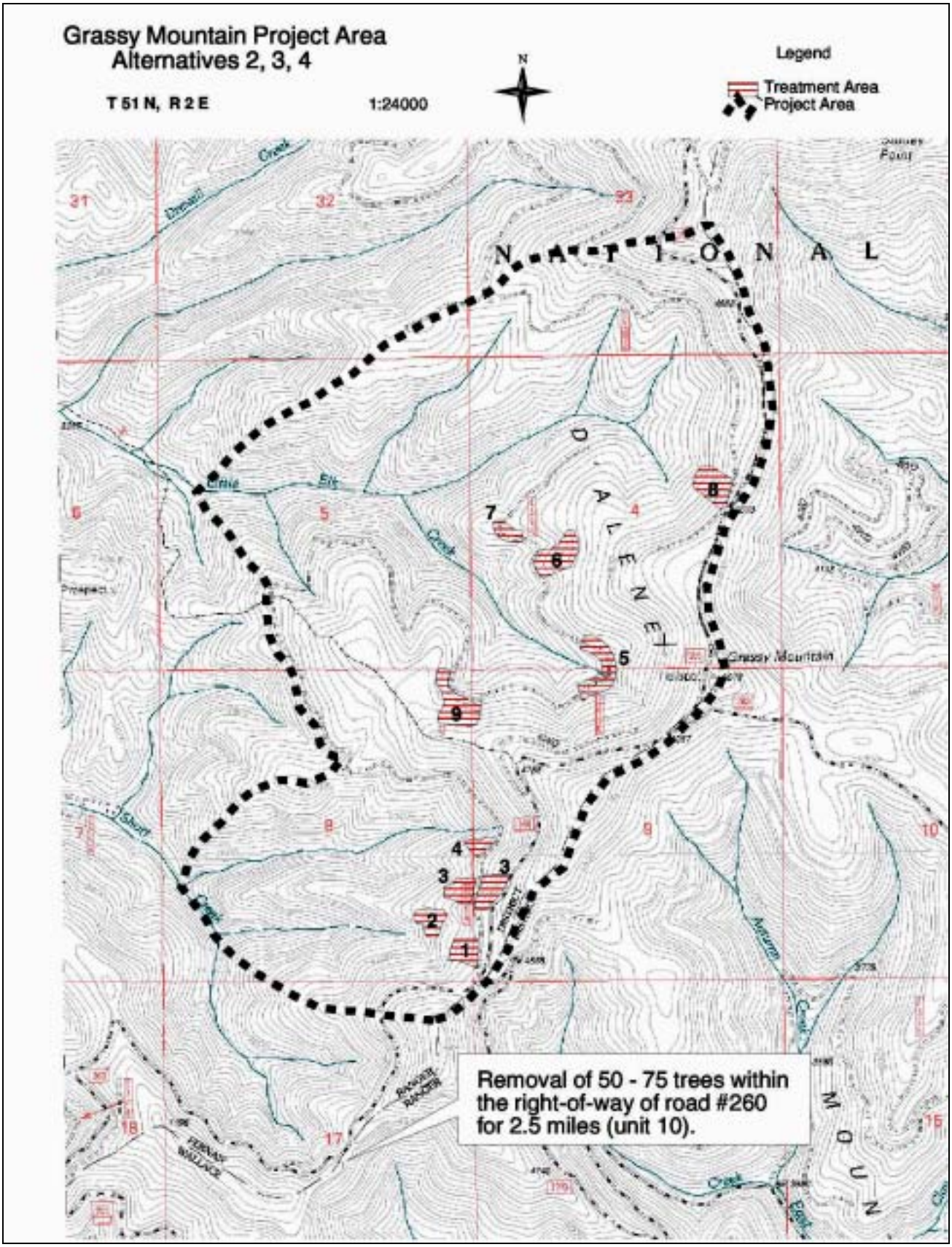


Figure 2-2. Map of the proposed activity locations in the Grassy Mountain project area.

Table 2-6. Specific Unit Information for the Grizzly Mountain Project Area, all alternatives.

Unit	Acres	Treatment	Volume (mbf[1])	Yarding	Fuels Treatment[2] and 3	Planting
1	4	Group Shelterwood	20	Helicopter	Jackpot	White pine/ Larch
2	4	Group Shelterwood	25	Helicopter	Jackpot	White pine/ Larch
3	2	Group Shelterwood	15	Helicopter	Jackpot	White pine/ Larch
4	2	Group Shelterwood	15	Helicopter	Jackpot	White pine/ Larch
5	3	Group Shelterwood	20	Helicopter	Jackpot	White pine/ Larch
6	2	Group Shelterwood	15	Helicopter	Jackpot	White pine/ Larch
7	3	Group Shelterwood	20	Helicopter	Jackpot	White pine/ Larch
8	3	Group Shelterwood	20	Helicopter	Jackpot	White pine/ Larch
9	3	Group Shelterwood	20	Helicopter	Jackpot	White pine/ Larch
10	3	Group Shelterwood	20	Helicopter	Jackpot	White pine/ Larch
11	3	Group Shelterwood	20	Helicopter	Jackpot	White pine/ Larch
12	4	Sanitation/Salvage	20	Helicopter	Lop & Scatter	None
13	5	Sanitation/Salvage	20	Helicopter	Lop & Scatter	None
14	14	Sanitation/Salvage	60	Helicopter	Lop & Scatter	None
Total	**55**		**310**			

[1] *mbf = thousand board feet*

[2] *Under Alternative 3, ecoburning would occur adjacent to Unit 1 and between Units 6-11 from the ridgeline to the road (72 acres), in addition to the treatments identified in the table above. An understory removal treatment would occur prior to burning using helicopter yarding systems.*

[3] *Under Alternative 4, ecoburning would occur between Units 8-11 from the ridgeline to the road (34 acres,) in addition to the treatments identified in the table above. No timber harvest treatments would occur prior to the burn under Alternative 4..*

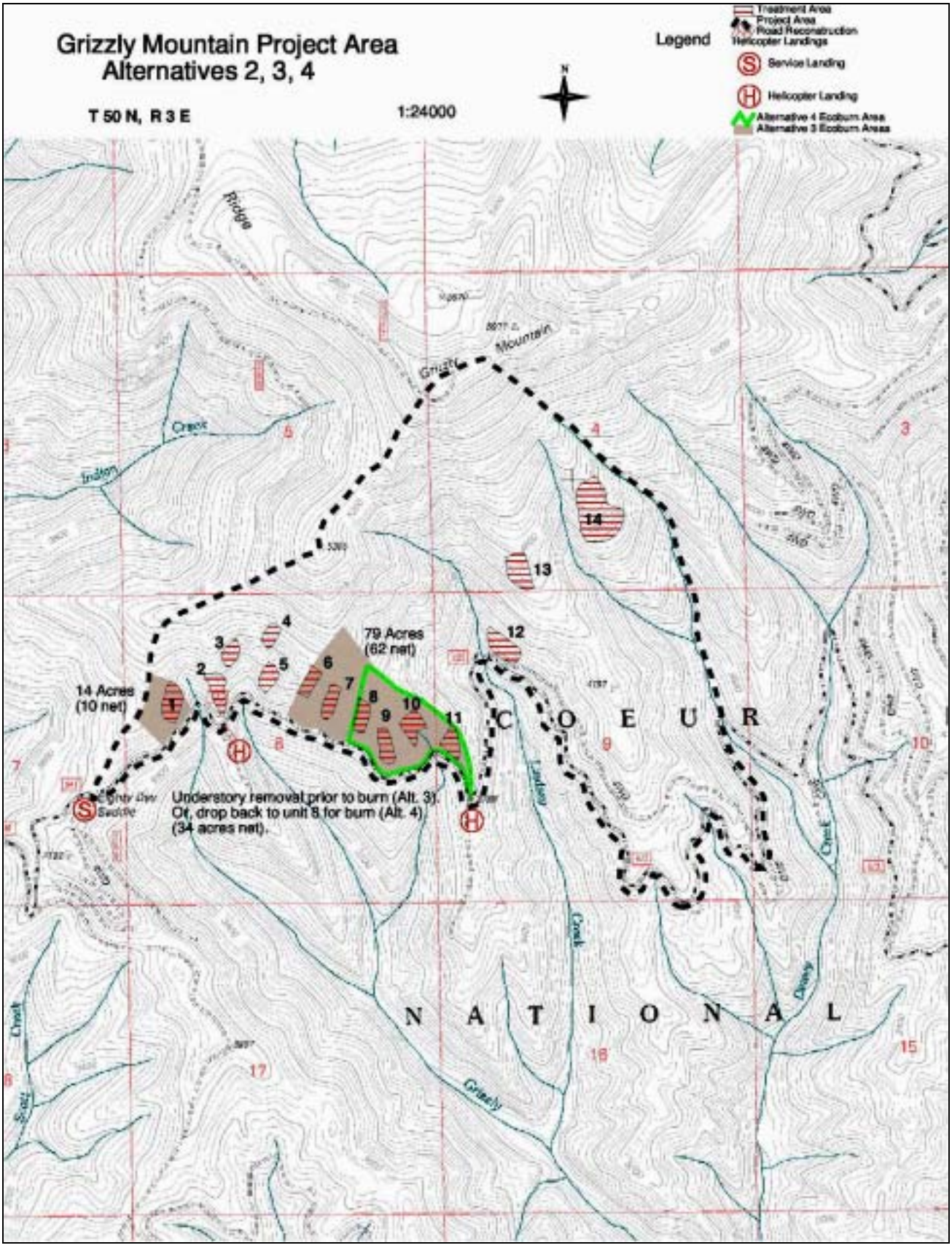


Figure 2-3. Map of the proposed activity locations in the Grizzly Mountain project area.

Table 2-7. Specific Unit Information, Dobson Pass Project Area.

Unit[1]	Acres	Treatment	Volume (mbf[2])	Yarding	Fuels Treatment	Planting
1	10	Group Shelterwood	60	Skyline	Underburn	Larch/white pine
2	28	Commercial thin larch	80	Skyline	Lop and scatter	None
3	5	Commercial thin larch	20	Skyline	Lop and scatter	None
4	5	Group Shelterwood	40	Heli	Jackpot	Ponderosa pine/larch/ white pine
5	12	Group Shelterwood	90	Heli	Jackpot	Ponderosa pine/larch/ white pine
6	9	Improvement Harvest	55	Skyline	Jackpot	None
8	8	Improvement Harvest	40	Skyline	Jackpot	None
Total	**77**		**385**			

[1] *Unit 7 was dropped under all alternatives due to concerns for wildlife habitat.*
[2] *mbf = thousand board feet*

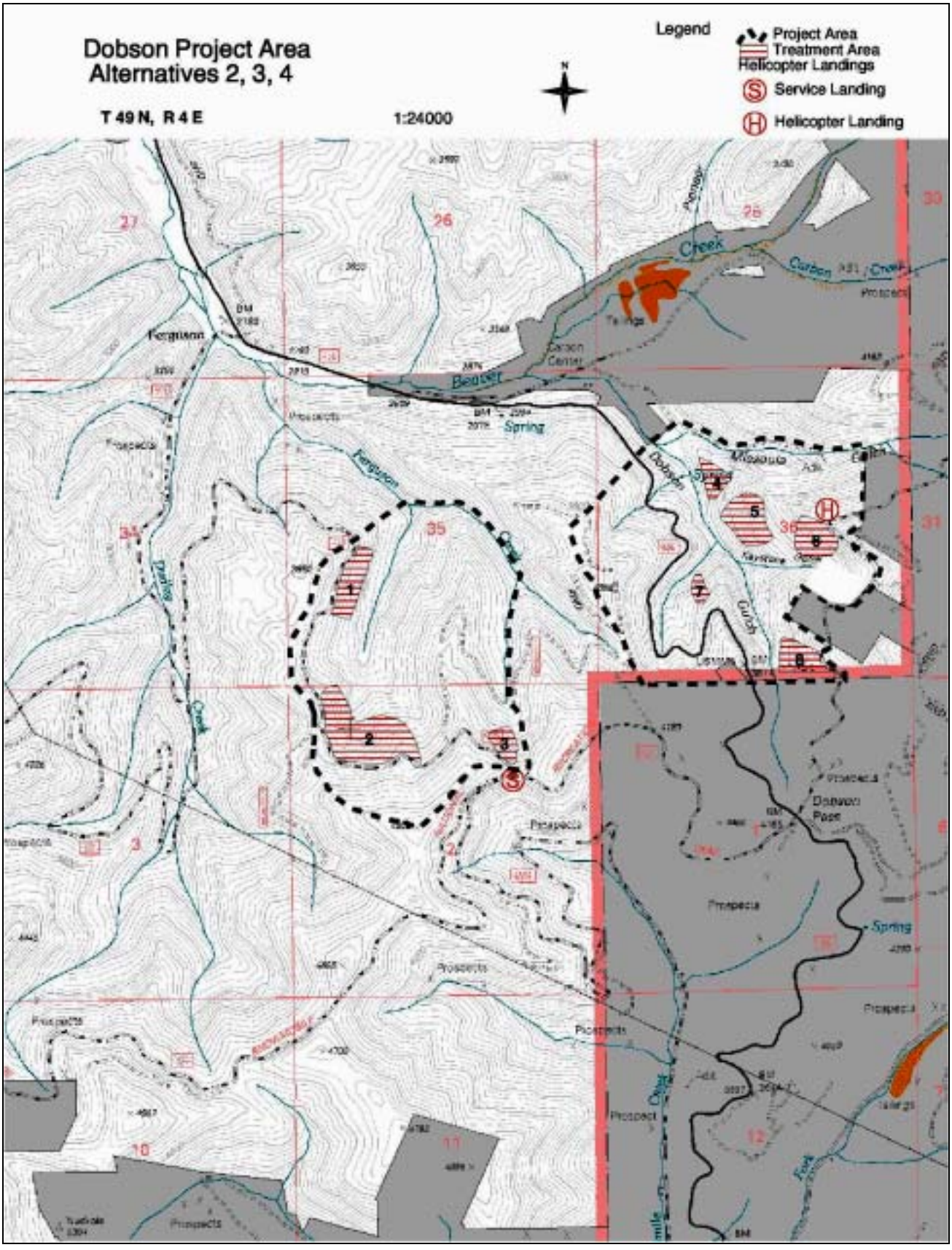


Figure 2-4. Map of the proposed activity locations in the Dobson Pass project area.

2.6.2. Features Common to All Action Alternatives

A. Features Designed to Protect Aquatic Resources

In development of the action alternatives, standards and guidelines of the Inland Native Fish Strategy were used specifically to protect water and aquatic biota within the Resource Area. Riparian Habitat Conservation Areas (RHCAs), known locations of sensitive plants and special wildlife habitat areas were excluded from proposed timber harvest or fuel treatment activities. Standard widths for defining interim Riparian Habitat Conservation Areas (RHCA's) were utilized with no modifications. Riparian Management Objectives and road management standards and guidelines were applied within the Resource Area boundaries on those roads used for harvesting or hauling of timber. Streamside buffers would be applied along all harvest units in all action alternatives. Buffers would either involve keeping the harvest unit outside of the riparian buffer, or in the case of roadside salvage units, not permitting the harvest of any trees within the riparian buffer. The intent of the buffers are to meet the riparian management objectives of maintaining slope stability in potentially sensitive areas, maintain stream temperatures and provide a long-term supply of large woody debris. Under the Inland Native Fish Strategy the stream channel buffer widths are as follows:

> ***Category 1 - Fish-bearing Streams**: Interim RHCA's consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.*
>
> ***Category 2 - Permanently flowing non-fish bearing streams:** Interim RHCA's consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.*
>
> ***Category 3 – Ponds, lakes, reservoirs, and wetlands greater than 1 acre:** Interim RHCA's consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, or to the extent of moderately and highly unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs of from the edge of the wetland, pond or lake, whichever is greatest.*
>
> ***Category 4 - Seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas:** This category includes features with high variability in size and site-specific characteristics.*

A 150-foot no-harvest buffer would be maintained on Dobson Gulch. A 75-foot no-harvest buffer would be maintained on Keystone Gulch, and all intermittent seasonal flowing streams and channels scattered throughout the project areas. There is no instream work proposed with this project, therefore timing restrictions would not be necessary.

To minimize erosion and ensure compliance with State water quality standards, all road use and timber harvest associated with the Hither and Yon Beetle project would be completed using Best Management Practices. The Forest Service Handbook 2509.22 (Soil and Water Conservation Handbook) outlines Best

Management Practices that meet the intent of the water quality protection elements of the Idaho Forest Practices Act. Soil and water conservation practices, identified in the Soil and Water Conservation Handbook, are standard provisions to timber sale contracts (USFS Timber Sale Contract - Division B, 2400-6). Activities would meet or exceed rules and regulations of the Idaho Forest Practices Act, Best Management Practices, and the Idaho Forestry Act and Fire Hazard Reduction Laws (1988).

B. Features Related to Vegetation Management

All proposed harvest units are on sites determined to be suitable for timber production. Within 5 years of regeneration treatment, site preparation for regeneration, fuel treatment and planting would occur. In approximately 10 to 30 years the stands proposed for regeneration may be entered for pre-commercial thinning, pruning, cleaning and possibly fertilization to meet target stand and management area guidelines. Proximity access for stand-tending purposes is available in these areas. Precommercial thinning and pruning has been shown to decrease mortality due to white pine blister rust in resistant and non-resistant stock (Schwant, Marsden, McDonald, 1994) and are important tools in managing for this species.

C. Features Designed to Protect Air Quality

The Idaho Panhandle National Forests are party to the North Idaho Smoke Management Memorandum of Agreement, which established procedures regulating the amount of smoke produced from prescribed fire. The North Idaho group currently uses the services and procedures of the Montana State Airshed Group. The procedures used by the Montana Group are considered to be the "best available control technology" 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 during the months of April through November. This unit monitors meteorological data, air quality data, and planned prescribed burning and decides daily on whether or not restrictions on burning are necessary the following day.

In practice, a list of all prescribed burning planned for the burning season on the Coeur d'Alene River Ranger District is forwarded to the monitoring unit through the Idaho Panhandle National Forest fire desk before March 1. Daily, by 8:30 a.m., the Coeur d'Alene River Ranger District informs the fire desk of all burning planned for the next day and the fire desk forwards this information to the monitoring unit. By 3:00 p.m. the same day the monitoring unit informs the Forest if any restrictions are to be in effect the following day, and the fire desk informs the District. These procedures limit smoke accumulations to legal, acceptable limits.

Historically, prescribed burning on the Coeur d'Alene River Ranger District occurs in the spring and fall seasons over a total time span of 45 to 60 days during each season. All burning complies with federal, state and local regulations. Management practices include, but are not limited to, burning under spring-like conditions (high moisture content in fuels, soil and duff) to reduce emissions, provide for retention of large woody debris, and to protect the soil. Prescribed burning during spring or fall will generate less smoke than a much hotter stand replacing summertime wildfire.

D. Features Designed to Protect Soil Productivity

No new road construction would occur with this proposal. Approximately 0.1 miles of system road currently in storage would be re-opened to access a helicopter landing. Some compaction would occur with approximately 17 acres of tractor skidding and 11 acres of grapple piling. Skid trails would be designed to be 120 feet apart (except where converging) to minimize ground disturbance. Grappling areas would require that the piling equipment walk on slash as much as possible. Skid trails in grapple pile areas would be decompacted after use. There are no proposed units where existing soil conditions would not meet Forest Plan soil quality standards before or after harvest. Minor soil disturbances would occur within skyline and cable units. Ground disturbance in helicopter units would be minimal.

None of the harvest units are located on geologic formations known to be lacking in potassium feldspar. Areas proposed for jackpot or underburning treatment would have limbs and tops required to be left in the woods prior to yarding. The slash would overwinter prior to burning to allow nutrients to leach from the material. Burning would occur when soil moistures would be higher than summer months, protecting soil horizons. Slash would overwinter prior to piling in the 11 acres planned for grapple piling. Most of the slash in the grapple pile areas has already been on the ground for several years. All other units would require lop and scattering of slash in the woods. Using recommendations of the Intermountain Forest Tree Nutrition Cooperative will maximize partible potassium on the sites.

E. Features Designed to Protect Wildlife Habitat

Figure 2-5. "Greybacks" (dead trees that have lost their foliage) on the far ridge are wildlife snag retention areas outside of harvest units at Grizzly Mountain.

Patches of beetle-killed timber have been excluded from harvest consideration within and adjacent to the project areas. Live leave trees in regeneration areas would be reserved from harvest to provide size class diversity and long-term snag recruitment. Snags would be retained in accordance with the Northern Region Snag Management Protocol (USDA Forest Service, 2000). The Northern Region Snag Protocol calls for greater snag retention than identified under Forest Plan standards. In proposed harvest units which currently contain quality snag densities, 2 to 4 of the largest dead trees per acre would be maintained. Exact number would depend on the levels of existing snags located adjacent to the treatment units, with the target being 4

per acre. Some smaller unmerchantable dead trees would also be retained to achieve the 6 to 12 snags per acre identified for these habitat types under the Snag Protocol guidelines.

Several birds of prey are listed on the Forest for special protection measures on the Idaho Panhandle National Forests. If active flammulated owl nest sites are found, the Forest Service may cancel timber harvest and yarding activities within 200 feet of the nest site. **Unit 5 in the Grassy Mountain area will be surveyed for goshawk prior to implementation.** If active goshawk nest sites were found, the nest site would be protected with a 30-acre no-harvest buffer. No tree felling, yarding or other potentially disturbing activities would occur within approximately one-quarter mile of the nest site from March 15 to August 15. These features would be incorporated into timber sale packages using the appropriate timber sale contract clauses. Any trees that are bole-scorched during prescribed fire operations would be retained on site for black-backed woodpecker habitat.

The gate on Road 1564 in the Grassy Mountain area will be opened for sale activities and will be closed at the end of daily activities.

In all harvest units it would be necessary to retain some down logs in order to protect long-term site productivity, maintain soil organic matter, and provide wildlife habitat. On moist sites, 15-20 logs or down trees should be retained on the site while on dry sites 3 to 6 logs or down trees should be retained. These logs should be at least 12 inches in diameter and 6 feet long.

F. Features Designed to Protect TES Plant Habitat

No harvest activity would occur which would adversely affect any known rare plant population. All populations potentially adversely affected would be buffered from harvest activity by a minimum of 100 feet. No harvest activity would occur within riparian habitat.

All newly-identified threatened and sensitive plant occurrences would be evaluated. Specific protection measures would be implemented to minimize impacts to that population occurrence and its habitat. Areas of high potential habitat would be surveyed prior to implementation. The timber sale contract would also contain provision C6.251, which allows for modification of the contract if protection measures prove inadequate, if new areas of plants are discovered, or if new species are added to the list. (Please refer also to the “Mitigation” discussion in this chapter.)

G. Features Designed to Protect Recreational Use

Contract provisions would be included to protect public safety (see public safety under Issues Not Discussed in Detail in Appendix A). In addition, log hauling would be prohibited on all forest roads on weekends and holidays. To avoid impacts to winter recreational use, logging operations would be prohibited during the period from December 1 to March 31 in the Grassy Mountain project area and along Road 429 in the Dobson Pass area.

H. Features Designed to Protect Heritage Resources

All known heritage resource sites would be protected under any alternative, as directed by the Cultural Resources Management Practices (Forest Plan, Appendix FF). Any future discovery of heritage resource sites or caves would be inventoried and protected if found to be of cultural significance. A decision would be made to avoid, protect or mitigate effects to these sites in accordance with the National Historic Preservation Act of 1966. All of the proposed treatment areas fall within areas previously surveyed for heritage resources.

I. Mitigation

The following mitigation measures are an integral facet of both action alternatives and have been identified as necessary to reduce environmental effects to natural resources as a result of implementing the proposed activities. Should an action alternative be selected for implementation, these measures would be incorporated into the project design, timber sale contract, and other contracts and project plans.

Mitigation to Reduce Effects to TES Plants

All previously unsurveyed areas identified as highly suitable habitat that, as a result of the proposed activity, would have a high risk of adverse effects to proposed, Threatened or Sensitive plant populations or habitat must be surveyed prior to project implementation. Some areas previously surveyed may be resurveyed, based on the date and intensity of the most recent survey and the risk to habitat from proposed activities.

Under Alternatives 2 and 4, Unit 5 in the Grassy Mountain area and Units 11, 12, and 13 in the Grizzly Mountain area would be surveyed for moist guild sensitive species prior to implementation. Units 2 and 3 in the Grizzly Mountain area and Units 4, 5, 6, and 8 in the Dobson Pass area would be surveyed for dry guild sensitive species prior to implementation of this alternative. It is also recommended that the entire dry guild habitat in the vicinity of units 1, 2, and 3 in the Grizzly Mountain area and areas adjacent to Units 4, 5, 6, and 8 in the Dobson Pass area be surveyed for dry guild species. Extra precautions could be employed during burning operations if plants are discovered in these adjacent areas. The above listed dry guild units and adjacent areas would also be surveyed for Spalding's catchfly. Under Alternative 3, in addition to the surveys listed above, approximately 3 acres of dry guild habitat would be surveyed above Unit 1 prior to implementation of the understory removal or ecoburning treatment.

Areas to be surveyed may be adjusted as project design and layout progresses, to assure all activity areas are covered by surveys, and for efficiency in completing the surveys. Specific features of the alternatives (Features Common to All Alternatives, in this chapter) would be implemented to protect any newly documented population and its habitat. Should rare plants be located prior to or during implementation, all newly identified occurrences would be evaluated, and one or more of the following protective measures would be implemented: 1) drop units from activity; 2) modify the unit or activity; 3) implement a minimum 100 feet (slope distance) buffer around sensitive plant occurrences as needed to minimize effects and maintain population viability; and/or 4) implement timber sale contract provisions for "Protection of Endangered Species" and "Settlement for Environmental Cancellation." Effectiveness of these measure are estimated by the District botanist to be "high," because surveys are conducted by trained botany personnel and any discovered habitat or populations are protected by physical buffers where ground-disturbing activities are not allowed.

J. Monitoring

This analysis incorporates monitoring of the Inland Native Fish Strategy (USDA Forest Service, 1995), Best management Practices, and othe rForest Plan standards described here and in Chapter 3. Monitoring wwould occur to ensure we've implemented activities as we said we would (implementation monitoring), that the activities are having the level of effects that we predicted (effectiveness monitoring) and that the long-term effects are as anticipated (trend monitoring).

Forest Plan Monitoring

The Forest Plan documents a system to monitor and evaluate Forest activities. Monitoring and evaluation each have distinctly different purposes and scope. In general, monitoring is designed to gather the data necessary for project evaluation. During evaluation of project effectiveness, data provided through the monitoring effort are analyzed and interpreted. This process will provide periodic data necessary to determine if implementation is within the bounds of the project design (Forest Plan, page IV-7). For activities related to the Hither and Yon Beetle project, all alternatives would comply with specific monitoring requirements identified by the Forest Plan (Forest Plan, Chapter IV).

Forest Corporate Monitoring

The Idaho Panhandle National Forests have implemented a process to monitor changes to a number of ecosystem conditions resulting from both project activities and natural disturbances. The overall focus of this monitoring is to evaluate changes in ecosystem condition (structure, composition, and function). The monitoring is tied closely to findings of the Interior Columbia Basin and Coeur d'Alene Geographic Assessments. The ecosystem conditions that will be tracked for long-term monitoring is identified in the following table.

Table 2-8. Long-term monitoring of ecosystem core data.

Ecosystem condition core data monitoring element	Core data to be monitored
Hydrologic integrity	Road density
Wildlife security and public access	Open road density
Water yield	Hydrologic openings (equivalent clearcut acres)
Changes in forest structure outside the historic range of variability	Forest structure by size and age-class groups
Changes in species composition outside the historic range of variability	Forest composition by forest cover type group
Habitat loss and species decline	TES dry and moist/cold site habitat restoration
Changes in landscape pattern	Landscape pattern indicators (mean patch size and variability, edge density, etc.)

Anticipated changes to these ecosystem conditions under the Selected Alternative will be described in the Decision Notice for this project.

K. Schedule of Activities

If any of the action alternatives are selected for implementation, timber harvest activities would likely occur during 2002-03, followed by prescribed burning in 2004 and tree planting in 2005. The season of work and acres treated would depend upon the alternative selected, availability of funding, and operating schedule. Please refer to Chapter 3, Finances, for a discussion of the types of funding.

2.7. COMPARISON OF ALTERNATIVES

The following briefly compares the effects of each alternative as they relate to the project objectives and issues. It is important that the data in the tables be used as a simple comparison, and not taken out of context. The decision to implement one alternative over another will mean weighing the trade-offs of benefits and effects. A detailed discussion of environmental consequences is provided in Chapter 3, by resource.

2.7.1. Forest Vegetation

The following figures display the percent of stands in each structural stage and cover type class in each of the three project areas. These figures demonstrate that even if no action is taken, many of the stands proposed for treatment (70 acres) are moving toward the seedling/sapling category (because of past losses to bark beetles, ice and snow damage, and continuing mortality to root disease), and would regenerate back to the same cover type of Douglas-fir and hemlock. The treatment proposed under Alternative 2 would provide the largest increase of pine and larch stands within the three project areas. Though small in scope, this would move the areas toward the goals discussed in the Interior Columbia Basin Ecosystem Management Assessment and the Forest Plan, for a more historic level of species composition.

Under Alternatives 3 and 4, ecoburning treatments in the Grizzly Mountain would not change stand structure or cover types in those areas. Changes in stand structure and species composition would be the same as Alternative 2 under these alternatives. Re-introduction of fire through ecoburning would be beneficial to these stands although there is some increased risk of root disease and bark beetle mortality with the treatment. Low and intermediate intensity fires tended to promote larger forest structures by thinning out the understory and reducing competition. Low and intermediate intensity fires also reduce fuels making the stands more resilient to wildfire events and extending stand-replacing fire intervals. Alternative 3 would provide for more acres of ecoburning treatment than Alternative 4 and would allow for the harvest of some of the understory timber that may be killed during ecoburning operations.

Figure 2-6. Structural stages in the Grassy Mountain Project Area (percent).

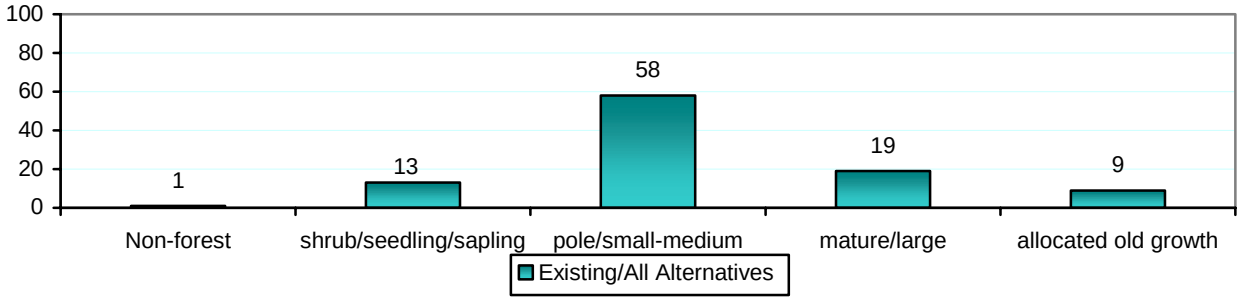


Figure 2-7. Cover types in the Grassy Mountain Project Area (percent).

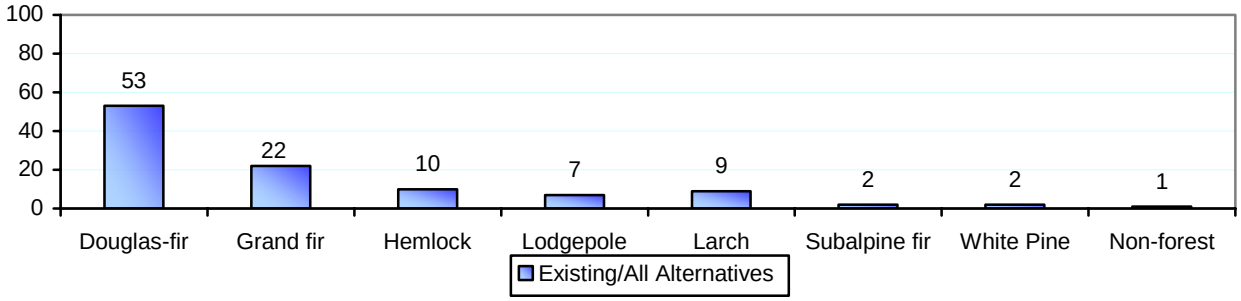


Figure 2-8. Structural stages in the Grizzly Mountain Project Area (percent).

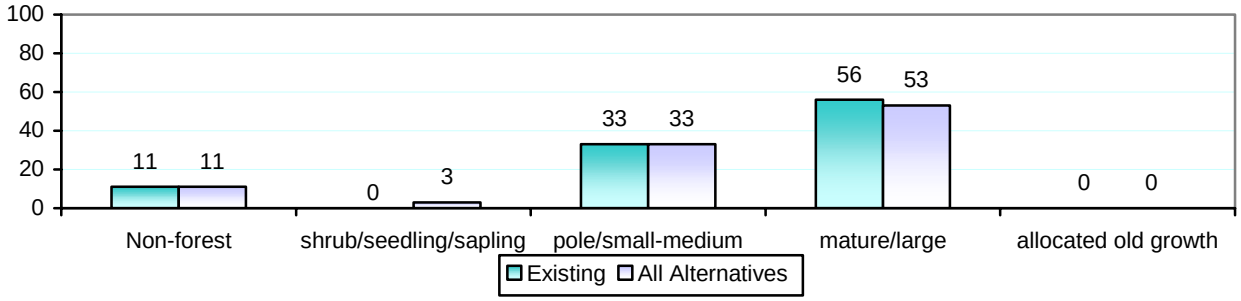


Figure 2-9. Cover types in the Grizzly Mountain Project Area (percent).

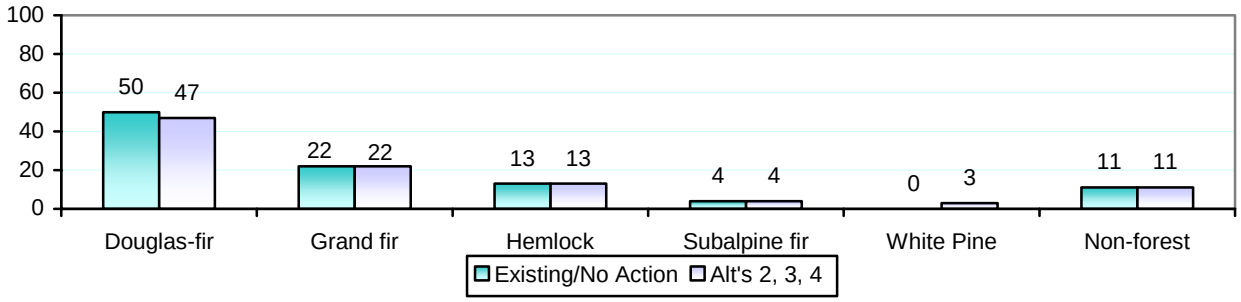


Figure 2-10. Structural stages in the Dobson Pass Project Area (percent).

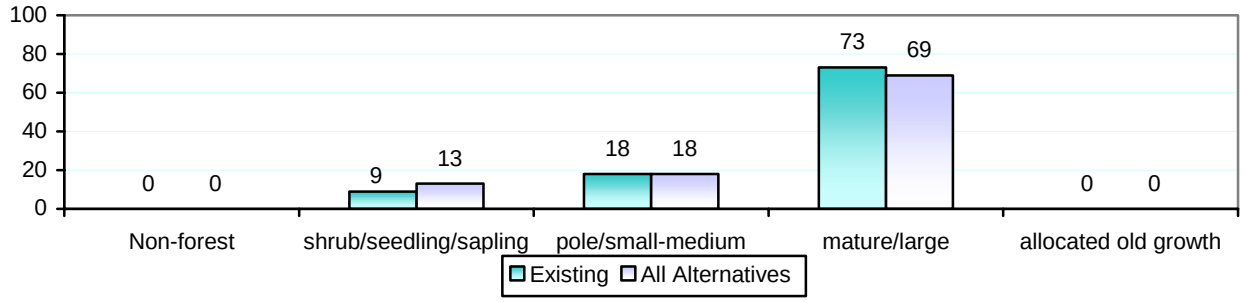
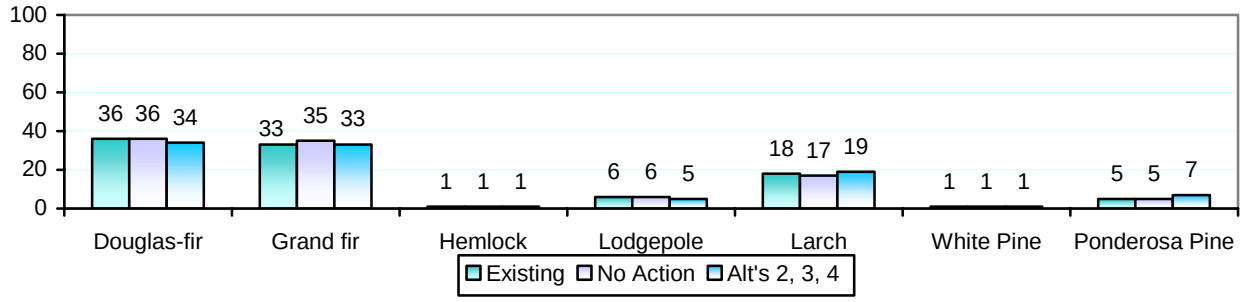


Figure 2-11. Cover types in the Dobson Pass Project Area (percent).



2.7.2. Fire/Fuels

Under the No-Action Alternative, the current trend of increased fine fuels (such as grasses and shrubs), new understory trees that serve as ladder fuels, and continuing accumulation of heavy fuels from down logs and snags would continue, since there would be no fuels reduction activities or changes in forest species to interrupt this trend.

Under the action alternatives, harvest of fir and hemlock, underburning in harvest units, and replanting with white pine and western larch would begin a tend toward reduced potential wildfire intensity and severity (please refer to Table 2-4 for the acres of activity under each alternative). Alternative 3 would best meet Forest Plan goals, objectives, and standards for fuels management, based on the amount and type of fuels treatment. Alternative 3 would also provide the best protection against escaped fire during prescribed fire treatments within harvest units. Alternative 4 would also reduce the long-term fuel loadings with the salvage of dead timber, but would provide less fuels reduction; and unit burn boundaries would not be as easily defended because there would be no understory removal prior to the prescribed burning.

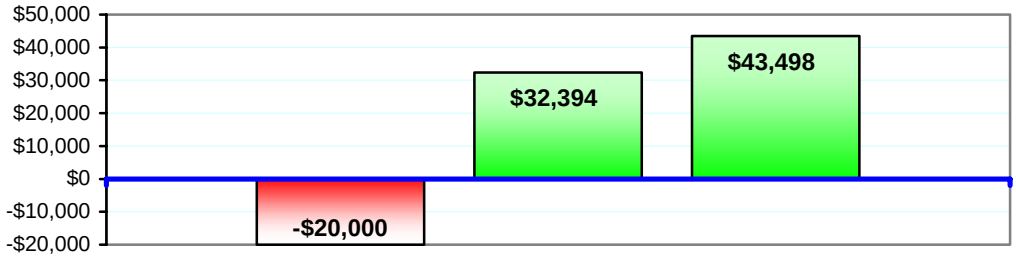
2.7.3. Finances

The timber sales generated by each action alternative would have a positive financial return, even after subtracting contractual, planting and sale preparation costs (Alternative 3 would provide the greatest net economic return after all costs are subtracted). Alternative 1 would not generate any revenues from the sale of timber to finance fuels reduction and the vegetative restoration needs in these areas. Alternative 2 represents the greatest return with the least amount of investment into other projects. Alternative 3 represents the greatest amount of accomplishment on the ground for the least costs. The understory salvage treatment in Alternative 3 would help finance the ecoburn and would utilize material that would likely be killed during the burning operation. Although small in scope, the action alternatives would contribute to the

continuing operation of local mills, directly and indirectly enhancing the local and state economy through employment and tax revenues.

The following figure provides a comparison of net values (after costs are subtracted) based on the timber sales generated by each alternative.

Figure 2-12. Comparison of net sale value, by alternative.



2.7.4. Watershed/Fisheries

At the tributary scale, no direct or indirect effects to beneficial uses are anticipated under any of the action alternatives. There would be no expected increase in sediment associated with stand treatment activities. Tractor yarding and minor road reconstruction would occur in locations where sediment would not be transported to stream channels. The only potential sediment generation would be associated with road maintenance which is a practice that would normally occur even under the No-Action Alternative. The implementation of Best Management Practices and adherence with the Inland Native Fish Strategy standards and guidelines would provide protection for riparian habitat and control any sediment associated with planned stand treatment activities.

The cumulative effects from implementation of activities associated with the action alternatives would not be measurable at the tributary or watershed scale for increases in peak flows or sediment over what would occur under the No-Action Alternative. Increases in flow would be primarily due to the mortality of trees from the Douglas-fir beetle or ice and snow damage. Additional harvest to create conditions to allow site preparation and reforestation of low stocking sites, commercial thinning, and improvement harvests would not result in a measurable increase in magnitude or quantity of flows at the tributary or watershed scale. No measurable effects would occur in stream channel conditions. Cumulative benefits due to past and ongoing watershed improvements and the reduction of sediment risk not associated with this project may be noticeable at the tributary scale and enhance stream conditions and water quality in some localized reaches.

There would be no change in fish population condition at the smallest scale, (a stream segment) as a result of any action alternative. Because the actions have minimal effects at the scale of a stream reach, this project would have no incremental effect at the scale of the watershed. Although there would be no additive cumulative effects from this project at the watershed scale, the overall effects of this project in combination with the recent past and present actions would be to maintain the rate at which the Management Indicator Species recover within the analysis areas.

2.7.5. Wildlife

Black-backed woodpecker: There may be impacts to individual black-backed woodpeckers because harvest activities would reduce some of the habitat available for potential population increase that may occur due to the bark beetle infestation. However, under all alternatives, there would be an increase in habitat compared to if the beetle outbreak had never occurred. Therefore, the action alternatives may impact individuals but would not trend the species towards listing.

Fisher: All action alternatives would pose a slight risk that individuals may be impacted, but would not trend toward listing. Under Alternative 2, 3 acres of modeled fisher suitable habitat and 59 acres of capable habitat would be within treatment areas. The 3 acres of suitable habitat falls within a roadside salvage unit. The salvage of timber along this roadway would have a minor affect on the overall fisher habitat since several large, contiguous blocks of suitable habitat occur in that area. Adequate canopy cover would still be maintained but some of the future down wood habitat component would be removed. Thirteen of the capable habitat acres are located within regeneration harvest units. Damage from ice, heavy snow, and beetle mortality have already reduced overstory canopies to the point that timeframes for these areas becoming suitable habitat have been altered. Thirty-one acres of salvage treatments would occur within capable habitat within the project areas. Salvage treatments would not significantly alter the existing overstory canopy component of these stands. Some future down wood habitat would be removed but the treatments would not set the timeframes for these areas becoming suitable habitat in the future. Approximately 15 acres of commercial thinning would occur within modeled capable fisher habitat within the Dobson Pass area. This thinning would promote the retention of main overstory component over the long term and is expected to allow the stand to reach a larger forest structure in a shorter period of time. Some loss of canopy could reduce the potential for use in the short term. Under Alternative 3, approximately 10 acres of understory removal and ecoburning would occur within capable fisher habitat. This treatment is not expected to set back the timeframe for the area becoming suitable habitat. Burning may improve browse for prey species in the area but some loss of small down wood habitat would occur with this treatment. Overall the effect of the ecoburning treatment is expected to be minor. Ecoburning treatments under alternative 4 would not be within modeled suitable or capable fisher habitat. Limited opening of Road 1564 in the Grassy Mountain area would create some disturbance however the road does not bisect any suitable fisher habitat areas. Opening up Road 1564 to preferred fuelwood gathering for one summer after salvage activities are completed would extend the disturbance period.

Goshawk: Under Alternative 2, 3 acres of modeled goshawk suitable habitat and 39 acres of capable habitat would be within treatment areas. The 3 acres of suitable habitat is associated with a roadside salvage unit within the Grassy Mountain area. The salvage of timber along the roadway would have a minor affect on the overall goshawk habitat. Twenty-four acres of salvage treatments would occur within capable habitat within the project areas. Salvage treatments would not significantly alter the existing overstory canopy component of these stands. Some future down wood habitat would be removed but the treatments would not set the timeframes for these areas becoming suitable habitat in the future. Approximately 15 acres of commercial thinning would occur within modeled capable goshawk habitat. This thinning would promote the retention of main overstory component over the long term and is expected to allow the stand to reach a larger forest structure in a shorter period of time (large forest structure is preferred habitat for goshawks). Under Alternatives 3 and 4, harvest treatments would be the same as Alternative 2. None of the ecoburning activity in the Grizzly Mountain area would occur within modeled suitable or capable goshawk habitat. Ecoburning treatments are not expected to alter the canopy composition of the stands to where they would not be considered usable by the northern goshawk.

Elk: Most of the Grassy Mountain project area lies within Elk Habitat Unit (EHU) 3. The Forest Plan goal for elk habitat potential in this EHU is 72 percent. The current level is 76 percent. During sale activities the potential would drop to 74 percent due to the use of Road 1564, which is currently closed with a gate. The gate would be required to be closed in the evenings and on weekends during sale implementation. After activities are completed, elk habitat potential would return to 76 percent. No change would occur to the other

EHU's associated with the Grassy Mountain area. The Grizzly Mountain project area lies within Wallace Elk Habitat Unit (EHU) 7. The Forest Plan goal for elk habitat potential in this EHU is 33 percent. The current level is 55 percent. During and after sale activities the potential would remain at 55 percent for the following reasons. Changes in road density in the Grizzly Mountain area would be very minor, with only one-tenth of a mile of reconstruction. Changes in cover/forage ratios would be minimal and very similar to what has occurred as a result of bark beetle and root disease mortality.

The Dobson Pass project area lies within Wallace Elk Habitat Unit (EHU) 5. The Forest Plan goal for elk habitat potential in this EHU is 55 percent. The current level is 48 percent. During and after sale activities, elk habitat potential would remain at 48 percent, for the following reasons. There would be no change to current road densities or road use within the Dobson Pass project area. There would not be enough change in cover/forage ratios to result in changes to elk habitat potential.

CHAPTER 3
EXISTING CONDITIONS, ENVIRONMENTAL CONSEQUENCES

3.1. FOREST VEGETATION

3.1.1. Regulatory Framework

Federal legislation, regulations, policy and direction that require protection of species and population viability, evaluation and planning process consideration of threatened, endangered and other rare (Forest Service "sensitive") plant species include 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, Forest Plan (1987); and direction from the Regional Watershed, Wildlife, Fisheries and Rare Plants program and Washington Office.

Regulatory constraints applying to the management of timber resources include the Forest Practices Act, Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), National Forest Management Act of 1976 (NFMA), 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."

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, stream banks, 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; this does not preclude the use of sound silvicultural systems such as thinning and other stand improvement measures and 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:

1) 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.

2) Prescribe treatments that are practical in terms of cost of preparation, administration, transportation systems, and logging methods.

3) Monitor practices using procedures specified in forest plans to ensure objectives are met.

4) 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 5 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.

5) Perform all silvicultural activities in the most cost-effective manner consistent with resource management objectives.

Forest Service policy further directs that:

6) 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.

7) 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 on 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.

3.1.2. Methodology

A. Existing Conditions

The information provided comes from a variety of sources. The extent and location of current bark beetle infestations, ponderosa pine improvement stands, and western larch stands were based on field reconnaissance during the fall of 2001. Information for National Forest System lands on habitat types, forest cover types, forest structural stage and past harvest activity are based on existing data bases (Timber Stand Management Record System, TSMRS), stand exam information, historical records and aerial photo interpretation. Maps of forest cover types, habitat types and past harvest activity are available in the Project File (Vegetation).

B. Environmental Consequences

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

The Geographic Assessment for the Coeur d'Alene River Basin found that the Grassy Mountain and Dobson Pass project areas are a high priority for vegetation restoration due to the effects of white pine blister rust, past harvest activities, and fire exclusion (IPNF, 1998, pages 62-63). Species composition has changed dramatically from historical conditions with increases in Douglas-fir, grand fir and hemlock and corresponding reductions in the amount of white pine and larch.

Historic stand structures have also been altered. Shrub/seedling/sapling structural stages tend to occur in smaller stands and are scattered over larger areas as a result of timber harvests. On drier sites, fire exclusion has allowed invasion by Douglas-fir and grand fir into stands historically dominated by ponderosa pine. Old forest structure has been reduced below historic levels and these stands have been further fragmented by harvests or road construction.

The Grizzly Mountain project area falls within an area that the Geographic Assessment has identified as having a terrestrial landscape that is classified as having moderate problems, as described above, but still containing some desirable attributes such as blocks of mature/old forest structure.

From a vegetation standpoint, the effects of the Douglas-fir beetle epidemic and proposed harvest activities on species composition and stand structure will be used to determine environmental consequences. Because beetle populations are dropping, no attempt was made to incorporate future beetle infestation that may occur outside currently known locations into any alternative. Mortality from root disease will gradually change forest structure toward shrubs/saplings over time. However, the change is so gradual that analysis will be based on current openings and will be considered the same over all alternatives.

FRAGSTATS, a model used to analyze fragmentation and compare alternatives was not completed for this analysis because there were no significant differences in effects to forest structure between alternatives. Bark beetles, ice and snow damage, and root disease created the change in stand structure in these areas, not the harvest treatments. FRAGSTATS is also designed for a larger scale analysis and would not be applicable to the scope of this project.

The reasonably foreseeable time frame for activities associated with the action alternatives would be approximately two to three years.

3.1.3. Affected Environment

A. Introduction

The vegetation in northern Idaho is a result of the prevailing climatic pattern in which westerly winds carry maritime air masses from the northern Pacific across the northern Rocky Mountains during winter and spring. This weather pattern is characterized by precipitation occurring mainly between November and February, with only 12 percent of the annual precipitation occurring between July and September (Geographic Assessment, p. 12). The inland maritime airflow provides northern Idaho with abundant moisture and moderate temperatures.

The subbasins of northern Idaho contain diversity of habitats and plant communities, many of which contain plant species that are known or thought to be rare. Of the estimated 1,200 to 1,500 plant species known or thought to occur here, about 10 percent are considered rare or uncommon. There are no federally listed endangered plants for the IPNF. Two species are listed as threatened for the IPNF, water howellia (*Howellia*

aquatilis) and Ute ladies'-tresses (*Spiranthes diluvialis*). There are no documented occurrences of these species although suitable habitat is thought to occur. There is a third plant species, Spalding's catchfly (*Silene spaldingii*), that has recently been listed as threatened for the Forest. This species too has no documented occurrences although suitable habitat is thought to occur on the IPNF. Thirty-one species of sensitive plants are known or suspected to occur within the sub basin. For additional information, please refer to Appendix A, and the Project Files (Vegetation).

B. Habitat Types

The vegetation in the Coeur d'Alene subbasin reflects the climatic conditions discussed above. "Habitat typing" is a land classification system based on the potential climax natural vegetation that could occupy a site. Habitat types are named for the potential climax community type or plant association, which is denoted by the climax tree species (usually the most shade tolerant tree adapted to the site), and the dominant or indicator undergrowth species of the plant association (Cooper et al. 1991). The climax tree species denoted in a habitat type is not necessarily dominant or even present on the site. A very high percentage of forested landscapes reflect some degree of disturbance resulting in a preponderance of seral stages. Forest Habitat Types of Northern Idaho: a Second Approximation (Cooper et al. 1991) was the basis for determining habitat types in the Coeur d'Alene sub basin.

There is quite a range of habitat types within the Grassy Mountain project area. The most common habitat types are western hemlock/queencup beadlily and western hemlock/wild ginger, which account for approximately 55 percent of the habitat types. Western hemlock/beargrass and cedar/ladyfern each comprise approximately 8 percent each. The remaining 37 percent ranges from Douglas-fir/bluebunch wheatgrass on the warm/dry end of the spectrum to mountain hemlock/beargrass on the cool end.

In the Grizzly Mountain project area, grand fir/ginger and grand fir queencup beadlily are the dominate types making up 41 percent of the area. This is followed by western hemlock/ginger, western hemlock/queencup beadlily and talis rock slopes. The remaining 22 percent ranges from Douglas fir/ninebark on the dry end to mountain hemlock/beargrass on the cool end.

The Dobson Pass project area is made up primarily of grand fir/queencup beadlily at 49 percent, western hemlock/queencup beadlily at 34 percent, and Douglas-fir/ninebark at 17 percent.

Threatened and sensitive plants and Forest species of concern can be assigned to one or more rare plant guilds. These guilds are artificial assemblages based on similar habitat requirements used for the purpose of analysis. For the Idaho Panhandle National Forests, the rare plant guilds are aquatic, deciduous riparian, peatlands, cold forest, wet forest, moist forest, dry forest and subalpine. Rock seeps and springs are another habitat that can support certain sensitive plants, however these can occur across all guilds and are not identifiable at a coarse scale (please refer to the Project Files – TES Plants for specific plant guild descriptions).

C. Habitat Type Groups

Although every habitat type is unique in some way, they can be grouped based on similarities in natural disturbance regimes, successional patterns and structural characteristics of mature stands (USDA Forest Service, Region One, 1997). The majority of the habitat types within the project areas are in the Warm and Moist Habitat Type Group (80%). The remainder falls into the Warm and Dry Habitat Type Group (13%) and the Cool/Moist or Cool/Dry Habitat Type Group (7%).

Warm, Moist Habitat Type Group

The habitat types of this group within the Hither and Yon project areas consist primarily of western hemlock/queencup beadlily or wild ginger and grand fir/queencup beadlily or ginger. The current forest cover types are dominated by grand fir and Douglas-fir. Western hemlock, lodgepole pine, and larch are the major species on only 9, 5, and 5 percent, respectively. Prior to the introduction of blister rust, with over 50 percent of these areas dominated by white pine, the area was known as the "white pine type". Currently, only 1 percent of the Hither and Yon project areas are classified as a western white pine forest cover type. Historically, these habitat types had fire-free intervals of 40 to 130 years or more (Zack and Morgan 1994). Stand replacement fires, while infrequent, could be severe during times of drought. This habitat type group covers about 80% of the project areas and has the majority of the bark beetle mortality. This habitat type group has more mortality than the drier group, which may be a result of these better growing sites having larger diameter trees that are preferred by the Douglas-fir bark beetle. Sensitive plants associated with the moist and wet forest guilds are most likely to be located within this habitat type group.

Warm, Dry Habitat Type Group

Approximately 13% of the Hither and Yon project areas are warm, dry habitat type, consisting primarily of grand fir and Douglas-fir/ninebark types. The current forest cover type in this habitat type group is dominated by Douglas-fir. Historically, many of these sites were maintained by periodic fire in open-grown stands of ponderosa pine and Douglas-fir with grass and brush understories (USDA Forest Service, Region One, 1997). The natural fire-free interval was approximately five to 50 years. Stand replacement fires were relatively infrequent under natural disturbance regimes. Sensitive plants associated with the dry forest guild are most likely to be located within this habitat group.

Cool, Moist and Cool, Dry Habitat Type Groups

These habitat type groups account for about 7 percent of the Hither and Yon project areas. The major types in the group include subalpine fir and mountain hemlock/beargrass or dwarf huckleberry. There is also a component of naturally non-forested talus slope in this cool habitat group. Subalpine fir is the primary cover type in most of these areas although Douglas-fir is also present. The natural fire-free interval in the cool moist areas is approximately 120 years. Fires were generally more frequent in the cool, dry areas at a frequency of 50-130 years. Sensitive plants of the subalpine forest guild are most likely to be located within these habitat types.

D. Coeur d'Alene River Basin Geographic Assessment

The condition descriptions identified by the Geographic Assessment were used to characterize the project area. Findings of the Geographic Assessment, at least in relation to vegetation disturbance, are very similar to more broad-scale conclusions found at the Columbia Basin and Northern Region scales:

1. *Disturbance and successional regimes have been altered since the Euro-settlement in North Idaho.*

2. *There has been a substantial reduction in the percent of the landscape composed of early seral species such as western white pine, ponderosa pine, and larch. This is primarily because of natural succession as a result of fire suppression, timber harvest and the introduction of white pine blister rust.*

3. *There has been a major reduction in old growth forest structure while intermediate-aged forest has increased dramatically. This is primarily the result of timber harvest focusing on older trees, fire suppression and the introduction of white pine blister rust.*

4. *Landscape patterns have been modified by timber harvest and exclusion of fire. Current landscape patterns are more uniform. Old growth patches are smaller in size. Approximately the same percentage of the landscape is in openings but the openings are more numerous, smaller in size, and scattered across the watersheds.*

The purpose of the Geographic Assessment was to develop a scientifically based understanding of the processes and interactions occurring in the project area, so that activities can be developed to promote healthy ecosystems. In order to maintain healthy, sustainable ecosystems, it is important that species are well adapted to the environmental variability inherent in the ecosystem and to maintain forest structures necessary to support ecosystem diversity and productivity. This is consistent with the Columbia Basin Assessment (ICBEMP) and the Northern Region Overview. The Geographic Assessment suggests converting shade-tolerant/drought- and fire-intolerant species to shade-intolerant/drought- and fire-tolerant species. The project interdisciplinary team considered these recommendations as they developed the proposed alternatives.

E. Disturbance and Successional Patterns

Fire: Historically, the major disturbances within the project area would have been large stand replacing fires that occurred at intervals of 200 or more years (Geographic Assessment, p. 29). Low and mixed severity fires were common but would seldom remove canopies and regenerate stands. This disturbance pattern would have created large patch sizes that would often develop into mature or old growth forests. Following intense disturbance, these stands would have gone through grass/forb and shrubs stages prior to the sites being dominated by trees again. The tree species that dominate the site following disturbance would have been dependent on the species present prior to the fire, the fires intensity and its extent. Assuming early seral species were present prior to the fire; species such as lodgepole pine, larch, white pine and Douglas-fir would dominate most sites initially. As crown closure became complete, regeneration of shade intolerant species would cease. Shade tolerant grand fir, hemlock, western red cedar and Douglas-fir (on the drier sites) would be present and survive as understory vegetation for long periods of time. In the absence of further disturbance the short-lived lodgepole pine would begin to decline and the long lived seral species such as white pine and western larch would dominate the stands. As the long-lived serals age and decline in vigor, they would become susceptible to insects and diseases.

Mountain pine beetles played a major role in killing individual trees and groups of white pine (Geographic Assessment, p. 29). Holes created in the canopy by the death of these overstory trees would likely be filled by the shade tolerant understory species. In the absence of further disturbance, climax forests of shade tolerant overstory and understory trees might be attained, although remnant large trees of seral species might remain a component for many years.

Low and mixed severity fires that occurred between the major stand replacement events would help to perpetuate the long lived seral species by removing competing, shade tolerant species from the understory. Where these mixed severity fires did create small or moderate sized openings in the canopy; early seral species were likely to regenerate. These types of fires have been largely eliminated by aggressive fire suppression efforts over the last 60 years.

Logging: There are few records of the early harvest activities. Generally, harvests were quite selective, removing only the large pine and larch and likely leaving stands of poor quality hemlock and grand fir. The exception to this was along the streams where most trees were often removed to build flumes or splash dams, or just to make it easier to transport logs. Where white pine did regenerate, it was susceptible to blister rust with few trees surviving to maturity. More intensive management began in the late 1950's with clearcutting, seed tree, and shelterwood harvest that tended to fragment the landscape into smaller patch sizes. Salvage of the remaining white pine often took place between harvest units. Most areas regenerated since the late 1970's have been planted with white pine, western larch and/or ponderosa pine. Prior to that time very little white pine was planted since blister rust was likely to kill the seedlings and disease resistant stock was not available.

Douglas-fir was the preferred species since seed sources were readily available and the species grew well, although larch was also planted to some extent. The problems associated with root disease that develop in these stands as they mature were not recognized at the time. Additional information (including maps and data tables) related to past harvest is provided in the Project Files, Vegetation.

Root Disease: Historically, root diseases were significant factors in reducing the competition from Douglas-fir and grand fir to maintain western white pine, western larch and, on some sites, ponderosa pine. Douglas-fir tended to regenerate readily in the early stages of stand development, but dropped out as a significant component due to high rates of root disease caused mortality (Byler and Zimmer-Gorve 1990). Western white pine, ponderosa pine and larch have a high level of resistance and were able to capitalize on this reduced competition. Fire exclusion and the loss of these species through logging and blister rust have reduced the opportunity for early seral species to become established in root disease areas. Because of the preponderance of susceptible species and the lack of other trees resistant to it, root disease is currently the most prominent landscape-altering process within the project area and the entire Coeur d'Alene basin (Geographic Assessment, p. 30).

Douglas-fir Beetle: Douglas-fir beetles have likely always been present throughout the Coeur d'Alene subbasin. The presence of root disease in many of the Douglas-fir forest types has resulted in high endemic levels of the Douglas-fir beetle and the propensity for rapid beetle population build ups during favorable conditions (Lockman and Gibson 1998). Douglas-fir beetle outbreaks occur following disturbances such as windfall, snow breakage or fire. In particularly dry years, insect infestations and mortality could increase dramatically. In some cases, these insect infestations may have contributed to large stand replacing fires (Geographic Assessment, p. 30).

Loss of White Pine: White pine blister rust was unintentionally introduced into this area in the early 1900s. Eventually, white pine was infected over the entire Coeur d'Alene subbasin; trees were either killed or there was an accelerated harvest to recover their economic value. The loss of mature white pine and the continuing mortality of younger trees led to the increase in Douglas-fir, grand fir and hemlock.

3.1.4. Existing Condition

A. Current Situation in the Coeur d'Alene River Basin

As stated earlier, the findings of the Geographic Assessment for the Coeur d'Alene River subbasin indicate that there has been a tremendous change in both species composition and stand structure within the Hither and Yon project areas.

Long-lived seral species (western white pine and western larch) have declined within the Coeur d'Alene subbasin as a result of white pine blister rust and timber harvesting that tended to remove these species while leaving species such as grand fir, hemlock and Douglas-fir. On the drier sites, aggressive fire suppression has allowed the encroachment of Douglas-fir and grand fir into the understories, creating much denser stands over larger areas and increasing the potential for stand replacing fires.

The early logging to remove white pine, continued salvage efforts, and white pine blister rust have combined to effectively eliminate white pine as an important forest cover type in this area. Historically, white pine was probably the dominant cover type on 50% of the Coeur d'Alene basin. In comparison, white pine is currently the dominant cover type on approximately 1% of the project areas.

In terms of forest structure, the greatest changes have been in the amount of old growth and pole/medium-sized timber found on the landscape. Old growth has declined from a historic average of about 21 percent of the area (Geographic Assessment, page 39) to 9% in the Grassy Mountain area with zero in the other project areas. (Old growth management units associated with the project areas currently contain 5% and 7%

allocated old growth in the Grassy Mountain area, 4% in the Grizzly Mountain area, and 7.5% in the Dobson Pass area). Reduction in old growth was generally the result of the aggressive harvest of white pine and larch and the loss of white pine to blister rust. Stands of grand fir and Douglas-fir that have replaced white pine and larch in the ecosystem are very susceptible to root disease and insect attack. These stands are unlikely to provide the same closed canopy, multi-storied mature and old forest structure containing large white pine and larch that was once a major component of the project area. Although the current stands may contain large old trees and provide some old growth characteristics, openings caused by root disease may be common, and a key component of the remnant white pine and larch will be missing. For more information regarding old growth management, please refer to Appendix A, Issues Not Discussed in Detail.

Douglas-fir, grand fir and western hemlock were, historically, the dominant cover types on about 30% of the Coeur d'Alene basin. The project area currently has 82% of the area in fir and hemlock cover types. This shift in species composition has also created a shift in insect and disease problems. Shade tolerant species such as grand fir, Douglas-fir, and western hemlock are more susceptible to root diseases than early seral species like larch and white pine. The dramatic increase in the shade tolerant species has been accompanied by a dramatic increase in root diseases. These diseases are now the major pathogens within the project areas. As stands increase in age, the incidence of root disease is also expected to increase.

The current Douglas-fir beetle outbreak began in Douglas-fir damaged by wind, snow and ice during the winter of 1996-97. Salvage operations removed some of this downed material but Douglas-fir beetles were able to develop brood in many down trees and the bark beetle populations increased dramatically. The 1999 insect and disease flight found 63,100 acres of National Forest System land within the Coeur d'Alene River Ranger District with some level of Douglas-fir beetle infestation. Some of these areas were harvested as part of the Douglas-fir Beetle Project EIS (USDA Forest Service, 1999) and the Small Sales EIS (USDA Forest Service, 1999). Within the Hither and Yon Beetle project areas, approximately 512 acres were identified with some degree of Douglas-fir beetle mortality. This is based on aerial and ground reconnaissance. In most cases the mortality caused by the beetles is relatively light and scattered but in some stands or portions of stands the mortality is heavy. Ice and snow damage within the project areas was generally light, except for an isolated pocket in the Grassy Mountain area. Most of the presence of the Douglas-fir beetle within the project areas is likely the result of subsequent beetle flights, carried on westerly winds, from initial infestation areas.

The Douglas-fir beetle prefers larger diameter, mature trees (Schmitz and Gibson 1996, Flanagan 1998) and the results of sampling completed on the IPNF, for the 1998 flight, indicate an average diameter of attacked trees of 18.5 inches (Kegley et al. 1999). The effects and extent of this outbreak were exacerbated by hot and dry weather during 1998. Over 85 percent of the trees attacked by the beetles in 1998 were dead or dying (Kegley et al. 1999). For trees attacked by beetles in 1999, this percentage dropped to about 71 percent (Kegley, 2000). This successful attack rate again approximated 71 percent in 2000 (Kegley, personal communication 2001). Eventually this success attack rate is expected to stabilize as beetle populations return to endemic levels, although annual weather conditions could affect this rate.

The Douglas-fir beetle tends to kill trees in groups because they release pheromones that attract other beetles to susceptible trees and cause mass attacks (Flanagan 1998). When trees are successfully attacked, the beetles release anti-aggregate pheromones, repelling incoming beetles that then attack adjacent trees. Due to the epidemic populations we are currently experiencing, these groups of attacked trees are coalescing to create larger openings in the forest canopy. Within the Hither and Yon project areas infested trees tend to occur in small groups of less than 15 acres in size.

The Douglas-fir beetle will create "openings" of varying sizes across the landscape. An "opening" is defined as a forest stand, group of stands or portion of a stand where bark beetles, in conjunction with other agents such as root disease and snow or ice damage, have killed more than 50 percent of the existing stand overstory. The loss of crowns results in conditions favorable for tree regeneration. Within the project area these openings range from 2 to 12 acres in size.

The peak year of the beetle epidemic was probably in 1998, but additional mortality has been occurring through 2001. Beetle populations tend to decrease rapidly when down and/or damaged trees are no longer available in large numbers.

Figure 3-1. Beetle-killed timber from inside a proposed treatment area at Grizzly Mountain.

B. Current Situation in the Project Areas

Based on aerial detection flights and field surveys conducted on the Coeur d'Alene River Ranger District in 1999 through 2001, there are currently approximately 512 acres that have mortality caused by Douglas-fir beetle within the project areas. There may have been some areas where trees attacked in 2001 were not yet showing symptoms and were therefore not mapped. Many of these acres have light infestations but some areas have been heavily attacked.

Root disease openings are scattered throughout the areas. These openings have been created over time with a gradual loss of overstory canopy. These openings are quite variable. They range in size from ¼ acre to 5-10 acres. Residual overstory component is also highly variable but these areas are opened enough that shrub/seedling/sapling is now the structural component of the area. Research shows that tree mortality to root disease on average generally runs at about 2-4 percent per year. This figure is even higher in infected areas (Schwant, Forest Pathologist, personal communication 2001). As these stands open up, regeneration and brush occupy the site. Most of the regeneration is to climax species, especially Douglas-fir and grand fir since they are the main cover types in the area. Seral species such as pines and larch do not have a chance to

become established in these areas as the change is too gradual to create conditions favorable to their regeneration and because their presence as a seed source in the existing overstory is low. Since the climax species that are regenerating these root disease openings are highly susceptible to the root disease, it may lead to a perpetual state of regeneration and brush in these openings (USDA Forest Service, July 2000, page 2-244).

The structural stage categories listed in the tables below are quite broad and are based on stand age. The shrub/seedling/sapling stage includes forest stands that are less than 35 years old. These stands have resulted from past regeneration harvests or natural events such as fire. These stands may consist of seedlings less than one year old or trees planted in clearcuts in the late 1960s that are now over 30 feet tall. Some stands may retain a considerable number of overstory trees for shelterwood purposes, while others may have no large tree component.

The pole and small-to-medium timber structural stage consists of stands that are 36 to 100 years old. These stands may represent natural regeneration left after selective removal of the large, valuable overstory trees or may have resulted from smaller fires or timber harvest in the early part of this century. Many of these stands are quite dense with high stocking levels; but some are rather open, particularly where commercial thinning harvests or mortality from root disease has taken place.

The mature, large timber structural stage includes stands of trees that are over 100 years old. These stands generally resulted from fires prior to 1900 and are quite varied in appearance. Stand conditions may be quite open as a result of past harvest activity, root disease, fire or soil conditions. Stands unaffected by these events will be dense with fairly closed canopies.

The allocated old growth category consists of stands being managed for old forest structure and includes stands of trees that are generally over 150 years old that resulted from fires or other natural disturbance prior to 1851. These areas have often been highly fragmented by past regeneration harvests, and existing stands will vary in composition and canopy closure based on past harvest activity, root disease, fire or soil conditions.

There is very little detailed information on areas harvested prior to the 1950s. Therefore, the tables do not include acres harvested prior to this time. Also, many areas have had more than one harvest entry, particularly commercial thinning and sanitation/salvage harvests. Acreages used are based on mapped acreages that may differ from acreages in the TSMRS database. This is particularly true of sanitation/salvage type harvests where only a portion of a mapped stand may have been treated.

Table 3-1. Vegetative conditions in the Grassy Mountain project area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	264	13
Warm/Moist (Groups 4,5,6)	1644	85
Cool/Moist, Cool/Dry	35	2
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	1024	53
Grand fir	427	22
Western hemlock	193	10
Lodgepole Pine	141	7
Larch	57	3
Subalpine fir	52	2
White Pine	36	2
Non-forest	13	1
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Non-forest	24	1
Shrubs/Seedlings/Saplings	251	13
Poles/small-medium timber	1134	58
Mature/large timber	353	19
Allocated old growth	180	9
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	195	10
Seed Tree & Shelterwood	56	3
Seed Tree Prep	2	0
Sanitation/Salvage	312	16
Commercial Thinning	0	0
Fires since 1950	0	0

The Grassy Mountain project area encompasses approximately 1,943 acres; all are National Forest System lands. Most of the stands in this area originated from large fires that occurred in the 1890's and early 1900's. Areas that were unaffected by these fires contain older forest structure, many of which have been allocated to old growth management. Early harvest activities were limited in this area due to lack of access and smaller size classes due to past fires. Light salvage operations occurred near the mouth of Halsey Creek and some harvest occurred along Roads 260 and 265, running along the main divide ridge. These early harvests were likely quite selective, removing only the large pine and larch and leaving stands of poor-quality Douglas-fir, grand fir, and hemlock. In the late 1980's, roads were constructed into this area and regeneration harvest treatments were implemented.

There are approximately 195 acres of clearcuts, 56 acres of shelterwood harvests, 2 acres of a seed tree prep cut, and 312 acres of salvage logging, that the database is tracking as having occurred within the project area. Areas harvested between 1900 and 1950 are not included in these figures, but harvest was thought to be minimal during that time period due to lack of access and younger age classes. Harvest associated with that time period was likely associated with individual tree selection of primarily larger white pine and larch. Many stands may have had several selection harvest entries over time. The most recent harvests occurred in 1996 and 1997 with scattered salvage harvests under the Short Grass Salvage and Three Peat Salvage timber sales. Regeneration harvest occurred in the early 1990's with the Little Elk and Drexsey timber sales. There have been no fires in recent history that would have altered stand structure, although there have been numerous small lightning fires.

About 13% (251 acres) of the project area is less than 35 years old. Generally these stands are the result of the regeneration harvests that have occurred since the 1960's. Most all these acres are seedling size timber. Approximately 58% (1134 acres) is 35 to 100 years old. These stands generally range from pole to immature sawtimber size classes. Around 19% of the area (353 acres) is in stands that are 100 years of age or older.

This is considered mature, large sawtimber. Approximately 9% (180 acres) of the area are stands that have been allocated to old growth management, generally over 150 years of age.

Table 3-2. Vegetative conditions in the Grizzly Mountain project area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 2,3)	85	8
Warm/Moist (Groups 4,5)	766	70
Cool/Moist, Cool/Dry (Groups 7,9)	234	22
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	543	50
Grand fir	235	22
Western hemlock	147	13
Non-forest	118	11
Subalpine fir	42	4
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Non-forest	118	11
Shrubs/Seedlings/Saplings	1	0
Poles/small-medium timber	353	33
Mature/large timber	613	56
Allocated old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	0	0
Seed Tree & Shelterwood	0	0
Overstory Removal/Liberation	326	30
Sanitation/Salvage	379	35
Commercial Thinning	0	0
Fires since 1950	0	0

The Grizzly Mountain project area encompasses approximately 1,085 acres, all are National Forest System lands. Age classes represented in the area indicate a relatively high fire frequency. At least some portions of the area general area burned around 1800, 1850, 1885, 1910, and 1919. These dates are consistent with known fire events elsewhere on the District. Records show that salvage activities were occurring in this area in the late 1920's. These early harvests were generally quite selective, removing only the large pine and larch and leaving stands of poor-quality Douglas-fir, grand fir, and hemlock.

There are approximately 326 acres of overstory removal and liberation harvests and 379 acres of salvage logging, that the database is tracking as having occurred within the project area. Many stands may have had several harvest entries over time. The most recent harvests occurred in 1983 under the Thin Grizzly Project, which implemented salvage treatments. Notably there have not been any clearcuts or shelterwood regeneration harvests within the project area. There have been no fires in recent history that would have altered stand structure, although there have been numerous small lightning fires.

There are virtually no stands in the project area that are less than 35 years of age, although some of these stands exist adjacent to the project area. Approximately 33% (353 acres) is 35 to 100 years old. Most of these stands are in the pole size class as a result of liberation harvests that occurred in Lindsey and Dewey Creeks during the early 1970's. Around 56% of the area (613 acres) is in stands that are over 100 years old. This is considered mature sawtimber. There are no stands allocated for old growth within the project area.

Table 3-3. Vegetative conditions in the Dobson Pass project area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Group 2)	131	17
Warm/Moist (Groups 4,5)	633	83
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	280	36
Grand fir	255	33
Larch	138	18
Lodgepole Pine	45	6
Ponderosa Pine	37	5
White Pine	5	1
Western hemlock	4	1
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Non-forest	0	0
Shrubs/Seedlings/Saplings	72	9
Poles/small-medium timber	134	18
Mature/large timber	558	73
Allocated old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	50	7
Seed Tree & Shelterwood	0	0
Overstory Removal	0	0
Sanitation/Salvage	10	1
Commercial Thinning	0	0
Fires since 1950	0	0

The Dobson Pass project area encompasses approximately 764 acres; all are National Forest System lands. There is private ownership adjacent to the project area. Most of the stands in this area are the result of fires that occurred in the late 1800's, primarily thought to be associated with a large fire that occurred in 1889. Much of the project area was probably harvested early in the century due to its proximity to the Wallace area and from access created by minerals exploration. These early harvests were generally quite selective, removing only the large pine and larch and leaving stands of poor-quality Douglas-fir, grand fir, and hemlock.

There are approximately 50 acres of clearcuts and 10 acres of salvage logging, that the database is tracking as having occurred within the project area. Areas harvested between 1900 and 1950 are not included in these figures. Harvest associated with that time period was likely associated with individual tree selection of white pine, larch and ponderosa pine. Many stands may have had several selection harvest entries over time. The most recent harvests occurred in 1994 under the Dudley Creek Project. Approximately 50 acres of clearcuts were implemented with that entry. There have been no fires in recent history that would have altered stand structure, although there have been numerous small lightning fires.

About 9% (72 acres) of the project area is less than 35 years old. Generally these stands are the result of the regeneration harvests that occurred in the 1990's. Most all these acres are a seeding size class. Approximately 18% (134 acres) is 35 to 100 years old. These stands generally range from pole to immature sawtimber size classes. Around 73% of the area (558 acres) is in stands that are over 100 years old. This is considered mature sawtimber. There are no stands allocated for old growth within the project area.

3.1.5. Environmental Consequences

A. Direct and Indirect Effects in the Project Areas

Direct and Indirect Effects Common to All Alternatives

Under all alternatives, the number of acres affected by Douglas-fir beetles and root disease would remain the same. The extent of bark beetle activity and stand openings as a result of root disease losses is based on aerial flights and on-the-ground surveys. Typically, Douglas-fir beetle outbreaks last 3 to 4 years. Although there may be some additional mortality in 2002, bark beetle populations are expected to drop back to endemic levels. The actual severity of future attacks can be greatly influenced by weather and predicting exactly which stands will attract the beetles is difficult since they are strong fliers and can move several miles. Based on aerial detection flights, initial bark beetle attacks in 1998 were usually associated with areas that sustained ice and snow damage in 1996-97. Beetle mortality within the Hither and Yon project areas is believed to be the result of subsequent beetle flights away from initial infestation areas.

Effects Common to the Action Alternatives

Beetle populations would no be reduced by proposed activities under any action alternative. Bark beetles have already flown from most trees proposed for harvest and it is unlikely that trees with current infestations could be harvested before the beetles leave to attack other trees.

There is some risk of increase in beetle populations as a result of the proposed treatments. Bark beetles could infest green cut trees if not removed in a timely manner, however provisions can be designed into sale contracts to greatly reduce this concern. The risk of an increase in beetle populations due to the presence of new stumps is low. Beetle population expansion due to fresh stumps has been documented in British Columbia. Sandy Kegley, Forest Entomologist, stated that she has never seen any significant increase in the Douglas-fir beetle population in the Northern Region due to stumps (personal conversation, 2/21/02). There is not enough surface area in the stumps and the stumps associated with dead tree harvest do not pose any beetle risk. Prescribed fire treatments can also increase the risk of population expansion by killing residual trees or putting them under stress. Reducing the fire intensity through timing and fuels reduction treatments prior to burning can reduce this risk. There is also an option to utilize anti-aggregate pheromones after treatment to reduce risks of additional beetle mortality.

At this time, there is no known literature displaying further infestation from Douglas-fir beetle-infested timber that has been transported to milling facilities. Although no literature exists, other species of beetles transported in timber to milling sites have been known to be a source for the spread of beetle activity. In the proposed alternatives, most trees to be removed would be dead Douglas-fir trees from which the beetles have emerged prior to logging activities. Because of this, there would be no spread of Douglas-fir beetles. A small portion of the trees removed could be infested with beetles and larvae at the time of removal and would be transported to mill sites. Prior to the beetles' emergence from the timber, most logs would be processed (i.e. debarked), which would kill the beetle and larvae.

An increase risk of root disease spread can also occur with both harvest and prescribed fire treatments. New mortality, either from green stumps or fire-killed trees, can serve as an infection source that can spread root disease. When harvest or mortality is generally associated with smaller trees the risk is less since the root systems are generally less developed and not as likely to be in contact with larger trees.

Generally, harvest or prescribed fire treatments would not change the existing structural stage class. Although green trees would be removed in some stands for the alternatives, this would not create changes to the structural stage category beyond that caused by the bark beetles and root disease for most acres. Thinnings and improvement harvest would still be managing for the preferred overstory component and would remain in

the same structural stage category. Cover types would be altered within regeneration treatment units, including the fishwood unit in the Grassy Mountain area. The treatment areas would then be dominated by seral species such as white pine, larch, and ponderosa pine. Cover types would remain the same within salvage units. Small openings within these salvage areas would likely regenerate back to firs or hemlock. Thinnings and improvement harvests would favor larch or ponderosa pine over the short and long term. The thinning treatment would likely change the cover type to larch if not currently dominated by that species. The improvement harvest, though favoring ponderosa pine over the short and long term, would not likely change the overall stand cover type.

Direct and Indirect Effects in the Project Areas Under Alternative 1 (No Action)

There would be no harvest of the trees killed by Douglas-fir beetle or weakened by other pathogens under this alternative. Douglas-fir mortality generally occurred in groups as the pheromones synthesized by the beetles attracted more beetles to the initial location. This led to mass attacks where most of the large Douglas-fir trees were killed. In most cases these groups of dead trees were less than one acre in size but in some cases, large Douglas-fir were killed over areas 10-12 acres in size. Smaller diameter trees sometimes were also attacked when they occur near these groups, especially in denser stands.

Stands affected by the beetle may experience a change in species composition, most often to a climax tree species, and changes in stand structure to a younger age class or a more open canopy. There are expected to be shifts in stand species composition due to mortality caused by bark beetles, but these shifts are not expected to increase the early seral species component. In most stands where over 50 percent of the basal area is killed by Douglas-fir beetles, the dominant overstory species following the beetle infestation is likely to be grand fir. In the absence of further disturbance these stands are likely to regenerate to Douglas-fir and grand fir, so there would be no long-term shift in species composition. Loss of overstory canopy to root disease is also expected to create little change in forest cover types. Since the disturbance is so gradual, regeneration of shade-tolerant species is also expected. The change in forest structure would depend on the amount of beetle mortality and the size of adjacent root disease openings.

Mortality of less than 25 percent of the basal area of a stand would not impact stand structure class. Because beetles tend to kill trees in groups, it is likely that any holes in the canopy are small and will quickly regenerate with shrubs or shade-tolerant species. Stands in which 26-50 percent of the basal area has died will have a more open appearance once the dead trees fall to the ground. Again, canopy openings are small and will regenerate quickly. In stands where 50-100 percent of the basal area has been killed by bark beetles, the results tend to be more dramatic. Groups of trees killed by the beetles combine, and more of the associated small diameter Douglas-fir may be attacked. The entire stand would have a more open appearance. The understory vegetation becomes more dominant and the stand structure reverts to a shrub/seedling/sapling structural stage. In some areas bark beetle created openings have coalesced with root rot pockets to create larger openings. These larger openings generally retain groups of trees and scattered individual trees that have been unaffected by the bark beetle infestation.

It is estimated that approximately 512 acres of National Forest System lands within the project areas has incurred some mortality due to the current bark beetle epidemic. Some of this mortality will have little impact on stand structure. Approximately 59 acres are projected to have a substantial (greater than 50 percent of the stand basal area) loss of forest tree cover due to the beetles in conjunction with existing root disease openings. Natural regeneration of shade-tolerant species is expected to occur in these more heavily impacted areas, but there would be no change to the desired early seral species composition. Early seral species would not regeneration on the site because the seed source is generally lacking and ground conditions would not be favorable to their establishment without additional treatments. As dead trees decay and begin falling to the ground there will be an increase in fuel loading that could effect fire intensity. In some areas mortality is relatively light and there will be little increase in the potential for severe fires. However, where there is moderate to high mortality, the increase in fuel loading as the dead trees fall to the ground and the fuel ladder created by regenerating Douglas-fir and grand fir will increase the risk of stand replacing fires.

Direct and Indirect Effects in the Project Areas Under Alternative 2 (Proposed Action)

From a vegetation standpoint, the objective of this alternative is to harvest dead and dying trees in areas attacked by bark beetles. In stands where bark beetles and root disease have killed a substantial portion of the basal area of the stand, the objective is to restore long-lived seral tree species such as white pine, western larch and ponderosa pine. Not all beetle-killed patches or root disease areas in the project area would be treated. Some small patches of beetle-killed trees would be retain for wildlife habitat or would be retain in Riparian Habitat Conservation Areas (RHCA) for woody debris recruitment.

In stands where bark beetle, ice and snow damage, and root disease mortality is generally light, a individual tree selection harvest treatment would salvage trees killed by bark beetles and associated trees fading to root disease or other pathogens. These units, ranging from 2 to 14 acres in size, would be scheduled for this salvage type treatment for a total of 62 treatment acres. For more information see Chapter 2, Alternative Descriptions. The effect of these salvage units would result in no change stand structure class or species composition on the sites. The amount of standing dead and future down wood component would be reduced on these sites by the individual tree selection harvest treatments.

In stands where bark beetle, ice and snow damage, and root disease mortality is more severe (over 50% loss of basal area) regeneration harvest would be used. These regeneration treatments would be group shelterwood harvests. Prescribed fire would be introduced into most of these areas to consume logging slash, reduce competing vegetation, and prepare the sites for planting of white pine, larch, and ponderosa pine. Smaller green trees that are not expected to survive prescribed fire treatments in these stands would be harvested unless retained for wildlife habitat. Generally, healthy Douglas-fir over 16 inches in diameter and grand fir over 18 inches in diameter would be retained on site. These harvests would range from 2 to 12 acres in size for a total of 68 regeneration treatment acres. These openings would retain groups of trees and/or scattered individual trees that have been unaffected by the bark beetle infestation, root disease, or other pathogens. Generally, 20-30% of the live stand basal area would be retained in shelterwood harvest prescriptions. For more information on this harvest treatment see Chapter 2, Alternative Descriptions.

One group shelterwood treatment in the Grassy Mountain project area would utilize the wood that is removed for ongoing fish habitat improvement projects not associated with this proposal. This area contains considerable down material that is no longer usable for sawtimber products. Some of the down trees removed from this area would have root wads attached. This would create more ground disturbance than normal salvage treatments. Skid trails will need to be spaced and 15-20 logs/ac of large down wood will need to be maintained on site to minimize soil compaction and provide for long term nutrient recycling. Grapple piling would need to use spaced skid trails as much as possible and walk on slash to minimize compaction. The same requirement of leaving larger down wood would apply.

The effect of these regeneration units would generally result in no change to forest structure class in the short term since the bark beetles, ice and snow damage, and root disease have already done that. Over the long term, forest structure is more likely to change with the introduction of pines and larch since these species are less susceptible to root diseases. The presence of root disease may keep a naturally regenerating stand of fir from ever achieving mature forest structure. Species composition would be affected by introducing pines and larch back into the ecosystems on these acres instead of allowing them to regeneration naturally back to their current species composition. The amount of stand dead and future down wood component would be reduced by the regeneration harvest treatments.

Figure 3-2. Beetle mortality in association with root disease openings creating canopy conditions similar to a group shelterwood harvest prescription in Grizzly Mountain area.

There are some stands in the Dobson Pass area that currently have western larch and ponderosa pine species on the sites. Western larch and ponderosa pine or known to be historical components of much of the Coeur d'Alene basin. The opportunity exists to implement harvest treatments in these areas that would help to favor and perpetuate these trees on those sites.

There are two units identified for improvement harvests. The objective of this treatment would be to improve the health and vigor of ponderosa pine and to restore a more open stand structure associated with historic disturbance regimes. Shade tolerant species, primarily Douglas-fir and grand fir, less than 16 inches in diameter within 25 feet of ponderosa pine would be harvested. This "daylighting" treatment would only occur if the ponderosa pine have adequate crowns capable of responding to the improved light and moisture regimes. If western larch occurs in these areas, it would also be daylighted. Two areas, 8 and 9 acres in size, would scheduled for this type of treatment for a total of 17 acres. Jackpot burning would be utilized in these areas to treat slash and enhance ecosystem conditions.

Also within the Dobson Pass project area are two units identified for commercial thinning. The objective of this treatment would be to improve the health and vigor of western larch in these stands. Approximately 1/3 of the existing basal area would be harvested. This harvest would focus on the removal of shade tolerant species such as Douglas-fir, grand fir, and western hemlock less than 16 inches in diameter within 20 feet of western larch trees. This treatment would reduce competition and improve tree vigor on the site. Larch with less than 20% live crown or with heavy mistletoe may also be removed if within 20 feet of an acceptable leave tree. Two areas, 5 and 28 acres in size, would be commercially thinned for a total of 33 treatment acres.

Slash would be treated with lop and scatter treatments to get fuels on the ground so they will decompose more quickly.

The improvement and commercial thinning harvests would not alter forest structure class. Forest cover type would likely be changed to western larch in the commercial thinning areas if not already western larch cover types. Forest cover type would likely not be changed in the improvement harvest although these harvests will improve the likelihood of having ponderosa pine as a component of the cover type over the longer term.

There is a section of Road 260 from the Grassy Mountain project area down to Riley Saddle (junction with Road 900) where trees are growing along the lower edge of the running surface of the roadway. These trees are making it difficult to do routine road maintenance and snowmobile trail grooming during the winter months. These trees, approximately 50-75, are scattered along 2.5 miles. Under this alternative, these "bumper trees" would be harvested to improve road maintenance and winter grooming. Stumps of the trees on the roadway would be ground down so that they do not interfere with surface blading operations. This special harvest treatment is estimated at approximately 4 acres based on the width of the road for 2.5 miles. Since these trees are widely scattered, logging slash would generally be scattered off the roadway. This scattered removal of trees along the end of the roadway would not affect forest structure or cover types for the adjacent timber stands.

Timber products produced by all these treatments would be removed using tractor, cable, skyline, and helicopter yarding methods. No new road construction would be needed. Approximately 0.1 miles of system road would need to be brought out of storage in the Grizzly Mountain area to access a suitable helicopter landing. This road had been ripped and barriered but has not brushed in. This roadway would be put back in storage after completion of use.

Direct and Indirect Effects in the Project Areas Under Alternative 3

Alternative 3 would propose the same harvests and treatments as described under alternative 2. In addition, approximately 72 acres of ecoburning treatment would occur within the Grizzly Mountain area. This ecoburning treatment would occur adjacent to unit 1 and from Unit 6, east to Unit 11. These ecoburning treatments would occur from the ridgetop down to Road 622. This alternative was developed to provide more defensible burn boundaries for harvest units and to return fire back into the ecosystem. Under this alternative, understory removal harvest treatments would occur within the ecoburn areas prior to implementation of the burns. The understory removal harvest would remove smaller merchantable trees not expected to survive the ecoburn. Generally, this would involve trees less than 12 inches in diameter depending on the species. Fading trees from root disease, beetles, and other causal agents would also be salvaged in this operation. Older, large, dead beetle mortality would be retained for wildlife habitat. Timber removed from these ecoburn areas using helicopter-yarding systems.

The effect of this ecoburn and understory removal would result in no change to stand structure class or species composition on the sites. The understory removal treatment would remove trees likely to be killed during burning operations although a small amount of mortality may still occur. Douglas-fir and grand fir would be the primary species removed during the understory removal operation. These species are not preferred for long-term management on these sites. There would be some reduction in the amount of standing dead with the harvest of dying trees, however most of the existing dead component would be retained. Some of the future down wood component would also be reduced with this treatment, however existing down and older standing beetle-killed trees would remain on site.

Direct and Indirect Effects in the Project Areas Under Alternative 4

Alternative 4 would also propose the same harvest and treatments as described under alternative 2. Under alternative 4, approximately 34 acres of ecoburning treatment would occur within the Grizzly Mountain area. This ecoburning treatment would occur from Unit 8, east to Unit 11 from the ridgetop down to Road 622. There would be no harvest treatment (between the units) within the ecoburn area under this alternative. This alternative only proposes ecoburning in areas where less understory exists since no harvest treatment would be allowed to occur under this alternative.

The effect of this ecoburn would result in no change to stand structure class or species composition on the sites. There would generally be no change in the amount of standing dead or future down wood component since no harvest would occur within the ecoburn area. There may actually be an increase in these components as a result of mortality to understory trees after the burning operation.

B. Cumulative Effects in the Project Areas

The following tables provide summary information on how each alternative would affect stand structure and species composition within the three project areas. "Existing Condition" for Structural Stage and Cover Type incorporates all past activities that have occurred over the landscape, such as timber harvests, planting and fires. Generally, ongoing activities are included in the existing condition. These are the cumulative effects to date. Changes shown to existing condition would be the result of the alternative and also of other reasonably foreseeable future actions. Changes in stand structure, from existing condition to no action, is generally the result of bark beetle mortality or severe ice and snow damage.

Cumulative Effects in the Grassy Mountain Project Area

As shown in the table below, changes in stand structure and species composition as a result of natural mortality or the proposed alternatives would affect less than 1 percent of the project area. This is to be expected given the small scope of the project in this area.

Table 3-4. Approximate acres of structural stages and cover types, Grassy Mountain Project Area.

	Existing		No Action		Alternative 2		Alternative 3		Alternative 4	
Structural Stage	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**
Non-forest	24	1	24	1	24	1	24	1	24	1
Shrub/Seedling/Sapling	251	13	262	13	262	13	262	13	262	13
Pole/Small-medium Timber	1134	58	1123	58	1123	58	1123	58	1123	58
Mature/Large Timber	353	19	353	19	353	19	353	19	353	19
Allocated old growth	180	9	180	9	180	9	180	9	180	9
Cover Type										
Douglas-fir	1024	53	1024	53	1024	53	1024	53	1024	53
Grand fir	427	22	427	22	427	22	427	22	427	22
Western Hemlock	193	10	195	10	186	10	186	10	186	10
Lodgepole Pine	141	7	141	7	141	7	141	7	141	7
Western Larch	57	3	55	3	55	3	55	3	55	3
Subalpine fir	52	2	52	2	52	2	52	2	52	2
Western White Pine	36	2	36	2	45	2	45	2	45	2
Non-Forest	13	1	13	1	13	1	13	1	13	1

1 Percentage represents the percent of National Forest System Land within this project area.

The Grassy Mountain project area would be located within the boundaries of the reasonably foreseeable Teratoid Tepee Planning Area. The Teratoid Tepee project will be a landscape level assessment scheduled to

be implemented starting in 2004. Locations and types of vegetative treatments under that project are not known at this time. Teratoid Tepee analysis will need to take into account the effects of treatments proposed under this project. There are no additional future timber sales currently planned for the project area. Road 1564 would likely be opened for preferred fuelwood gathering after the Hither and Yon Beetle project. This would have no impact on stand structure class or species composition. There is no private or other agency lands within or adjacent to the project area.

Cumulative Effects in the Grassy Mountain Project Area Under Alternative 1 (No Action)

Approximately 9 acres of immature sawtimber structural size class has become shrub/seed/sapling as a result of ice and snow damage within the project area. Species composition is expected to remain the same over 7 of those acres as those acres will likely regenerate to western hemlock since it dominated the overstory. Two of the 9 acres will likely change species composition from western larch, which dominated the overstory, to western hemlock since natural regeneration, without ground disturbance, will favor the climax species. Bark beetle mortality within the project area is generally scattered. Approximately 2 acres of beetle mortality is expected to change stand structural class but species composition will not be altered as it regenerates naturally.

Currently, 5 percent of National Forest System lands within the project area are dominated by long-lived seral species, in this case larch, and white pine, compared to an historic level of over 50 percent for the Coeur d'Alene basin. Alternative 1 would see a reduction in 2 acres of seral species as a result of ice and snow damage.

Currently, 19 percent of National Forest System lands within the project area are in mature structural stages, which is well below historic levels of 46 percent for the Coeur d'Alene sub basin. These stands are generally dominated by Douglas-fir, grand fir and hemlock while historically these stands would have had a substantial component of white pine and larch within this area. There will be no change to the percentage of mature structural stages as a result of bark beetles or ice and snow damage.

Approximately 9 percent of the project area is within allocated old growth. Bark beetle mortality and ice and snow damage within these areas is not believed to be significant enough to change overall old growth habitat in those areas. Foreseeable actions are not expected to affect old growth within the area.

Cumulative Effects in the Grassy Mountain Project Area Under Alternatives 2, 3 and 4

White pine and larch would be planted on approximately 9 acres following removal of forest products for fish habitat structures and site preparation burning under these alternatives. These alternatives would increase the acres in long-lived seral species from 93 acres to 100 acres (2 acres lost to ice damage with 9 acres planted to white pine and larch). These acres would be more likely to provide a long-term improvement in stand structure, since long-lived seral species are less susceptible to root disease than firs and hemlock which would regenerate in natural openings without ground disturbance. The Interior Columbia Basin Assessment and the Forest Plan recommend this improvement in long-term species composition.

Forty-three acres (83 percent of the harvest acres) would be salvage harvested to remove dead and dying trees. Salvage harvest would not improve seral species composition. Forest structure class would not be changed on the salvage treatment or the regeneration treatment areas as a result of the harvest. Salvage and regeneration treatments would reduce the long-term risk of stand replacing fires on 48 acres. There would be a reduction in standing dead and future down wood component over these same treatment acres.

Four acres of special harvest would occur along Road 260. The removal of 50-75 right-of-way trees along a 2.5 miles section of this road would not alter forest structure or species composition of the timber stands.

There would be no change in mature forest structure acres from timber harvest under these alternatives. There would be no affect to allocated old growth with these alternatives.

Cumulative Effects in the Grizzly Mountain Project Area

As shown in the table below, changes in stand structure and species composition as a result of natural mortality or the proposed alternatives would affect approximately 3 percent of the project area.

Table 3-5. Approximate acres of structural stages and cover types, Grizzly Mountain Project Area.

	Existing		No Action		Alternative 2		Alternative 3		Alternative 4	
Structural Stage	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**
Non-forest	118	11	118	11	118	11	118	11	118	11
Shrub/Seedling/Sapling	1	0	33	3	33	3	33	3	33	3
Pole/Small-medium Timber	353	33	353	33	353	33	353	33	353	33
Mature/Large Timber	613	56	581	53	581	53	581	53	581	53
Allocated old growth	0	0	0	0	0	0	0	0	0	0
Cover Type										
Douglas-fir	543	50	543	50	511	47	511	47	511	47
Grand fir	235	22	235	22	235	22	235	22	235	22
Western Hemlock	147	13	147	13	147	13	147	13	147	13
Non-forest	118	11	118	11	118	11	118	11	118	11
Subalpine fir	42	4	42	4	42	4	42	4	42	4
White Pine	0	0	0	0	32	3	32	3	32	3

1 Percentage represents the percent of National Forest System Land within this project area.

There are no ongoing or foreseeable projects identified for the Grizzly Mountain project area. The currently open Road 622 would likely be identified as a preferred fuelwood gathering area after the Hither and Yon project. This will have no impact on stand structure class or species composition. There are no privately-owned or other agency lands within or adjacent to the project area.

Cumulative Effects in the Grizzly Mountain Project Area Under Alternative 1 (No Action)

Approximately 32 acres of mature sawtimber structural size class has become shrub/seed/sapling as a result of beetle and root disease mortality within the project area. Species composition is expected to remain the same as these acres will likely regenerate to Douglas-fir or grand fir since they dominated the overstory. Currently, none of National Forest System lands within the project area are dominated by long-lived seral species. This is compared to an historic level of over 50 percent for the Coeur d'Alene basin. Approximately 50 percent of National Forest System lands within the project area are currently in mature structural stages, which is actually above the average levels of 46 percent for the Coeur d'Alene sub basin. These stands are generally dominated by Douglas-fir, grand fir and hemlock while historically these stands would have had a substantial component of white pine and larch within this area. There will be a 3 percent reduction in mature structural stages as a result of bark beetle and root disease mortality.

There are no stands allocated to old growth management within the project area. This analysis prompted consideration of several stands that appeared to have the age attributes but further analysis indicated that they would not meet the criteria for old growth habitat. Please refer to Appendix A, Issues Not Addressed in Detail, for further discussion of old growth.

Cumulative Effects in the Grizzly Mountain Project Area Under Alternatives 2, 3 and 4

Long-lived seral species would be planted on approximately 32 acres following group shelterwood harvest and jackpot burning under this alternative. Planted species would be a mix of white pine, larch, and ponderosa pine. White pine would likely be the dominant species in the plant mix so all these acres were added to the white pine cover type in the table above. This alternative would increase the acres in early seral species from 0 to 32 acres (3 percent). These acres would be more likely to provide a long-term improvement in stand structure, since early seral species are less susceptible to root disease than firs, which would regenerate in natural openings. This improvement in long-term species composition is recommended by the Interior Columbia Basin Assessment and the Forest Plan.

Twenty-three acres (42 percent of the harvest acres) would be salvage harvested to remove dead and dying trees. Salvage harvest would not improve seral species composition. Forest structure class would not be changed on the salvage treatment or the regeneration treatment areas as a result of the harvest. Salvage and regeneration treatments would reduce the long-term risk of stand replacing fires on 55 acres. There would be a reduction in standing dead and future down wood component over these same treatment acres. There would be no change in mature forest structure beyond what was caused by the bark beetle and root disease mortality with this alternative.

The 72 acres of ecoburning treatments proposed under Alternative 3 would not be expected to change stand structure class or species cover types within the ecoburn areas. Fire disturbance would occur which could favor the regeneration of seral species. However, there is not expected to be enough of a seral seed source on the site and small openings in the area would likely regenerate back to Douglas-fir and grand fir. The 34 acres of ecoburning under Alternative 4 is also not change the stand structure or species cover types within the ecoburn areas.

Cumulative Effects in the Dobson Pass Project Area

As shown in the table below, changes in stand structure and species composition as a result of natural mortality or the proposed alternatives would affect 4 percent of the project area.

Table 3-6. Approximate acres of structural stages and cover types, Dobson Pass Project Area.

	Existing		No Action		Alternative 2		Alternative 3		Alternative 4	
Structural Stage	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**	**Appx. Acres**	**%[1]**
Non-forest	0	0	0	0	0	0	0	0	0	0
Shrub/Seedling/Sapling	72	9	99	13	99	13	99	13	99	13
Pole/Small-medium Timber	134	18	134	18	134	18	134	18	134	18
Mature/Large Timber	558	73	531	69	531	69	531	69	531	69
Allocated old growth	0	0	0	0	0	0	0	0	0	0
Cover Type										
Douglas-fir	280	36	280	36	258	34	258	34	258	34
Grand fir	255	33	265	35	255	33	255	33	255	33
Western Larch	138	18	128	17	151	19	151	19	151	19
Lodgepole Pine	45	6	45	6	37	5	37	5	37	5
Ponderosa Pine	37	5	37	5	54	7	54	7	54	7
Western White Pine	5	1	5	1	5	1	5	1	5	1
Western hemlock	4	1	4	1	4	1	4	1	4	1

1 Percentage represents the percent of National Forest System Land within this project area.

The Dobson Pass project area would fall within the boundaries of the reasonably foreseeable Beaver Creek Planning Area. Locations and types of vegetative treatments under that project are not known at this time. Beaver Creek analysis will need to take into account the effects of treatments proposed under this project.

There are no other future timber sales currently planned for the project area. Open Road 429 would likely be identified for preferred fuelwood gathering after the Hither and Yon project. This will have no impact on stand structure class or species composition. There is private ownership and other agency lands (BLM) adjacent to the project area to the north, east, and south. Private ownership is moving toward smaller size structure classes and climax species types with multiple partial harvest entries occurring over time. Other agency ownership is moving toward smaller size structure classes but the long-lived seral component will likely increase with planting investments.

Cumulative Effects in the Dobson Pass Project Area Under Alternative 1 (No Action)

Approximately 27 acres of mature sawtimber structural size class has become shrub/seed/sapling as a result of bark beetles and root disease within the project area. Species composition is expected to remain the same over 17 of those acres as the acres will likely regenerate to Douglas-fir since it dominated the overstory. Ten of the 27 acres will likely change species composition from western larch, which dominated the overstory, to grand fir since natural regeneration, without ground disturbance, will favor the climax species.

Currently, 24 percent of National Forest System lands within the project area are dominated by early seral species, in this case larch, white pine, and ponderosa pine, compared to an historic level of over 50 percent for the Coeur d'Alene basin. Alternative 1 would see a reduction in 10 acres of seral species as a result of beetles and root disease opening up the stand to the point that natural climax regeneration will dominate.

Currently, 73 percent of National Forest System lands within the project area are in mature structural stages, which is actually above the average levels of 46 percent for the Coeur d'Alene sub basin. These stands are generally dominated by Douglas-fir and grand fir while historically these stands would have had a substantial component of white pine and larch within this area. There will be a 4 percent reduction in mature structural stages as a result of bark beetle and root disease mortality.

Currently there are no stands allocated to old growth management within the project area.

Cumulative Effects in the Dobson Pass Project Area Under Alternatives 2, 3 and 4

Long-lived seral species would be planted on approximately 27 acres following harvest and site preparation burning under these alternatives. These alternatives would increase the acres in long-lived seral species from 170 acres to 210 acres (13 acres would be changed from lodgepole pine or Douglas-fir dominate to larch dominate during thinning operations). These acres would be more likely to provide a long-term improvement in stand structure, since early seral species are less susceptible to root disease than firs which would regenerate in natural openings without ground disturbance. This improvement in long term species composition is recommended by the Interior Columbia Basin Assessment and the Forest Plan.

Improvement harvests would thin out or "daylight" around the existing health ponderosa pine and larch on some sites. The improvement harvest would likely not change the existing cover type for the stands but would favor these long-lived seral species over the long term. Commercial thinning in western larch would also favor the retention of this species over the longer term. The thinning operation is expected to change the cover type from lodgepole pine or Douglas-fir to western larch over approximately 13 acres of the treatment area. Regeneration, improvement, and commercial thinning treatments would reduce the long-term risk of stand replacing fires on 77 acres. The commercial thinning treatments would increase the risk of stand replacing fire over the short term. There would be a reduction in standing dead and future down wood component over these same treatment acres.

There would be no change in mature forest structure beyond what was caused by the bark beetle and root disease mortality with this alternative. There would be no affect to allocated old growth with these alternatives.

C. Effects of Opportunities on Forest Vegetation

Installation of overflow pipes along a diked section of the county road at the mouth of Grizzly Creek would not affect forest tree vegetation. Direct control of noxious weeds and management practices designed to prevent their spread or introduction to additional areas would improve the potential for natural vegetation to colonize disturbed sites but would probably not affect forest tree vegetation since most weed invasion is occurring along road edges.

3.1.6. Consistency With the Forest Plan and Other Regulatory Direction

Forest Plan direction (Forest Plan, Chapter II, page II-8) provides that timber management activities will be the primary process used to minimize the hazards of insects and diseases and will be accomplished by maintaining stand vigor and diversity of plant communities and tree species. Improvement and thinning operations would improve stand vigor and help promote historical long-lived seral stand components in these areas. Ecoburning operations, with or without understory removal, could increase risks of insects and diseases in the short term. However, there are benefits to re-introducing fire into the ecosystem over the long term. The forest ecosystems developed over time with the effects of fire and with the increased risk of insect and disease mortality as a result of fire. Low and intermediate intensity fires tended to promote larger forest structures by thinning out the understory and reducing competition. Low and intermediate intensity fires also reduced fuels making the stands more resilient to fire events and extending stand-replacing fire intervals. These fires maintained stand vigor and diversity of plant communities over the long term.

In the stands proposed for salvage and regeneration treatment, harvest is primarily associated with the removal of dead and dying trees. This is consistent with Forest Plan direction for stands which are "substantially damaged by fire, wind throw, insect or disease attack, or other catastrophe may be harvested where the salvage is consistent with silvicultural and environmental standards".

Regeneration harvests are proposed for stands in which the majority of the basal area of the stand has been lost to bark beetles and root disease. Following site preparation, regenerated stands would be planted with seral species (white pine, larch, and ponderosa pine) to promote stand structures and species composition that reduce susceptibility to insect and disease damage. This is consistent with forest plan direction that "regeneration with species combinations that are least susceptible to root disease is the primary protection objective for the root rot diseases" and that "reforestation will feature seral tree species". All stands proposed for regeneration harvests are on lands suitable for timber production and can be adequately restocked within 5 years of the final harvest. In accordance with Forest Plan direction, stands would be regenerated with trees from seed that is well adapted to the specific site conditions and will be regenerated with a variety of species. There are no stands scheduled for treatment under this proposal where clearcutting was considered the optimal silvicultural treatment for the stand.

Forest Service policy requires public review and Regional Forester approval, with some exceptions, if even-aged silvicultural methods create openings exceeding 40 acres. The largest regeneration unit under this proposal is 12 acres. None of the proposed units, in association with past harvest units will exceed 40 acre openings (Project Files, Vegetation, "Previous Harvest" maps).

The National Forest Management Act (NFMA) provides that timber harvest and other silvicultural practices shall be used to prevent damaging population increases of forest pest organisms and treatments shall not make stands susceptible to pest-caused damage levels inconsistent with management objectives. The best way to achieve this is to increase the component of long-lived seral species, as proposed under Alternative 2, to provide greater diversity of native tree species across the forest landscape.

3.2. FIRE/FUELS

3.2.1. Introduction

Effective wildfire suppression since the 1930's and the broad scale change in species composition of the forest over the past several decades have caused fuel levels to build much higher than historic levels in the intermountain west. Overmature trees are succumbing to normal levels of forest pests at an accelerated rate and over-crowded understories are providing excessive ladder fuels (forest fuels, normally green foliage, arranged in a vertical pattern that enable a ground fire to climb into the tree crowns) in mature stands. On the Coeur d'Alene River Ranger District, storms during the winter of 1996/97 damaged many stands. Subsequent insect attacks (especially Douglas-fir bark beetle) have killed even more trees, adding to the fuel levels. Due to the increased number of snags, a wildfire could be unsafe for fire fighters and it could be so intense it could be difficult to control. The resulting potential wildfires could destroy most of the trees (referred to as a "stand-replacing" fire). Potential high-intensity wildfires could also have severe consequences to other vegetation, soils, stream networks, and the visual quality of landscapes.

3.2.2. Regulatory Framework

The 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 (Forest Plan, pages II-10, II-38). Management area standards and goals provide direction for appropriate response. Fire management plans are to be guided by the following standards:

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

The Forest Plan Management Areas (MA-1 and MA-6) within the Hither and Yon Project Areas includes goals to manage suitable lands for timber production for the long-term growth and production of commercially valuable wood products. The fire protection standard to achieve that goal is to use initial attack strategies (confine, contain and control) appropriate to achieve the best benefit based on commercial timber values.

Forest Service Manual (FSM) 5150, defines fuel as combustible wildland vegetative materials, living or dead. Agency direction is to evaluate, plan and treat wildland fuel to control flammability and reduce resistance to

control utilizing 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 under this project 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 the potential fire severity.*

Fire suppression policy from the early 1900's until the late 1970's has been that of total suppression. Only recently has fire policy been modified to recognize the importance of fire in balancing vegetation cycles within the temperate forest. The "Federal Wildland Fire Management Policy and Program Review" was chartered by the Secretaries of the Interior and Agriculture to examine the need for modification of and addition to Federal fire policy. The review recommended a set of consistent policies for all Federal wildland fire management agencies. In adopting the policy, the Federal Agencies recognized 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, USDA, 1995; USDI, USDA, 1996). The severe wildfire seasons in northern California and Oregon in 1987, in Yellowstone Park and the Northern Rocky Mountains in 1988, throughout much of the West in 1994, Florida and Texas in 1998 and 1999, California again in 1999, and the Northern Rockies again 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, it is not feasible to fully restore fire to its historic character, except perhaps in a few of the largest wilderness areas (USDA, 1996.)

3.2.3. Affected Environment

Fire was and is the major disturbance factor that produces vegetation changes in our ecosystems. If the role of fire is altered, or removed, this will produce significant changes in the ecosystem. Fire has burned in every ecosystem and virtually every square meter of the coniferous forests and summer-dry mountainous forests of northern Idaho, western Montana, eastern Washington, and adjacent portions of Canada. Fire was responsible for the widespread occurrence and even the existence of western larch, lodgepole pine, and western white pine. Fire maintained ponderosa pine throughout its range at the lower elevations and killed ever-invading Douglas-fir and grand fir (Spurr and Barnes 1980). Many ecosystems are regularly recycled by fire; life for many forest species literally begins and ends with fire. The effects of the historic disturbance factors, mostly associated with fire, and their current absence are discussed in more detail in the Forest Vegetation section of this Chapter.

The Coeur d'Alene basin historically had a variable fire regime of long interval large lethal fires mixed with shorter return interval non-lethal and mixed severity fires. Non-lethal fires are typically low severity surface and understory fires that kill 10% or less of the dominant tree canopy. Mixed severity fires are typically patchy and irregular burns producing a mosaic of different burn severities where the fire kills more than 10% but less than 90% of the dominant tree canopy. Lethal fires are often called stand-replacing fires and generally burn with high severity. They are commonly but not always crown fires and kill 90% or more of the dominant tree canopy.

In addition to cycling carbon and nutrients, the infrequent large lethal fires played a dominant role in resetting the successional sequence and structuring the vegetation matrix across the landscape. However, the non-lethal and mixed severity fires were also important. Most stands within the Coeur d'Alene Basin apparently experienced an average of one to three of these low severity burns between lethal fires. These lower severity fires would reduce ground fuels, reduce ladder fuels, thin stands, and favor larger individuals of fire resistant

species (larch, Douglas-fir, and ponderosa pine), than if these mixed severity and non-lethal fires had not occurred.

Lower severity fires structured how the landscape responded when a lethal severity fire did occur. The lower severity fires increased the proportion of the landscape with big trees and open canopies that would not sustain a crown fire. Reduction of ladder fuels would mean that even high intensity fire might not reach tree canopies in some cases. The larger trees that grew as a result of this thinning by fire would be more likely to survive even intense fires. The net result would be that even most lethal severity fires would be likely to leave more individual residual trees and patches of residual trees than if the lower severity fires had not occurred. The effects of lethal fire events would therefore be less uniform as a result of the lower severity fires.

The Hither and Yon project areas are primarily comprised of moist forest types with a minor amount of transition type forest, which possess most of the features of both dry and moist forest types. Dry forest types typically had fire return intervals of 25-60 years. Historically in moist forest types, large lethal fires that occurred at intervals of approximately 140-250 years had the greatest influence on stand structure.

There are several reasons for the departure from historic stand structure now evident in the areas. Early timber harvests typically were "high grade" selection harvests removing only the large valuable tree species. This resulted in major stand conversions to dense, uniform, grand fir, hemlock, and Douglas-fir stands where the large fire-resistant trees such as ponderosa pine and larch were no longer present. The introduction of white pine blister rust disease from Europe resulted in devastating losses to white pine which was a prime component of warm/moist forest types. This too contributed to the major stand conversion mentioned above. Since the late 1930's fire control efforts became much more effective. The primary impact of fire control has been to eliminate underburns and mixed severity fires that served to thin out stands and reduce fuel loads.

Although increases in volume and stocking are not as evident in moist forests as in dry and transition forests, some excessive fuel buildups have developed. Fuel accumulations associated with blister rust mortality can be substantial, and increasing accumulations of dead Douglas-fir and true firs associated with root disease mortality is expected. Additionally, conversion of tall, well-spaced white pine to low, densely stratified fir results in hazardous fuel ladders. Thus, significant changes in fire behavior are also a characteristic of modern-day, moist interior forests. Such changes in fire behavior threaten future fire control and place neighboring forest ecosystems at risk (Harvey, 1984).

Transition forests (warm, dry to warm, moist) possess most of the features of both dry and moist forests. Landscapes were historically a complex patchwork of stands resulting from fires that produced both lethal and non-lethal effects. Due primarily to the influences of fire exclusion and selective logging, as discussed above, modern day transition forests are far more homogeneous than historical forests. Loss of landscape diversity is primarily associated with increasing dominance and layering of shade-tolerant species in stands previously dominated by open-growing ponderosa pine or other seral species. On areas that transition to moist forest types, the historic forest species composition was mixed, with pines and larch playing a more dominant role than that of today. Mixed severity fires are now an improbable occurrence in many transition forests (Harvey, et al, 1995, USDA 1999).

A significant change from common historic patterns is indicative of unhealthy conditions. Application of this concept to most north temperate and boreal forests characteristic of the western interior of the United States suggests many are unhealthy, especially where historical fire regimes have been significantly interrupted (Harvey, 1984, U.S. GAO, 1999a and 1999b).

For more information on fire severity, return intervals, fire history, and fire effects on forest types in the Coeur d'Alene basin please refer to the Fire/Fuels section of the Douglas-fir Beetle EIS (IPNF, 1999, pages III-219 to III-235).

3.2.4. Environmental Consequences

A. Methodology

Of primary concern to fuels management is the long-term fuel loading increase and subsequent changes in fire intensity and severity that may occur as a result of forest pest activity. The Douglas-fir Beetle EIS (IPNF, 1999) did an in depth assessment of the effects of bark beetle mortality on fire behavior. That project used the Forest Vegetation Simulator with the Fire and Fuels Extension (FFE-FVS) to predict the effects of various vegetation management actions on future forest fire behavior and severity. That assessment used the BEHAVE model to predict rates of spread and intensities. In addition, site-specific studies were made 10 years after at previous beetle outbreak locations. See the Fire/Fuels section of the Douglas-fir Beetle EIS (IPNF, 1999, pages III-219 to 235) for more information on methodology for determination of environmental consequences. The Hither and Yon Beetle project has similar consequences as discussed in that assessment.

B. Direct and Indirect Effects

Direct and Indirect Effects Common to All Action Alternatives

Under any action alternative, timber harvest would significantly affect both short and long-term fuel loading in beetle-affected areas. Timber harvest converts unavailable aerial fuels into available surface fuels. 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 loadings in order to decrease long-term fuel loadings. An increased fire hazard and risk of ignition from timber harvest may result. Treatment of created fuels can reduce these risks. The potential for a fire outside of proposed harvest areas, the overall fuel mosaic on the landscape, and future vegetation and fuel succession must be considered when planning fuels treatments. The treatment of fuels in the harvested stands would certainly reduce potential fire severity and help reduce potential damage to soil productivity. Reducing fire severity would also increase the probability of more vegetation surviving a wildfire.

Any type of human activity increases the possibility of ignition and wildfire. Common ignition sources include; equipment operation, smoking and arson. The timber purchaser would be required to have fire equipment and to take necessary fire precautions to prevent a wildfire from occurring. In the event of extreme fire conditions, the harvest activities would be regulated or suspended until conditions improve. The timber sale administrator closely monitors the fire prevention requirements of the timber contract throughout the timber harvest operations.

The preferred fuels treatment for all units that contain fire resistant species is underburning or jackpot burning. In units were fire resistant species are not present, vegetative manipulation to remove smaller diameter trees and slash pullback from the base of the larger trees is an option so that underburning can still be accomplished with the desired end result. Grapple piling and burning can also be used if slopes are not too steep. Hand piling and burning is also a very effective fuels treatment, however costs per acre are extremely high. Where the size of the harvested area is very small or where relatively few trees are removed, fuels treatment may be limited to lop and scatter or top attached yarding.

The Douglas-fir Beetle FEIS (USDA Forest Service, 1999) modeled three different fuel treatment scenarios. These scenarios included salvage logging with two different slash treatment prescriptions, yarding of tops and lopping tops. The third scenario was a regeneration harvest system, shelterwood with reserves, followed with underburning. A jackpot burning fuel treatment would be similar to an underburning treatment, but only concentrations of fuel would be burned, instead of attempting to reduce all fuel over the entire harvested area. Salvage logging, with no prescribed fire treatments would increase potential flame lengths over the short term. This is because when these trees are harvested, all fuel would be on the ground instead of accumulating more slowly, as under the No-Action Alternative.

A lop and scatter treatment, while not reducing the residual fuel load, is designed to get fuel reduced to ground level. This has the effect of reducing flame lengths should a wildland fire occur. This treatment also would increase the rate of decomposition and decrease the length of time that these fuels could contribute to potential increased severity. Yarding tops would reduce fuel loadings and potential flame lengths somewhat but would not eliminate the increases, as with burning options. Yarding tops can be reasonably effective in immature stands as shorter, younger trees are more flexible and tend to result in less breakage during felling operations. It is estimated that yarding tops would only remove 50 percent of the tops of harvested dead trees due to breakage. Removal of all logging slash would not totally eliminate the potential for increased flame length should a fire occur because the extent of mortality would provide more open stand characteristics allowing increased wind and solar penetration.

Regeneration harvesting, followed with prescribed fire appears to be the best treatment to reduce fuel loads and reestablish long-lived seral species. Underburning or jackpot burning treatments would significantly reduce the fire intensity over the short and long term and fire rate of spread over the short term. Grapple piling and burning would have a similar result. Maintaining long-lived seral species is an important step in sustaining forested environments that can adapt and sustain disturbances within the range of natural variability. (Effects of the action alternatives on changes to structural stage and species composition are discussed in the Vegetation section of this environmental assessment.) Other treatments would be relatively the same over the long term; however, in the short term, the removal treatments would be better than the lop and scatter method. Removal would decrease fire severity and, to a lesser extent, fire intensity. This would give initial attack forces a better opportunity to control fires in the initial attack phase of fire suppression activities.

The deciding factor in choosing which treatment to apply may be dependent upon the number of trees harvested, and risks to other values such soil nutrients or timber value of adjacent stand, and the costs of the treatments. Please refer to the Fire/Fuels section of the Douglas-fir Beetle EIS (IPNF, 1999, pages III-219 to III-235) for more information on the effects of these treatments.

Under the action alternatives, the reduction in snag component associated with the salvage of beetle-killed trees would improve firefighter safety. This may give hand crews the ability to directly attack a fire start so that contain and control objectives can be achieved before a fire increases in size.

Direct and Indirect Effects Common to All Alternatives

Once forest canopies are opened, structural changes begin to take place in the surface vegetation. As more sunlight reaches the ground, more grass and brush species can grow and conifer regeneration begins. Fuel models used for estimating fire behavior would also change. In adjacent portions of the stands that were unaffected by snow and ice damage, the Douglas-fir beetle, or root disease, the stands represented closed canopy timber stands (fuel models 8 and 10). Fire in the portions of these stands affected by these mortality agents would now react as a shaded grass fuel model (model 2) or a brush model (model 5 or 6). This condition would last for several years. Rates of spread would increase compared to a model 8 or 10 (please refer to the table below). Since the stands would be more open, atmospheric conditions would have more effect on the fuel, fuels would dry quicker and more wind could penetrate the forest canopy to fan flames.

Beetle-infested and root diseased trees that are killed will stand for several years and therefore will not immediately become available ground fuel that would influence fire activity. By 15 years all branches and large limbs will have fallen and approximately 50 percent of the snags will have fallen also; greater than 90 percent of the snags will fall within 35 years (USDA, 1998b). The fuel accumulation rate will far exceed the decay rate for several decades. In affected stands, within 10 to 15 years, fuel conditions will start to resemble a fuel model 10 (a timber stand with heavy down material and fuel ladders that enable a surface fire to climb into the crowns) or a fuel model 11 or 12 (a stand with heavy debris, often referred to as a slash model). Since the stands would still be fairly open and contain more grass and brush or regeneration than a dense

timber stand, spread rates may resemble a grass or brush model while intensities may start to resemble that of a fuel model 10, 11, or 12. These conditions are similar to those found by Leiberg (1897) that historically contributed to severe stand-replacing fires in the Coeur d'Alene basin. Timber stand with severe ice and snow damage would reach these conditions described above in a much shorter period of time.

Values in the table below were predicted using the BEHAVE model and constant weather and fuel moisture conditions to show changes in fire behavior as fuel models change. Two sets of values were used for calculations. The first set represents burning conditions commonly found during normal summers in the inland Northwest and the second set represents burning conditions commonly found during drought conditions (NWCG, 1992). The differences between a fuel model 8 and a grass model 2 or brush model 5 or 6 is even more pronounced during drought conditions.

Table 3-7. Estimated rate of fire spread and flame length, during normal and drought conditions.

	Rate of spread (chains per hour)		Flame length (feet)	
Fuel Model	**Normal**	**Drought**	**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 refers to the forward rate of spread of the fire, expressed in chains per hour. One chain equal 66 feet. **Flame length** is the distance measured from the tip of the flame to the middle of the flaming zone at base of the fire. This information is valuable in determining type of resources necessary to fight fire by direct attack methods. Hand crews can normally suppress fires with flame lengths up to 4 feet. Equipment is necessary when flame lengths are between 4 and 8 feet. Aerial support is needed for fires with flame lengths up to 11 feet. Direct attack is not effective on fires with flame lengths over 11 feet.

Similar changes in ecosystem structure in the past have undoubtedly contributed to fires, from lethal stand-replacing to low severity underburns, that recycled inland ecosystems. However, prolonged buildup of fuel may eventually lead to fires more catastrophic and destructive to the site than typically occurred in the native forest. Fuel loadings and flame lengths of a wildfire would be expected to increase over time as a forested stand matures and surface fuels accumulate faster than the decay rate. Because of bark beetle induced changes in stand structure, these changes would occur at an accelerated rate. The immediate effect would be for increased wind penetration into forested stands, which in the event of a fire start, would increase flame lengths and rates of spread. In successive years, the effects of surface fuel loading changes as portions of limbs and tops from the beetle killed trees fall to the ground. As the dead fuel accumulation from the beetle killed trees slows, increases in regeneration provide fine fuels necessary to maintain flame lengths and spread rates. After fire occurrence, the fuel loading and potential flame lengths would be reduced while fuel accumulated from trees killed by the fire. After several years of fuel accumulation, the potential would rapidly increase, which would explain the repeat burns historically common to inland forests (Leiberg, 1897; Zack and Morgan 1994). Following these reburns the potential intensities would be lower for many years as forests became reestablished.

The increase in snag component associated with beetle mortality can also make it difficult to suppress fire when they are small. High snag densities may not allow for safe firefighter conditions. This may result in hand crews having to rely on indirect attack methods. This may allow fires to increase in size and intensity and make them more difficult to control.

Root disease results in a change similar to the stand conditions and fuels model that occurs as a result of bark beetles, though it occurs over an extended period of time. The stands are gradually opened up increasing the rate of spread with the ingrowth of brush and regeneration. Fire intensities are still quite high with large fuels present from mortality to the overstory trees. The amount of dead does not occur all at once as with bark beetle mortality. However, it still contributes at a faster rate than decay.

Direct and Indirect Effects in the Project Areas Under Alternative 1 (No Action)

Alternative 1 is the No-Action Alternative, under which there would be no change from current management direction or from the level of management intensity. Timber harvest, fuels reduction, and vegetative restoration would not be initiated at this time. The effects analysis reflects existing conditions and the anticipated effects if no actions are taken.

Direct and Indirect Effects in the Project Areas Under Alternative 2 (Proposed Action)

Under Alternative 2, prescribed fire treatments (jackpot burning or underburning) would occur on 76 of the 184 acres proposed for treatment. Approximately 11 acres would be grapple piled and burned. The remaining treatment acres would be lopped and scattered. Top attached yarding would generally be the preferred fuels treatment options in these remaining acres (especially the commercial thinning units). However, a recent concern over recycling of nutrients has led to reduced use of this treatment option. When salvaging dead timber, lop and scatter treatments may actually be more effective because breakage often results and 50% of the tops not being removed anyway. Lop and scatter would get all material on the ground, reducing flame lengths and decomposing the material quicker. However, in thinning units, top attached yarding can provide an effective fuels reduction treatment as most limbs and tops would stay attached.

Many of the salvage units involve the harvest of scattered trees so slash concentration would be low to moderate and not uniformly distributed throughout the harvest area. Removing the larger dead fuels and getting the small fuels on the ground to decompose quicker would improve the long-term fire hazard, even though short term increases in fire intensity occur.

The commercial thinning of western larch stands would increase the fire risk since limbs and tops will be left on site. Lop and scatter treatments will help mitigate this risk getting the slash on the ground to reduce flame lengths and hasten decomposition. This increased fire risk period, typically 5-10 years, is similar to what occurs during pre-commercial thinning operations. (Based on size of material, pre-commercial thins would be closer to the 5 year period, commercial thins closer to the 10 year period.) Piling and burning of residual slash to reduce fire risk is limited due to costs, especially on steeper slopes where handpiling would be necessary, and spacing of the residual overstory, burning may lead to fire damage of the residual timber. Understory burning would also be high risk to the residual stand since thinning operations are generally of a smaller size class. The commercial thinning units proposed with this project would be located on generally north slopes in moist habitat types, which would help to reduce fire risk over the short term. Over the long term, commercial thinning would reduce the fire risk of the stand. The thinning operation would favor the more fire-resilient species in the stand, will aid in getting the stand to larger size classes at a quicker rate, and will removed a significant portion of the potential down fuel loading that would occur as the stand thins itself over time.

The scheduled improvement harvests would reduce the ingrowth of firs (ladder fuels), which would reduce the long term fire risk and improve the health and vigor of the long-lived seral species within the stands. This is beneficial to the sustainability of the forest ecosystem. Jackpot burning treatments will reduce the fire risk over the short term as well.

The group shelterwood harvest treatments followed by prescribed fire or grapple piling treatments would reduce the fire hazards within these stands over the short and long terms. Reforestation of these areas to long-

lived seral would improve the sustainability of the forest ecosystems. Fire lines would be constructed in the Dobson Pass area to contain the underburning operation for unit 1 and to contain the jackpot burning operations associated with units 5, 6, and 8 since they are located near private ownership.

The harvest of 50-75 trees along Road 260 would result in slight increase in fire risk, because the harvest would be scattered along a 2.5-mile section of the road. Yarding with limbs and tops attached would be preferred from a fuels reduction standpoint, but lop and scatter would be acceptable because of the scattered nature of the treatment.

Direct and Indirect Effects in the Project Areas Under Alternatives 3 and 4

Harvest and fuels reduction treatments within the proposed units would be the same as Alternative 2. The difference in Alternatives 3 and 4 occurs in the Grizzly Mountain area. Under Alternative 3, ecoburning would occur on 72 acres adjacent to some of the harvest units. This alternative was developed to provide logical, defensible burn boundaries for introducing prescribed fire into the mid-slope harvest units. Ecoburning would occur from the ridgetop to the road in the ecoburn area. Ecoburning in these areas would also be beneficial in these areas to return fire into the ecosystem under controlled, cool burn conditions. This would reduce potential fire intensities in this area during wildfire season, which would help maintain existing timber stands in this area over a longer term. This ecoburn activity would also be beneficial in reducing slash levels just above the road that has developed from considerable public fuelwood gathering in this area.

Under alternative 3, a understory removal harvest treatment would occur prior to burning. This activity would generally remove trees merchantable trees less than 12 inches that have a high risk of being killed during burning operations. Limbs and tops would be lopped and scattered prior to yarding. Timber would be removed using helicopter-yarding systems. Ecoburning this area without understory removal treatment could result in considerable recruitment of smaller dead material to ground fuels over time. This may not be acceptable with considerable larger beetle mortality already planned for retention in this area. Ecoburning was not considered above Units 2-5 because of a shallow soils area above the harvest units. Alternative 4 would implement ecoburning on 34 acres with no understory removal. This was the proposal that was developed if no understory removal was allowed to occur. Areas with higher levels of understory were eliminated from ecoburning treatments under this alternative.

Ecoburning would be expected reduce the fire hazard in this area over the short term and is expected to be beneficial over the long term by producing a more wildfire resilient timber stand.

C. Cumulative Effects

Cumulative Effects Common to All Alternatives

The effects of the Douglas-fir beetle on infested forested areas will be an acceleration of successional changes that the areas are currently going through. The projected infestation on the project area is confined to approximately 512 acres within 3,792 total acres. As a percentage, this is rather insignificant and would not likely, in itself, lead to catastrophic large stand-replacing wildfires in the project areas. Most large stand-replacing fires on the Idaho Panhandle National Forests are wind driven or the result of regional climatic patterns, higher fuel loadings from beetle-killed trees would have minimal affect on such an event once it occurs. The scattered nature of regeneration units with underburning also would have minimal affect on such an event. The treatment acres are too small to serve to stop a large running crown fire. The regenerated acres, though moving the drainage in the proper direction do not significantly contribute to restoration of historic species composition. Ecoburning under alternative 3 would create a fairly large area where fire hazards and fire intensities would be reduced. This would be beneficial to contain and control of wildfires in the local area.

Improvement harvests would be beneficial in restoring more fire resilient ecosystems in the Dobson Pass area but again would be small in scope. Ponderosa Pine restoration projects, proposed in other locations on the district, would have a larger scale affect on returning areas to more historic and natural conditions.

The amount of slash and the short-term increase in fire hazards associated with the precommercial thinning would be similar to those under a commercial thinning operation. The annual precommercial thinning program implements 1,000-1,200 acres of treatments scattered across the District. The 32 acres of commercial thinning proposed under the Hither and Yon project does not represent a significant increase in the area of increased short term fire risk.

Cumulative Effects Common to All Action Alternatives

It is true that catastrophic fires are generally wind driven or the result of climatic patterns such as drought, however catastrophic fires must have an ignition source. Treatment of these areas would reduce fire intensity and rate of spread within the treatment areas over the long term. Treatments involving prescribed fire or grapple piling and burning would reduce fire intensity and rates of spread over the short and long term. This may allow firefighters to contain and control a small fire before it becomes a large one. Reducing fire intensity in even small areas may improve the chances of firefighters to contain and control a small fire start in conditions that would otherwise lead to a catastrophic fire occurrence. Reducing the snag component may also allow for a direct attack by firefighters that could serve to keep a fire start small during conditions that might otherwise lead to a catastrophic fire occurrence. Commercial thinning would increase short-term fire risk with the goal of creating a more fire resilient stand in the future.

Cumulative Effects on Private Lands

There is no private ownership within or immediately adjacent to the Grassy or Grizzly Mountain project areas. There is a large block of mixed private and other agency ownership to the east of the Dobson Pass area. There areas are generally under differing degrees of timber management. There is a home site in Carbon Creek. Mining claims are widely scattered to the east and may be occasionally inhabited. A wildfire in the eastern half of the Dobson Pass area would be expected to burn to the east into this mixed ownership being pushed by prevailing winds out of the west. Land management agencies in Northern Idaho are not advocating a return to historic disturbance regimes at the landscape level. Natural disturbance regimes included severe and rapidly moving forest fires that sometimes exceeded 100,000 acres. Over 500,000 people now live in an area that historically was inhabited by 5,000 - 10,000 Native American people. While the full range of historic fire regimes was a functional part of the historical natural ecosystem, we are now operating

in an environment of a changed human context. Returning to the full range of historic disturbance patterns would generate significant threats to human life and property. Even smaller threats (such as "Fire Storm 91") have not been acceptable to the public.

Cumulative Effects of Ongoing and Reasonably Foreseeable Actions

Ongoing and reasonably foreseeable actions are identified in Chapter 2. Ongoing activities associated with site preparation and reforestation of previous timber sales will reduce fuel loadings and move the drainage toward more historic timber species composition, however these actions will only result in changes at a stand scale. Disturbances similar to historic proportions would be necessary to facilitate the vegetation restoration that is needed to change trends in potential fire intensities and severities.

Fuelwood gathering will reduce some of the large dead wood component in the drainages but it is very limited in scope, within short distances of open roads, and would have no effect at the drainage level. Fuelwood gathering activities could increase the risk of a human-caused fire start however. Mining activities could also increase the risk of a human-caused fire. Timber harvest on private ownership often removes the larger more fire resilient species from the sites. Timber is often whole tree yarded to reduce short-term fire risks, however investments in prescribed fire treatments and reforestation to long-lived seral species reducing short and long-term fire risks are rarely made. Treatments on other agency ownership, in this case BLM, are often similar to treatments that occur on the National Forest and are based on more long term forest management needs.

Effects of Opportunities on Fire/Fuels

Installation of overflow pipes in the county road at the mouth of Grizzly Creek would have no affect on fire and fuels. Noxious weed treatment and monitoring would have no effect on wildland fire intensities in forest fuel types. If spotted knapweed were to invade and dominate surface vegetation in dry open forest types and meadow types, a reduction of fire intensity could be expected. Spotted knapweed out-competes native grasses and does not burn well. In areas where knapweed infestations are reduced in these types, fire intensities could be expected to increase in the event of wildland fire.

Cumulative Effects At The Forest Scale

The effects of 100 years of past human activity on inland forested ecosystems has resulted in a significant change from historic patterns and is indicative of unhealthy ecosystem conditions. Prior to 1960 many upland areas were high-grade logged removing only the valuable species, resulting in major stand conversions to grand fir, hemlock, and Douglas-fir. Since the late 1930s, fire control efforts have become effective. The primary impact of fire control has been to eliminate underburns and mixed severity fires which served as the thinning agents that favored larch and ponderosa pine. In 1909 white pine blister rust was accidentally introduced to western North America. This Eurasian disease devastated white pine forests in north Idaho (Zack 1995).

Because of this change in species composition and structure, low and mixed severity fires are now an improbable occurrence in many forests; severe stand replacing fires are more likely. The No-Action Alternative not take any steps to interrupt this trend. Under the action alternatives, large fuel removal and various fuel treatments would occur to reduce fuel accumulations, reintroduce seral species (ponderosa pine, white pine and larch) where present levels of stand mortality make this desirable, and makes progress towards reducing potential intensities and severities of wildfire over the long term. Even with this treatment, untreated areas and areas treated with salvage harvest only will continue to trend toward conditions that favor potential high intensity wildland fires. Ecoburning treatments proposed under alternatives 3 and 4 take a more landscape level approach to reintroduction of fire to the ecosystem in the Grizzly Mountain area. Only the action alternatives will reduce high snag densities and address the problem of firefighter safety.

3.2.5. Consistency With the Forest Plan and Other Regulatory Direction

The goal of the Forest Plan is to provide efficient fire protection and fire use to help accomplish land management objectives (IPNF Forest Plan, Chapter II, pages II-10 and II-38). Under Alternative 1, no fuels treatment would occur beyond that already ongoing or planned under other projects. The continued succession of fuels and vegetation, mortality from insect disease, and the exclusion of fire will create areas where the trend in fire behavior characteristics will in time exceed the goals, objectives and standards established in the Forest Plan. The action alternatives propose various forms of fuels treatment and make progress towards reducing the potential intensities of wildfire. Since the proposed treatments are small in scope, even with this treatment, untreated areas and areas treated with salvage harvest alone will continue to trend toward characteristics that exceed the goals, objectives and standards established in the Forest Plan. Treatment of the activity fuels will moderate the near term fire risk due to bark beetle attacks, ice and snow damage, and root disease losses, however vegetative manipulation techniques to shift stand composition to fire resilient species is important to appreciably alter long term fire risk and consequences. Harvest, reforestation, and ecoburning treatments proposed under Alternative 3 would best address this long-term fire management goal.

3.3. FINANCES

3.3.1. Regulatory Framework

The Forest Plan EIS (page IV-47) stated, "The level of timber harvest is important not only in providing jobs in the timber industry, but also through indirect and induced impacts on other business sectors as well." One of the seven major issues for the Forest Plan was community stability (Forest Plan FEIS, pp.1-8). Forest Service policy sets a minimum level of financial analysis for timber sale planning (see Forest Service Handbook 2409.18 section 32).

3.3.2. Methodology

Each alternative was run through the current Transactional Evidence (TE) appraisal system to determine expected bid rates. The TE appraisal system is used to determine the selling values when timber sale contracts are developed. Costs, such as road maintenance, fuel reduction/site preparation (burning), and planting, were based on experienced District costs, as is the case during contract development.

Based on past bidding results from previously offered beetle-killed timber, small helicopter or mix system offerings do sell but generally are not bid up very much. This is due to the fact that there is limited competition of these sales. Small operators do not have access to helicopters and larger mills do not bid on small quantities of timber. This project plans vegetative restoration and fuels reduction treatments on the landscape using a large component of helicopter yarding systems to minimize ground disturbance. It is an investment and would not be expected to generate much economic return. This project may be broken up into multiple timber sale offerings in an effort to maximize return. Non-commodity values were not included in this analysis because these resources are evaluated under the specific resource section. Title 40, Code of Federal Regulations for NEPA (40 CFR 1502.23) indicates that "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." Effects on resources are documented in individual resource sections. The description of the features of the alternatives presented in Chapter 2 (Table 2-4) was used for the financial analysis.

3.3.3. Financial Setting

Within northern Idaho, the Forest Service has been contributing about 11 to 12 percent of the timber that was on the local market the last few years. This figure is down from approximately 33 percent of the timber harvested during the late 1980s - early 1990s. Based on the most recent information at the Forest level (TSPIRS, 1998), each million board feet of timber harvested on the Idaho Panhandle National Forests (IPNF) annually results in a total of 39.2 jobs and $1,158,000 income for that year. These figures include the impacts associated with harvesting and processing timber plus the impacts of Forest Service salaries and investment.

Over the past year the Reserve Board has lowered interest rates. This has lead to a strong housing market despite the downturn in the economy. This has resulted in moderately steady delivered log prices at local mills. Changes in trading agreements with Canada have resulted in an increase in imports from our neighbor to the north. This has tempered expected increases in delivered log prices. District sales of Douglas-fir timber by the Forest Service during 1999 and 2000 have brought bids averaging $126 per thousand board feet for the Douglas-fir beetle killed timber (Project File – Finances). This figure is for sales that contained a high amount of helicopter yarding and generally high brush disposal costs, similar to this proposal. Bid prices have a wide range from $32 to $412 per thousand board feet depending on the yarding systems involved.

3.3.4. Financial Consequences

The following table presents costs for this project, based on the time line identified in Chapter 2. These cost include inflation and overhead where appropriate. For comparison purposes, estimated costs of some activities not planned under this project were included in this table.

Table 3-8. Cost Estimates for Project Activities.

Project Activity	Cost	/Per Unit
Roads: Timber Sale		
Maintenance (During Sale)	$1.50	/ccf
Fuel Treatment: Purchaser		
Pile slash at landings	$667.00	/Acre
Fire Line constructed by hand	$116.00	/Chain
Lop and scatter	$50.00	/Acre
Safety: Purchaser		
Safety snagging	$0.25	/ccf
Safety -flagpersons	$2.98	/ccf
Fuel Treatment: Forest Service*		
Burn slash at landings	$143.14	/Acre
Underburn	$762.55	/Acre
Jackpot burn	$294.88	/Acre
Ecoburn	$206.79	/Acre
Grapple piling	$365.33	/Acre
Burn grapple piles	$137.86	/Acre
Erosion Control		
Seed & Fertilize Skidtrails & Landings (Purchaser)	$113.96	/Acre
Essential Regeneration**		
Plant (8x8 ft spacing)	$618.97	/Acre
Surveys (3 each per acre planted)	$48.08	/Acre

** Includes overhead.*

A. Direct and Indirect Effects

Not managing the timber resource in these areas (as under Alternative 1) would result in a loss of mature timber value. The majority of this timber component is dead as a result of insect infestation. A portion of the timber value and volume has already been lost. If this dead timber is not recovered, then the demands and expectations of timber supply from the National Forest will need to be made up from other areas. The action alternatives look at reforestation of areas hit hard by the beetle infestation and address productivity over the long term. Reforestation will hasten the return of these areas to high value timber stands. This directly relates to expected ***future*** revenues.

Under the action alternatives, timber harvest would contribute (to a small extent) to continuing operation of local mills, thus, directly and indirectly enhancing the local and state economy through employment and tax revenues. These economics may also be enhanced by employment created through reforestation needs identified. Historically, 25 percent of the gross timber receipts generated by the Coeur d'Alene River Ranger District would go directly to Kootenai and Shoshone Counties, Idaho, for public schools and roads. Under Public Law 106-393 (Secure Rural Schools and Community Self-Determination Act of 2000), eligible counties have the option continuing to receive their share of the State's payments under the 25 Percent Fund Act (15 USC 500), or electing to receive their share of the average of the three highest 25 percent payments to the State during the period of fiscal year 1986 through 1999 (essentially the full payment amount). The Act directs the Secretary of the Treasury to pay each State the sum of the amounts elected by the eligible counties in the State. The States then distribute the funds among the eligible counties. At this time it appears that the counties of Idaho have elected to take the average of the high three 25 percent payments. It is unclear whether timber sale receipts will still be used by the Treasury to help finance these payments to the counties.

It is anticipated that the sale of timber from National Forest System lands would have very little effect on the price that private land owners receive for their timber, because the timber in this proposal would be part of the IPNF's normal timber program and constitutes only 11 to 12 percent of the local market.

Table 3-9. Cost/revenue table.

Timber Sale Revenue	Alt. 1	Alt. 2	Alt. 3	Alt. 4
(1) Stumpage Value (gross)	NA	$135,927*	$151,560*	$135,927*
Total MBF	none	835	1000	835
(2) Total CCF	none	1650	2000	1650
Timber Sale Costs Affecting Predicted Bid	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
(3) Road maintenance (during sale)	$0	$2,475	$2,475	$2,475
(4) Road reconditioning	$0	$3,300	$3,300	$3,300
(5) New road construction				
a) Permanent road construction	$0	$0	$0	$0
b) Temporary road construction	$0	$0	$0	$0
(6) Road reconstruction				$0
a) Brushing, ditch and shoulder earth work:	$0	$500	$500	$500
b) Upgrading existing culverts:	$0	$0	$0	$0
c) Install/remove culverts in closed roads	$0	$0	$0	$0
d) Install gates on roads presently closed	$0	$0	$0	$0
(7) Road obliteration and wildlife-related road closures (Sale Contract)	$0	$0	$0	$0
(8) Seed skid trails and landings	$0	$912	$912	$912
(9) Slash disposal/site prep (Purchaser)	$0	$19,988	$19,988	$19,988
a) Safety snagging	$0	$409	$409	$409
(10) Slash disposal/site prep (FS)	$0	$28,536	$28,536	$28,536
(11) Safety - Flagpersons (Purchaser)	$0	$4,913	$6,551	$4,913
(12) Total sale contract costs (sum of lines 3 through 11)	NA	$61,033	$62,671	$61,033
(13) Predicted (high) bid value (subtract line 12 from line 1)	NA	$74,894	$88,889	$74,894
(14) Predicted bid/CCF (line 13 divided by line 2)	NA	$45	$44	$45
Other Project Costs	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
(15) Reforestation	$0	$39,356	$39,356	$39,356
(16) Ecoburning	$0	$0	$14,889	$7,031
(17) Site prep and Reforestation of Fishwood Unit	$0	$10,532	$10,532	$10,532
(18) Total Other Project Costs (add 15 thru 17)	$0	$49,888	$64,777	$56,919
(19) Minimum bid (per mbf) that would fund all other projects (divide line 18 by line 2)	NA	$30	$32	$34
(20) Difference between predicted and minimum bid (per CCF) (Subtract line 19 from line 14)	NA	$15	$12	$11
Other Forest Service Costs	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
(21) Planning	$20,000	$20,000	$20,000	$20,000
(22) Sale preparation	$0	$11,690	$14,000	$11,690
(23) Harvest and engineering administration	$0	$2,939	$3,520	$2,939
(24) Net value (subtract lines 18, 21, 22, and 23 from line 13)	-$20,000	-$9,623	-$13,408	-$16,654

** the gross stumpage value is derived from Transaction Evidence (TE) appraisal runs. See Project Files (Finances) for this and other cost basis data.*

As seen in the table above, none of the alternatives (attempting to finance all projects) would generate enough funds to pay for the planning costs necessary to accomplish the objectives. Part of the reason for this is the increase in planning costs needed to carry small projects such as this through an environmental assessment. In the past, a project such as this would have met the criteria to be categorically excluded from documentation in an EA or EIS, and would therefore have required less time and expense in conducting the analysis and preparing documentation.

The timber sale that would be generated by each alternative would be positive. All sales could pay for the reforestation needs, although none would be required to pay more than 10-20% of the reforestation cost because of the high component of dead timber within the regeneration units (FSH 2409.22, 81). The timber

sale would also not be required to finance the ecoburns or the site preparation and planting of the fishwood unit, although all action alternatives are capable of doing so. Alternative 2 represents the greatest return with the least amount of investment into other projects. Alternative 3 represents the greatest amount of accomplishment on the ground for the least costs. The understory salvage treatment in Alternative 3 would help finance the ecoburn and would utilize material that would likely be killed during the burning operation.

Timber Management Financial Viability: Implementing stand-management treatments can depend on having financially viable timber sales that the local forest products industry is willing to purchase. For such an analysis, all identifiable costs associated with timber sales (including administration, planning, sale preparation, and sale execution) were included. The timber sales would only be required to finance 20% of the reforestation cost because of the high component of dead and lowered stocking levels as a result of root disease mortality over time. The sales would not be required to carry the ecoburning costs but do carry the jackpot and underburning costs associated with the harvest units.

Table 3-10. Cost/Revenue Summary.

Hither and Yon Beetle	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Stumpage Value (gross)	$0	$135,927	$151,560	$135,927
Stumpage minus contractual costs	$0	$74,894	$88,889	$74,894
Remainder minus planting costs*	$0	$67,023	$81,018	$67,023
Remainder minus sale prep costs	-$20,000	$32,394	$43,498	$32,394

** This table reflects 20% of the planting cost ($7871). FS policy requires only the green harvested component of the stand to carry reforestation costs.*

Below-cost Sales: The table above reflects the true return of just the timber sales. None of the alternatives would generate a below cost sale because each would only be required to carry approximately 20% of the reforestation cost. None of the timber sales would be required to finance the ecoburning or site preparation and planting in the unit where wood would be removed for use in stream restoration, although timber receipts may represent the best way to get those projects financed.

B. Cumulative Effects

The timber sale considered under this proposal would be part of the volume normally offered for sale by the IPNF; thus there is not an additional volume of timber that could adversely affect the regional timber market, and thereby private landowners with timber to sell.

Effects of the Opportunities on Financial Considerations

Minimal opportunities exist within the expected sale area boundaries of the timber sale(s) since significant amounts of watershed restoration work has already been accomplished. As shown in the information presented above, alternatives of this project would not generate much in the way of financing for opportunities, especially since it is expected that timber receipts generated by these sales would likely be used to finance the entire reforestation need and the ecoburning features. Based on the financial analysis, Alternative 3 would represent the best chance to be able to fund other projects.

3.3.5. Consistency With the Forest Plan and Applicable Regulatory Direction

Forest-wide goals, objectives, and standards for finances are not specifically addressed in the Forest Plan. This issue is 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 woods product industry," (Forest Plan, page II-11, Objectives).

The No-Action Alternative would not meet this objective, since it does not propose any commercial timber harvest, and would not contribute to local employment or income. All action alternatives would meet this Forest Plan direction.

3.4. WATER RESOURCES

3.4.1. Regulatory Framework

The regulatory framework for the watershed and water resources aspect of the analysis is based on the Clean Water Act and its amendments; Idaho State's implementations of the Clean Water Act; the Forest Plan, and the Inland Native Fish Strategy (INFS).

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.

3.4.2. Existing Conditions

A. Methodology

The assessment of existing condition describes the current condition of the project areas and provides a basis for comparing the effects of management alternatives. This existing condition discussion was developed from many information sources including field surveys, aerial photographs, Geographic Information Systems (GIS), Timber Stand Management Record System (TSMRS), hydrologic response techniques and models such as WATSED, and other watershed and aquatic data derived by the Forest Service and other sources (please refer to the past harvest maps and data tables provided in the Project Files, Vegetation). The assessments followed the principles and processes in the Ecosystem Analysis at the Watershed Scale: Federal Guide for Watershed Analysis, Version 2.2, August, 1995 (Regional Interagency Executive Committee and the Intergovernmental Advisory Committee, Forest Service and other federal agencies, copies available from Regional Ecosystem Office, PO Box 3623, Portland, Oregon 97208.)

The project areas were analyzed from at least two scales: the local site or tributaries where activities take place, and the cumulative effect watershed. The cumulative effect watershed (or watershed area) is the logical culmination point of water flow where the effects of the distributed project activities could possibly integrate or synchronize over time and space and be addressed cumulatively in a larger watershed. The cumulative effects analysis includes an analysis of past, present, and reasonably foreseeable activities.

In each case, the direct, indirect, and cumulative impacts related to the alternatives of this project on watershed, water, and streams were usually local in nature, and sometimes to the next larger tributary formed by multiple tributaries. In no case will the cumulative effects extend beyond the watershed or watershed area.

For a detailed discussion of historic hydrologic conditions, please refer to the Geographic Assessment for the Coeur d'Alene River Basin (USDA Forest Service, 1998).

A summary of information specific to watersheds of the project area is provided in a table for each watershed; including physical characteristics, qualifications, hydrologic regime, erosion and sediment, channel conflicts, and stream crossings. An explanation of each descriptor is provided below.

Physical Characteristics

HUC (Hydrologic Unit Code): The HUC is a hierarchal watershed classification. The first 8 digits of the HUC number (17010304) represent the Coeur d'Alene subbasin. Additional digit pairs indicate watersheds and sub-watersheds delineated by the Forests. The basic analysis unit was the 6th code HUC.

Drainage Area (mi^2): The area of the watershed or watershed area being analyzed.

Sensitive Landtypes (%): Each watershed or watershed area is characterized by the percent (%) of the drainage area comprised of "sensitive landtypes" susceptible to mass erosion and increased sediment delivery to streams. As a point of reference, watersheds with more than about 30% sensitive landtypes are often very sensitive to cumulative disturbances.

Sensitive Snowpack: Mountain slopes on the Idaho Panhandle in an elevation band between 2500 and 4500 feet can produce rapid melt and runoff during warm, moist winter storms. The percentage of the watershed within this band partially characterizes the overall sensitivity of the watershed. As a point of reference, watersheds with a small proportion of sensitive snowpack (less than 30%) do not appear to be very responsive to rain-on-snow events at the watershed scale. Watersheds with a large proportion (greater than 70%) of sensitive snowpacks are often highly volatile and are very sensitive to other disturbance regimes in terms of runoff from the stream system. These parameters do not change with forest development, and therefore are not carried into the Environmental Consequences section of Chapter III.

Qualifications

Water Quality Limited Stream Segments: Section 303(d) of the Clean Water Act requires the States to list water bodies (stream segments and lakes) that do not support beneficial uses, even though BMPs are employed. These are identified as Water Quality Limited. The watershed status has been estimated based on known conditions in the watershed, its sensitivity and resilience, and the disturbance history in the drainage. The tables located in the Environmental Consequences section indicate if any part of a watershed contains one or more listed segments.

Apparent Watershed Status: The following description of current conditions of the watersheds is based on categories outlined in the Coeur d'Alene River Geographic Assessment (CDAGA 1998). For a more detailed discussion, see the "Watershed Characterization" report of that document.

- Properly functioning: Within the scope of this assessment, a properly functioning watershed system is one that is exhibiting dynamic equilibrium characteristics and whose streams are operating and responding appropriately under their current environment.

- Functioning-at-risk: A watershed system that is functioning-at-risk is one that is essentially still properly functioning. However, it may be exhibiting trends or it may contain known risks that are likely to compromise that status and the ability to fully support beneficial uses in the future. Watershed systems with this classification area the highest priority for watershed restoration and improvement (Coeur d'Alene Geographic Assessment, pp59-61).

- Not properly functioning: Watershed systems that are not properly functioning often exhibit rapid adverse trends and may not fully support beneficial uses. Watershed systems with this classification are the lowest priority for watershed restoration and improvement (Coeur d'Alene Geographic Assessment, pp59-61).

Hydrological Regime

Estimated Peak Flow (cfsm): The estimated peak flow that is expected to occur on the average about every two years (Q_2) is listed for characterization as cubic feet per second per square mile of drainage area (cfsm).

Current Runoff Modification (% of peak): The current runoff modification is shown as a percent of the "natural" peak month discharge and reflects watershed climate patterns and disturbance history (USFS 1989, USFS 1996).

Equivalent Clearcut Area (ECA): The equivalent clearcut area is used as a surrogate to estimate the percentage of hydrologic openings in a watershed and accounts for vegetative recovery since the initial disturbance (USFS 1989, USFS 1996).

Erosion and Sediment

Estimated Annual Sediment (tons/mi^2/yr): The estimated annual sediment yield for natural or baseline conditions (WATSED Project Files, p. 7). If WATSED was not run for the analysis, this estimate was obtained from the Coeur d'Alene Geographic Assessment Database (USDA Forest Service 1998).

Current Sediment Load Modification (%): The estimated annual sediment yield for existing conditions expressed as a percent increase over natural conditions (WATSED Project Files, p. 7). It is an indicator of the effects of past management activities on the sediment delivered to streams. If WATSED was not run for the analysis, this estimate was obtained from the Coeur d'Alene Geographic Assessment Database (USDA Forest Service 1998).

Road Density (mi/mi^2): The road density is an indicator of watershed condition reported as the miles per square mile of roads within a watershed. Generally, road densities are high throughout northern Idaho and a trend toward lower road densities is desired for a variety of resource benefits (Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin Pp 67).

Sensitive Road Density (mi/mi^2): Sensitive road density is a measure similar to road density, except that the roads considered are only those on sensitive landtypes. This measure and other road stratifications are able to better explain watershed responses than road density alone.

Channel Conflicts

Riparian Road Density: Riparian road density is estimated from maps, photos, and GIS to determine road segments within 300 feet of any perennial stream. This is presented in miles per square mile.

D. Stream Crossings

Stream Crossing Frequency (# per mile of stream): Stream crossing frequency is the number of road crossings divided by the number of miles of stream in a watershed.

Number of Fish Migration Barriers: The number of inventoried road crossings which create fish migration barriers are listed.

B. Watershed Restoration Accomplished in the Project Areas

Within the Tepee Creek watershed, there were 9 culvert removals, rolling dip installation, skid trail decompaction, and a large stream channel restoration project completed under the Drexsey Sale Area Improvement Plan. The stream channel restoration project in Tepee Creek included restoring meanders back into the channel, restoration of the floodplain, 30 large stepdowns, 60 stream stepdowns, 6 fish structures, 180 fish cover security additions, riparian tree and shrub planting, and seeding.

Within the Grizzly Creek area, approximately 16 miles of system road was put into storage (made hydrologically inert) including 11 miles of road ripping and 7 stream channel restoration sites. This was completed under the Grizzly Rehab project in 1992. Another 6 miles of road ripping and 3 stream channel restoration sites were implemented in 1993-1994. In 1996, 1 channel site was restored and the roadway was waterbarred on Road 260.

Within the Beaver Creek watershed, a total of 27 miles of road has had watershed improvement work completed under the following sales; Dudley, Capitol Hill, Alder Kid, Upper White, Lower White, and Kings Ridge. Work included removal of 59 road channel crossings, stabilizing unstable road sections, removal of encroaching road segments and applying erosion control. Also included was the application of erosion control and upgrading of undersized pipes to meet 100-year flows on roads that will be used for long-range transportation. Under the King's Ridge KV plan, 19 stream channel crossings were recently restored.

Watershed improvement work associated with the Beaver Heli Bug project included culvert upgrades to meet 100-year flood events. Other funded foreseeable watershed improvement associated with Unknown Pony and

East Side Heli Bug Timber Sales includes; 2 culvert upgrades, one armored overflow, fish habitat improvement, fish cover structures, log step downs, riparian planting and erosion control on 4 miles of road.

C. Conditions in the Tepee Creek Watershed above Trail Creek

Overview

The upper portion of Tepee Creek is a 34.7-square mile, fifth-order watershed, with 0.2 square miles in private ownership. Tepee Creek flows into the North Fork of the Coeur d'Alene River. Valley sideslopes are moderately steep (50 to 60 percent) and vegetated predominately with conifers**.** Activities such as timber harvest and road building have occurred mostly in the headwater drainages. Much of the lower (northern half) is unroaded. This is likely due to lack of past timber harvest opportunities in this area due to large fires that occurred in this area in the early 1900's. The Watershed status within the upper Tepee Creek watershed is designated as a functioning at risk condition in the Coeur d'Alene Geographic Assessment. The headwaters of Tepee Creek, above and including Big Elk Creek, is listed as a 303d watershed by the Environmental Protection Agency for sediment and habitat alteration. Although a lot of the main body of the watershed is unroaded, considerable impact occurred within the riparian zone of as a result of ribes eradication efforts in the 1930's. Functioning at risk watersheds are a high priority for watershed improvement work. Considerable improvement work has already been accomplished (Tepee Creek Riparian Restoration Project, Project Files – Fisheries)

Beneficial uses within the Tepee Creek Watershed are Salmonid Spawning, Cold Water Biota, and Recreation as listed in the 1992 Idaho Water Quality Status Report.

Within the watershed, 50 miles of old logging roads have been treated and 78 stream channel crossings have been restored. This restoration work was implemented under the Big Mac and Big Short project decisions within the headwaters of Tepee Creek and in Big Elk Creek, respectively. The Forest Service implemented a restoration project within the Big Meadows area in the year 2000. This project restored the natural meander back to a portion of the Tepee stream channel, created pools, added woody debris, and planted brush and trees for cover and future wood recruitment (Project Files – Fisheries). No timber sales are ongoing in this area. Foreseeable actions include the Teratoid Tepee EIS. This will be a large landscape level assessment of the area and will likely identify additional watershed restoration opportunities as well as vegetative treatments for the area.

Streamflow Regime

The hydrology of the upper Tepee Creek watershed and all its major tributaries has been altered by past large fires, timber harvest, and road building, in four respects. First, it can be inferred, from the peak flow increases, that periods of spring peak flow are longer in duration (Troendle and King, 1983). The timing of runoff from increased water yields is dependent upon air and snowpack temperature and exposure to solar radiation, which are controlled by elevation, aspect, slope, and shading from topography and/or vegetation.

Second, data from the Idaho Panhandle National Forests and several studies (Kappesser,1991. Christner and Harr, 1982. Harr, 1981) suggest that peak flows generated by rain-on-snow events can increase substantially when the forest canopy is removed by harvest or natural disturbance. Approximately 91% of the upper Tepee watershed is sensitive to rain-on-snow events.

Third, the effective gradient of some of the channels has been increased. This is evident in some of the channels that have had large woody debris (pool creators) removed during timber harvest, and in the main Tepee Creek channel and several of the smaller tributaries that have been straightened by road placement or development. The effects of longer duration peak flows, peak flows of increased magnitude, and increased channel gradients is increased stream power. Increases in stream power results in increased probability to create and transport sediment. Increases in monthly peak flows are elevated above natural conditions due to

past timber harvest activities and road building. The equivalent clearcut area in the upper Tepee Creek watershed is approximately 8%.

Fourth, subsurface flows intercepted by road cuts can be rapidly routed by compacted road surfaces and ditches to stream channels, causing an increase in the total runoff. This is a special concern when roads are located low in the watershed and where roads traverse clearcuts. Megahan (1983) noted that the volume of water intercepted by road cuts below clearcuts that have been burned, increased by 96 percent.

Stream Channel Stability

Encroachment by streamside roads is a dominant feature of the riparian areas in some of major tributaries and face drainages. This is due to the fact that early access generally followed rivers and creeks and past logging access usually followed that same pattern. Road failures have caused excess sediment introduction through the years, including during the February 1996 flood event. The upper Tepee Creek watershed does have numerous drainages where early entry did not occur, such as Halsey and Little Elk Creeks. This is likely due to lack of past timber harvest opportunities due to large fires in this area. Overall within the upper Tepee Creek drainage, there is a riparian road density of 0.4 miles per square mile. Within this riparian roading, an estimated 0.9 miles of riparian road directly encroach on the stream channel reducing stream shading to the extent that local water temperatures may be affected. As previously discussed, increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Within the upper Tepee watershed, only a small percentage of the linear riparian influenced area has been directly affected by past regeneration harvest. Very little has occurred along the main channel with most riparian harvest occurring within the Big Elk tributary. This represents a relatively low amount of past riparian harvest within the watershed, so the effects are minimal compared, to riparian roads and crossings failures.

Water Quality

Approximately 137 miles of road and associated channel crossings exist in the upper Tepee Creek watersheds, with road densities of 3.9 miles per square mile of land. This represents a reduction from the 176 miles and road densities of 5.0 miles per square mile that were present prior to recently completed watershed restoration activities in the area. Each of the road channel crossings, particularly on roads that are no longer maintained, have the potential to plug and subsequently fail. Within the upper Tepee Creek risk assessment area, 40 percent of the watershed is on sensitive landtypes with high landslide and sediment delivery potential. Road densities on sensitive landtypes are 1.3 miles per square mile. This represents a reduction from the 1.8 miles per square mile that were present prior to watershed restoration activities in the area. Road channel failures and the continual bank erosion and road fill failures of the streamside road are the primary sediment contributors and component of disturbance to the lower to mid-elevation areas of the watersheds.

Table 3-11. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Tepee Creek Watershed above Trail Creek.

Physical Characteristics	
HUC: 1701030115	
Drainage Area (square miles)	34.7
Sensitive Landtypes (percent of watershed)	40
Sensitive Snowpack (percent of watershed)	91
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Functioning at Risk
Subwatersheds used for analysis	Little Elk and Short Creeks
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	35
Current Runoff Modification (percent of peak)	5
Equivalent Clearcut Area (percent of watershed)	8
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	17
Current Sediment Load Modification (percent)	216
Road Density (miles/mile2)	5.0
Road Density after Restoration (miles/mile2)	3.9
Sensitive Road Density (miles/mile2)	1.8
Sensitive Road Density after Restoration (miles/miles2)	1.3
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	0.9
Riparian Road Density (miles/mile2)	0.4
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	0.2
Number of Fish Migration Barriers	0

D. Conditions in the Grizzly Creek Watershed

Overview

Grizzly Creek is a 7.1-square mile, fourth-order watershed, that flows into the North Fork of the Coeur d'Alene River. Valley sideslopes are generally steep (50 to 70 percent) and vegetated predominately with conifers**.** A large fire occurred in the lower half of the drainage in 1917. A large portion of this timber was salvaged logged. An old railroad line came up the main Grizzly channel with log chutes extending up the side drainages. Timber harvest and road building occurred throughout the middle reaches of the watershed in the 1960's. The Watershed status within the Grizzly Creek watershed is designated as properly functioning condition in the Coeur d'Alene Geographic Assessment, although some degraded conditions exist in the lower reaches of the drainage.

Beneficial uses within the Grizzly Creek Watershed are Salmonid Spawning and Cold Water Biota, as listed in the 1992 Idaho Water Quality Status Report.

Within the Grizzly Creek watershed, over 17 miles of road have been ripped and 11 stream channel crossings have been restored. Most of this activity occurred during the early 1990's. Road 622 is the main travelway through this area. Most all the side roads in this drainage have been closed and are now hydrologically inert. There are no ongoing or reasonably foreseeable activities scheduled in this area.

Streamflow Regime

The hydrology of the Grizzly Creek Watershed and all its major tributaries has been altered by past fire, timber harvest, and road building, in the same four respects as discussed under Tepee Creek. Approximately 70% of the Grizzly Creek watershed is sensitive to rain-on-snow events. The equivalent clearcut area in the Grizzly Creek watershed is approximately 9%. Much of the impacts related to roads have been eliminated in this area. However, impacts from past activities and events are apparent in this watershed system.

Stream Channel Stability

Overall within Grizzly Creek, current encroaching road densities are low. Encroaching and riparian roads are limited to road channel crossing locations. Many of the road channel crossing were eliminated during restoration activities during the 1990's. Considerable riparian harvest occurred in the lower reaches of the Grizzly Creek drainage with the presence of an old railroad line that use to run up the stream channel. Some riparian harvest occurred in the middle reaches of the drainage during the 1960's. This past riparian harvest, with encroachment from the railroad line in the lower reaches has reduced channel stability over the long term.

Water Quality

Approximately 15 miles of road and associated channel crossings exist in the Grizzly Creek watershed, with road densities of 2.1 miles per square mile of land. This represents a significant reduction from the 44 miles and road densities of 6.2 miles per square mile that were present prior to completed watershed restoration activities in the area. Each of the road channel crossings, particularly on roads that are no longer maintained, have the potential to plug and subsequently fail. Within the Grizzly Creek risk assessment area, 55 percent of the watershed is on sensitive landtypes with high landslide and sediment delivery potential. Road densities on sensitive landtypes are 1.1 miles per square mile. This represents a reduction from the 2.6 miles per square mile that were present prior to watershed restoration activities in the area.

Table 3-12. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Grizzly Creek Watershed.

Physical Characteristics	
HUC: 170103010020	
Drainage Area (square miles)	7.1
Sensitive Landtypes (percent of watershed)	55
Sensitive Snowpack (percent of watershed)	70
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Properly Functioning Condition
Subwatersheds used for analysis	Grizzly, Dewey, Lindsey Creeks
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	31
Current Runoff Modification (percent of peak)	7
Equivalent Clearcut Area (percent of watershed)	9
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	27
Current Sediment Load Modification (percent)	184
Road Density (miles/mile2)	6.2
Road Density after Restoration (miles/mile2)	2.1
Sensitive Road Density (miles/mile2)	2.6
Sensitive Road Density after Restoration (miles/miles2)	1.1
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	*
Riparian Road Density (miles/mile2)	*
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	0.3
Number of Fish Migration Barriers	0

* *Only at the road channel crossings*

E. Conditions in the Beaver Creek Watershed

Overview

Beaver Creek is a 41.1-square mile, fifth-order watershed, with 2.9 square miles in private ownership, that flows into the North Fork of the Coeur d'Alene River. Valley sideslopes are generally steep (50 to 70 percent) and vegetated predominately with conifers**.** Activities such as timber harvest, mining and road building has occurred throughout the watershed. The Watershed status within the Beaver Creek watershed is designated as not properly functioning condition in the Coeur d'Alene Geographic Assessment and listed as a 303d watershed by the Environmental Protection Agency. This status is the result of the relative sensitivity of the watershed system, (its soils, and the predominance of sensitive snowpacks) and from its history of development. As previously described, these watersheds are a low priority for watershed improvement work**.**

Beneficial uses within the Beaver Creek Watershed are Salmonid Spawning, Cold Water Biota, and Recreation as listed in the 1992 Idaho Water Quality Status Report.

Within the Beaver Creek watershed, a total of 19 miles of roads have had watershed improvement work completed under the following sales; Dudley, Capitol Hill, Alder Kid, Upper White, and Lower White. Work included removal of 40 road channel crossings, stabilizing unstable road sections, removal of encroaching road segments and applying erosion control. Also included was the application of erosion control and upgrading of undersized pipes to meet 100-year flows on roads that will be used for long-range transportation.

Recently completed work associated with the Kings Ridge timber sale removed 8 miles of road and 19 channel crossings.

Other ongoing activity within the Beaver Creek watershed includes the removal of dead and dying Douglas-fir associated with the East Side Beetle Heli and Unknown King Bug timber sales.

Foreseeable actions included additional removal of dead and dying timber associated with the Missouri Heli Bug project and the Small Sales EIS. Other funded foreseeable watershed improvement associated with East Side Beetle, Unknown King and Unknown Pony timber sales includes; culvert upgrades, armored overflow crossing, and installation of fish cover structures and log step downs in Pony Gulch.

Streamflow Regime

The hydrology of the Beaver Creek Watershed and all its major tributaries has been altered by past timber harvest and road building, in the four respects described for the Tepee Creek watershed. They are that periods of spring peak flow are longer in duration. That peak flows generated by rain-on-snow events can increase substantially when the forest canopy is removed. The effective gradient of some of the channels has been increased. And that road cuts can cause an increase in total runoff. Approximately 70% of the Beaver Creek watershed is sensitive to rain-on-snow events. The equivalent clearcut area in the Beaver Creek watershed is approximately 9%.

Stream Channel Stability

Encroachment by streamside roads is a dominant feature of the riparian areas in the majority of major tributaries and face drainages due to extensive mining that has occurred in the past and is ongoing. Road failures have caused excess sediment introduction through the years, including during the February 1996 flood event. Overall within Beaver Creek, encroaching road densities are estimated to be 0.02 miles per mile of riparian area, with a total of 37 miles of riparian road. Within this riparian roading, an estimate 1.20 miles of riparian road reduces stream shading to the extent that local water temperatures may be affected. As previously discussed, increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Within the Beaver Creek Watershed, 13 percent of the linear riparian influenced area has been directly affected by past regeneration harvest. This represents a relatively low amount of past riparian harvest within the watershed, so the effects are minimal compared, to encroaching roads and crossings failures.

Water Quality

Approximately 204 miles of road and 163 road channel crossings exist in the Beaver Creek watersheds, with road densities of 5.0 miles per square mile of land. The stream-crossing frequency throughout the watershed is approximately 2.0 crossings per mile of stream. Each of the road channel crossings, particularly on roads that are no longer maintained, have the potential to plug and subsequently fail. Within the Beaver Creek Risk Area, 44 percent of the watershed is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 35 percent of the miles of road on these sensitive land types. Road channel failures and the continual bank erosion and road fill failures of the streamside road are the primary sediment contributors and component of disturbance to the lower to mid-elevation areas of the watersheds.

Table 3-13. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Beaver Creek Watershed.

Physical Characteristics	
HUC: 1701030130	
Drainage Area (square miles)	41.1
Sensitive Landtypes (percent of watershed)	44
Sensitive Snowpack (percent of watershed)	70
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Not Properly Functioning
Subwatersheds used for analysis	Ferguson and Dobson Gulch
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	25
Current Runoff Modification (percent of peak)	5
Equivalent Clearcut Area (percent of watershed)	9
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	17
Current Sediment Load Modification (percent)	142
Road Density (miles/mile2)	5.0
Sensitive Road Density (miles/mile2)	1.8
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	2.9
Riparian Road Density (miles/mile2)	0.4
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	2.0
Number of Fish Migration Barriers	3*

* *Not under National Forest jurisdiction*

3.4.3. Environmental Consequences

A. Methodology

As stated earlier, the project areas were analyzed on at least two scales: the local site or tributaries where activities occur and the cumulative effect watershed. The cumulative effect watershed is the logical culmination point of water flow, where the effects of the distributed project activities could possibly integrate or synchronize over time and space and be addressed cumulatively in a larger watershed.

For purposes of comparing alternatives and analyzing the effects of each alternative, a table of watershed effects is presented. These effects include, but are not limited to, watershed restoration activities. The methods used in this section are the same as were used in the Affected Environment.

The table consists of measurement indicators and their units of measure, and the estimate of that parameter over the periods of time during and following the project for each alternative. The table is followed by a narrative discussion of direct, indirect, and cumulative effects in each watershed at the appropriate spatial and temporal scale. The following is a brief description of indicators; for a more detailed explanation of the indicators used, please refer to the "Watershed Hydrologic Response Estimate, and WATSED" discussion (See project Records, WATSED Interpretation Report, 3 pages).

Sediment Yield (%): Sediment yield, reported as the percent change above the estimated natural conditions, was estimated using the WATSED model (Project Records, Watershed Hydrologic Response Estimates and WATSED Summaries) for the year 2002. Proposed timber harvest units, road construction (if present), and site-preparation treatments are included in the analysis. WATSED does not predict increases in sediment yield associated with in-channel and stream-bank erosion due to management-induced increases in peak flows. However, the sediment levels that are the baseline for WATSED come from natural in-channel and stream-bank erosion that was a measured parameter used in preparation of the model (personal communication with Rick Patten, 2002). WATSED was not used for evaluating the effects of restoration projects.

Peak Flow (%): The change in runoff estimated by WATSED (Project Records, Watershed Hydrologic Response Estimates and WATSED Summaries) expressed as a percent change from the estimated natural peak month discharge.

Net Stream Crossings (#): The change in the number of stream crossings compared to the existing conditions. These values reflect increases from any new road construction and decreases from any watershed restoration activities.

Net Roads (mi): The net change in road mileage in each watershed. These values reflect increases from any new road construction (permanent) and decreases from any watershed restoration activities. Temporary roads (if proposed) would not be included in this calculation because they would be hydrologically inert following project activities.

Net Encroaching Roads (mi): The net change in inventoried road miles that hydraulically modify stream flows at bankfull stage. Restoration such as road obliteration can reduce this value.

Rain on Snow Analysis: No rain on snow model was run for the analysis area watersheds. WATSED does not evaluate the effects of rain on snow events on in-channel and stream-bank erosion. However, rain on snow events are part of the precipitation patterns used in the base calculations for peak flows in WATSED (personal communication with Rick Patten, 2002). To a large extent the project consists of widely scattered, relatively isolated patches of beetle-infected or ice and snow damaged trees with numerous small areas of high mortality that will be regenerated. Alterations in the canopy cover from past harvest have, in all probability, altered the magnitude, timing, and duration of snowmelt in the watershed under existing conditions. However, the risk of increasing the magnitude of rain on snow events would be negligible under Hither and Yon EA because few openings would be created in addition to those that would be created under the No Action Alternative (See Watsed Report, Project Records, ECA's Pp 13,16, and 19). Harvest of dead trees would be similar to the loss of forest canopy that would occur under the no-action alternative as a result of beetle mortality and ice and snow damage. No appreciable new openings would be created. The largest and healthiest trees would be retained in all cases. Harvests associated with commercial thinning or improvement harvests would not create openings in the stands that would be large enough to create rain on snow concerns. The magnitude of change for rain-on-snow events, if any exists, would be insignificant under any of the action alternatives.

Cumulative Effects Analysis on Forest Service Land: The Hither and Yon Beetle project is a small, scattered salvage sale proposal within upper Tepee, Grizzly, and Beaver Creek watersheds. Within these areas, widely scattered, relatively isolated patches of beetle-infected and snow and ice-damaged trees would be harvested to salvage dead and dying trees. Some of the areas would be individual tree harvested while other areas, in which the overstory has been reduced to low levels, regeneration harvest with partial overstory retention would occur. Within the Dobson Pass area, commercial thinning and improvement harvests would also be implemented to favor the long-term retention of pines and larch in the ecosystems. The loss of forest canopy would be primarily associated with dead and dying timber and with intermediate and understory trees that are crowding trees desirable for long term management of the ecosystem. The loss of forest canopy would be low in comparison to regeneration treatments in fully stocked stands and would be low in relation to the size of the watersheds involved.

For the cumulative effects analysis for this project, watershed analysis was completed using WATSED modeling of changes and treatments being proposed. Past timber sale and roading activities were included in the analysis. This established the existing condition and a measure of the amount of activity that has occurred in these areas in the past. Changes that occurred as a result of bark beetle mortality and ice and snow damage are measured and are shown under Alternative 1, the No-Action Alternative. Changes that would be expected to occur as the result of proposed treatments are measured for each of the action alternatives. This modeling was used in conjunction with professional judgment, current scientific information, and implications of past, present, and foreseeable activities to arrive at conclusions as to the effects of the alternatives.

Cumulative Effects for Non-Forest Service Lands: Private ownership in the upper Tepee Creek drainage consists of 3 isolated parcels along Tepee Creek. The ownerships involve non-timbered floodplain areas and timbered hillsides. One home site exists in the northern parcel. Some light partial cutting has occurred on this private ownership. Generally, activities on private ownership in this area have been of little consequence to the overall condition of the watershed. Past timber harvest operations on private and other federal ownership in the headwaters of Beaver Creek has been a mix of regeneration and partial harvests. Considerable roading access has occurred within these areas. Much of the roading in the headwaters areas in Beaver Creek is above major stream channels. Planned operations on this ownership, as shown in the foreseeable actions in Chapter 2, are minor in nature and are not expected to affect conditions downstream. Since the Hither and Yon project is not expected to have an effect on the watershed, the cumulative effects of private harvesting in the headwaters would not need to be considered. There is private ownership running much of the length of the Beaver Creek floodplain. This private ownership has a greater potential to create effects to the watershed. Past activities such as mining and development within the floodplain area has created adverse effects to the watershed. The Forest Service has no control over management on these lands, but it does ensure that the quality of the water leaving Forest Service land is improved or unchanged when it enters private land. As a result, the cumulative effects downstream of the private land will not be degraded by Forest Service activities, regardless of how private landowners manage their land. Because of this, formal cumulative effects analysis for downstream private land would not provide useful information for the Hither and Yon project and was not performed.

B. Effects Common to All Alternatives

There are several common, or typical, effects that would occur with any action alternative and are discussed below. Many of these effects are related to the watershed restoration activities such as removal of encroaching roads. In the discussion, the effects of not removing the encroaching road (or other action) also are discussed.

Effects of Encroaching Roads

As described in the Existing Conditions discussion (Stream Channel Stability), roads that encroach into stream channels or flood-prone areas are common in the Beaver Creek area. There is a minor amount in the upper Tepee Creek drainage, mostly associated with Trail #32 (which use to be an old roadway) in the Little Elk Creek drainage. Short sections of Road 812 encroach on upper Tepee Creek. Most of the encroaching sections of Road 422 on Tepee Creek were eliminated during the Tepee Creek Restoration project. There are no encroaching roads in the Grizzly Creek area at this time. However, railroad lines and flumes affected Grizzly Creek in this manner in the past. No activities are proposed under any alternative to address encroaching roads.

Effect on stream condition: Encroaching roads occupy the active flood prone area associated with the stream, or the active channel itself, with road fill. Those road sections reduce capacity of the stream at flood stages, alter flow patterns, increase local velocities, redistribute sediment loads, and compromise the function of the stream's riparian areas. During flood flows, the depth of flow is increased, and normal flow patterns are disrupted. This often causes scouring of opposing stream banks and undercuts opposing hillslopes, which in

turn is an erosion source that increases sediment input into the stream. Sometimes the scour undercuts the opposing slope which destabilizes it and initiates a mass failure (such as a slump or debris avalanche) of material into the stream. In some cases, the road constricts the channel enough that the natural meanders are straightened and stream slope is steepened. This can result in rapid adjustments by the stream to regain its balance with the water flow and sediment load. The result is an unstable stream, which will compromise the support of beneficial uses.

Effect on sediment: Roads located close to streams usually deliver more sediment to streams than other roads for two reasons: 1) roads in close proximity to streams are more likely to be subject to the erosive forces of running water; and 2) eroded materials do not have to travel far to be delivered to the streams. The closer a road is to the stream, the smaller the expanse of forest floor and its rough materials available to capture and store sediment.

Effect of Encroaching Road Removal: Removal of encroaching roads would reduce sediment delivery in the short and long-term. Improvement in stream condition and habitat in terms of clarity, accumulation of sediment, loss of cover, erosive velocities, etc., would occur at the road removal site and immediately downstream. Currently there are no ongoing or foreseeable projects within the project areas that will reduce the number of encroaching roads. Projects to reduce the miles of encroaching roads have occurred in the past. The Hither and Yon Beetle project does not proposed any further reduction in encroaching road miles.

Tree Mortality and its Effect on Stream Temperature

At the tributary scale, stream temperature would not be expected to change in any watersheds under any alternative including the No-Action Alternative. No harvest would occur where shade or cover to the stream would be affected under any action alternative. Some trees that are currently providing shade to streams have already died or may die soon as a result of the Douglas-fir beetle attack and root disease. The loss of shade from this mortality would not be expected to increase water temperatures locally or downstream due to one or more of the following: high mixing capacity of most mountain streams, inflow of subsurface water, and/or the low amount mortality of shade trees in riparian areas.

Effect of Stream Crossing Failures

No activities are proposed under any alternative to address stream crossings, although the ongoing and reasonably foreseeable activities (described in Chapter II) include activities that will address this issue to a small degree in the Beaver Creek drainage. Considerable stream channel restoration activities have already occurred within the three analysis areas. The following effects would occur under any alternative.

Effects on abandoned or unmaintained roads: Extensive road networks were constructed in the 1960's throughout the analysis areas. Typically these older roads were designed for a useful life of 20 years, including the crossing structures. The majorities of these roads are presently stabilized with vegetation, and are not actively delivering sediment to stream channels. Although often brushed in, many of these roads still have culverts and fills at stream crossings. Abandoned and unmaintained roads, including stream crossings, can be expected to fail over time.

These failures are usually associated with relatively infrequent hydrologic and climatic events. A typical example is when warm, moisture-laden air masses move into the region over a watershed that is dominated by a ripe snowpack (near freezing temperature and loaded with water) that is ready to melt. The results are often a rapid and flashy runoff that is referred to as a "rain-on-snow" flood. During these events, water flow can exceed the capacity of the crossing structure (such as a culvert pipe or bridge), or debris blocks the inlet. The water rises and overtops the fill, eroding it (often en masse), and depositing the material into the creek. In some locations, pore water pressure in the soil actually destabilizes the fill material and the hillslope, causing them to slump into the creek.

Effects of sustained grade roads: Stream crossings on steep sustained grades are sometimes inadvertently installed. At these crossings, the downhill approach of the road is lower than the road surface at the stream crossing. When the structure is blocked by debris or its capacity somehow is exceeded, the water overtops the pipe and begins flowing down the road. Instead of flowing directly over the road and back into the channel, it flows downslope on the road or in the ditch line until an obstruction, such as a low point in the road, forces the flow across the road surface and onto the fill. The water often erodes the road surface, causing gullies in the road tread, road fill, and the slope below the fill as the water travels back to the stream. The amount of sediment delivered to the stream from this type of erosion would exceed the amount of sediment delivered from only the stream crossing failure and would include erosion from the crossing, the ditch line, the road prism and the fill. In some cases, failure of a crossing and subsequent overflow can initiate mass failure of the hillslope above the failure.

Flow relief drivable and hardened dips can be installed at stream crossings where flows could escape as described down the road. This would reduce the amount of sediment delivered to the stream for the long term. Some sediment may be delivered to the stream during installation of the dips, but the amount would be small and not expected to reduce water quality or alter stream condition.

General Effects: The failure of large fills at stream crossings or encroaching roads inundates the stream with sediment and overwhelms its capacity to move it. The deposited materials tend to remain intact as a mass or 'slug' of sediment that can severely alter smaller streams by filling both channel and flood prone areas. The result is a loss of channel capacity and habitat that supports beneficial uses. The sediment mass begins to disperse as it moves downstream and enters larger streams, which reduces the channel effects of the single failure. However, multiple failures in a single watershed can result in long-term adverse effects downstream.

Effects of Grazing

There is no grazing in the upper Tepee Creek or Grizzly Creek drainages. The effects of grazing in Beaver Creek have been documented in the Environmental Assessment for Coeur d'Alene River Grazing Allotments (2001). The grazing allotment within the project area is identified in the Reasonably Foreseeable Activities section in Chapter 2. The Forest Service has not yet selected a management alternative, so the No-Action Alternative (which would have the most environmental impact) will be assumed, in order to analyze the highest potential impact. Direct effects to stream conditions in the project area would consist of localized areas of bank trampling and erosion, primarily in the lower reaches of Beaver Creek (Grazing EA 2001, pp. 66-68). Cumulative effects could include delayed vegetative recovery in portions of the riparian area, but would not affect overall stream conditions. In terms of water quality, nutrient loading and pathogens would not decrease and could inhibit support of beneficial uses including cold-water biota and salmonid spawning (Grazing EA, p. 70). However, low usage of this grazing allotment would result in these effects being very minor.

C. Effects Common to All Action Alternatives

Effects of Increased Sediment due to Road Use

Use of roads during project activities would increase sediment delivered to streams. The heavy use of vehicles, mainly logging trucks, and frequent surface blading of the road surface would increase the amount of sediment eroded during summer rainfall events. Some of this sediment may be delivered to the stream where the road is near the stream or when runoff is carried down a ditch line. The amount of increased sediment would be expected to be immeasurable and would not reduce water quality or affect stream condition.

Sediment Delivery Due to Road Reconstruction, Harvest, Yarding, and Ecoburning Activities

It is unlikely that sediment would be delivered to streams as a result of road reconstruction because the 0.1-mile of reconstruction is located along a ridgeline away from riparian zones. It is also unlikely that sediment would be delivered to streams as a result of harvest or yarding activities, because of the implementation of Best Management Practices. Harvest, yarding and site preparation activities would be located beyond the riparian areas of streams or lakes. Undisturbed lands between all logging activities and Riparian Habitat Conservation Areas (RHCAs) would trap any sediment that may reach the margins of disturbed areas (Belt, G.H., et al, 1992). All landings would be located outside of RHCAs and designed to minimize the risk of sediment delivery and to prevent mass failure potential.

Under Alternatives 3 and 4, ecoburning operations would avoid introduction of fire into riparian zones. There is a chance that fire could creep into two small headwater riparian areas within or adjacent to the ecoburn areas. With a cool, low intensity, burn planned during the spring period, it is unlikely that fire would consume the duff layer to where sediment delivery could occur. Fire in the riparian would likely be limited to a stringer or two of burn patches within the zone. This risk could be reduced by constructing fire lines to keep fire from backing into these areas. However, under spring burning conditions, it is likely unnecessary.

Effects to Stream Temperature as a Result of Loss of Riparian Trees

Water temperature is the principal regulator of biological activities for aquatic organisms and often the limiting factor in their survival. Direct solar radiation is the main factor that can be altered by management activities. Field reviews suggest that the number of dead and dying riparian trees is very low and that these trees are scattered throughout stream basins. There would be no harvesting of riparian trees under the Hither and Yon Beetle project. Therefore, there would be no impact on existing stream temperatures. The risk of loss of riparian trees under ecoburning operations in alternatives 3 or 4 is low. Fire would be limited in these areas and the intensity would likely not kill trees other than small regeneration.

Direct and Indirect Effects to Local Sites and Reaches

Tepee Creek above Trail - At the tributary scale, no direct or indirect effects to beneficial uses are anticipated from harvest activities under any of the alternatives, including the No-Action Alternative. WATSED modeling concludes that there is no potential for increase and/or recovery delay in sediment yield in Short Creek. There is potential for a non-measurable increase in sediment yield and/or recovery delay in Little Elk Creek due to tractor yarding. However, due to location of harvest units away from stream courses, implementation of Best Management Practices (BMP's), and adherence with Inland Native Fish Strategy any increase is not likely to occur.

Under Alternatives 2-4, green tree harvest would result in an additional 1 scattered equivalent clearcut acre (ECA) over the No Action Alternative in both the Little Elk and Short Creek tributaries to Tepee Creek. The direct and indirect effects of canopy removal at localized sites under all alternatives would be altered snow accumulation patterns and melt rates. Some change in timing, and increases in the magnitude and quantity of flow would occur under all alternatives at individual sites. The increase in flow would be primarily due to the mortality of trees from the Douglas-fir beetle or ice and snow damage. In the Short and Little Elk Creek drainages, WATSED modeling shows, under the action alternatives, that no potential exists for an increase and/or recovery delay in peak flows above the no-action alternative. No measurable effects would occur in stream channel conditions.

Due to the low level of harvest, no direct or indirect effects to beneficial uses are anticipated under any of the alternatives, (including the No-Action Alternative) to tributaries of Tepee Creek. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat.

Grizzly Creek **-** At the tributary scale, no direct or indirect effects to beneficial uses are anticipated from harvest activities under any of the alternatives, including the No-Action Alternative. WATSED modeling concludes that there is potential for a non-measurable increase and/or recovery delay in sediment yield due to road reconstruction. However, due to the location of the road reconstruction along a ridgeline, away from drainage structures or riparian areas, any increase is not likely to occur.

Under Alternative 2, green tree harvest would result in an additional 2 scattered equivalent clearcut acres over the No Action Alternative. Green tree harvest and ecoburning activities would result in an additional 4 scattered equivalent clearcut acres over the No Action Alternative under Alternative 3. Under Alternative 4, the additional scattered equivalent clearcut acres over No Action would be 3. The direct and indirect effects of canopy removal at localized sites under all alternatives would be altered snow accumulation patterns and melt rates. Some change in timing, and increases in the magnitude and quantity of flow would occur under all alternatives at individual sites. The increase in flow would be primarily due to the mortality of trees from the Douglas-fir beetle and root disease. WATSED modeling shows, under the action alternatives, that no potential exists for an increase and/or recovery delay in peak flows above the no-action alternative. No measurable effects would occur in stream channel conditions.

Due to the low level of canopy removal, no direct or indirect effects to beneficial uses are anticipated under any of the alternatives, (including the No-Action Alternative) to tributaries of Grizzly Creek. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat.

Beaver Creek **-** At the tributary scale, no direct or indirect effects to beneficial uses are anticipated from harvest activities under any of the alternatives, including the No-Action Alternative. WATSED modeling concludes that there is no potential for increase and/or recovery delay in sediment yield in Beaver Creek. No tractor yarding, road construction, or reconstruction would occur within this project area.

Under Alternatives 2-4, green tree harvest would result in an additional 6 scattered equivalent clearcut acres (ECA) over the No Action Alternative. The direct and indirect effects of canopy removal at localized sites under all alternatives would be altered snow accumulation patterns and melt rates. Some change in timing, and increases in the magnitude and quantity of flow would occur under all alternatives at individual sites. The increase in flow would be primarily due to the mortality of trees from the Douglas-fir beetle and to reduction in canopy associated with thinning and improvement harvests. Canopy reduction associated with thinning and improvement harvest is widely scattered by nature and often associated with intermediate and understory trees. WATSED modeling shows, under the action alternatives, that no potential exists for an increase and/or recovery delay in peak flows above the no-action alternative. No measurable effects would occur in stream channel conditions.

Due to the low level of harvest, no direct or indirect effects to beneficial uses are anticipated under any of the alternatives, (including the No-Action Alternative) to tributaries of Beaver Creek. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat.

Direct, Indirect, and Cumulative Effects at the Watershed Scale

Tepee Creek above Trail **-** The cumulative effects analysis area for the Grassy Mountain portion of the Hither and Yon Beetle Project extends from the headwaters of Tepee Creek to its confluence with Trail Creek. All cumulative effects for this watershed are estimated at a point just above the confluence with Trail Creek. This was a logical unit for analyzing cumulative effects as well as the largest area over which effects would be measured.

At the confluence of Tepee and Trail Creeks, no measurable changes in watershed hydrology would result from proposed management activities. Activities are situated high in the watershed, well away from the streams, and treatment activities (Alternatives 2-4) would result in only a 2 ECA increase over the no action alternative. This ECA increase represents 0.01% of the watershed analysis area. Analysis using the WATSED model predicted no change from management activities (Table 3-14) (See WATSED Report, Project Files). Peak flows and flood frequency would not be affected.

There would be no increase in sediment yield at the confluence of Tepee and Trail Creeks from management activities under Alternatives 2-4. There would be a low level of harvest, no road construction or reconstruction, and Inland Native Fish buffers would be maintained on all streams. As a result, the WATSED model predicted no increase in sediment yield under all action alternatives over what would occur under the No-Action Alternative (Table 3-14).

Cumulatively, there would be no measurable short- or long-term effects to stream condition or hillslope hydrology. No adverse effects to beneficial uses can be expected under any of the alternatives. Risk of future sediment loading, primarily at the road channel crossings and along road sections that directly encroach on the stream channels, has been substantially and permanently reduced with past watershed improvement activities. The pollutant of concern (sediment) that has caused the upper Tepee Creek watershed to be listed as Water Quality Limited has been substantially reduced in the both short- and long-term because of reductions stream crossings and encroaching roads. Habitat alteration, which was another condition that caused the upper Tepee Creek watershed to be listed as Water Quality Limited, has been substantially corrected with implementation of the Tepee Creek Restoration Project.

In the following table the sediment yield and peak flow change estimates represent the cumulative expected responses as a result to forest management activities over time and throughout the watershed represented. The estimates assume standard Best Management Practices and Soil and Water Conservation Practices are employed. The five "net change" lines in the table are an accounting of the driving disturbance and restoration elements. An explanation of each measure of change displayed in the table is provided under "Methodology" at the beginning of the Environmental Consequences section.

Table 3-14. Projected watershed response in the Tepee Creek Watershed above Trail Creek.

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	216	216	216	216
Peak flow (%)	5	5	5	5
Net stream crossings (#)	0	0	0	0
Net roads (miles)	0	0	0	0
Net encroaching road (miles)	0	0	0	0

Grizzly Creek **-** The cumulative effects analysis area for the Grizzly Mountain portion of the Hither and Yon Beetle Project extends from the headwaters of Grizzly Creek to its confluence with the North Fork of the Coeur d'Alene River. All cumulative effects for this watershed are estimated at the mouth of Grizzly Creek. This was a logical unit for analyzing cumulative effects as well as the largest area over which effects would be measured.

At the confluence of Grizzly Creek, no measurable changes in watershed hydrology would result from proposed management activities. Activities are situated high in the watershed and generally away from stream courses. Treatment activities would result in an ECA increase of 2% under Alternative 2; 4% under Alternative 3; and 3% under Alternative 4, over the no action alternative. This ECA increase represents 0.04%, 0.07%, and 0.09% of the watershed analysis area, respectively. Analysis using the WATSED model predicted no change from management activities (Table 3-15) (See WATSED Report, Project Files). Peak flows and flood frequency would not be affected.

There would be no increase in sediment yield at the mouth of Grizzly Creek from management activities under the action alternatives. There would be a low level of canopy removal, no road construction, minor road reconstruction along a ridgeline, and Inland Native Fish buffers would be maintained on all streams. As a result, the WATSED model predicted no measurable increase in sediment yield under all action alternatives over what would occur under the No-Action Alternative (Table 3-15). The modeled 1% change in sediment is associated with reconstruction of a ridgetop road on a sensitive landtype. Due to the stable location of the road and lack of drainage structures or riparian zones in the area, this modeled increase in sediment is not expected to occur on the ground.

Cumulatively, there would be no measurable short- or long-term effects to stream condition or hillslope hydrology. No adverse effects to beneficial uses can be expected under any of the alternatives. Risk of future sediment loading, primarily at the road channel crossings, has been substantially and permanently reduced with past watershed improvement activities.

In the following table the sediment yield and peak flow change estimates represent the cumulative expected responses as a result to forest management activities over time and throughout the watershed represented. The estimates assume standard Best Management Practices and Soil and Water Conservation Practices are employed. The five "net change" lines in the table are an accounting of the driving disturbance and restoration elements. An explanation of each measure of change displayed in the table is provided under "Methodology" at the beginning of the Environmental Consequences section.

Table 3-15. Projected watershed response in the Grizzly Creek Watershed , by alternative.

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	184	185	185	185
Peak flow (%)	7	7	7	7
Net stream crossings (#)	0	0	0	0
Net roads (miles)	0	0	0	0
Net encroaching road (miles)	0	0	0	0

Beaver Creek **-** The cumulative effects analysis area for the Dobson Pass portion of the Hither and Yon Beetle Project extends from the headwaters of Beaver Creek to its confluence with the North Fork of the Coeur d'Alene River. All cumulative effects for this watershed are estimated at the mouth of Beaver Creek. This was a logical unit for analyzing cumulative effects as well as the largest area over which effects would be measured.

At the confluence of Beaver Creek, no measurable changes in watershed hydrology would result from proposed management activities. Under all action alternatives, activities would be situated high in the watershed, away from the streams, and treatment activities would result in an increase of only 6 ECAs over the no action alternative. This ECA increase represents 0.02% of the watershed analysis area. Analysis using the WATSED model predicted no change from management activities (Table 3-16) (See WATSED Report, Project Files). Peak flows and flood frequency would not be affected.

There would be no increase in sediment yield at the mouth of Beaver Creek from management activities under the action alternatives. There would be a low level of harvest, no road construction or reconstruction, and Inland Native Fish buffers would be maintained on all streams. As a result, the WATSED model predicted no increase in sediment yield under all action alternatives over what would occur under the No-Action Alternative (Table 3-16).

Cumulatively, there would be no measurable short- or long-term effects to stream condition or hillslope hydrology. No adverse effects to beneficial uses can be expected under any of the alternatives. Risk of future sediment loading, primarily at the road channel crossings, has been substantially and permanently reduced with past watershed improvement activities.

In the following table the sediment yield and peak flow change estimates represent the cumulative expected responses as a result to forest management activities over time and throughout the watershed represented. The estimates assume standard Best Management Practices and Soil and Water Conservation Practices are employed. The five "net change" lines in the table are an accounting of the driving disturbance and restoration elements. An explanation of each measure of change displayed in the table is provided under "Methodology" at the beginning of the Environmental Consequences section.

Table 3-16. Projected watershed response in the Beaver Creek Watershed , by alternative.

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	133	133	133	133
Peak flow (%)	4	4	4	4
Net stream crossings (#)	0	0	0	0
Net roads (miles)	0	0	0	0
Net encroaching road (miles)	0	0	0	0

Cumulative Effects of Reasonably Foreseeable and Ongoing Activities

***Tepee Creek above Trail*:** Site preparation burning and reforestation of harvest units associated with the Big Short timber sale are expected to have minor short-term effects. Reforestation of these areas to long-lived seral species is expected to have a positive long-term effect on the watershed. Pre-commercial thinning operations will result in a short-term reduction in canopy cover but is expected to be beneficial in the long term with increased health and vigor of the stand. Thinning operations will favor long-lived seral species. Canopy cover is expected to return to full stocking within a 10-15 year period. The Tepee Creek EIS will be a landscape level project. This project will provide a thorough assessment of the overall watershed condition and is expected to provide greater opportunities to enhance the existing condition of the watershed. Effects of this future project will be analyzed at the time of the proposal. Not enough is known about the possible hard rock exploratory drilling project at this time. Mitigation measures would be incorporated into the design of this project to minimize impacts to the watershed resource.

***Grizzly Creek*:** There are no ongoing or reasonably foreseeable activities identified for the Grizzly Creek watershed at this time.

***Beaver Creek*:** The timber harvest associated with the East Side Heli Bug and Unknown King Bug timber sales is generally located high on the hillsides. No harvest will occur within riparian areas. A large portion of the volume is to be helicopter logged under the East Side timber sale and no new road construction will occur under either timber sale project. A large portion of the timber being harvested under these sales is dead and the majority of harvest units are associated with an individual tree salvage prescription. Harvest activities proposed under these two project are not expected to have negative effects on existing watershed conditions.

A small amount of watershed restoration work will occur under the East Side Heli Bug project for a minor benefit to the overall watershed condition. Generally, ongoing projects on closed timber sales will have minimal effect on watershed conditions. In-stream work scheduled for Pony Gulch will produce some increase in fine sediments in the short term but will be beneficial to fisheries habitat and the overall watershed condition in the long term. Foreseeable timber sales such as Missouri Heli Bug and the Small Sales EIS are small in scope, a large portion of the harvested timber will be dead, and will primarily involve helicopter yarding with no road construction. Negative watershed effects are not expected. The Beaver Creek EIS will be a landscape level project that will provide a thorough assessment of the overall watershed condition and is expected to provide greater opportunities to enhance the existing condition of the watershed.

Ongoing mining projects are generally small in scope but do contribute some negative effects to the watershed. Most of this activity is located in Potosi Gulch. Mitigation measures have been incorporated into the development of each mining project to minimize impacts to the water resource. The commercial fuelwood gathering planned for some of the roads in this area is not expected to have any effect on the watershed as harvest is an individual tree selection of dead trees along roads that are up out of riparian areas. Other ongoing or reasonably foreseeable activities listed in Chapter II have either already been discussed or are minor in nature and are not affecting the watershed.

Cumulative Effects of Opportunities to Water Resources

If implemented, the installation of overflow pipes in County Road 503 would reduce the risk of road failure and sediment delivery to the Coeur d'Alene River. Treatment of noxious weeds would have no effect on the water resources, as treatments would follow standards that minimize risk to riparian vegetation and aquatic resources.

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

Forest Plan Standards: All alternatives are consistent with Forest Plan Standards for water (IPNF Forest Plan, Chapter II, page II-33) because of 1) the low level of harvest, 2) the distance between harvest units and the stream channel, and the 3) implementation of Best Management Practices (BMP's). Models, field data, monitoring data, and professional judgment were used in the analysis to approximate the effects of activities on the water resource.

***Protect water quality per the Clean Water Act and to meet or exceed States' Water Quality Standards*:** The Forest Service has agreements with the States to implement Best Management Practices (BMP) or Soil and Water Conservation Practices for all management activities to meet the objectives for Forest Practices. Monitoring would be designed to demonstrate the implementation of BMPs and provide feedback concerning their effectiveness in protecting water quality. Watershed conditions that contribute to water quality that is impaired would be improved through ongoing and foreseeable restoration projects. Riparian areas would be managed to meet objectives for riparian-dependent resources (fish and wildlife habitats, water quality, stream channel integrity, vegetation, public water supplies).

Inland Native Fish Strategy: The Inland Native Fish Strategy has been implemented as amendments to the Forest Plans of the Idaho Panhandle and Colville National Forests. All action alternatives would be consistent with this direction. The amendments require mitigation of environmental effects of management decisions. Specified riparian management goals and objectives have been developed, and Riparian Habitat Conservation Areas (RHCA) are defined and delineated. Riparian management and Riparian Management Objectives (RMO) are addressed using site-specific analysis and supportive data, and watershed analyses. The strategy also specifies standards and guidelines, which must be applied for certain activities in RHCAs. These are incorporated into the action alternatives as described in Chapter 2.

Clean Water Act and Water Quality Limited §303(d) Listings: Under authority of the Clean Water Act, the EPA and the States must develop plans and objectives (TMDLs) that will eventually restore listed stream segments. In lieu of those plans, Forest Service will demonstrate or find that their actions will not result in a net substantial increase in the pollutant of concern or prohibit or delay potential recovery (IDHW, 1997; USFS, 1995). All alternatives would be consistent with the Clean Water Act and Water Quality Limited Listings.

3.5. FISHERIES

3.5.1. Regulatory Framework

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). The 1969 National Environmental Policy Act (NEPA) requires analysis of projects to insure the anticipated effects upon all resources within the project area are considered prior to project implementation (40 CFR 1502.16). Section 7 of the 1973 Endangered Species Act (ESA) includes direction that Federal agencies, in consultation with the United States 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. 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 Forest Plan for the Idaho Panhandle National Forests (IPNF) provides management goals and objectives for the protection of the fisheries resources. The Inland Native Fish Strategy (INFS) amended the IPNF Forest Plan in August 1995 and contains additional standards and guidelines to protect the aquatic environment.

Proposed activities in the Hither and Yon Beetle project areas were analyzed with respect to these regulatory requirements in the Fisheries sections. Additional regulatory requirements related to fisheries resources (*e.g.* Clean Water Act and Idaho Water Quality Standards) are addressed in the Water Resources sections.

3.5.2. Methodology

The cumulative effects area is based on the Tepee Creek drainage above Trail Creek, Grizzly Creek, and Beaver Creek. The Tepee Creek analysis also includes Ryan, Halsey, Drexall, Little Elk, Short, Riley, Big Elk, and Van Hoosier Creeks. Several other minor named side drainages are also included. The Grizzly Creek analysis also includes Lindsey and Dewey Creeks. The Beaver Creek analysis also includes Trail, Pony, Unknown, Carbon, Dobson, Ferguson, Moore, Alder, White, Missouri, and Rock Creeks. Several other minor named side drainages are also included.

A. Methodology Used to Identify Existing Conditions

Fish habitat surveys were conducted on the Tepee Creek area by the Forest Service in 1992-93. Upper Tepee Creek is a larger 5th order stream. Stream reaches 4-8 are within the analysis area. Reach 4 is a B channel type and flows past the Magee Ranger Station. This reach is characterized with 73% of the length in pocket water with the rest in riffles and runs. No pools were surveyed in this area. The remaining 4 reaches are C channels. The habitat composition for this area averages 25% riffle, 59% run/glide, and 12% in pools (Project Files – Fisheries). Most of these pools were associated with beaver ponds. The average volume of these

pools is quite large at 2200 cubic feet. The average depth is 0.9 feet. Large woody debris was very low through this area averaging 5-6 stems per 1000 feet. The riparian zone in this area has a history of significant disturbance, especially in reach 5. In the 1930's there was a major effort to rid the area of ribes plants. The riparian area was dozer piled and burned. The stream channel was diverted from its natural meandering path through the wide flood plain. The Forest Service implemented a restoration project within the Big Meadows area, the lower half of reach 5 in the year 2000. This project restored the natural meander back to the stream channel, created pools, added woody debris, and planted brush and trees for cover and future wood recruitment (Project Files – Fisheries). Approximately 5,800 fish were moved from the old to the new channel during the restoration effort. Species included westslope cutthroat trout, dace, and sculpin.

Little Elk Creek is a 3rd order tributary to Tepee Creek. About half of the fisheries reach is a C type channel composed of 72% riffle, 23% run/glide and 5% pools. Mean residual pool volume was 53 cubic feet with an average depth of 0.4 feet. The remainder of the fisheries reach is A and B channel types with 3-7% in pools with pool depths of 0.4 feet (Project Files – Fisheries). Larger woody debris in the channel was approximately 10 stems per 1,000 feet. Large woody debris has likely increased since this time with the ice and snow damage that occurred during the winter of 1996-97.

Short Creek is a 4th order tributary to Tepee Creek. About half of the fisheries reach is a C type channel composed of 51% riffle, 30% pools, 20% run/glide and the balance of habitat in a braided condition. Mean pool volume was 81 cubic feet with a depth of 0.4 feet. The remainder of the fisheries reach is A and B channel types with 11-17% pools with a depth of 0.3 feet (Project Files – Fisheries). The entire stream has an average of 2 stems per 1000 feet. This stream has a much larger component of pools than many of the other streams in the area. Most of the pools are meander formed. Woody debris component is limited. Pools appear to be of low complexity and with a low residual pool volume.

Grizzly Creek is a 4th order tributary to the North Fork of the Coeur d'Alene River. Fish habitat surveys in 1991 indicated that 68% of the reach consisted of riffles, 13% in pocket water, 9% in pools, 5% in runs, 1% in glides, and 3% of the stream had seasonal subsurface flow. Subsurface flow was associated with bedload movement at the mouth. This deposition in conjunction with the drainage structure on the county #503 road served as a barrier to fish passage. After the flood of 1996, the county replaced this structure and it is believed that the lower section of the stream is now passable to fish during higher flow periods. It was determined that several stream reaches in this system have unstable channels while other section are in relatively good shape. Overall habitat conditions are considered fair. Although several woody debris jams were encountered, the amount of large woody debris is assessed to be insufficient. Riparian stands in the lower reaches are lacking in overstory wood for future recruitment. This lack of woody debris is likely the result of past salvage logging with an old railroad line and log chutes being constructed in the riparian area after a large fire in the lower half of the drainage in 1917. Fish surveys in Grizzly Creek showed a range of 0.09 fish/square meter to 0.45 fish/square meter with the highest concentrations of fish in the upper reaches (Project Files-Fisheries).

Beaver Creek is very unstable and highly erosive system, and contributes visible quantities of sediment to the North Fork of the Coeur d'Alene during high flow events. Flood events in 1964, 1974, and 1996 have affected channel stability in the lower to middle reach of the Beaver Creek. In-stream sediments are high due to past road and culvert failures, peak flow increases, and road constriction of the channels. Beaver Creek has also been significantly impacted by past mining activities with direct impacts to the channel and with the presence of heavy metals. Over 85 percent of Beaver Creek flood plain is in private ownership. Past and current management on private lands include cattle grazing, mining, timber harvest, agricultural clearing, and clearing for home-sites. Management activities on public land include timber harvest, grazing, and mining. Stream conditions in this area are degraded as a result of local and upstream impacts and from loss of riparian vegetation on private ownership.

Within Beaver Creek, the predominant fish habitat on public lands is made up of the B and C channel types within the tributaries. These include Alder Creek, Deer Creek, Dudley Creek, Moore Gulch, White Creek,

Pony Gulch and Scott Gulch. Most of Missouri Gulch is too steep a gradient to be a fisheries stream. Fish habitat surveys were conducted on Alder and White Creeks, tributaries of Beaver Creek, in 1993. Surveys showed considerable variation by reach, or segment of the tributary. Some sections were seriously degraded, other sections in fair condition. Pool length varied from 0 to 50 percent of the channel depending on the reach. However, pools were generally found to be shallow and of low volume. Most pools were found to be associated with large woody debris with low to moderate cover. Most of the cover was associated with the woody debris or terrestrial vegetation (Project Files – Fish). Watershed restoration surveys in Alder and White Creeks in 1998 founds these streams to be degraded, but stabilizing due to adequate large woody debris, and generally of poor fish habitat. Other tributaries in the Beaver Creek drainage are expected to be in a similar degraded condition.

Fish surveys were conducted in Alder Creek in 1985 as part of the Taft-Bell Fishery Monitoring Project. Cutthroat trout and brook trout were found to be present but numbers were quite low (Project Files – Fish).

B. Methodology Used to Determine Environmental Consequences

Existing conditions were established for primary habitat components believed to be influencing the productive potential of the Management Indicator fish species within the analysis area. Changes to these habitat components by the action alternatives are addressed by measuring changes in physical structures that affect the habitat components important to fish and are affected by management actions. Habitat components of interest include stream temperature, aquatic habitat diversity, cover complexity, and channel stability.

- ***Stream temperature*** is one indicator of aquatic habitat conditions for this project area (Hicks et al. 1991). Stream temperature information collected during stream surveys is evaluated in relation to Idaho State Water Quality Standards for designated beneficial uses. The direct removal of riparian vegetation through road construction and timber harvest can indirectly change stream temperature by increasing sunlight to the water. If this increases outside the range that cutthroat trout evolved, detrimental effects may occur (6-17 C; Bjornn and Reiser 1991). Because of the low water temperature requirements of bull trout any increase in stream temperature would likely have a negative effect on this species.

- ***Habitat diversity*** (composition and quality) is another indicator of aquatic habitat conditions and is assessed as to the quantity and degree of development of various types of aquatic habitat (*e.g.* pools, riffles, etc.). Stream segments possessing numerous habitats with a wide variety of stream velocities, water depths, and physical habitat configurations are considered more diverse and have a greater potential for meeting the habitat requirements of naturally reproducing trout populations. Removal of riparian vegetation, which reduces instream wood, along with increases in bedload and sediment, and changes in stream morphology can affect the composition and quality of habitat.

- ***Cover complexity*** is also an indicator of habitat conditions and is evaluated by the degree of habitat partitioning by various structural elements such as large woody debris, boulders, and undercut banks. This physical separation within habitat units can help maximize fish production by decreasing competition and aggression, reducing predation, increasing carrying capacity, and producing micro-habitat conditions that minimize energy requirements and provide refugia for fish inhabitants. The same information used to reflect changes in habitat diversity are used to display changes to cover complexity, particularly instream wood and channel morphology.

- ***Channel stability*** is another indicator for fish habitat conditions because it influences the quality of pool habitat as well as helps to establish the trend for aquatic habitat conditions. Channel stability is discussed in the "Watershed" section of this EA and incorporated into the assessment of fisheries resources. The relationship between upslope processes and stream channel condition were also assessed by incorporating the analysis of the hydrologic condition within the project areas. Changes to channel stability are highly dependent upon changes in water yield and timing, and bedload movement. Other selected features that are believed to influence the condition of riparian areas, and subsequently fish habitat are also discussed.

Because of the difficulty of directly measuring stream habitat components as well as delay between land management actions and altered stream conditions, the cumulative effects analysis was based on management actions that could alter stream conditions. The relationship between the habitat component and the measurement of change is discussed below.

- ***Riparian Harvest:*** For this EA the amount of riparian harvest is a measurement for changes in stream temperature, habitat diversity, cover complexity, and channel stability. The direct effect of riparian harvest is the reduction of shade and large wood component near streams. The indirect effect of reducing the amount of streamside vegetation include altering timing and amount of sediment delivery, wood loading in stream, stream temperature, and the hydrologic regime (Meehan et al. 1991). The cumulative effects of riparian harvest can be reduced egg-to-fry survival (by increased fines in reeds) and reduced adult survival (by increasing temperature outside of tolerated range and/or by altering carrying capacity by reducing highly utilized habitat) of Management Indicator species. For purposes of consistency in this analysis, an average distance of 300 feet from fish-bearing streams will be considered as riparian habitat. Although not all the vegetation within this 300 foot buffer will consist of vegetation that is dependent on the water table, it does provide conditions necessary to maintain these types of vegetation (FEMAT, 1993). In addition, riparian harvest within 75 feet of intermittent streams will be considered riparian harvest. By maintaining riparian habitat, the Forest will trend toward meeting the large woody debris Riparian Management Objective of the Inland Native Fish Strategy.

- ***Sediment Delivery Risk***: The risk of sediment delivery will be tracked by risk of failure at crossings and temporary/permanent road constructions. A majority of these risks are located where roads cross streams. The direct effect of sediment delivery at roads can be reduced passage of fish. The indirect effects of these failures include increased fine sediment in redds, and channel simplification due to torrents. The cumulative effects of additional sediment delivery can be reduced egg-to-fry survival (by increased fines in redds) and reduced adult survival (by altering carrying capacity by reducing highly utilized habitat such as pools) of Management Indicator Species. The cumulative effects related to road failures can ultimately lead to a decline in fish number (Furniss et al. 1991). Reducing the amounts sediment entering streams will result in a trend toward the Pool Frequency and the Width/Depth Riparian Management Objectives.

- ***Increased Fish Passage:*** The placement of culverts at road crossings alters the ability of fish to utilize stream habitat above the culvert. The direct effects of modifying these culverts is increased fish passage. The indirect effects of fish passage is the movement of fish to portions of streams not previously used but also replacement activities may increase short-term sediment production. The cumulative effects of increased passage is the increased probability of persistence of the Management Indicator Species. Passage for this analysis will be focused on spring migration of adult westslope cutthroat and summer/fall migration of bull trout.

- ***Reduced Length of Encroaching Roads:*** The fourth of these measures of change will be the amount of encroaching roads removed as a result of restoration activities. Direct effects of reducing the length of encroaching roads is reduced flow velocity. Indirect effects are an increase in habitat complexity and fish carrying capacity. Cumulative effects are increased numbers of fish. Because valley bottom roads pose a significant risk for fish (Dose and Roper 1994, Hick et al. 1991), reducing these roads is extremely important to maintaining the long-term viability of fish species (including the Management Indicator Species), as well as maintaining terrestial species within the basin that rely on riparian habitat. By reducing the amounts of encroaching road the result will be trending towards the Pool Frequency and the Width/Depth Riparian Management Objectives.

3.5.3. Existing Conditions

A. Fish Presence

The cumulative effects areas contain approximately 27 miles of fish-bearing stream segments in upper Tepee Creek, 4 1/2 miles in Grizzly Creek, and 28 miles of fish-bearing stream segments associated with Beaver Creek. Fish species that may inhabit streams in these areas include native populations of westslope cutthroat (*Oncorhynchus clarki*), bull trout (*Salvelinus confluentus*), mountain whitefish (*Prosopium williamsoni*), northern pike minnow (*Ptychocheilus oregonensis*) (formerly squawfish), large-scale sucker (*Catostomus macrocheilus*), torrent sculpin (*Cottus rhotheus*.) shorthead sculpin (*Cottus confusus*), longnose dace

(*Rhinichthys cataractae*), and possibly redside shiner (*Richardsonius balteatus*). Introduced fish species include populations of rainbow trout (*Oncorhynchus mykiss*) and brook trout (*Salvelinus fontinalis*) (Data on file at the Coeur d'Alene River District, Simpson and Wallace 1978). Fish that are the product of hybridization between native cutthroat trout and exotic rainbow trout may be present.

The current condition and distribution of the fisheries resources within the area analyzed within this EA were established by utilizing the best available information including interpretation of information from stream inventories, field reviews, historical records, aerial photographs, analysis of watershed conditions, published scientific literature, discussions with Fisheries Biologists from the Idaho Department of Fish and Game, the United States Fish and Wildlife Service (USFWS), and the Idaho Division of Environmental Quality (DEQ), and comprehensive knowledge of the fisheries resources in the Coeur d' Alene basin. The distribution of selected fish species within the Beaver Creek watershed can be found in the following table.

Codes for species: *WCT - westslope cutthroat trout, BT - bull trout, RT - rainbow trout, BkT - brook trout, MW - mountain whitefish, Scp - Sculpin*

Codes for access: *Y=access present, no known migration barriers; N=human-caused migration barrier within the stream; N*=natural migration barrier within stream.*

Codes for species present: *- Y - Surveyed and present, LY - Unsurveyed but likely present, N - Surveyed but not found, N* - Natural barrier, LN - Unsurveyed but unlikely present, H - Documented historic, now unlikely, LH - Likely historic, now unlikely.*

Table 3-17. Summary of the distribution of selected fish species within the project area watersheds.

Stream Name	HUC #	Access	WCT	BT	RT	BkT	MW	Scp
Upper Tepee	17010301151200	Y	Y	N/LH	N	N	Y	Y
Grizzly Creek	17010301002000	Y	Y	H	Y	N	N	Y
Beaver Creek	170103013004	Y	Y	H	LY	Y	N	Y

Due to the large number of fish species within the cumulative effects area, analysis of direct, indirect, and cumulative effects to fish uses the concept of Management Indicator Species (MIS). Under this concept, larger groups of organisms or communities are believed to be adequately represented by a subset of the group (Idaho Panhandle National Forest Plan 1987). The use of Management Indicator Species within the area affected by this EA is simple since historically the area was dominated by cold water biota and these species are sensitive to the types of land management action proposed under most alternatives (Meehan 1991). The Forest Plan identifies westslope cutthroat trout and bull trout as potential Management Indicator fish species for the effects of management actions on fisheries and they are used for that purpose in this document. The life histories of one additional species listed on the Regional Foresters sensitive species list, the torrent sculpin, are included below. Since torrent sculpin is also a cold water species, the effects of this action to these species would be similar, where these species occur in the watershed analysis area, and is covered under the effects to the Management Indicator Species. Two other sensitive species, the burbot and redband cutthroat, will not be addressed in the EA because they are known not to occur in the Coeur d'Alene Watershed (Simpson and Wallace 1978).

Fish populations in the analysis areas consist predominately of Westslope cutthroat trout (*Onchorhynchus clarki lewisi*) and shorthead sculpin (*Cottus confusus*). Westslope cutthroat trout are known to be utilizing streams within the analysis areas for migration, spawning, rearing, and possibly over-wintering. Bull trout (*Salvenlinus confluentus*) have been found in the Coeur d'Alene River and Lake (IDF&G, 1989) but more recent surveys (Dunnigan, 1998) show no indication of their presence in the analysis areas. Individual fish, however, have been reported within the mainstem Coeur d' Alene River, Prichard Creek and the Little North Fork Coeur d'Alene River. Westslope cutthroat trout and bull trout have been selected as appropriate

Management Indicator Species for the fisheries analysis of the Hither and Yon Beetle project. These species are indicators for all the cold-water biota within the stream segment (Meehan 1991).

Westslope Cutthroat Trout

Westslope cutthroat trout are listed as "Sensitive" by Region 1 of the USDA Forest Service and also 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) (3/2/98 letter, FWS 1-9-99-SP-158). This species is currently under review for listing under the Endangered Species Act.

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

Resident, fluvial, and possibly adfluvial life history strategies of westslope cutthroat trout are likely present within the watershed in the analysis areas. Resident populations remain in river tributaries throughout their life. Migratory populations (fluvial and adfluvial fish) use river tributaries for early rearing and spring spawning as adults, but typically migrate to river (fluvial) or lake (adfluvial) habitat as they mature. In the fall, fish that have not previously returned to river and lake areas migrate to deeper water where they congregate and over-winter (Bjornn 1975). Streams within the analysis area are utilized by westslope cutthroat trout representing all life history strategies during various phases of their life cycle.

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

Bull Trout

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 the distribution and abundance (Jakober 1995; Dambacher and others, 1994; Rieman and McIntyre 1993).

Stream temperature and substrate composition are important characteristics of suitable bull trout habitats. Bull trout have repeatedly been associated with the coldest stream reaches within basins. In a status review of bull trout on the Idaho Panhandle National Forests, stocks from the Coeur d' Alene watershed were considered to be at high risk of extinction (Cross 1992). Genetic analysis has shown bull trout within many sub-basins of Northern Idaho may be unique stocks (B. Rieman, Rocky Mountain Research Station, personal communication), but are closely linked to the upper Columbia River group - one of three major groupings of bull trout throughout the Columbia and Klamath River drainages (Williams, 1997). Bull trout have recently (within the last 10 years) been documented or observed in the main Coeur d' Alene river. No individuals are known to spawn within the Coeur d'Alene basin.

Torrent Sculpin

Torrent sculpin were added to the Idaho Panhandle's sensitive species list March 12, 1999. This species has been found within the mainstem Coeur d'Alene River and larger tributary streams. Their preferred habitat is riffle habitat in medium to wide streams and rivers (Markle et al. 1996). Large adults (>150 mm), however are found in pools. Spawning usually occurs in May and June and occurs in riffles with moderate to swift flows. The range of torrent sculpin overlaps with both westslope cutthroat and historic bull trout and are also a cold-water species. Because this species primarily inhabits large streams this species would only be affected by this project if the magnitude of the effects altered habitat conditions in the larger streams. The possible effect on this species is covered by analyzing effects on the cold-water Management Indicator Species. This species will be assumed present in all larger streams. The middle and lower reaches of Upper Tepee and Beaver Creek would be considered a large enough stream for torrent sculpin to be present. The lower reach of Grizzly Creek would likely be large enough as well.

B. Habitat Connectivity

Environmental conditions in the planning area have been influenced by natural events and processes as well as human activities. Effects of natural disturbances such as volcanic eruptions (such as Mt. St. Helens, Mt. Mazama), historic fires, landslides, and flooding have interacted with other land-evolving processes (for example, geologic up-lift and stream channel down-cutting) to form the basic character of watersheds and the dependent stream resources. Due to variability in the location, frequency, intensity, and ultimately, the effects of natural processes on the physical environment, dynamic landscapes with diverse conditions are formed at various spatial scales. Biological communities including native fish populations led to development of functional ecosystems that are inherently resilient to effects from natural disturbance regimes representing pulse-type disturbance (Reeves *et al.* 1995). Pulse disturbances influence the natural range of environmental conditions that are expected for ecosystems functioning at broad geographic scales but typically allow systems to begin recovering to pre-disturbance conditions after the disturbance.

Natural disturbance regimes and their associated properties (sedimentation rates and other influences on aquatic habitat) have been altered in the cumulative effects area by human activity. Land use activities that have modified natural disturbance characteristics include railroads, roads, flumes/chutes, settlements/towns, grazing, mining, stream modifications (constriction, channelization, diversion, dams, culverts, and cleaning - removal of woody debris), logging, and fire suppression. Many of these human influences are considered press-type disturbance that continue to affect the condition and trend for fisheries resources long after the initial disturbance. Press disturbance differs from pulse disturbance in several aspects but generally press disturbance is persistent in ecosystems and impairs the ability for ecosystems to recover to pre-disturbance conditions (Reeves *et al.* 1995). Within the cumulative effects area, the recovery process from pulse disturbance has been hindered by the presence of various press disturbances. The following discussion relates these findings to the existing condition of fish habitat.

C. General Effects of Past Land Management Activities

Newer roads and some historic roads within the planning areas have been constructed in more stable locations higher on the hillslopes and are of less concern for fisheries resources (please refer to the "Watershed" discussions). However, roads on hillslope locations can contribute to impaired fish habitat conditions. These roads can elevate stream sedimentation by increasing surface erosion potential and mass erosion potential. Fill failures from sections of riparian roads can be a major contributor to stream sedimentation and considerably alter the condition and trend for fish habitat.

Recent (past ten years) timber harvest units, mining, and recreational facilities have generally had a less dramatic effect on fisheries resources than historical fires, historical salvage operations, and the existing transportation system (Furniss et al. 1991). Recent timber harvests (within the past ten years) and associated

roads have contributed to cumulative effects that are affecting recovery of fish habitat conditions in these streams.

The quality of fish habitat conditions in the cumulative effects area has generally been compromised but are adequate to support viable populations of some cold-water biota, especially resident fishes. Diverse conditions of the habitat components (stream temperatures, aquatic habitat diversity, cover complexity, and channel stability) that are primarily responsible for regulating populations of native salmonids in the cumulative effects area have enabled these populations to persist albeit at suppressed levels. Analysis of existing conditions indicates that many streams in the cumulative effects area continue to recover from the residual effects from historic pulse-type (fires, volcanoes) disturbance acting in isolation or in combination with effects from on-going press-type (timber harvest, road building) disturbances (Chamberlin et al 1991).

One possible effect of land management activities on Management Indicator fish species that is not addressed in the fisheries section is changes in peak flow. Inasmuch as large-scale fires in Northern Idaho resulted in the historic condition of this basin often having more openings than the current condition (IPNF Monitoring Plan 1998) it is unlikely any changes in peak flows resulting from management activities would have a direct, indirect, or cumulative effect outside the conditions in which these fish evolved. In addition, Jones and Grant (1996) state the natural range of variability of peak flow varies by an order of magnitude whereas the increase associated with human activities are no more than 50%. This once again suggests that fish have evolved to live through variable flows. The conditions fish have not evolved with, however, is aquatic habitat that has been greatly simplified as the result of habitat modification; these are covered in environmental consequences.

Because most of the analysis areas are in watersheds that have been negatively affected by human management the goal for future management is to restore processes that form stream habitat. The easiest way to achieve this goal is to reduce the effects of roads while maintaining or improving riparian habitat conditions. While the minimum requirement for this project is to maintain fish habitat (USDA Forest Service, Inland Native Fish Strategy, 1995) the fisheries resource would be served by improving stream habitat conditions.

3.5.4. Environmental Consequences

A. Direct, Indirect, and Cumulative Effects Common to All Alternatives

Riparian Harvest: Loss of riparian habitat does not benefit the Management Indicator Species. This loss of riparian vegetation is the direct result of road construction across or within Riparian Habitat Conservation Areas (RHCA's) or from harvest units within RHCA's. No road construction would occur with this project. No road reconstruction or timber harvest units would occur within RHCA's as a result of the action alternatives. There is not expected to be any loss of riparian habitat as a result of ongoing and foreseeable actions, although there may be the possibility of some minor loss with one mining project. All action alternatives would remove no additional riparian vegetation, as there are no new stream crossings or riparian harvest. No change in stream temperature within fisheries reaches would be realized in any action alternative.

In addition to removing shade, the removal of riparian habitat could reduce the amount of large woody debris that is eventually incorporated into the stream. The direct effect of this is less wood in the channel. There would be no direct effects in any action alternative from loss of wood debris recruitment. The indirect effect of this loss could be a slight reduction in pool habitat, increased channel gradient and stream velocity. No indirect effects would occur under any of the action alternatives. The cumulative effect of this would be limited to reducing fish numbers in small downstream reaches proximate to the removal of riparian habitat. Since no riparian harvest or riparian road construction would occur under the Hither and Yon Beetle project, none of the action alternatives would result in any cumulative effect to Management Indicator Species from loss of riparian habitat within the Upper Tepee, Grizzly, or Beaver Creek drainages.

Sediment Delivery Risk: The short-term effects are related to the number of new culverts crossing streams and the length of the new roads. There would be no new road construction or stream crossings under any action alternative. There would be no change in sediment risk in the watershed under as a result of any action alternative. The reconstruction of 0.1 miles of roadway in the Grizzly Mountain project area is located on a ridgetop. With no stream channels in this area there would be no increase in risk of sediment delivery. As a result of ongoing and foreseeable activities, there would be a risk reduction in sediment delivery. This is associated with 2 culvert upgrades and an armored overflow scheduled under the East Side Beetle Heli timber sale. There would be no additional cumulative effect to the Management Indicator Species with any of the action alternatives since there is no road construction or road removal scheduled. With the foreseeable culvert upgrades and armored overflow under ongoing and foreseeable actions, there may be a minimal short-term increase in sediment in the Beaver Creek watershed, with a long-term reduction in sediment delivery risk.

Increased Fish Passage: Alternatives that remove barriers to fish passage would be a benefit to the Management Indicator species. The removal of barriers through culvert removals and upgrades allows the fish to utilize more habitat than is present under the existing conditions and may lead to more genetic diversity by reconnecting isolated stocks of fish. There would be no increase or decrease in fish passage as a result of any action alternatives or ongoing and foreseeable activities. The Hither and Yon Beetle project would have no additional cumulative negative or positive effects to the Management Indicator Species within this watershed in terms of increased fish passage. There are no known fish passage barriers on roads under National Forest jurisdiction associated with cumulative effects analysis areas for any of the project areas.

Reduced Length of Encroaching Roads: Alternatives that reduce the length of encroaching roads would have a short-term increase in sediment but would result in the long-term benefit to Management Indicator Species.

The action alternatives would not remove any encroaching roads, and would therefore be the same as Alternative 1 in that respect.

C. Cumulative Effects to Westslope Cutthroat Trout and Bull Trout Individuals and Populations

Alternative 1: Historically, the upper Tepee, Grizzly, and Beaver Creeks watersheds had abundant populations of cutthroat trout. Historic populations of bull trout likely occurred as well. The population trend of cutthroat trout has been on the decline in these watersheds. Bull trout is non-existent. The effect of the No-Action Alternative would result in slightly improved changes in the current condition or trend in the Management Indicator Species due to culvert upgrades scheduled under other projects in the Beaver Creek drainage. Instream restoration work is also scheduled in the Pony Gulch drainage, which will improve fish habitat conditions. Other ongoing and reasonably foreseeable activities are expected to have minimal effect on fish habitat in the project area drainages.

Alternative 2: The proposed vegetative treatment areas are generally located in the headwaters of tributaries to Tepee, Grizzly, and Beaver Creek. A large component of the timber being removed is dead or dying. Most of the harvested green component would be associated with group shelterwood, improvement harvests and commercial thinning where the dominant green canopy structure of the stands would be maintained. Green harvest in these areas would primarily be associated with understory and intermediate trees. No new road construction would occur within the project areas. Minor reconstruction of 0.1 miles of a ridgetop road would occur in the Grizzly Mountain area. Helicopter yarding would be used to remove all of the timber in that area. Most of the other areas would involve line skidding timber from existing roads although approximately 17 acres of tractor yarding would occur in the Grassy Mountain (Tepee) area. Based on the watershed analysis of this activity, there would be no change in population conditions at the scale of a stream segment as a result of this alternative. Because the actions have minimal effects at the scale of a stream reach, this

alternative would have no incremental effect at the scale of the watersheds. Although there would be no cumulative effects from this alternative at the watershed scale, the overall effects of this project in combination with the past, present and reasonably foreseeable actions would be to maintain the rate at which the Management Indicator Species recover within the analysis areas.

Alternatives 3 and 4: Under these alternatives, ecoburning activities would occur in the Grizzly Mountain project area. This is in addition to the activities identified for Alternative 2. Under Alternative 3, understory removal treatments would occur prior to ecoburning 72 acres. Lost of canopy cover associated with this treatment would be similar to what would be expected to occur if the area was burned without harvest, since most of those understory trees are expected to be killed by the prescribed fire. Alternative 4 would result in less understory canopy loss than Alternative 3 with only 34 acres being underburned. Fire creeping into small riparian areas above Road 622 would have minor effects since a cool burn would not consume the duff layer and any timber killed in this area would be retained to recruit into the channel. Most of the side roads within the Grizzly Mountain area have been ripped and have had culverts removed during the early 1990's. Small-scale vegetative restoration efforts, such as this project, to reduce the risks of stand replacing fires and introduce long-lived seral species back onto the ecosystems have minimal effects to the watershed in the short-term and should be beneficial to the long-term health of the watershed. Based on the watershed analysis of these alternatives, there would be no change in population conditions at the scale of a stream segment as a result of either alternative. Because the actions have minimal effects at the scale of a stream reach, these alternatives would have no incremental effect at the scale of the watersheds.

D. Effects of Reasonably Foreseeable and Ongoing Activities

Fish habitat improvements are scheduled under the Unknown Pony project. This will include installation of fish cover structures and stepdowns in Pony Gulch. This activity will have a short-term sediment increase, however there will be a long-term positive net benefit to fish habitat within the Beaver Creek drainage. This net benefit of improved pools ratios and improved rearing habitat is expected to increase fish populations within the drainage and downstream from the drainage.

The timber harvests associated with the East Side Beetle Heli (50 acres) and Unknown King Bug (40 acres) projects are generally located high on the hillsides away from riparian areas. A portion of the volume is to be helicopter logged and no new road construction would occur. Most of the timber being harvested under the treatments is dead so only minor changes in tree canopy is occurring. The activities proposed under these projects within the Beaver Creek drainage will not produce negative effects on fish habitat. Planned harvest under Missouri Heli Bug (52 acres) and the Small Sales EIS (10 acres) are again harvests associated with beetle mortality and involve mostly helicopter yarding with no road construction. Planned timber harvest on private ownership in the headwaters of Beaver Creek, based on the type of treatments proposed, is minor in nature and is not expected to have negative effects on the fisheries population.

Mining projects are studied on a case-by-case basis. Mitigation measures are incorporated into these projects to minimize impacts to fish populations and habitats.

The Beaver Creek grazing allotment may produce minor sedimentation from stream bank erosion, where cows cross the creek, but this is very minor in nature especially with the limited number of cows using the allotment. The preferred fuelwood gathering planned for some of the roads in this area is not expected to have any effect on fish habitat, as harvest is an individual tree selection of dead trees along roads that are up out of riparian areas. The firewood permit also prohibits the cutting to trees within RHCA's.

Effects of possible future projects such as Teratoid Tepee and the Beaver Creek EIS will be analyzed at the time of the proposals. These projects will be at the landscape level, which will provide a thorough assessment of the overall watershed condition and is expected to provide opportunities to enhance the existing condition of the watershed and the fisheries resource.

Although there would be no cumulative effects from this project at the watershed scale, the overall effects of this project in combination with the past, present and reasonably foreseeable actions would be to maintain the rate at which the Management Indicator Species recover within the analysis areas.

All future decisions associated with those projects identified as Reasonably Foreseeable have or will need to complete consultation with the U.S. Fish and Wildlife Service prior to the decision if any effects to T&E species is projected. Each of these activities has the potential to alter various aspects of watershed conditions. Protective measures were recommended and incorporated into the designs for most of these projects allowing watershed resources to be maintained. Effects to fisheries resources can be expected from some of these activities, and any action alternative under this analysis is considered to have additive effects when combined with the No-Action Alternative.

E. Effects of Opportunities

Installation of overflow pipes in the county road at the mouth of Grizzly Creek would reduce the risk of road failure and sediment transport into the North Fork of the Coeur d'Alene River during flood events. The project should be able to be implemented without any short term increase in sediment and would benefit the Management Indicator Species over the long term.

Treatment of noxious weeds would have no effect on the Management Indicator Species, as treatments would follow standards that minimize risk to riparian vegetation and aquatic species.

F. Determination of Effects to Management Indicator Species

Table 3-18 portrays effects of the ongoing and proposed activities under either of the action alternatives (including the reasonably foreseeable activities, described in Chapter 2). A definition of each rating is provided below. These calls integrate the preceding evaluations of habitat components and the foreseeable actions. The "X" indicates the composite rating of the cumulative effects of the all actions in an alternative on the Management Indicator Species and summarized by the cumulative watershed effects areas.

Definitions

The impact to Management Indicator Species is described using the following definitions:

No change in population conditions means that there would likely be no net positive or negative effect to the population within the cumulative watershed effects areas. No change in riparian or stream conditions.

Likely to result in a long-term reduction in risk of past management actions to individuals indicates the action taken within the watershed is limited in nature but would result in a net benefits to individuals when compared to the existing condition. Actions that result in the reduction of risk to individuals include isolated culvert upgrades and small-scale reduction of encroaching roads with little increased risk associated with road building or riparian harvest. A change in stream and riparian conditions so that Riparian Management Objective are trended towards at the segment or reach scale.

Likely to result in a long term reduction in risk of past management actions to population indicates the actions is broad enough in scope to effect individuals throughout the basin thereby improving the condition of the population within the cumulative watershed effects area when compared to the existing conditions. Actions that result in the reduction of risk to populations include widespread culvert upgrades, large-scale reduction of encroaching roads, and/or increased fish passage without increased risk associated with road building or riparian harvest. A significant change in stream and riparian conditions so that Riparian Management Objective are trended towards at the subwatershed scale.

Likely to result in a long-term risk in individuals indicates the action taken within the watershed is limited in nature but would result in a net harm to individuals when compared to the existing condition. Actions that result in the increased of risk to individuals include road building or harvesting riparian areas without a widespread effort to upgrade culverts and reduction of encroaching roads. A change in stream and riparian conditions so that Riparian Management Objective are trended away from at the segment or reach scale.

Likely to result in a long-term decline in populations indicates the action taken within the watershed is widespread and would result in a net harm to individuals when compared to the existing condition. Actions that result in the increased of risk to populations include widespread road building without a widespread effort to upgrade culverts and the reduction of encroaching roads. A change in stream and riparian conditions so that Riparian Management Objective trend away from the subwatershed scale.

Table 3-18. Effects to Management Indicator Fish Species in the project area watersheds under all alternatives.

	Likely to result in a long-term decline in populations
	Likely to result in a long-term risk to individuals
X	No change in population conditions
	Likely to result in a long-term reduction in risk of past management actions to individuals
	Likely to result in a long-term reduction in risk of past management actions to populations
	No westslope cutthroat trout recently found within basin
X	No bull trout recently found within basin
None	Direct and indirect effects (positive components)
None	Direct and indirect effects (negative components)

G. Consistency with the Forest Plan and Other Applicable Regulatory Direction

Fish Standard 1: Activities on National Forest System lands will be planned and executed to maintain existing water uses. To maintain is defined as "limiting the effects from national Forest management activities to maintain at least 80 percent of fry emergence success in identified fishery streams."

Fish Standard 2: Streams providing spawning and raring habitat, which are considered critical to the maintenance of river and lake populations of special concern, will be managed at a standard higher than the 80 percent standard.

These standards are no longer considered applicable since the Inland Native Fish Strategy was developed. 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 (J. Kershner, 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, offering far more protection to inland native fish habitat. 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. Activities that reduce habitat quality to any extent are contrary to INFS direction, regardless of whether RMOs have been attained.

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 (please refer to the Water Resources discussion in this chapter).

Fish Standard 3: Streams listed under this standard of the Forest Plan 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. This standard does not apply under this project, since none of these low-access fishing streams are within the project areas. See Forest Plan page II-30.

Fish Standard 4: Provide fish passage to suitable habitat areas by designing road crossings of streams to allow fish passage or by removing instream migration barriers. None of the alternatives would build any new roads or create any new migration barriers. No migration barriers are known to exist on road within the analysis areas that are under National Forest jurisdiction; therefore there are no known opportunities with this project.

Fish Standard 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. Data and inventories have been and will continue to be collected on selected streams with other projects. Fish habitat improvement projects have been implemented and will continue to be a focus item across the Coeur d'Alene River Basin. Ongoing and foreseeable activities in the Beaver Creek drainage include such projects. The Hither and Yon Beetle project is not one of those proposals.

Fish Standard 6: Coordinate management activities with water resource concerns as described in Management Area 16 (riparian corridors), Appendix I, and Appendix O. No new management activities would occur under Alternative 1, therefore this standard would not apply. Design of the action alternative were fully coordinated with the specifications found in the Forest Plan (Appendices I and O), and standards and goals stated for Management Area 16. Class I and II streams would receive protection beyond the requirements of the Forest Practices Act under either action alternative. The action alternatives were not designed to move all streams toward meeting Riparian Management Objectives. The project was designed to avoid entry into riparian corridors.

Inland Native Fish Strategy: Specified riparian management goals and objectives have been developed, and Riparian Habitat Conservation Areas are defined and delineated. Riparian management and Riparian Management Objectives (RMO's) are addressed using site-specific analysis and supportive data and watershed

analyses. Specific features (standards and guidelines) have been incorporated into the action alternatives as described in Chapter II (Features Designed to Protect Aquatic Resources). Based on the conditions and design features described, all action alternatives would be consistent with the Forest Plan as amended by the Inland Native Fish Strategy.

No new projects would be implemented under Alternative 1, therefore application of the Inland Native Fish Strategy standards and guidelines would not be required.

Under any action alternative there is proposed stand treatment which would be initiated by the harvesting of the timber resource. Standards and guidelines from Inland Native Fish Strategy were used specifically to protect water and aquatic biota within the project areas. Standard widths for defining interim Riparian Habitat Conservation Areas were utilized, without site-specific modifications. The road management standards and guidelines were applied only to roads used or affected by the proposed project. The Road Management Objectives were applied only within the project area boundary, and only on those roads used for the harvesting or hauling of timber.

National Forest Management Act: The National Forest Management Act requires the Forest Service to maintain the viability and habitat for native and desirable non-native species. The environmental consequences discussion in this "Fisheries" section of Chapter III discussed each alternative and the effects of the activities on viability of fish populations within the project area. The effects of the alternatives would be no change in habitat or populations. With the ongoing and foreseeable activities, the current conditions for species viability would be maintained or enhanced. This would occur by having no changes in stream temperature, dissolved oxygen, aquatic habitat diversity, cover complexity, and channel stability, with possible increases in habitat diversity, cover complexity, and channel stability where long-term reductions in risk would occur.

Endangered Species Act, Section 7: Within Section 7, federal agencies are required to carry out programs to conserve endangered and threatened species. Consultation is required to ensure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The effects of the alternatives would be no change in habitat or populations. With ongoing and foreseeable activities, this is likely to result in a long term reduction in risk of past management actions to populations and habitat. Documentation of these effects to Threatened and Endangered fish species is provided in the effects analysis and tables in the "Fisheries" section of Chapter III. These tables display the determination of effects. A biological assessment will be prepared for all endangered and threatened species (Project Files, "Biological Assessment and Evaluations").

Recreational Fishing (Executive Order 12962, 1995): The Recreational Fishing Act identifies objectives to improve the quantity, function, sustainable productivity, and distribution of federal actions on aquatic systems and recreational fisheries, and document those effects. Information on the effects to fish species are discussed in the effects analysis in the "Fisheries" section of Chapter III. The analysis discusses both habitat and populations. As populations and habitat are affected, either negatively or positively, the recreational fishing should respond similarly.

3.6. WILDLIFE

3.6.1. Regulatory Framework

The regulatory framework providing direction for the protection and management of wildlife habitat comes from the following principle sources:

- *Endangered Species Act of 1973 as amended (ESA),*
- *National Forest Management Act of 1976 (NFMA), and*
- *Forest Plan for the Idaho Panhandle National Forests*

Section 7 of the Endangered Species Act directs Federal agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any Threatened or Endangered species or result in the destruction or adverse modification of their critical habitat.

NFMA provides for balanced consideration of all resources. It requires the Forest Service to plan for diversity of plant and animal communities. Under its regulations the Forest Service is to maintain viable populations of existing and desired species, and to maintain and improve habitat of Management Indicator Species.

The Forest Plan, in compliance with NFMA, establishes Forest-wide management direction, goals, objectives, standards and guidelines for the management and protection of wildlife habitat and species, including old-growth habitat, Management Indicator Species, Sensitive species, and Threatened and Endangered species.

This analysis is tiered to the following documents, which provide the primary direction and methods used to develop the analysis for potential effects on wildlife.

- *Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin*
- *Toward an Ecosystem Approach: An Assessment of the Coeur d'Alene River Basin*
- *IPNF Forest Plan*
- *Available Conservation Assessments and Strategies for wildlife species*
- *Douglas-fir Beetle Project Final EIS*
- *Additional scientific literature as appropriate*

On January 10, 2001, President Clinton signed an Executive Order describing the Responsibilities of Federal Agencies to Protect Migratory Birds, directing executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act. Section 3 of the Order states, "Each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the Fish and Wildlife Service (Service) that shall promote the conservation of migratory bird populations." Item e-6 directs that each agency shall "ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern."

The analysis of effects to wildlife in the Hither and Yon Project Areas evaluated effects of the proposed activities on neotropical (migratory) birds, as disclosed in Appendix A (Issues Not Discussed in Detail in this EA). As more information and direction related to this Executive Order becomes available, the analysis and documentation related to the Hither and Yon Beetle project will be reviewed to determine whether a correction, supplement, or revision to the EA is necessary, in compliance with Forest Service Handbook 1909.15 (Chapter 18).

3.6.2. Methodology

A. Species Relevancy Screen

Some elements of wildlife habitat require a detailed analysis and discussion to determine potential effects on a particular species. Other elements may not be impacted; be impacted at a level which does not influence use, occurrence or the decision to be made; or can be adequately addressed through design of the project. These elements do not necessarily require in-depth analysis.

The level of analysis is dependent on a number of variables, including but not limited to the existing condition, the cause and effect relationship, the magnitude or intensity of effects, the contrast in effects between alternatives, the risks to resources, and the information necessary for an informed decision. The analysis is commensurate with the importance of the impact (CEQ 1502.15), the risk associated with the project, the species involved, and the level of knowledge already in hand (USDA Forest Service, 1992, pg 1-19).

Threatened, Endangered and Sensitive species (including Proposed Sensitive species) and other Management Indicator Species that are known to occur on the IPNF were screened for their relevancy to the Hither and Yon project areas by reviewing sighting records, planning documents and other sources, such as scientific literature. Relevancy was 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 actions. Species relevancy for this project is specific to the Coeur d'Alene drainage and the conditions/situation which exists in the project area.

Some habitat and species may occur within the Coeur d'Alene River drainage but may not be applicable to these project areas. A course filter screen was applied at the Coeur d'Alene River drainage level and then a finer filter screen was used to assess species relevancy at the project area level.

No further discussion or analysis is necessary for those species or suitable habitat that are not found within the project area. Additional rationale is provided in Appendix A ("Issues Not Addressed in Detail") and the Project File ("Wildlife") for those species dismissed from further discussion.

Some wildlife species or their habitat are found to be present in the project areas, but not measurably affected because they would not be impacted by the proposed actions, the impacts would be at a level which would not influence their use or occurrence, or their needs can be adequately addressed through the design of the project. Species determined to be not measurably affected are not discussed and analyzed. NEPA directs the agency to focus on a full and fair discussion of significant issues, and identify and eliminate from detailed study the issues which are not significant. Supporting rationale is provided in Appendix A ("Issues Not Addressed in Detail") and the Project Files ("Wildlife") for these species.

B. Methodology Used to Determine Reference and Existing Conditions

This section includes a brief discussion of the species habitat preferences and requirements based on scientific literature, information from the Geographic Assessment and site-specific information for the analysis area. The indicators used to display potential effects on the species are developed based on this information.

An important concept in the existing condition descriptions and analysis is the difference between capable and suitable habitat. The following definitions are helpful in distinguishing between these two terms and the concepts upon which they are based.

Capable habitat refers to the inherent potential of a site to produce essential habitat requirements of a species. The vegetation on the site may not be currently suitable for a given species because of variable stand attributes, such as inappropriate seral stage, cover type, or stand density.

Suitable habitat is that which currently has both the fixed and variable stand attributes for a given species' habitat requirements. Variable attributes change over time and may include seral stage, cover type, stand density, tree size, stand age, or stand condition.

C. Methodology Used in the Effects Analysis

The acres of the three project areas are combined for the wildlife analysis, although specific changes are discussed by project area. The analysis considered direct, indirect, and cumulative effects. Refer to Chapter 2 for a list of foreseeable and ongoing projects. It is the intent of this analysis that the information base reflect changes in habitat conditions (such as stand structure), resulting from past, present and reasonably foreseeable actions. Therefore, the analyses of species are a cumulative representation of these actions.

USDA Forest Service policy (Forest Service Manual 2670.32) requires a documented review or Biological Assessment of Forest Service programs or activities in sufficient detail to determine how an action may affect Threatened, Endangered, Proposed, or Sensitive species. Consultation with U.S. Fish & Wildlife Service is mandatory if the Biological Assessment concludes that a proposed action may have an effect on federally listed species or habitat. The documentation of effects and rationale for conclusions for Sensitive species are consolidated into the main text of the EA and Project Files ("Wildlife").

Based on habitat relationships, appropriate indicators of habitat with a potential to be impacted by the proposed action will be measured. Those indicators are displayed in the following table. Queries of the timber stand data base (TSMRS) were developed to identify capable and suitable habitat within each wildlife analysis area. The changes in habitat for each relevant species will be disclosed and a discussion of the effects on species will be displayed. Potential effects on relevant species will be organized and displayed.

Table 3-19. Management indicators for analyzed wildlife species.

Species	Indicator
Sensitive Black-backed woodpeckers Fisher Northern goshawk	• changes to suitable habitat. • alteration of suitable denning habitat and security • alteration of suitable nesting habitat and disturbance.
Management Indicator Elk	• changes to potential elk use (Elk Habitat Potential)

For each species analyzed in this chapter, the cumulative effects area initially looked at the project area scale. If there were no or minimal effects to the species within the project area boundary, then there was no need to expand to a larger cumulative effects analysis level since this project would not add to or subtract from the existing cumulative effect. If necessary, the cumulative effects boundaries were moved to a larger scale based on the species' or guilds' relative home range size in relation to its available habitat, topographic features (watershed boundaries) which relate to how species move and utilize their home range, and boundaries that represent the furthest extent of effects. Maps depicting wildlife habitat by species are in the Project Files ("Wildlife").

Potential wildlife habitat on other ownership within the project area drainages is generally in a modified or altered state. Though some forested habitat may be provided, it is thought to be of low quality due to past

development or harvest. It is anticipated that other ownership in the area will be maintained in this modified state and will in general not provide suitable forested habitat for most Threatened and Endangered or Sensitive species.

This analysis is tiered to the following documents, which provide the primary direction and methods used to develop the analysis for potential effects on wildlife.

- *Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin*
- *Toward an Ecosystem Approach: An Assessment of the Coeur d'Alene River Basin*
- *IPNF Forest Plan*
- *Available Conservation Assessments and Strategies for wildlife species*
- *Douglas-fir Beetle Project Final EIS*
- *Additional scientific literature as appropriate*

3.6.3. Affected Environment

A. Introduction

Wildlife populations and habitats do not stay constant over time. Habitat changes result in population increases or decreases, depending on the species. Wildfires, fires set by Native Americans, and insect and disease outbreaks were the primary disturbances and natural processes affecting habitats in the assessment area.

Low intensity, frequent fires maintained open understories in ponderosa pine and dryer Douglas-fir habitats. Western white pine, white bark pine, ponderosa pine and western larch forests were more abundant than today, especially those in an old-growth condition. Historically, these trees provided important habitat for birds, bats, bears and other wildlife that use large snags and logs.

B. Old and Mature Forest

Many wildlife species occurring on the Idaho Panhandle National Forests prefer or only occur in mature and old growth forests. Mature and old forests are more likely than younger forests to provide habitat for species which prefer large trees, structural and biological diversity, and closed canopies, and/or which depend on snags or down logs for nesting, foraging or raising their young. Existing structurally immature stands could provide old-growth habitat over time if not disturbed or if managed to maintain large, old, diseased and dead structural components of the forest within the levels needed to provide suitable habitat. Mature forest structure currently makes up approximately 45% of the stand structure within the project areas (please refer to the Forest Vegetation section of this chapter). This project could potentially affect 127 acres of mature forest structure with harvest treatment, although a large portion of this mature forest structure has already been affected by bark beetles and root disease in this case. Ecoburning treatments could also affect another 72 acres of mature forest structure.

Old forest structure has been reduced in amount and patch size across the Coeur d'Alene drainage. Approximately 6% of the basin is currently identified as old forest structure. Historically, there was a range of 10 to 25% old forest structure in the basin. Currently there are 180 acres of stands within the vegetative analysis areas that meet old forest structure (please refer to the Forest Vegetation section of this chapter).

C. Dry Forest Habitats

These habitats have survived through low-intensity ground fires that occurred frequently (every 20 to 35 years). To protect human developments and future timber resources, fires have been suppressed, allowing

smaller shade-tolerant trees to become established under the canopy of the dry site species. This has changed the structure of what was traditionally open-grown forest into dense, multi-canopied forests with more tree species diversity and greatly increased crown-fire hazard.

Some wildlife species prefer open, dry forests with large trees. Flammulated owls, pygmy nuthatches, white-headed woodpeckers, western bluebirds and Lewis' woodpeckers are a few examples. Forests which have developed a dense understory of grand fir or other shade-tolerant conifers are no longer suitable for these birds. Some species, including goshawk and flammulated owls, prefer gentle slopes more than steeper dry sites. Approximately 13% of the project areas contain what are considered dry forest types. Most of the dry habitats in the areas tend to closer to the warm/moist side of the scale. This project would potentially affect 53 acres of this forest habitat type with harvest and fuels reduction treatments. Ecoburning treatments would generally be outside of dry forest types.

D. Snags and Dead Down Woody Habitat

Over 40 wildlife species depend on snags (dead trees) for their forage, cover or a place to raise their young. Sensitive species which nest in snags include flammulated owls, black-backed woodpeckers and boreal owls. Black-backed woodpeckers also feed on insects in snags. Snags provide den sites for fishers and other mammals, and roosts for several species of bats and owls. Not all species of snags are used by all snag-dependent wildlife species; some tree species appear to be more important than others. Large-diameter snags provide habitat for the greatest variety of cavity users and remain standing longer than smaller snags. Ponderosa pine and larch tend to last longer than other species. Many birds which nest in snags promote forest health by controlling forest insect pests.

The amount of snags and down woody material present has been identified as a measure of forestland integrity (Quigley et. al. 1996). Many wildlife species depend on dead trees for nesting, roosting, denning, foraging, resting, or shelter. These include primary cavity nesters (woodpeckers and nuthatches), which have the ability to excavate cavities in snags; and secondary cavity users (many species of birds and mammals), which use existing cavities for nesting, denning or shelter. Providing numbers of snags that have been shown to support viable populations is a prudent approach to managing for viable/sustainable populations of woodpeckers and other species which use snags and logs. Recent studies indicate that viable woodpecker populations occurred in areas with about four snags per acre (Bull et al. 1997). Research also recommends managing snags in every 5 to 25-acre patch (Bate, 1995; Evans and Martens, 1995). The Northern Region Snag Management Protocol (2000) recommends leaving 2-4 large snags with a total of 6-12 snags per acre on moist habitat types. Recommended snag numbers are lower in drier habitats.

After snags fall and become logs on the forest floor, they are still important to many wildlife species. They provide travel corridors and cover for rodents and other mammals, reptiles and amphibians. Hollow logs are used as den sites by many species. Lynx, boreal toad, marten, turkey and snowshoe hare are a few of the species that favor habitats with an abundance of down logs.

In addition to snags, living trees with decay, hollow trees and broomed trees are important to many wildlife species and are an integral part of the natural processes and functions of forested ecosystems.

Timber harvesting and firewood gathering are common activities in the forest. Forest management typically selectively harvests the dying, diseased and dead trees for timber harvest, so most stands have fewer snags and dying or diseased trees after a timber sale. Snags are often felled during forest management activities because they pose a safety threat to forest workers.

Salvage logging after fires also removes snags from the landscape. Salvage logging targets recently-killed trees which have not had sufficient time to develop the decayed condition which is preferred by many snag-dependent species. Snags and down logs are used by many people who cut firewood, and corridors along open

roads often have few snags. Once large snags are removed, it may be 100 years before a regenerated stand can grow new trees and produce snags large enough to meet the needs of most snag-dependent wildlife species.

Wildlife in the IPNF lived with periodic outbreaks of a variety of insects and diseases. The outbreak of Douglas-fir beetle and tree mortality provides the opportunity to recognize and retain habitat components that support a host of wildlife species. It is intuitive that species associated with old growth and snags are probably less abundant than historically. With that in mind, the beetle outbreak can be viewed as an important change that could benefit many forest wildlife species and at the same time adversely affect other habitat components for some species (e.g. percent canopy cover).

Please refer to PNW-GTR-391, Bull, 1997 and the Northern Region Snag Management Protocol (2000) for more background and general management recommendations regarding snag-dependent species.

E. Security

Prior to European settlement, local inhabitants lived and traveled mainly in the major river bottomlands. Human developments and disturbance outside these bottomlands were minimal. Historically, all of the national forest was considered security for wildlife dependent upon it and animals moved freely across the landscape.

Recreation, mining, and timber management have all led to an increase in the number of roads which provide access for humans and impact security for wildlife.

F. Populations

Species which are associated with mature/old forest structure, snags, or that are sensitive to human disturbance, such as many Threatened, Endangered, and Sensitive species, were likely more abundant historically across the Idaho Panhandle and the Coeur d'Alene River drainage. The gray wolf, bald eagle and Canada lynx are Threatened and Endangered wildlife species which may occur within the Coeur d'Alene River drainage. These species, except the bald eagle which is recovering, have decreased in population and distribution and occur in only portions of their former ranges on the IPNF; occurrence in the Coeur d'Alene River drainage is limited.

Human developments, habitat loss, fragmentation and disturbance have affected Threatened, Endangered and Sensitive species; hunted, trapped and wide-ranging species; and species associated with habitats outside the historical range of variability. As roads were built for mining and logging, previously secure habitats were opened to motorized traffic and other disturbances, leading to displacement of wildlife (from otherwise suitable habitat) and increased mortalities. Forest management has altered the amount and distribution of structural stages resulting in changes in the amount and distribution of suitable habitat and the populations of species which require or occur in these habitats.

Some populations are artificially controlled by humans. Idaho Fish and Game has transplanted elk, woodland caribou and mountain goats to augment low populations and increase distribution. Unlike carnivores, big-game species such as deer, elk and moose are more abundant now than historically, due in large part to continued creation of early succession foraging habitats through timber harvests, and Fish and Game's population management objectives.

3.6.4. Black-backed Woodpecker

A. Introduction

Black-backed woodpecker is a Sensitive species found within insect infested forests of North America, Cascade Mountains, and northern portions of the Sierra Nevada and Rocky Mountains (Washington Department of Wildlife 1991). The black-backed woodpecker has been sighted during their breeding season on the Coeur d'Alene Mountains.

Black-backed woodpeckers have been found in Washington in scattered locations throughout the state. Heaviest concentrations seem to be east of the Cascade crest. Their distribution in Idaho is unknown. They forage for insects in the bark of live trees such as lodgepole pine and larch; however, they may prefer to forage on burned snags. They forage in various levels of the canopy, and have been seen foraging from ground level to 60 feet high or more (Jewett, et al. 1953). It is possible that the species inhabits the project areas. Root disease has probably resulted in endemic levels of insect infestations that provide foraging opportunities for the black-backed woodpecker. Larch and lodgepole pine stands, which are a preferred breeding area, are present in the Grassy Mountain and Dobson Pass project areas.

B. Reference Condition

No accurate estimates or records exist for historic populations within the project areas. It would be reasonable to infer the numbers of woodpeckers were greater than what occurs currently. Fire likely played a significant role in providing habitat. Fires not only would have provided a food source, since it is believed black-backs prefer burned snags, but would also would have provided conditions for the establishment of seral species cover types that are preferred by the black-backed woodpecker. Fire-scorched trees across the landscape are at lower numbers than historic levels.

C. Existing Condition

Exclusion of fire has resulted in a loss of conditions that were preferred by black-backed woodpeckers, not only in food sources but in preferred cover types as well. Changes in forest structure as a result of past logging practices have also reduced habitat components within the project areas.

D. Environmental Consequences

Effects Common to All Action Alternatives

The project includes design criteria intended to maintain a minimum number of snags distributed across the harvest units. These guidelines would retain snags in addition to the tremendous number of snags that are being created by the Douglas-fir bark beetle across the Coeur d'Alene Basin, north Idaho and northeastern Washington. Snag recruitment outside of the beetle activity area, such as from root disease and snow/ice damage, is primarily in the smaller size classes of snags, which are used more by black-backed woodpeckers than some other snag-dependent species dependent on larger snags (see pileated woodpecker discussion in Appendix A – Issues Not Discussed in Detail). For these reasons, the project would contain design criteria and mitigation measures to adequately protect and maintain appropriate habitat for black-backed woodpeckers.

Aerial detection flights in 1998 showed 2730 acres on the Coeur d'Alene River District affected by beetle mortality. Aerial detection flights in 1999 showed 63,100 acres affected. Flights in 2000 showed 62,800 acres affected by beetle mortality. Some of these acres likely overlap as they are based on locations where red trees are present. The Douglas-fir Beetle EIS has implemented salvage operations on approximately 5000 acres. The Small Sales EIS proposed to treat about 1,100 acres. There have been several other beetle salvage harvest

proposals in 2001 each to harvest approximately 50 acres. The Hither and Yon Beetle project proposes to treat an additional 121 beetle-affected acres. This salvage effort is small is scope compared to the amount of snags that are being created. This also does not take into account that some of the beetle-affected acres proposed for treatment under this proposal, may not have been included in the aerial detection flights, (i.e. they are the result of year 2000 mortality after the aerial flight was made).

Maintenance of snags within the harvest units, in addition to the many untreated beetle-affected acres within and adjacent to the project areas, would avoid long-term impacts to the black-backed woodpecker. Unit 7 in the Dobson Pass project area was dropped from consideration due to evidence of considerable woodpecker activity on dead trees within this area. There may be impacts to individual black-backed woodpeckers because harvest activities would reduce some of the habitat available for potential population increases that may occur due to the Douglas-fir beetle infestation. Under all alternatives, there would be an increase in habitat compared to if the beetle outbreak had never occurred. Therefore, the action alternatives may impact individuals but would not trend the species towards listing.

Direct and Indirect Effects

Alternative 1: The effects of the Douglas-fir bark beetle outbreak is an increase in feeding and nesting opportunities for the black-backed woodpecker within the project areas. This created habitat is not optimal in terms of cover types and feeding sources but would be expected to be utilized. Concentrations of dead trees would likely also be preferred, as it would increase the feeding opportunities without having to fly as far from nesting areas. This species is thought to be quite timid so it is not certain how much use would potentially occur near areas of frequent motorized vehicle traffic along open roads. Some of the older regeneration harvests in the project areas did not provide for residual snag habitats or replacement snag trees so retention of the habitat created by the beetle mortality would be preferred for increasing black-back populations in the areas.

Alternative 2: Under Alternative 2 there would be a reduction in snag habitat with the salvage and regeneration harvest of 121 of the 512 beetle-affected acres in the project areas. Treatments would generally occur where the snag densities are the highest. Treatment areas would retain 2-4 of the largest snags on the sites to maintain part of the larger snag habitat component created by the bark beetles. Some smaller snags would also be retained for a total of 6-12 snags per acre.

The majority of the proposed regeneration units are designed to be group shelterwood harvests leaving most of the larger green component on site. It is believed that the group shelterwood units would still provide suitable habitat since this species does use open areas and would still have groups of green trees available for hiding cover from some predators. The site preparation burning of these units may provide some fire-scorched trees after treatment, which may be beneficial since this species seems to key into burned timber. Bole-scorched trees should remain on the landscape after treatment. Over the long-term, the regeneration of these units to pines and larch habitats would provide more habitat that is preferred for feeding and nesting than is currently available in the project area.

Commercial thinning of western larch stands in the Dobson Pass project area would be beneficial to the long-term maintenance of larch in the area. This would help maintain preferred breeding habitat for black-backs over the long-term. Removal of scattered “bumper” trees along the #260 road is not expected to affect black-backed woodpeckers or habitat.

Alternative 3 and 4: Under these alternatives, there would be the same reduction in snag habitat as described for alternative 2. Harvest treatments and fuels reduction within the units would be identical. However, under these alternatives, ecoburning activities would occur adjacent to some of the harvest units in the Grizzly Mountain area. Under alternative 3, 72 acres would be ecoburned with understory removal treatments prior to burning operations. Under alternative 4, 34 acres would be ecoburned without harvest treatments prior to burning. Ecoburning would be seen as beneficial for black-backed woodpeckers as some fire-scorched timber

would provide preferred feeding habitat. Trees bole-scorched by ecoburning operations should be retained on the landscape.

Generally, the more ecoburning the better. However, in this instance, the understory removal treatment in alternative 3 would remove many of the understory trees that would likely be killed by the burning operation. Preferred for black-backs would be alternative 3 without the understory removal treatment. Alternative 4 would likely provide some fire related timber mortality in the smaller size classes but likely less per acre than alternative 3. Alternatives 2 and 4 present a greater risk of escaped fire, which may create even better black-backed habitat but this may not be acceptable due to other resource concerns.

Cumulative Effects

Perhaps the greatest effect on the reduction of black-backed woodpecker habitat has been the exclusion of fire from the ecosystem with aggressive fire suppression. This has resulted in less preferred feeding sources with patches of fire-scorched timber and with less seral species habitat which is preferred as foraging and breeding habitats. Past timber harvests in the project areas have also reduced snag habitats, as old regeneration units often did not leave a snag component or large recruitments for future snag habitat.

The Douglas-fir beetle outbreak has increased the snag component over what existed prior to the outbreak. The proposed treatments would reduce the current snag habitat but not more than the increase in snags provided by the beetle outbreak. Root disease, widely scattered through the project areas, is also providing a continual influx of snag habitat over time. Although expected to be used, snag habitat created by root disease and bark beetles is not thought to be preferred because the snags are not fire charred and root disease snags to not stand for a long period of time.

Some site preparation burning, jackpot burning, and browse burning activities associated with the ongoing active and closed timber sales within upper Tepee and Beaver Creek drainages may provide some short term increase in preferred feeding sources by creating some amount of fire scorched timber. Salvage operations associated with other beetle sales in the Beaver Creek basin will reduce existing snag numbers, however, as previously stated, snag number are still higher than if the outbreak hadn't occurred. Though small in scale, regeneration activities from ongoing and completed timber sales in the drainages, and proposed under this project would be expected to provide more suitable black-backed woodpecker habitat over the long term with the establishment of seral species stands preferred by the species.

The commercial fuelwood gathering projects identified under foreseeable actions and the planned preferred public fuelwood gathering on Road 1564 after sale activities would result in a reduction in snag component along roadways which could reduce some potential habitat. Other projects listed as ongoing and foreseeable activities in Chapter 2 are not expected to affect black-backed woodpeckers.

3.6.5. Fisher

A. Introduction

Fisher are medium-sized mammalian carnivores and are identified as a Sensitive species. They tend to be opportunistic predators, eating anything they can catch. Their major prey tend to be small to medium-sized mammals, birds, and carrion. Fishers are found only within North America and presently occur from southern Canada south into the northwestern states, California and the Great Lake States. Fishers occur most commonly in landscapes dominated by mature to old-forest cover. Within the Pacific states and Rocky Mountains they appear to prefer late-successional coniferous forests in the summer and mid to late-successional forests in winter.

Fishers prefer habitats with high canopy closure (greater than 80 percent) and avoid areas with low canopy closure (less than 50 percent) (Powell, 1982). They also have been known to use riparian areas. In north-central Idaho, grand fir and spruce forests were preferred by fishers (Jones, 1991), in elevations from approximately 3,000 to 5,000 feet. The habitat requirements of fishers are thought to be associated with the physical structure of the forest and associated prey. This structure includes the vertical and horizontal complexity created by a diversity of tree sizes and shapes, light gaps, dead and downed wood and layers of overhead cover. Large-diameter spruce and grand-fir snags and large downed material are used for denning and foraging. Fishers tend to avoid non-forested areas. The home ranges for fishers vary with prey densities. Studies indicate that the average home range for adult males is 40 square kilometers; this is nearly three times that of females, which is 15 square kilometers.

Fishers tend to avoid human presence and generally are more common where there are fewer people and less human disturbance. Fishers are easily trapped. Where populations are low, fisher populations can be jeopardized by the trapping of coyote, fox, bobcat and American marten (Ruggiero et al., 1994). Habitat security in the form of low road density reduces the risk of this mortality because trapping areas are reduced.

B. Reference Condition

No accurate estimates or records exist for historic wildlife populations of fisher or American marten in the analysis area. Hudson Bay trapping records indicate that furbearers, including these two species, were trapped in the area, particularly in the northern portion of the Coeur d'Alenes. Occurrence of fishers have been documented within the last 10 years in the Coeur d'Alene Basin. It would be reasonable to infer the numbers of animals were greater than what occurs currently given the number of records within the last 10 years in the Geographic Assessment area. There are no recorded sightings of fishers within or adjacent to the project areas.

C. Existing Condition

Extensive alteration of forest structure as a result of natural and human-caused disturbances (i.e. reduction in canopy closure, snags, old growth, and down woody material) has altered the habitat value for fisher and marten. Generally, the openings created by human development and timber harvesting have reduced denning habitat value, whereas the increase in canopy cover brought about by fire suppression has expanded denning habitat quality.

D. Environmental Consequences

Effects Common to All Action Alternatives

Analysis of the fisher reflects changes in habitat for the marten, since their habitat needs are similar. Existing open road densities within the Grassy and Grizzly Mountain project areas are quite low. Densities in the Dobson Pass area are moderate, contributing to vulnerability or low security for fisher. All of the action alternatives propose the same road use activity. Road 1564 in Grassy Mountain is currently gated closed. Under the timber sale contract, the gate would be required to be closed at the end of daily activities. It is unlikely that public use would be established during this period since the road would be closed on weekends. Road 1564 does not go through suitable fisher habitat but runs adjacent to a suitable stand towards the end of the roadway. All of the side roads in the Grizzly Mountain area have been barriered, stream crossings pulled, and roadways ripped making them no longer suitable for motorized travel. Road 622 is an open road and Road 6538 down into Grizzly Creek is open during the summer season. Reconstruction of 0.1 mile of roadway to access a helicopter landing is minor in nature and is not located in suitable or capable fisher habitat. Activities within the Dobson Pass area all occur on open roads so no change in road management would occur in that area.

The capable habitat varies in structure and age class. Some of the stands could feasibly provide habitat for the fisher in 25 to 50 years. Other capable stands may have the correct tree species composition, position on the slope, and terrain features, but are very young and it may be over 100 years before they are providing habitat for the fisher.

Direct and Indirect Effects

Alternative 1: The modeling of the existing condition based on the TSMRS database shows 418 acres of suitable fisher habitat and 864 acres of capable fisher habitat within the project areas. Most of the potential fisher habitat falls within the Grassy Mountain project area. Approximately 52 beetle-affect acres are in suitable habitat and 65 acres in capable habitat. Most of the beetle mortality is scattered and not concentrated in patches that would significantly impact habitat in potential fisher areas. Additional mortality associated with the Douglas-fir bark beetle in this area is expected to be minor. None of the beetle mortality in suitable fisher habitat is expected to significantly change the existing stand structure. Approximately 13 acres of capable fisher habitat have concentrated beetle mortality or ice and snow damage which have opened up the stands setting back the period of time before these areas would achieve suitable habitat.

Alternative 2: Under Alternative 2, three acres of modeled fisher suitable habitat and 59 acres of capable habitat would be within treatment areas. The 3 acres of suitable habitat falls within a roadside salvage unit in the Grassy Mountain area. This salvage would occur along the edge of a large contiguous block of suitable habitat. There is scattered beetle mortality beyond which would be reached within the 150 foot roadside salvage zone. This scattered mortality will provide future down wood habitat in areas farther away from the occasional disturbance zone along the roadway. The salvage of timber along the roadway would have a minor affect on the overall fisher habitat. Adequate canopy cover would still be maintained but some of the future down wood habitat component would be removed.

Thirteen of the acres in capable habitat are located within regeneration harvest units. The ice and snow damage in Grassy Mountain Unit 9 and the beetle mortality and root disease in Grizzly Mountain Unit 1 have already reduced overstory canopies to the point that timeframes for these areas becoming suitable habitat has been altered. A large portion of the existing down wood, though not large diameter, and some of the future down habitat would be removed with these treatments. Thirty-one acres of salvage treatments would occur within capable habitat within the project areas, all in the Grassy Mountain area. Salvage treatments would not significantly alter the existing overstory canopy component of these stands. Some future down wood habitat

would be removed but the treatments would not set the timeframes for these areas becoming suitable habitat in the future.

Approximately 15 acres of commercial thinning would occur within modeled capable fisher habitat within the Dobson Pass area. This thinning would promote the retention of main overstory component over the long term and is expected to allow the stand to reach a larger forest structure in a shorter period of time. Some loss of canopy could reduce the potential for use in the short term.

Grassy Mountain Unit 8 would have fallen in suitable fisher habitat. This unit was dropped from consideration due to potential lynx denning habitat.

Alternatives 3 and 4: The effects of the harvest treatments would be the same as described above. Most of the ecoburning activity is outside of suitable or capable fisher habitat. Under Alternative 3, approximately 10 acres of understory removal and ecoburning would occur within capable fisher habitat. This treatment is not expected to set back the timeframe for the area becoming suitable habitat. Burning may improve browse for prey species in the area but some loss of small down wood habitat would occur with this treatment. Overall the effect of the ecoburning treatment is expected to be minor. Ecoburning treatments under alternative 4 would not be within modeled suitable or capable fisher habitat.

Cumulative Effects

Little potential fisher habitat exists within the Grizzly and Dobson Pass project areas. Treatment activities would not alter that. Past harvests in the Grassy Mountain area did result in some loss of suitable fisher habitat. However, there are several large (300 or more acres) contiguous blocks of suitable fisher habitat along the main divide ridge on the eastern boundary. Limited opening of Road 1564 would create some disturbance however the road does not bisect any suitable fisher habitat areas. Opening up Road 1564 to preferred fuelwood gathering for one summer after salvage activities are completed would extend the disturbance period. However, since that activity occurs adjacent to the road and there is very little suitable habitat near the first ¾ length of the roadway, that activity would likely have only minor affects on fishers in the area. The Teratoid Tepee project will need to consider locations of suitable fisher habitat and affects of the Hither and Yon project when planning future vegetative treatments in the Grassy Mountain project area. The Beaver Creek landscape level project will need to consider the limited availability of suitable fisher habitat in the headwaters of Beaver Creek during that assessment. Other ongoing and reasonably foreseeable activities within the project areas have assessed the affects of those projects on fisher habitat and populations. All action alternatives pose a slight risk that individuals may be impacted but would not trend toward listing.

3.6.6. Northern Goshawk

A. Introduction

Goshawks, a Sensitive species, have habitat requirements associated with components and attributes of late successional forests (USDA, 1990). While associated with mature to old growth habitat, they utilize other successional stages. For example, feeding habitat can be found in pole-sized timber stands. Habitat features important to goshawk are those that influence nest site selection and food availability. Large regeneration harvests would reduce nesting (and feeding) values to zero. Reductions in canopy cover (either from stand decline or salvage treatment) would reduce the feeding value.

B. Reference Condition

Historic numbers of goshawks were likely higher than they are today. This would be due to loss of old forest structure and because many of the species they prey upon were likely more numerous due to better habitat

conditions for the prey. There are two recorded sightings of northern goshawk within the Grizzly Creek and Steamboat Creek drainages. These sightings occurred in the early 1980's.

C. Existing Condition

The Geographic Assessment for the Coeur d'Alene River basin indicates a greater proportion of old growth was present in the Coeur d' Alene Mountains than currently occurs. Old growth is important for northern goshawks not only for prey species habitat but also for the large trees that provide the substrate for their substantial nest structures.

Another factor influencing the amount of goshawk habitat is the amount of understory vegetation that an area produces. Because northern goshawks require a combination of adequate understory to provide prey species, and adequate clearance for flight maneuverability, some stands that historically were suitable for foraging are no longer suitable because of increased density of understory.

The project areas contain approximately 213 acres of modeled suitable habitat (all in the Grassy Mountain area) and 619 acres of modeled capable goshawk habitat. Goshawks generally prefer moderately dense mature forest structure on gradual terrain. Suitable goshawk habitat is quite similar to what is modeled as suitable fisher habitat.

Generally, because northern goshawks require a high level of canopy closure, a reduction to below 50% canopy cover would remove stands from nesting suitability. Stands with interspersed standing live trees, would however still function as foraging habitat. Those stands in which canopy closure remained above 50% would remain suitable nesting and foraging habitat (USDA Forest Service, 1990).

D. Environmental Consequences

Direct and Indirect Effects

Alternative 1: The Douglas-fir bark beetle affected approximately 512 acres in the project area. Of these, approximately 52 acres are in suitable habitat and 45 acres in capable habitat. Most of the beetle mortality is scattered and not concentrated in patches that would significantly impact habitat in potential goshawk areas. None of the suitable or capable stands have concentrated beetle mortality or root disease losses which would either eliminate suitable nesting habitat or set back the timeframes from becoming suitable nesting habitat.

Alternative 2: Under Alternative 2, 3 acres of modeled goshawk suitable habitat and 39 acres of capable habitat would be within treatment areas. The 3 acres of suitable habitat is associated with a roadside salvage unit within the Grassy Mountain area. These 3 acres are along an edge of a larger suitable habitat stand. The salvage of the beetle-killed trees would still maintain over 50 percent canopy closure on the site so the salvage operation would not change this area from being considered suitable habitat. Salvage would however reduce some of the standing dead and future down wood component that is an important component for the prey base of the goshawk. There is scattered beetle mortality beyond which would be reached within the 150 foot roadside salvage zone. This scattered mortality will provide future down wood habitat in areas farther away from the occasional disturbance zone along the roadway. The salvage of timber along the roadway would have a minor affect on the overall goshawk habitat. To minimize the risk of disturbance to an active nest in the area, goshawk surveys would be conducted in this area prior to implementation. Surveys would follow Southwest Regional Protocols. If an active nest were discovered, then the features (Features Designed to Protect Wildlife Habitat – Chapter 2) would be implemented.

Twenty-four acres of salvage treatments would occur within capable habitat within the project areas, all in the Grassy Mountain area. Salvage treatments would not significantly alter the existing overstory canopy

component of these stands. Some future down wood habitat would be removed but the treatments would not set the timeframes for these areas becoming suitable habitat in the future.

Approximately 15 acres of commercial thinning would occur within modeled capable goshawk habitat within the Dobson Pass area. This thinning would promote the retention of main overstory component over the long term and is expected to allow the stand to reach a larger forest structure in a shorter period of time. Large forest structure is preferred habitat for goshawks.

The small, scattered, group shelterwood treatments proposed in the Grizzly Mountain area may provide scattered forage areas next to potential nesting habitats. This could create considerable edge effect usage. However, lack of suitable terrain features would likely limit goshawk usage.

Grassy Mountain Unit 8 falls in suitable goshawk habitat. This unit was dropped from consideration due to potential lynx denning habitat.

Alternatives 3 and 4: The effects of the harvest treatments would be the same as described above. None of the ecoburning activity in the Grizzly Mountain area would occur within modeled suitable or capable goshawk habitat. Ecoburning treatments are not expected to alter the canopy composition of the stands to where they would not be considered as usable by the northern goshawk.

Cumulative Effects

Like fisher, little potential goshawk habitat exists within the Grizzly and Dobson Pass project areas. Treatment activities would not alter that. Past harvests in the Grassy Mountain area did result in some loss of suitable goshawk habitat. Limited opening of Road 1564 would create some disturbance however the road does not bisect any suitable goshawk habitat areas. Opening up Road 1564 to preferred fuelwood gathering for one summer after salvage activities are completed would extend the disturbance period. The fuelwood gathering operation would not be permitted if goshawk surveys indicate an active nest in the area. The Teratoid Tepee project will need to consider locations of suitable goshawk habitat and affects of the Hither and Yon project when planning future vegetative treatments in the Grassy Mountain project area. The Beaver Creek landscape level project will need to consider the limited availability of suitable goshawk habitat in the headwaters of Beaver Creek during that assessment. Other ongoing and reasonably foreseeable activities within the project areas have assessed the affects of those projects on goshawk habitat and populations.

The timber sale contract for this proposal would include the feature designed to protect goshawk habitat listed in Chapter 2, whether surveys in the Grassy Mountain area indicate the presence of an active goshawk nest or not. These mitigation measures, in conjunction with the small scale and duration of the project and the survey of modeled suitable habitat prior to implementation, are expected to result in no effect to northern goshawk populations.

3.6.7. Elk

A. Introduction

White-tailed deer, moose and elk inhabit the analysis areas. Elk are the primary big game species using the area. Since elk are the Management Indicator Species for big game on the Central and Southern portion of the IPNF (Forest Plan, Appendix L, p. 5), the analysis for big game will focus on elk. Consequently, white-tailed deer can adequately be represented by discussions on elk. The IPNF Forest Plan does not emphasize moose on the central and southern portion of the Forest.

B. Methodology

Elk habitat potential was calculated using the "Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho," (Leege, et al. 1984). "Elk habitat potential" represents the percentage of the maximum potential habitat (100 percent) that is provided to the animal. The elk model uses habitat data to predict the ability of an area to support elk populations. The factors that are used in this model include cover-forage ratios, thermal cover, summer and winter range acres, open roads, gated roads, obliterated and barriered roads, security acres, and cumulative effects of adjacent timber sale and road building activity.

Elk Habitat Units are made up of several timber stand compartments and encompass large areas. Compartments typically follow drainage boundaries. Most of the Grassy Mountain project area lies within Elk Habitat Unit (EHU) 3. EHU 3 encompasses 3,576 acres and includes stand compartments 321, 323, 324, 338, and 356. The “bumper tree” removal along the #260 road would occur within EHU 4. EHU 4 encompasses 6,329 acres and includes stand compartments 306, 314, 319, and 320. The Grizzly Mountain project area lies within Wallace EHU 7. EHU 7 encompasses 11,399 acres and includes stand compartments 125, 138, 139, 140, 141, 179, 182, and 183. The Dobson Pass project area lies with Wallace EHU 5. EHU 5 encompasses 4,182 acres and includes stand compartments 111, 112, 113, 185, 186, 187, 188, 189, 190, and 191.

B. Reference Condition

Elk are now present in greater numbers than were present historically, partially due to reintroductions in the early 1900’s (Idaho Fish and Game, 1997).

C. Existing Condition

Elk are a species of social concern for management because they are regularly hunted on the Forest. Management for elk involves providing for thermal and hiding cover, and secure areas greater or equal to 250 acres in size. Existing elk habitat potential is described in further detail in the “Environmental Consequences” discussion.

D. Environmental Consequences

Direct, indirect, and cumulative effects during and after post sale activities

Effects common to all action alternatives: There is a loss of security in the Grassy Mountain project area under the action alternatives with use on Road 1564. The disturbance period would be short term but would be extended by the removal of wood for instream use, by site preparation and planting. The EHU associated with this project area would still maintain a large security area even with activities associated with this project. Any preferred fuelwood gathering should occur during the post-sale activity period and should avoid opening during center-fire rifle season. There would be no change in road densities or road use in the Dobson Pass area. Changes in the Grizzly Mountain area would be very minor with only 0.1 miles of reconstruction and opening of a roadway along a ridgeline. Opening this road would not allow for use beyond the helicopter landing location, since the roadway has been ripped and is no longer drivable. The purchaser would re-establish the earth barrier closure after use. Changes in cover/forage ratios would be very similar to the no action alternative over most of the treatment areas since canopy changes would be similar to what has already occurred from beetle and root disease mortality and ice/snow damage.

Most of the Grassy Mountain project area lies within Elk Habitat Unit (EHU) 3. The Forest Plan goal for elk habitat potential in this EHU is 72 percent. The current level, under the existing condition, is 76 percent. During sale activities the potential would drop to 74 percent (Project Files –Wildlife). This drop is associated with the use of Road 1564, which is currently closed with a gate. After activities are completed the potential would return to 76 percent. Changes in cover/forage ratios are minimal with the proposed activities. The

"bumper tree" removal along Road 260 would occur within EHU 4. The Forest Plan goal for elk habitat potential in this EHU is 35. The current level, under the existing condition, is 31 percent. There would be no change in elk habitat potential with this light treatment activity along this existing open road (Project Files – Wildlife).

Consideration was given to prohibiting use on Road 1564, in the Grassy Mountain area, during center-fire rifle season. This would be preferred for elk security. However, due to the salvage nature of this material and the length of time it will take to get approval for implementation, fall operations are likely needed to remove this material in a timely fashion. Removal of wood for use in instream projects can be delayed until the following season. The gate would be closed at the end of daily activities so security would still be maintained in the evenings and over the weekends. On option to consider would be to require the purchaser to close the gate with passage of each vehicle during center-fire rifle season and not permit the purchaser to carry firearms. The drawback to this option would be the perception by the public that the purchaser has vehicle access to hunting areas that they do not and the disturbance to hunters thinking that the area is a non-motorized hunting opportunity. Harvesting activities associated with the Hither and Yon Beetle project are expected to be completed prior to the implementation of the Teratoid Tepee EIS.

The Grizzly Mountain project area lies within Wallace Elk Habitat Unit (EHU) 7. The Forest Plan goal for elk habitat potential in this EHU is 33 percent. The current level, under the existing condition, is 55 percent. During sale activities the potential would remain at 55 percent (Project Files –Wildlife). Changes in cover/forage ratios are minimal and would be very similar to what has occurred as a result of bark beetle and root disease mortality. There is no change in the elk potential under alternative 3 or 4 either as road use remains the same and canopy changes are not significant enough to affect the model.

The Dobson Pass project area lies within Wallace Elk Habitat Unit (EHU) 5. The Forest Plan goal for elk habitat potential in this EHU is 55 percent. The current level, under the existing condition, is 48 percent. During sale activities the potential would remain at 48 percent (Project Files –Wildlife). Changes in cover/forage ratios are not significant enough to result in changes to elk habitat potential. There will be no change to current road use within the Dobson Pass project area.

Most of the Small Sales EIS (East Side and Unknown King) harvest activities lower in the Beaver Creek drainage will likely be completed prior to implementation of this project, however there could be some overlap. Commercial firewood projects would be likely to be occurring during this period. Activities associated with the Missouri Heli Bug project, down near the mouth of Beaver Creek, will likely run concurrent to the Hither and Yon project. This was taken into account during modeling of elk potential. Harvest activities would be completed on the Hither and Yon project prior to implementation of the Beaver Creek EIS.

Alternative 1: Under Alternative 1, there will be some loss of thermal cover due to the Douglas fir beetle mortality and openings created by ice and snow damage. Increases in canopy openings would provide forage over time rather than cover. This would have a minor effect on elk, and would not be measurable enough to cause the elk habitat potential to change. There would be no loss of security beyond the existing condition. Cumulatively, there would be no change from the existing elk habitat potential.

Alternative 2: Under Alternative 2, there would be a loss of some hiding and thermal cover beyond the damage already done by bark beetles, ice and snow damage, and root disease. Removal of dead trees that do provide some hiding cover would occur. Thermal cover would be reduced, to a minor extent, beyond what occurred as a result of bark beetles in the regeneration units. This would occur with the removal of smaller diameter green trees that are not expected to survive prescribed fire treatments. There would also be some loss of hiding cover associated with the loss of advanced regeneration in the root disease portions of the regeneration units. The site preparation burning of the regeneration units should provide preferred foraging habitat. The loss of hiding cover along open roads could result in an increase hunter take, however many of

the regeneration units are not immediately adjacent to open roads. Commercial thinning and improvement harvest would reduce some of the understory hiding cover within these stands.

Alternatives 3 and 4: Harvest and fuels reduction treatment would remain the same as Alternative 2. Under these alternatives, ecoburning would occur in the Grizzly Mountain area. Ecoburning would reduce hiding cover by consuming much of the brush and scattered regeneration on the sites. Understory removal treatments would also reduce hiding cover to some extent. Thermal cover should remain similar to the existing condition after the beetles although some reduction would occur with loss of understory either through harvest or fire mortality. Burning operations should provide preferred foraging habitat for big-game species in the area. Disturbance from harvest activities would increase by 7-10 days under Alternative 3.

3.6.8. Consistency With Forest Policy and Legal Mandates

Forest Plan standards (Forest Plan, Chapter II, pages II-26 through II-29; Project Files, "Wildlife"), in compliance with NFMA, were incorporated into all alternatives. These standards addressed elk and elk goals, threatened and endangered species, sensitive species and old growth management. Elk habitat potential analysis was consistent with the "Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho" as specified on page II-27 (Item 1c) of the Forest Plan.

All alternatives would be consistent with Forest Plan management direction, goals, objectives, standards and guidelines for the management and protection of wildlife and species.

All of the alternatives would comply with the Endangered Species Act of 1973 as amended (ESA) since no alternative would lead a threatened or endangered species towards extinction.

All alternatives are consistent with the January 10, 2001 Executive Order describing the Responsibilities of Federal Agencies to Protect Migratory Birds. The analysis of effects to wildlife evaluated effects of proposed activities on neotropical landbirds (migratory birds), as disclosed in Appendix A (Issues Not Discussed in Detail in this EA). As more information and direction related to this Executive Order becomes available, the analysis and documentation related to the Hither and Yon project will be reviewed to determine whether a correction, supplement, or revision to the document is necessary, in compliance with Forest Service Handbook 1909.15 (Chapter 18).

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ACRONYMS/GLOSSARY

CCF	Cunit (hundred cubic feet)*
CFR	Code of Federal Regulations*
ECA	Equivalent Clearcut Acres
FSH	Forest Service Handbook
INFS	Inland Native Fish Strategy
KV	Knutson-Vandenberg Act of 1924
MA	Management Area*
MBF	Thousand Board Foot
MMBF	Million Board Foot
NEPA	National Environmental Policy Act*
NFMA	National Forest Management Act*

* These terms are defined in the Glossary below.

A

Affected Environment. The natural, physical, and human-related environment that is sensitive to changes due to proposed actions.

Air Quality. Refers to standards for various classes of land as designated by the Clean Air Act, P.L. 88-206: Jan. 1978

Airshed. A geographical area that, because of topography, meteorology, and climate, shares the same air.

Allowable Cut. Amount of timber which can be harvested in any given year.

Allowable Sale Quantity (ASQ). The quantity of timber that may be sold on the Idaho Panhandle National Forests from the area of land suitable for timber management, as directed in the Forest Plan.

Alluvial. Materials transported and deposited by water.

B

Background (Visual Distance Zone). That part of a scene, landscape, etc., which is furthest from the viewer, usually three miles to infinity from the observer.

Basal Area. Area of the cross section of a tree stem near the base, generally at breast height and inclusive of bark.

Best Management Practices (BMP). Practices determined by the State to be the most effective and practicable means of preventing or reducing the amount of water pollution generated by non-point sources, to meet water quality goals.

Big Game. Those species of large mammals normally managed as a sport-hunting resource.

Biodiversity or Diversity. The relative distribution and abundance of different plant and animal communities and species within an area.

Board Foot (BF). A unit of measurement equal to an unfinished board one foot square by one inch thick.
Broadcast Burn. See Prescribed Burning.

C

Canopy. More or less continuous cover of branches and foliage formed collectively by the crown of adjacent trees and other woody growth.

Cavity Habitat. Snags, broken-topped live trees and down logs used by wildlife species that excavate and/or occupy cavities in these trees.

Clearcut Harvest. A regeneration method under an even-aged silvicultural system. As suitable seed trees are either non-existent or unprotectable, all trees within a defined area are removed at one time. Reserve trees may be left in the unit.

Climax Vegetation. The culminating stage in plant succession for a given site where the composition of the vegetation has reached a highly stable condition over time and perpetuates itself unless disturbed by outside forces.

Code of Federal Regulations (CFR). The listing of various regulations pertaining to management and administration of the National Forests.

Compartments. A geographic area delineated by a subwatershed drainage for management planning purposes.

Condition Class. A descriptive category of the existing tree vegetation as it relates to size, stocking, and age.

Conifer. Any of a group of needle and cone-bearing evergreen trees.

Council on Environmental Quality (CEQ). An advisory council to the President, established by NEPA. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

Cover. Vegetation used by wildlife for protection from predators, or to adverse weather conditions, or in which to reproduce. The different types are identified as hiding cover, thermal cover, and security areas.

Cover/Forage Ratio. The ratio, in percent, of the amount of area in cover conditions to that in forage conditions.

Cunit (CCF). One hundred cubic feet. A measurement for timber volume.

Cultural or Heritage Resources. The physical remains of human activity (artifacts, ruins, burial mounds, pertroglyphs, etc.) having scientific, prehistoric, or social values.

Cumulative Effect. The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time.

D

Developed Recreation. Recreation dependent on facilities provided to enhance recreation opportunities in concentrated use areas. Examples are ski areas, resorts and campgrounds.
Dispersed Recreation. Recreation that occurs outside of developed recreation sites; requiring few, if any, facilities or other improvements; and includes such activities as hunting, hiking, viewing scenery and cross-country skiing.

E

Ecosystem. The organisms of a particular habitat together with the physical environment in which they live; a dynamic complex of plant and animal communities and their assosicated environment.

Ecosystem management. Using an ecological approach to achieve the multiple-use management of national forests and grasslands by blending the needs of people and environmental values in such a way that national forests and grasslands represent diverse, healthy, productive and sustainable ecosystems.

Edge. Where plant communities meet or where successional stage or vegetation conditions within the plant community come together.

Effects (or impacts). Environmental consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action. Effects may be either direct, which are caused by the action and occur at the same time and place, indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable, or cumulative.

Endangered Species. Any plant or animal species which is in danger of extinction throughout all or a significant portion of its range. (Endangered Species Act of 1973).

Endemic. The population of potentially injurious plants, animals, or diseases that are at their normal, balanced level, in contrast to epidemic.

Ephemeral Streams. Streams that flow only as a direct response to rainfall or snowmelt events. They have no baseflow.

Epidemic. The population of potentially injurious plants, animals, or diseases that are widely prevalent, and exceed their normal, balanced level, in contrast to endemic levels.

Erosion. Detachment or movement of soil or rock fragments by water, wind, ice, or gravity. Accelerated erosion is much more rapid than normal, natural, or geologic erosion, primarily as a result of the influence of activities of people animals, or natural catastrophes.

Even-aged Management. The application of a combination of actions that results in the creation of stands of trees of essentially the same age, growing together. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands.

F

Forage. Vegetation used for food by wildlife, particularly big game wildlife and domestic livestock.

Forage Areas. Vegetated areas with less than 60 percent combined canopy closure of tree and tall shrub (greater than seven feet in height).

Foreground (Visual Distance Zone). That part of a scene, landscape, etc., which is nearest to the viewer, and in which detail is evident, usually one quarter to one half mile from the observer.

Fry. Recently hatched fish.

Fuels. Combustible materials present in the forest which potentially contribute a significant fire hazard.

Fuels Management. Manipulation or reduction of fuels to meet Forest protection and management objectives while preserving and enhancing environmental quality.

G

Group Selection. A modification of the selection system in which trees are removed periodically in small groups, resulting in openings that are at least one and one-half times the height of the trees removed. The objective is to create a balance of size and age in a mosaics of contiguous groups in the same forest.

H

Habitat Type. (Vegetative). An aggregation of all land areas potentially capable of producing similar plant communities at climax.

Hardwoods. A conventional term for the wood of broadleaf trees.

Hiding Cover. Vegetation capable of hiding 90 percent of a standing adult deer or elk at 200 feet or less. Includes some shrub stands and all forested stand conditions with adequate tree stem density or shrub layer to hide animals. In some cases, topographic features also can provide hiding cover.

I

Immediate Foreground (Visual Distance Zone). That part of the foreground which is extremely critical for visual detail, usually within 400 feet of the observer.

Indicator Species. Species of fish, wildlife, or plants adapted to a particular kind of environment, which reflect ecological changes caused by land management activities.

Indirect Effects. Secondary effects which occur in locations other than the initial action or significantly later in time.

Individual Tree Selection. The selection of trees for harvest based on individual tree characteristics, and their position within the stand structure.

Inland Native Fish Strategy. A decision amending Regional Guides for the Forest Service's Intermountain, Northern, and Pacific Northwest Regions, and Forest Plans for 22 National Forests. The strategy provides interim direction to protect habitat and populations of resident native fish, through riparian management objectives, standards and guidelines, and monitoring requirements.

Interdisciplinary Approach. Utilization of one or more individuals representing areas of knowledge and skills focusing on the same task, problem, or subject. Team member interaction provides needed insight to all stages of the process.

Intermittent Stream. A stream which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow.

Irretrievable. Applies to losses of production, harvest, or a commitment of renewable natural resources. For example, some or all of the timber production from an area is irretrievably lost during the time an area is used as a winter sports (recreation) site. If the use is changed, timber production can be resumed. The production lost is irretrievable, but the action is not irreversible.

Irreversible. Applies primarily to the use of nonrenewable resources, such as minerals, or cultural resources, or to those factors that are renewable only over long time spans, such as soil productivity. Irreversible also includes loss of future options.

Issue. A point, matter, or question of public discussion or interest, to be addressed or resolved through the planning process.

Issue Indicator. A specific, measurable element which expresses some feature or attribute relative to an issue.

L

Land Allocation. The assignment of a management emphasis to particular land areas with the purpose of achieving goals and objectives. Land allocation decisions are documented in environmental analysis documents, such as the Forest Plan for the Idaho Panhandle National Forests.

Landtype. A unit of land with similar designated soil, vegetation, geology, topography, climate and drainage. The basis for mapping units in the land systems inventory.

Leave Island. Group of trees within a harvest unit that are left unharvested.

Lodgepole Pine. See Timber Types.

Long-term Sustained Yield. The estimated timber harvest that can be maintained indefinitely over time, once all stands have been converted to a managed state under a specific management intensity consistent with multiple-use objectives.

M

Management Area (MA). Geographic areas, not necessarily contiguous, which have common management direction, consistent with the Forest Plan allocations.

Management Direction. A statement of multiple use and other goals and objectives, along with the associated management prescriptions and standards and guidelines to direct resource management.

Management Prescription. A set of land and resource management policies that, as expressed through Standards and Guidelines, creates a Desired Future Condition over time.

Mature Timber. On lands allocated for timber harvest, and for the purpose of this project, mature is defined as trees or stands in which average annual stand growth has culminated, generally around 80 years. In the context of wildlife - Mature forest habitat with characteristics needed to provide habitat for species such as pine marten and pileated woodpecker (generally occurs around age 100).

Middleground (Visual Distance Zone). That part of a scene or landscape which hits between the foreground and background zones.

Mixed Conifer. See Timber Types.

Monitoring and Evaluation. The evaluation, on a sample basis, of Forest Plan management practices to determine how well objectives are being met, as well as the effects of those management practices on the land and environment.

Mortality. Trees of commercial species, standing or down, that have died during a specific period, and were not cull trees at the time of death.

N

National Environmental Policy Act (NEPA) Process. An interdisciplinary process, which concentrates decisionmaking around issues, concerns, alternatives and the effects of alternatives on the environment.

National Forest Management Act (NFMA). Law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring preparation of Regional Guides and Forest Plans, and the preparation of regulations to guide that development.

Natural Regeneration. Renewal of a tree crop by natural means using natural seed fall.

No-Action Alternative. The No-Action Alternative is required by regulations implementing the National Environmental Policy Act (NEPA) (40 CFR 1502.14). The No-Action Alternative provides a baseline for estimating the effects of other alternatives. Where a project activity is being evaluated, the No-Action Alternative is defined as one where current management direction would continue unchanged.

Nongame Species. All wild animals not subject to sport-hunting and fishing regulations.

Noxious Weeds. Rapidly spreading plants which can cause a variety of major ecological impacts to both agriculture and wild lands.

O

Open Road Density. A standard set in the Forest Plan that is applied to most Management Areas important to big game. This road density standard of three-quarters of a mile of open road per square mile of habitat correlates directly to the elk habitat effectiveness of the area.

Outputs. The goods and services produced from and offered on National Forest System lands.

Overmature Timber. For the purpose of this project, overmature stands are considered to be approximately 100 years of age or greater, average annual stand growth has culminated, or in which mortality often exceeds growth.

Overstory. The portion of trees in a forest which forms the uppermost layer of foliage.

P

Partial Cut. Term to relate harvest units where many trees are left ad forested appearance is retained. Partial cutting usually provides no long-term benefits to forest health and productivity.

Payments to Counties. The portion of receipts derived from Forest Service resource management that is distributed to State and county governments, such as the Forest Service 25 percent fund payments.

Perennial Streams. Streams that flow continuously throughout the year.

Preferred Alternative. The alternative recommended for implementation in an EIS (40 CFR 1502.14).

Prescribed Burning. The intentional application of fire to wildland fuels in either their natural or modified state under such conditions as to allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to further certain planned objectives (i.e., silviculture, wildlife management, reduction of fuel hazard, etc.).

Prescribed Fire. A wildland fire burning under preplanned specified conditions to accomplish specific planned objectives. It may result from either a planned or unplanned ignition.

Prescription. Management practices selected and scheduled for application on a designated area to attain specific goals and objectives.

Programmatic Document. An environmental document that establishes a broad management direction for an area by establishing a goal, objective, standard, management prescription and monitoring and evaluation requirements for different types of activities which are permitted. It also can establish what activities are not permitted within the specific area(s). This type of document does not mandate or authorize the permitted activities to proceed.

Project Area. The geographic area defining the scope of this document and the alternatives proposed by it.

R

Rain-on-Snow Event. A winter storm that is characterized by precipitation falling as rain, rather than snow, and melting of existing snowpack.

Range of Alternatives. An alternative is one way of managing the National Forest, expressed as management emphasis leading to a unique set of goods and services being available to the public. A range of alternatives is several different ways of managing the Forest, offering many different levels of goods and services.

Reforestation. The natural or artificial restocking of an area with forest trees; includes measures to obtain natural regeneration, as well as tree planting and seeding. The work is done on National Forests to produce timber and other forest products, protect watershed functioning, prevent erosion, and improve other social and economic values of the forests, such as wildlife, recreation, and natural beauty.

Regeneration. The renewal of a tree crop, whether by natural or artificial means. This term may also refer to the crop (seedlings,saplings) itself.

Regeneration Harvest. Used in reference to clearcut, seedtree and shelterwood harvest methods which remove an existing stand to prepare a site for regeneration.

Rehabilitation. To return unproductive lands, other than roads and trails, into good health through stabilization so as to produce the same vegetation (or similar species) as found on adjacent areas.
Residual Stand. Trees remaining standing after some event, such as selection cutting.

Restricted Road. A National Forest road or segment which is restricted from a certain type of use or all uses during certain seasons of the year or yearlong. The use being restricted and the time period must be specified. The closure is legal when the Forest Supervisor has issued and posted an order in accordance with 36 CFR 261.

Riparian Areas/Habitats. Areas of land that are directly affected by water, usually having visible vegetation or physical characteristics reflecting this water influence. Streamsides, lake edges, or marches are typical riparian areas.

Road Maintenance. The upkeep of the entire Forest Development Transportation Facility including surface and shoulders, parking and side areas, structures, and such traffic-control devices as are necessary for its safe and efficient utilization.

Rotation. The planned number of years required to establish (including the regeneration period) and grow timber crops to a specified condition or maturity for regeneration harvest. Selected management prescriptions provide the basis for the rotation age.

S

Salvage Harvest. The cutting of trees that are dead, dying, or deteriorating before they lose commercial value as sawtimber. The removed trees are generally overmature, damaged by fire, wind, insects, fungi or other injurious agencies.

Sanitation Harvest. Removal of dead, damaged or susceptible trees to prevent the spread of pests or pathogens.

Sawtimber. Trees containing at least one 12-foot sawlog or two noncontiguous 8-foot log, and meeting regional specifications for freedom from defect. Softwood trees must be at least 9 inches in diameter at breast height, and hardwood trees must be 11 inches in diameter at breast height.

Scoping. The procedures by which the Forest Service determines the extent of analysis necessary for a proposed action, i.e., the range of actions, alternatives, and impacts to be addressed, identification of significant issues related to a proposed action, and establishing the depth of environmental analysis, data, and task assignments needed.

Sediment. Any material carried in suspension by water, which will ultimately settle to the bottom. Sediment has two main sources: from the channel area itself and from disturbed sites.

Seed Tree. A tree selected as a natural seed source within a shelterwood or seedtree harvest cut; sometimes also reserved for seed collection.

Seed Tree Harvest. Similar to clearcutting, except a smaller number of better seedbearing trees of the desired species per acre are left singly or in small groups distributed over the area.

Seedlings and Saplings. Non-commercial-size young trees, generally occurring in plantations.

Selection Harvest. The periodic removal of trees, usually at 10-20 year intervals, individually or in small groups, from an uneven-aged forest in order to realize yield and establish regeneration of irregular constitution.

Sensitive Species. Those species identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trends in (a) population numbers or density, or (b) habitat capability that would reduce a species' existing distribution.

Seral Stage. A transitory or developmental stage of a biotic community in an ecological succession (does not include climax successional stage or pioneer stage).

Shade Intolerant. Tree species which regenerate best in direct sunlight.

Shade Tolerant. Tree species which regenerate best in a shaded environment.
Shelterwood Harvest. A regeneration system in which a new stand is established under the protection of a partial canopy of trees. A minimum of two harvests is required, the last or final removal cut removing the remaining old stand after the new stand is established. This results in continuous coverage of large or small trees.

Silvicultural System. A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the cuttings that remove the mature crop and provide for regeneration, and according to the type of forest thereby produced.

Site Preparation. A general term for a variety of activities that remove or treat competing vegetation, slash, and other debris that may inhibit the establishment of regeneration.

Slash. The residue left on the ground after felling and other silvicultural operations and/or accumulating there as a result of storm, fire, girdling, or poisoning of trees.

Snag. A standing dead tree usually without merchantable value for timber products, but may have characteristics of benefit to some cavity nesting wildlife species.

Special Use Permit. A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest System lands for some special purpose.

Stand. A community of trees or other vegetation uniform in composition, constitution, spatial arrangement, or condition to be distinguishable from adjacent communities.

Stand Conversions. Application of silvicultural practices that change the species composition of trees in a stand, including planting a variety of species, discrimination against undesirable species during thinning, and other practices that naturally discriminate against undesirable species, such as specific site preparation and harvest methods.

Stocking. The degree to which trees occupy the land, measured by basal area and/or number of trees by size and spacing, compared with a stocking standard; that is, the basal area and/or number of trees required to fully utilize the land's growth potential.

Stream Order. It is often convenient to classify streams within a drainage basin by systematically defining the network of branches. Each nonbranching channel segment (smallest size) is designated a first-order stream. A stream which receives only first-order segments is termed a second-order stream, and so on. The order of a particular drainage basin is determined by the order of the principle or largest segment.

Successional Stage. A stage or recognizable condition of a plant community which occurs during its development from bare ground to climax.

Suitable Forest Land. Forest land (as defined in CFR 219.3, 219.14) for which which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions; for which there is reasonable assurance that such lands can be adequately restocked (as provided in CFR 219.4); and for which there is management direction that indicates that timber production is an appropriate use of that area.

Sustained Yield. See Long-term Sustained Yield.

T

Thermal Cover. Vegetation used by animals to modify the adverse effects of weather. A forest stand that is at least 40 feet in height with tree canopy cover of at least 70 percent provides thermal cover. These stand conditions are achieved in closed sapling-pole stands and by all older stands unless the canopy cover is reduced below 70 percent. Deciduous stands may serve as thermal cover in summer, but not in winter.

Thinning. Cutting in even-aged stands to redistribute growth potential or benefit the quality of the residual stand.

Threatened Species. Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and which has been designated in the Federal Register as such. In addition, some States have also declared certain species as Threatened in their regulations or statutes.

Tiering. Refers to the coverage of general matters in broader Environmental Impact Statements or Environmental Assessments with subsequent other related statements in Environmental Assessments incorporated, by reference, the discussions contained in the previous document, solely on the issues specific to the statement subsequently prepared.

Timber Base. Lands within the Forest that are capable, available, and suitable for timber production.

Timber Types. A descriptive classification of forestland based on present occupancy of an area by tree species (i.e., lodgepole, mixed conifer). More appropriately called forest cover types, this category is further defined by the composition of its vegetation and/or environmental factors that influence its locality.

Tractive. Any logging system which uses ground-based machines.

U

Understory. Vegetation (trees or shrubs) growing under the canopy formed by taller trees.

Uneven-age Management. The application of a combination of actions needed to simultaneously maintain continuous high-forest cover. Cutting methods that develop and maintain uneven-aged stands are individual-tree and group selection.

Unplanned Ignition. A fire started at random by either natural or human causes or a deliberate incendiary fire.

Unroaded. Area characterized by its lack of existing roads, but not designated as a Roadless Area or Wilderness.

Unsuitable Forest Land. Lands not selected for timber production in Step II and III of the suitability analysis during the development of the Forest Plan due to: (1) the multiple-use objectives for the alternative preclude timber production; (2) other management objectives for the alternative limit timber production activities to the point where management requirements set forth in 36 CFR 219.27 cannot be met; and (3) the lands are not cost-efficient over the planning horizon in meeting forest objectives that include timber production. Land not appropriate for timber production shall be designated as unsuitable in the Forest Plan.

V

Viable Population. Minimal population level to maintain the genetic diversity of a species.

Viewshed. Sub-units of the landscape where the visitor's view is contained by topography similar to a watershed.

Visual Quality Objective (VQO). A system of indicating the potential expectations of the visual resource by considering the frequency an area is viewed and the type of landscape.

Visual Resource. The composite of landforms, water features, vegetative patterns and cultural features which create the visual environment.

W

Watershed. Entire area that contributes water to a drainage system or stream.

Wildfire. Any wildfire not designated and managed as a prescribed fire with an approved prescription.

Wildlife Diversity. The relative degree of abundance of wildlife species, plant species, communities, habitats or habitat features per unit area.

Y

Yarding. A method of bringing logs in to a roadside area or landing, for truck transport. Methods may include forms of skyline cable logging systems, ground-based skidding, balloon, helicopter, etc.

Yield. Measured output; for example, timber yield or water yield.

APPENDIX A
PUBLIC INVOLVEMENT IN THE ALTERNATIVE DEVELOPMENT AND REVIEW PROCESS

A. 1. SCOPING AND ISSUE IDENTIFICATION

A.1.1. Public Notices and Outreach

Scoping is an early process for identifying the issues related to the proposed action, and the extent of those issues. The public was notified of this project in several ways:

- *scoping letter mailed to those that typically provide comment on our projects and for those that requested additional information dated December 26, 2001*
- *legal ad in the newspaper of record (Spokesman-Review) dated December 28, 2001*
- *"Quarterly Schedule of Proposed Actions" for the IPNFs (February 2002 issue)*

During scoping, letters were received from Bryan Bird, (Forest Conservation Council), Ryan Shaffer (Alliance for the Wild Rockies), and Mike Mihelich (Kootenai Environmental Alliance). Copies of their letters and Forest Service response to comments are provided later in this section.

The team has considered concerns identified by the public and incorporated their ideas whenever possible. Additional documentation is provided in the Project Files.

A.1.2. Issues Not Discussed in Detail in This Environmental Assessment

Issues considered as factors in the decision to be made are identified and described in Chapter 2. During the course of this analysis, the public and project resource specialists identified other issues that could be relevant to the proposed project. Each issue was considered by the appropriate team member to determine if/how it is related to the proposal and the level of potential impact. As a result, a decision was made either to address the issue in detail in this EA, or not to address the issue in detail. There were three situations in which an issue was not addressed in detail: 1) the issue is beyond the scope of this project; 2) there will be little or no effect to the issue of concern; or 3) the issue has been effectively addressed through specific alternative features and/or mitigation measures. These issues include:

A. Specific Wildlife Species
B. Threatened, Endangered, Proposed, and Sensitive Plants
C. Noxious Weeds
D. Air quality
E. Soils
F. Heritage resources
G. Grazing allotments
H. Transportation Planning
I. Public safety
J. Social Values
K. Recreation
L. Scenery
M. Old growth
N. Roadless areas

For each of these, a brief overview of the issue and the reason for not providing further documentation in the Environmental Assessment is provided below.

A. Specific Wildlife Species

Threatened, Endangered and Proposed Wildlife Species

Grizzly Bear: The grizzly bear is not likely to occur on the district, and the district is not within a recovery area (USFWS 1997, MacCracken and Goble 1994). Grizzly bears were more abundant within the Coeur d'Alene River District historically than they are today. Hudson Bay trapping records show grizzly bears were harvested by early fur trappers in the Coeur d'Alenes, primarily in the northern portion of the Coeur d'Alenes (Coeur d'Alene Geographical Assessment). Today the basin is influenced by human presence and development through timber harvesting and associated road building, mining, recreation, and urbanization. These changes have influenced the distribution of wildlife species, including the grizzly bear (Coeur d'Alene Geographical Assessment).

Grizzly bears are occasionally sighted in the Coeur d'Alene River Basin, especially in the Upper North Fork area. The most recent sightings occurred in 1995. Both sightings were in the Upper North Fork. No high quality grizzly bear habitat has been identified in the Coeur d'Alene Mountains. The Hither and Yon Project Areas do not lie within a recovery area and there have been no sightings of grizzly bears in the areas within the last 10 years. The project would not result in the long-term degradation of grizzly bear habitat; there would be no effect to grizzlies.

Gray Wolf. There was a gray wolf sighting in the Short Creek drainage in 1980. There have been 3 sightings of gray wolf in the Grizzly Mountain and Steamboat areas. Two sightings occurred in the early 1980's. One sighting was of 3 individuals in the Grizzly Mountain area in 1989. There are no recorded sightings in the Dobson Pass area. There is no winter range proposed for harvest under the Hither and Yon project. However, the Grassy Mountain project area is located within big game summer range habitat. Cover:forage ratios would change slightly in the areas with regeneration harvests, but a large portion of the canopy loss is from Douglas-fir bark beetle mortality and ice and snow damage which has already occurred. Improvement harvests and commercial thinning would create some loss of canopy, that could reduce hiding cover for big game, but in general the management will maintain the dominant overstory canopy component. It is unlikely that the prey population is limiting for the gray wolf in these areas given the high numbers of prey availability. Analysis shows that design features would adequately protect big-game populations, and there would be no measurable change in wolf habitat over the long term.

This project would have a minor increase in disturbance short term (a period of approximately a few weeks to a few months in any given area) above the existing levels and could affect prey base by temporarily displacing big game. Disturbance periods, though generally short term for harvest, will extend into the next year or two for burning and planting treatments. Treatments in the Dobson Pass area are generally located near open or main travelways. The reconstruction of 0.1 miles of roadway in the Grizzly Mountain area is minor. Road 622 is an open travelway but is not a main transportation route. The disturbance from helicopter yarding along the southern face of Grizzly Mountain would create more disturbance than road access changes, however the disturbance period would be limited to a month or two including felling and yarding operations. Ecoburning operations, though creating a day or two of disturbance, would have minor effects on the gray wolf. Burning operations may actually improve browse in the area, which would be beneficial to the prey base. Road 1564 in the Grassy Mountain area is currently gated and closed to public use. Activity in this area is expected to have minor effects on prey populations with a large unroaded security area to the west of the project area. In the long term, under any action alternative, there is no substantial change to existing conditions with no substantial change to road densities or habitat capability of the area. Since the scope of this project is small and generally of short duration, the action alternatives may affect individuals but would not likely adversely affect populations.

Bald eagle. None of the proposed harvest units or helicopter flight paths would affect potential bald eagle habitat. The nearest unit or helispot is approximately three miles from any suitable nesting site in the Coeur

d'Alene River corridor area. The anticipated service landings would be a similar distance away. Based on these features, this project would have no effect on the bald eagle.

Lynx. The Canada Lynx Conservation Assessment and Strategy (USDA Forest Service, 2000) has identified high integrity areas or Lynx Analysis Units (LAU's) to be managed for lynx. Six LAU's and two Lynx Travel Corridors have been established on the Coeur d'Alene River District for the management and further protection of lynx populations. The Grizzly Ridge LAU is located east and north of the Grassy Mountain and Grizzly Mountain project areas respectively. Unit 8 in the Grassy Mountain area was dropped to avoid activities immediately adjacent to the LAU and to protect denning habitat. None of the other harvest units are located within or immediately adjacent to any Lynx Analysis Units or Lynx Travel Corridors. Activities in the Grassy Mountain and Grizzly Mountain project areas, though small in scope, may affect individuals due to proximity to habitat conservation areas, but would not likely adversely affect populations. Activities in the Dobson Pass area would have no effect on lynx or habitat.

Sensitive Wildlife Species

Flammulated owl. Flammulated owls are seasonal migrants that occupy home ranges in the northern latitudes during the spring, summer and fall. They depend upon naturally occurring or excavated cavities for nesting. Consequently, snags and other defective trees are an important component of their breeding habitat.

These owls are attracted to relatively open, older forests featuring ponderosa pine and Douglas-fir that are correlated 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 was at least present, if not dominant. The flammulated owl's preference for ponderosa pine and/or Douglas-fir can also be linked to prey availability. Reynolds and Linkhart noted a stronger correlation between prey availability and ponderosa pine and Douglas-fir, than with other common western conifers.

No populations numbers exist for this species' historic condition; however, a geographic assessment of the Coeur d'Alene River basin determined that the historic amounts of dry site large/mature and old-growth ponderosa pine and Douglas-fir were much more numerous than currently. This is due to several reasons. Low intensity wildfires that maintained these stands in suitable conditions for flammulated owls have been essentially eliminated by aggressive fire suppression. Timber harvesting has fragmented stands into smaller patches. These lower elevation, low gradient areas are also suitable for human development. These factors have dramatically reduced the amounts of suitable habitat for this species. Approximately 95% of suitable habitat has been reduced within the Lower Clark Fork Ecological Unit; the Coeur d'Alene drainage is part of this ecological unit (Wisdom, in press). Much of the habitat loss is due to urban and agricultural development on low elevation private lands outside the forest boundary.

Based on modeling against the timber stand database (TSMRS), there is no suitable flammulated owl habitat within the project area. All treatment areas proposed under this project are outside of modeled flammulated owl capable habitat (see Project Files - Wildlife). Field reconnaissance indicates that a ponderosa pine stand component, preferred by flammulated owls, is lacking in the vicinity of the proposed treatment areas in the Grassy Mountain and Grizzly Mountain project areas. Units 6 and 8 in the Dobson Pass area are proposed for improvement harvests. These harvests are proposed to improve the health and vigor of the ponderosa pine component on the sites. Activities in these stands may affect individuals but would not trend the species toward federal listing. In the long term, treatments this "daylighting" treatment would help maintain the existing ponderosa pine component. This would be beneficial to maintaining flammulated owl habitat on the forest. Proposed vegetative restoration treatments considered for units 4 and 5 in Dobson Pass may also increase habitat over the long term with ponderosa pine being a major component of the plant mix.

Peregrine Falcon: A decline in American peregrine falcon populations began in the 1950s leaving western populations severely depressed (Levine and Melquist, 1996). The Idaho population was essentially extirpated by 1974 (Bechard et al. 1987). In 1982, work to restore this population was begun through the release of

captive-produced young using a process referred to as "hacking." Re-introductions of peregrine falcons have occurred in North Idaho. The peregrine falcon was taken off the threatened and endangered species list during the summer of 1999. They are now on the R1 Sensitive Species List of the Idaho Panhandle National Forest.

Peregrine falcons are known to exist in North Idaho. These birds prefer steep rocky outcrops and cliffs for nesting. They are often associated with water because of the abundant prey base that can be found in wetlands. Besides waterfowl, these birds prey upon a variety of songbirds. Surveys along the Clark Fork River in 1996 found an adult pair of peregrines re-occupying a historic cliff near a release site. No successful nesting attempt was observed; however, the pair was observed engaging in courtship activities (Levine, 1996). Another historic, but currently unoccupied eyrie, lies in the Bernard Peak area. This area is over 15 miles west of the project areas. There is some potential habitat 2-3 miles south of the Grizzly Mountain project area along the North Fork of the Coeur d'Alene River. There are no records of peregrine falcons occupying this area however. Since there is no habitat within or immediately adjacent to the project areas, the proposed actions are not expected to impact peregrine falcon.

Boreal toad. Preliminary analysis shows that Inland Native Fish Strategy guidelines concerning riparian habitat conservation areas within 150 feet of the edge of wetlands would prevent sedimentation of toad breeding habitat. Most of the proposed treatment units are upslope near major ridgelines, a long way from any wetland habitat. This project would apply standard buffers under the Inland Native Fish Strategy, without modification. No alternatives would measurably change water yields or flows downstream from the treatment areas. Therefore, it was determined that there would be no impact to boreal toads or habitat with this proposal. Therefore, no further analysis or discussion is needed.

Common loon. Loons are large, heavy-bodied birds with their legs and feet positioned far to the rear. This allows them to propel quickly under water but renders them unable to walk well on land or to take off without a long expanse of water. They require lakes of at least 10 acres in order to gather enough speed to take off. Lakes suitable for nesting are 10 acres or larger with emerging shoreline vegetation and secluded areas for nesting and brood rearing (USDA Forest Service, 1989). Loons have been sighted on Coeur d'Alene Lake and Fernan Lake. Since loons are located on lakes, and the project area is not near or adjacent to a lake, the proposed actions would not affect habitat for loons. No further analysis and discussion is necessary for this species.

Coeur d'Alene salamander. All alternatives associated with this project would have a minimal effect on water quality from increased sedimentation released into the watershed over the existing condition created by the beetles (please refer to the watershed discussion). No timber harvest would occur within streamside buffers defined by the Inland Native Fish Strategy. No road construction would occur with this proposal. The only road reconstruction is for 0.1 miles located along a ridgetop with no drainage structures. No known or potential Coeur d'Alene Salamander habitat would be impacted by this project. No further analysis and discussion is necessary for this species.

Harlequin duck. There would be no activities under any of the alternatives that would affect harlequin duck habitat or cause a change in streamflow downstream from the treatment areas. Water quality would be maintained under the action alternatives (please refer to the "Watershed" section for a detailed discussion on water yield). A "no harvest" buffer would be maintained along all stream channels in accordance with guidelines of the Inland Native Fish Strategy. For these reasons, the risk factors to harlequin ducks have been avoided through project location and design features. Therefore, no further analysis or discussion is warranted.

Northern leopard frog. Preliminary analysis shows that Inland Native Fish Strategy guidelines concerning riparian habitat conservation areas within 150 feet of the edge of wetlands would prevent sedimentation of frog breeding habitat. As described above under the boreal toad section, this project would have no effects to the northern leopard frog or its habitat. Therefore, no further analysis or discussion is needed.

Townsend's big-eared bat. There are no known mine sites within or immediately adjacent to the project areas. This is the primary habitat for Townsend's big-eared bats. For this reason, it is unlikely the project would have measurable impacts on the Townsend's big-eared bat. Therefore, no further discussion and analysis is necessary.

Wolverine. Based on their wide-ranging nature, lack of existing habitat components (i.e. both denning habitat and large sparsely inhabited wilderness areas) and sighting information, recorded wolverine occurrences in the Coeur d'Alene River drainage are likely transient individuals. There is no wolverine denning habitat within or adjacent to the activity areas of the Hither and Yon Beetle project. Relatively high road densities in the Coeur d'Alene drainage (on both National Forest and non-National Forest System lands) limit the drainage's suitability as wolverine habitat. With the minor change in open road densities and the disturbance associated with widespread use of prescribed fire treatments, especially under Alternative 3, activities associated this project may impact transient individuals but would not likely trend the population toward federal listing.

Management Indicator Wildlife Species

American Marten. This species is in the same guild as the fisher. Any changes in fisher habitat are the same for marten. Refer to the fisher analysis in Chapter 3 (Wildlife) for impacts to the marten.

Pileated Woodpecker. Design features for alternatives would assure that snags for pileated woodpecker would be maintained in harvest units under all alternatives (See Features Designed to Protect Wildlife Habitat, Chapter 2). The project is designed to maintain at least the minimum number of snags needed to support woodpecker populations, distributed uniformly across the landscape (please refer also to the discussion on "Snags and Dead Down Woody Habitat," in the Wildlife section of this chapter). Snag retention within treatment units will also be of the largest diameter classes, which are also preferred by pileated woodpecker. Also, not all areas affected by bark beetle mortality are being considered for harvest within the project areas. Some snag patches are being retained for habitat. Due to snag retention requirements and the size and the small size and scope of the project, no further discussion or analysis is necessary.

Other Wildlife Species and Habitat

Boreal owl. Stands and areas impacted by the proposed actions lie below the preferred spruce-fir zone for boreal owls. Therefore, because capable or suitable habitat would not be affected no further analysis and discussion is necessary for this species.

Forest land birds. One of the primary concerns to neotropical migrant birds is the risk of nest parasitation by cowbirds. Brown-headed cowbirds pose a threat to neotropical migrant birds. The cowbird is a nest parasite which lays its eggs in the nests of over 250 species of birds (Friedmann and Kiff, 1985), the majority of which are neotropical migrants. The clearing of forests for agriculture and the introduction of livestock in the west have expanded the range of cowbirds (Robinson, Scott et al., 1992). There is some indication that cowbirds may currently be on the decline in Idaho (Ritter, pers. comm.). Cowbirds pose a threat to many hosts because of the cowbirds extraordinary productivity and the extent to which cowbird parasitism reduces host productivity. Rothstein (1984) found cowbirds traveling up to 7 kilometers between feeding and nest searching sites. Timber harvest in forested landscapes provide the cowbird with opportunities for nest parasitism.

Types of logging practices used may have little impact on cowbird parasitism levels and cowbirds are just as likely to parasitize nests in group selection cuts as in clearcuts (Robinson, et al., 1992). Edge effect will be created by regeneration harvests, however the areas will be managed as forest lands over the long term. The regeneration harvest areas would provide potential cowbird habitat for less than 20 years. The project areas are felt to be located far enough from agricultural lands that the risk of cowbird parasitation of neotropical migrant nests if felt to be low. The Dobson Pass project area is located just outside a small grazing allotment

in Beaver Creek. It should be noted that grazing allotments within the forest generally lack the presence of large open meadows, and grazing is more likely to occur along grassy roadsides, along riparian corridors, and in small natural meadows. These may not be as attractive to the cowbird for feeding. Seasonal livestock concentration areas, such as trailheads used by hunters for their horses in the fall, are not common within the project area. The presence of livestock in these seasonal areas is generally considered to be of such a short-term nature that suitable cowbird feeding areas are not created anyway. A wide range of canopy conditions exist throughout the study area providing adequate habitat for a wide range of neotrophical birds with or without the proposed treatment.

Because a detailed analysis has been conducted for other species (goshawks and black-backed woodpeckers) that share similar habitats and based on the effects described above, species in this group are not analyzed further in this document.

Snags and dead down woody habitat. Historically, ecosystems in north Idaho were shaped by disturbance patterns that altered the size and distribution of various structures across the landscapes. Forest succession, wind damage, insects and disease, fire and other disturbances created snags in areas that ranged in size from individual trees to small patches or stands to entire drainages (1,000 acres or more). Consequently, snag densities varied across the landscape, from areas with low levels of snags to other areas with abundant snags.

Recent studies indicate that viable woodpecker populations occurred in areas with about four snags per acre (Bull et al. 1997). Managing for viable populations of snag dependent species does not require providing for snags on every acre in any subdrainage or across the landscape. Bull et al. (1997) recommends providing snags in every 5 to 25-acre stand to satisfy distribution needs.

The present bark beetle outbreak has, is and will continue to kill live trees (though the beetle population is declining), thereby creating snags and areas of high snag densities. The scope of the bark beetle infestation is discussed elsewhere in this document. In the action alternative some snags created by bark beetles would be harvested and lost as habitat for cavity dependent species. However, the potential effect on snags and down wood is ameliorated by a number of factors. Not all areas impacted by bark beetles would be treated; it is not the intent of this project to remove all pockets/patches of dead trees created by the Douglas-fir bark beetle outbreak. Concentrated pockets of snags would remain untreated and unaffected by any management across the landscape. Unit 7 in the Dobson Pass project area was dropped from consideration due to evidence of considerable woodpecker activity on dead trees within this area. Areas outside of proposed treatment areas are and would continue to provide snags in excess of numbers shown to support viable populations. Areas would be reserved from treatment within Inland Native Fish Strategy buffers. These areas along with untreated stands would contribute to snags and cavity habitat.

Design features of the project were devised to ensure the retention and selection of snags at a level and distribution that has been shown to support viable populations of species which use snags and logs (Chapter 2, Section 2.5.1. Features Common to All Action Alternatives). Snags and snag replacements would be retained in all treatment units at levels recommended by the Northern Region Snag Management Protocol (2000). Snag retention objectives exceed Forest Plans standards and snag retention levels developed by Thomas et al.(1979). Snag retention objectives, including compensation levels are consistent with recent published data that suggests that populations of cavity nesters were viable in stands of mixed conifer forests that contained about four snags per acre (Bull et al. 1997).

To retain a down wood component, marking guides will designate that 15-20 down logs per acre be retained on moist sites and 3-6 logs per acre will be retained on dry sites. These logs should be at least 12 inches in diameter and 6 feet or more in length. The snag retention component will add to the down wood component over time.

The project would meet Forest Plan goals and objectives for cavity habitat, and Forest Plan standards would be met or exceeded in all alternatives.

B. Threatened, Endangered, Proposed and Sensitive Plant Species

The US Fish and Wildlife Service (USDI 1999) list two species as threatened for the Idaho Panhandle National Forests, water howellia (*Howellia aquatilis*) and Ute ladies'-tresses (*Spiranthes diluvialis*). There are no documented occurrences of these species on the Idaho Panhandle National Forests, although suitable habitat is suspected to occur. The recent Douglas-fir beetle outbreak has not affected suitable habitat for water howellia or Ute's ladies'-tresses. There is no proposed treatment within or adjacent to potentially suitable habitat for water howellia. It was determined that implementation of any alternative would have no effect on water howellia or Ute ladies'-tresses or their habitat.

The Spalding's catchfly (*Silene spaldingii)* has recently been listed as threatened for the Idaho Panhandle National Forests. Its potential habitat is in grasslands in dry forest types. No occurrences are documented for the Coeur d'Alene River District. The closest occurrences to the project area are approximately 65 miles west in Spokane County. Treatment areas within suitable habitat for dry guild plant species would be surveyed for Spaulding's catchfly. If Spalding's catchfly is found, mitigation measures such as avoidance would be implemented. The proposed treatments may individuals but would not likely adversely affect populations due to mitigation measures in place.

There are no federally listed endangered plants for the Idaho Panhandle National Forests. Mitigation measures and features (discussed in Chapter 2) would help to avoid disturbances to sensitive plant populations. While some sensitive plant individuals may be impacted, implementation of projects on National Forest System lands cumulatively constitute insignificant impacts to sensitive plant populations or suitable habitat. Please refer to Appendix B and the Project Files (TES Plants) for supporting information.

C. Noxious Weeds

While existing infestations of certain weed species may continue to increase on Federal lands and adjacent private lands, features of the action alternatives would serve to minimize (but not eliminate) the risk of weed spread. Please refer to the "Features Common to All Action Alternatives" discussion in this chapter and the Project Files (Noxious Weeds) for supporting information. Weed treatment will occur in compliance with the Coeur d'Alene River Ranger District Noxious Weed Environmental Impact Statement and Record of Decision (USDA Forest Service, 2000).

D. Air Quality

Because use of prescribed fire would be based on smoke management guidelines, current air quality standards would not be exceeded under either action alternative. Over the long term, prescribed fire may reduce total particulates by reducing the risk of large wildfires that cannot be managed for emissions.

E. Soils

Alternative development was based in part on the "Soils Guidelines for NEPA Analysis" (Niehoff, 1998). The guidelines helped to determine soil management issues for environmental analysis of alternatives, prepare resource management prescriptions, and identify areas that would require on-site evaluation of proposed management activities. Soils data was used to identify location of timber harvest and regeneration activities; analyze potential sediment delivery impacts; and analyze potential depletion of key nutrients.

To minimize erosion and ensure compliance with State water quality standards, all timber harvest associated with the Hither and Yon Beetle project would be completed using Best Management Practices. All units would require that limbs and tops be removed prior to yarding except for 11 acres of grapple piling. Most of the slash in the grapple pile areas will have been on the ground for several years prior to entry. Prescribed fire

operations would be for low intensity burns and during conditions when soil moistures are high enough to minimize impacts to soil horizons. Forest Plan Soil Quality Standards would be met before and after treatment. Approximately 23 percent of the treatment acres occur on high erosion landtypes however no tractor yarding or new road construction would occur within these areas. Retention of a portion of the tree canopy, riparian buffers, woody debris retention, and implementation of BMP's would minimize any erosion in these areas making sedimentation to stream channels unlikely. The cumulative combined average unit soil disturbance for the proposed harvest activities would be 2.7% under Alternative 2, 2.2% under Alternative 3, and 2.3 % under Alternative 4. The percentage would be lower under Alternatives 3 and 4 because, even though there would be more total treatment acres, the additional treatments include helicopter yarding, and burning activities, which are considered low impact.

The highest level of disturbance in an individual unit approaches 15%, with the tractor skidding and grapple piling associated with Grassy Mountain Unit 9. This disturbance can be reduced by keeping skid trails a minimum of 120 feet apart, decompacting skid trails after use, and walking the grapple machine on slash as much as possible. For additional information, please refer to the soil productivity analysis in the Project Files (Soils). Maps related to soil conditions and additional soils analyses are also provided in the Project Files (Soils).

F. Heritage Resources

Within the Grassy Mountain project area, known sites containing important cultural resources were previously assessed for their historical value under the Lower Short T.S. Report #99, Halsey Creek T.S. Report #81-IP-3-53, and the Short Riley T.S. Report #90-IP-3-27. Within the Grizzly Mountain project area, known sites containing important cultural resources were previously assessed for their historical value under the Brown Hart T.S. Report #85-IP-1-55 and the Grizzly Creek Salvage T.S. Report #92-IP-1-40. Within the Dobson Pass project area, known sites containing important cultural resources were previously assessed for their historical value under the Dudley Creek Road Report #349 and the Capital Hill T.S. Report #86-IP-1-34. All areas would be protected as appropriate. Activities associated with the proposed Hither and Yon Beetle activities would not impact any known heritage resource properties. Any future discovery of cultural resource sites would be inventoried, and protected if found to be of cultural significance. Decisions to avoid, protect, or mitigate impacts to these sites are in accordance with the National Historic Preservation Act of 1966.

G. Grazing Allotments

Ongoing grazing allotment projects are identified in Chapter 2. The proposed activities would have very little effect, if any, on the movement or management of cows, based on the location of and use within this allotment. An environmental assessment concerning management of the allotments has been initiated and is expected to be completed in mid-2002.

H. Transportation Planning

The transportation planning for this EA is tiered to the Forest Plan, but has a higher degree of specificity. The goals for transportation facilities in Chapter II of the Forest Plan state in part:

> *Construct the minimum number of roads necessary to permit the efficient removal of timber and mineral resources. Construct and reconstruct roads only to minimum standards necessary to prevent soil loss, maintain water quality, minimize safety hazards for a reasonable and prudent Forest user, and provide access for fire protection where needed to meet management area goals.*

The existing roads coverage was developed from the geographic information systems (GIS) roads layer for the Coeur d'Alene River Ranger District. The project area encompasses a total of approximately 3792 acres of National Forest System land. Within this Grassy, Grizzly, and Dobson Pass project areas there are approximately 14, 13, and 6 miles of road for a total of 33 miles. Approximately 18 of these miles are open or otherwise drivable (gated Road 1564 is included in this figure). The remaining roads are either grown over or have been altered so they do not have a detrimental effect on the hydrologic resources of the watershed. Approximately 11 miles of these open roads would be used to yard and haul timber. Approximately 0.1 miles of closed road would be reconstructed to access a helicopter landing. This road would be closed after use.

Most of the roads used to yard and haul timber are main arterial or collector system roads open to the general public for recreational use and general forest access. These roads, which are used by the public, would be maintained for travel in a standard passenger (Maintenance Level 3). These roads would be maintained for low speed and would be single lane with turnouts and spot surfacing. Road 1564 is currently gated and closed to motorized use. Long-term maintenance on this road would be Level 2, or maintained for high clearance vehicles. In the short term, Road 1564 would be brought up to Level 3 maintenance for log haul. Road 456-UW in the Dobson Pass area is open but not under Forest Service maintenance jurisdiction. A road use agreement would need to be obtained prior to use.

This proposal seeks to treat areas of ice and snow damage and beetle mortality using the existing transportation system that is in place. No new construction would occur. Minor reconstruction would occur to access a helicopter landing location. This approach, though not as economical as constructing direct access to all treatment areas, avoids ground impacts associated with roading.

Under Alternative 1, Road 1564 would remain at Level 2 maintenance. Under the action alternatives, Road 1564 would be brought up to Level 3 for a short duration, then return to Level 2. Maintenance levels on all other open roads would remain the same under all alternatives. However, timber sale activities would allow for routine maintenance to be achieved at a faster rate than under normal Forest Service maintenance schedules on these roadways. Please refer to the Project Files (Transportation) for a Summary of the Roads Analysis Process (RAP's) and other information on transportation planning.

I. Public Safety

Proposed activities would be accomplished utilizing safety standards based on the Forest Service's Health and Safety Code Handbook (FSH 6709.11). The timber sale contract would contain safety provisions C6.33 – Safety, C6.331 – Safety (Helicopter Operations), and C6.332 – Safety (Timber Hauling). These provisions require development and implementation of a traffic control plan and other safety requirements.

J. Social Values

There are social values associated with each of the resources and issues analyzed in this assessment. The Coeur d'Alene River Ranger District currently provides a wide range of economic, recreational, hydrologic, aesthetic and scenic values. These values are present in the areas being considered for treatment under this project. Higher fuel loads associated with concentrations of dead and damaged timber present an increase in

fire hazard potential putting all these values at risk. Hillslopes with a high component of dead timber are also often not considered as very aesthetically pleasing to the general public.

Trees killed by the Douglas-fir beetle lose a portion of their value as sawtimber each year they remain unharvested (Douglas-fir Beetle Project EIS, June 1999; page I-10). A large number of the trees being considered for removal under this project were killed by bark beetles in 1999 or 2000. Based on reports from timber sale purchasers, sale administration, and local mills, timber removed under the Douglas-fir Beetle Project was 20-30 percent defective. This is primarily associated with sapwood defect as a result of a rot fungus brought in by the beetle. The timber removed under this project would have similar defect percentages. It is important this timber be removed as quickly as possible to provide for the greatest opportunity for long-term vegetative restoration within the affected areas and for economic benefits to local communities.

The National Forest System is designed to provide for multiple uses and values. It is not the intent to achieve this on every acre but to provide for a diverse range scattered across the forest landscape. The forest is a dynamic system. It is in a constant state of change though often not very well perceived in human time frames. It is often desirable from a social value standpoint to bring about change gradually in the landscape and to change small areas of the landscape. By reducing the amount of dead and damage timber, fire intensities can be reduced to levels that may allow for initial attack forces to control a fire before it brings about significant change to the visual landscape.

Salvage of wood fiber from beetle-killed trees provides jobs and income to local communities. The demand for timber products is real and is increasing with increasing populations. It is desirable to salvage dead and dying timber to help meet some of the demand so that there is less pressure to harvest green trees. It is also environmentally wise to grow more trees and use more wood as a substitute for non-renewable fossil fuels and materials such as steel, concrete, and plastics (Moore –Greenspirit speech). Salvaging this timber does not come without some disturbance or interruptions to the other social values and services the forest is providing, but these disturbances are of a temporary nature. Recreational experiences may have to be achieved in another area of the forest setting until activities are completed. However, salvage of this material does provide for a funding source for road maintenance on roads used by the recreational public.

In February 1994, President Clinton signed an Executive Order on environmental justice, requiring federal agencies to conduct activities related to human health and the environment in a manner that does not discriminate or have the effect of discriminating against low-income and minority populations. Although low-income and minority populations live in the vicinity, activities under the Hither and Yon Beetle project would not discriminate against these groups. Based on the composition of the affected communities and the cultural and economic factors, the activities that are proposed would have no disproportionately adverse effects to human health and safety or environmental effects to minority, low-income, or any other segments of the population.

K. Recreation

Proposed harvest units in all project areas associated with this project lie where there are no recreation developments or known dispersed (undeveloped) camping or picnicking sites. Under the Recreation Opportunity Spectrum (ROS), the affected areas are classified as roaded and modified in appearance.

Trail 32 in the Grassy Mountain area is on the system but is not being maintained. It is used as a hunting trail and does not possess unique recreational attributes. Proposed activities would not affect this trail. Road 1564 is gated closed year round. Harvest activities that would occur during the fall hunting season may affect the quality of non-motorized hunting opportunities in this area. The removal of “bumper trees” along Road 260 (Unit 10) would be beneficial to minimize damage to grooming equipment during the winter recreational period. Since Road 260 is a groomed snowmobile route, sale operations should be avoided during the winter recreational period of December 1 to March 31. Overall, the size and scope of proposed management

activities in this area would represent no more than short-term disruptive effects.

The Grizzly Mountain project area does not provide any unique recreational attributes. Road 622 is a secondary access route, which is open for public use. Road 622 and Road 961 are not part of the groomed snowmobile system so winter operations could occur without affecting developed winter recreational opportunities. Noise disturbance from helicopter logging operations is expected to be minor since the Coeur d'Alene River is over 3 miles away and the operation would generally be downwind from recreationists on the river. There is also considerable traffic noise with FH9 running adjacent to the river along this section. Again the size and scope of the proposed management activities in this area would represent no more than short-term disruptive effects. Helicopter yarding would likely be completed within a 2-3 week period under all alternatives.

The Dobson Pass project area does not provide any unique recreational attributes during the summer period. Road 429 is an open secondary access route for the public. Some delays could occur during yarding of units 1-3 but alternate bypass routes are available. In the winter, Roads 424 and 271 are groomed snowmobile routes. Because of this, winter operations should be avoided in Units 1-3 during the period of December 1 to March 31. Activities in the Keystone Gulch area could continue without winter recreational conflicts. Helicopter yarding may provide some noise disturbance to private landowners along the upper reaches of Beaver Creek, however home sites are widely-scattered and the disturbance period would likely be less than one week. This short-term helicopter yarding operation may provide a point-of-interest for members of the public traveling along County Road 456 to stop and watch the logging operation from across the canyon.

Timber operations would be compatible with a Recreation Opportunity Spectrum, (ROS) classification of "roaded modified."

Standard warning signs would need to be posted in all areas of operation and along routes used for log transport. Log hauling would be prohibited during weekends and holidays from all project areas. Flagpersons would be used on Road 622 in the Grizzly Mountain area where inhaul of logs crosses or lands on the roadway since this route is open to the general public.

Combined, this project and most of the ongoing and foreseeable activities listed in Chapter II will not alter the Coeur d'Alene River Basin ROS because they are all small in scope and duration. Generally, these projects will have only transitory effects on recreation access and opportunities. Various harvest and post harvest activities could temporarily displace some recreation visitors to other parts of the Coeur d'Alene River District. These types of disturbances to general recreational usage on the forest have been a common feature on the National Forest under Multiple Use Management.

L. Scenery

The Grassy Mountain project area is common from a scenic point of view. There is general mixed conifer stands and brush of varying age classes with some evidence of past timber harvest. The units in this area are located on terrain of low visual concern and are classified in the Visual Quality Objectives analysis (VQO), as maximum modification lands. In general, this area is not seen from main travel routes, recreation facilities, or large residence areas. The proposed individual tree selection harvests in this area would be acceptable within any VQO regime.

Grizzly Mountain is more visible. The upper portion of Grizzly Mountain would fall within a partial retention category for the background viewing area from Forest Highway 9. Only the upper portion of Grizzly Mountain is visible from the FH9/Coeur d'Alene River corridor. The proposed treatment units 1-12 would not be visible from the corridor. Units 13 and 14 may be visible, but the individual tree selection treatment would be acceptable for partial retention. Actually, the visible portion of Grizzly Mountain has some visual absorption properties because of the natural openings along the ridgetop. This visual absorption would allow for some artificial openings to be created with the proper placement and shape. The scattering of group

shelterwood harvest units should provide acceptable visual quality within the foreground viewing area along Road 622. Ecoburning treatments may result in some branch or tree scorching however these visual changes are considered short term. Alternative 3, with the salvage of understory trees would likely reduce or soften this should term visual affect. All alternative would meet Visual Quality Objectives for the area.

Dobson Pass project area would be classified as have a Visual Quality Objective of modification. Change in the forest landscape can occur but with some visual sensitivity. Treatments in the Ferguson Creek area would either be screened from Road 456 (such as Unit 1) or would meet partial retention as is the case for the larch thinning units in the upper, more visible part of the basin. The improvement harvests and group shelterwood treatments in the Keystone Gulch area would meet VQO's. This is especially true given the modification that has occurred on the private lands within the area. Efforts should be made to conduct slow, cool jackpot burns within these units to minimize mortality to residual timber and minimize the amount of branch scorching.

The scenery resources consider cumulative effects at the Coeur d'Alene River Ranger District scale. The National Forest provides a wide range of scenic views scattered across the district. The ongoing and reasonably foreseeable projects and activities identified in Chapter II fall within that wide range and natural variation. The alternatives under this project and other ongoing and foreseeable projects are designed to meet Forest Plan visual quality objectives for the overall landscape.

Alternative 1 would be consistent with the visual quality objectives. All action alternatives would meet the assigned Visual Quality Objectives in the Forest Plan.

M. Old Growth

The definitions for allocated old growth used in this analysis are those found in the Forest Plan, Forest Supervisor follow-up letters on implementing old growth standards, and Forest Plan Monitoring Report 2000. No harvest is proposed in currently allocated old growth under the Hither and Yon project. The analysis areas include 179 acres of allocated old growth. The number of acres and percentage of each old growth management unit (OGMU) of allocated old growth by OGMU for areas within the Hither and Yon analysis areas are provided in the following tables.

Table A-1. Allocated Old Growth in the Grassy Mountain Project Area.

OGMU	Compartments	1999 allocated OG acres	1999 % of old growth in OGMU	Acres allocated OG in analysis area
1-30	138	2446	24.6	8
1-32	143	558	7.3	6
3-9	321,323	595	5.4	165
3-10	319,320,322	1524	7.2	0

Table A-2. Allocated Old Growth in the Grizzly Mountain Project Area.

OGMU	Compartments	1999 allocated OG acres	1999 % of old growth in OGMU	Acres allocated OG in analysis area
1-26	141,171	325	4	0
1-29	181,144	1115	9.5	0
1-28	139	1682	14.7	0

Table A-3. Allocated Old Growth in the Dobson Pass Project Area.

OGMU	Compartments	1999 allocated OG acres	1999 % of old growth in OGMU	Acres allocated OG in analysis area
1-15	191,197	618	7.5	0

The IPNF is currently maintaining almost 11 % allocated old growth, and the Coeur d'Alene River Ranger District is managing 60,122 acres as allocated old growth (see Monitoring Report 2000, Project Files - Vegetation). This exceeds both the Forest Plan standard at the IPNF forest level and the Coeur d'Alene district's allocation of old growth. The Coeur d'Alene district is the former Wallace and Fernan Districts. The district is currently in the process of verifying current old growth allocations and considering potential additional stands for old growth allocation. None of the stands in the project areas, or proposed for harvest treatment under this proposal, meet Forest Plan old growth allocation minimum criteria nor are they being considered as additions to the old growth allocation (please refer to the Project Files, Vegetation, for additional information on old growth).

A.2. ALTERNATIVE DEVELOPMENT AND MODIFICATION

A.2.1. Alternatives Considered in Detail

Development of alternatives was based on existing condition of resources in the project area, issues and concerns identified by the project team and by the public, and the purpose and need identified for the project. The "Federal Guide to Watershed Analysis - Environmental Analysis at the Watershed Scale" (USDA Forest Service, August 1995) was not used in alternative development for this proposal. The "Watershed Analysis" is a process used to focus on proposed activity areas, describe current conditions, and identify possible treatment alternatives. This process has been used for proposals similar in scope (for example, the Burnt Cabin Heli Bug project) and was found to be of limited value small-scale projects. Although the process was not used to development alternatives, watershed conditions for the Hither and Yon Beetle proposal were assessed at the watershed scale, as described in Chapter 3. In addition to the No-Action Alternative, three action alternatives were developed. These alternatives are discussed in detail in Chapter 2.

A.2.2. Alternatives Considered But Eliminated From Further Analysis

Eight alternative concepts were developed by the project interdisciplinary team and considered during early scoping and project development, but dismissed from further study as explained below.

The interdisciplinary team considered options for **harvest treatment in the Spyglass Peak area**. A large number of small salvage areas were proposed. During the analysis process this area was dropped from further consideration by the interdisciplinary for the following reasons: Old-growth stands are being re-assessed in this area. The Teritoid Tepee EIS will be making a larger landscape level assessment of this area in 2003. Concern was expressed that this "shot-gun" approach to salvage was not adequately assessing the overall stand conditions and forest fuels concerns in the area. Wildlife disturbance concerns were also expressed over re-opening a barriered road with the likelihood that it would be opened again for treatments proposed under the Teritoid Tepee project. These reasons in combination lead to dropping the Spyglass Peak area from further consideration. The loss of the timber value of the existing beetle mortality was acknowledged in selecting not to enter this area at this time.

The original proposal in the Grizzly Mountain area was to **reconstruction 1.2 miles of system road** to access a helicopter landing. This roadway was put into storage in 1992 when it was deep-ripped and closed with an earth barrier. This reconstruction alternative would have allowed for shorter, more economical helicopter flights for salvaging the timber from 3 treatment areas. During the analysis it was decided to require longer flights to a landing location on an existing open roadway and avoid reconstructing 1.2 miles of road.

A third alternative that was considered would utilize **conventional yarding methods only.** Building road and use of conventional yarding equipment (ground and line machines) generally results in a better financial return on timber proposed for harvest and results in better access for fuels treatment options. However, due to the scattered nature of the beetle-killed timber, considerable new road construction would be needed to access these pockets. Some channel crossings that had recently had culverts pulled would also have to be re-established. Proposing new road construction did not meet the primary purpose and need of this proposal to produce timber products with minimal effects on the forest environment.

Another option proposed would **utilize only regeneration treatments**. This alternative was eliminated because of previous regeneration treatments within the areas, size and location of treatment areas, and the primary purpose and need of this proposal to produce timber products with minimal effects on the forest environment.

An option was considered by the team that would **utilize only salvage treatments**. A salvage-only alternative would not demonstrate a substantial difference in loss of canopy than would occur with regeneration treatments under this proposal, since much of the timber to be cut in regeneration areas is already dead. Therefore, the only change that would be measured was whether the sites would be planted or allowed to regenerate naturally. This was not enough of a difference to develop a separate alternative. This alternative would also not meet part of the purpose and need to promote long-term vegetative restoration in areas of low residual stand stocking as a result of timber mortality.

A **no-harvest vegetative restoration only** alternative was proposed by the Forest Conservation Council. A no-harvest vegetative restoration treatment would be possible, however it was dismissed for the following reasons: The Forest Service management policy is based on multiple use of the forest resource. Federal Code of Regulations (36 CFR 221.3) directs that management plans for national forest timber resources will be designed to aid in providing a continuous supply of national forest timber, be based on sustained yield, provide and even flow of timber in order to facilitate the stabilization of communities and employment, and be coordinated with other uses of National Forest System lands in accordance with the principles of multiple use management. Providing forest products with minimal effects to the forest environment is the primary purpose and need for this project.

Felling the trees, leaving them on site, then doing fuels treatments could be done. This activity could be quite expensive and generates concerns of fire control and soil productivity issues. Having that much activity fuel on the forest floor and introducing fire without good defensible burn boundaries could result in an escaped fire that consumes more of the forest than desired. Burning the areas with a high tonnage of fuels on the ground, especially with a large component already being dead, could result in fire intensities and durations that adversely affect soil horizons. Performing fuels treatment options without felling the trees would reduce the short-term fire risk but would not reduce the long-term fire hazard as the dead trees shed their branches and fall over the next 10-20 year period.

Salvaging the trees would provide timber products, reduce future fuel loads on the site, and generate dollars to be used for fuels treatments and for re-establishment of historical forest components such as pines and larch. We believe this is consistent with multiple use management direction and would provide the most efficient and reasonable means to accomplish these goals while having minimal effects on the forest environment.

An alternative that would **ecoburn in Keystone Gulch** within the Dobson Pass project area was considered but dismissed. The residual stand of timber was determined to be of a smaller size class and of a species mix that would result in high mortality rates after prescribed fire treatments. Harvest of the smaller size class prior to burning would have resulted in too much of the stand being removed and would have lead to the need for regeneration treatments. This was not in keeping with providing forest products with minimal effects to the forest environment.

A **watershed restoration only** alternative was also considered. The Hither and Yon project areas fall within previous analysis areas of a larger scale (Drexsey, Little Elk, Big Dewey Brown, Grizzly Salvage, and Capitol Hill). Watershed restoration that included road obliteration, channel site removal, and the upgrade of culvert and channel sites along existing system roads has already been completed in these areas. The Hither and Yon Beetle project proposal is the result of recent Douglas-fir bark beetle mortality. The purpose and need is to produce timber products with minimal effects to the forest environment, treat fuels, enhance historical ecosystem components, and promote long-term vegetative restoration in areas of low residual stand stocking levels. The project is small in scope and scattered. There are no watershed restoration sites within the project areas that are considered high priority or that would provide a good return for the investment. Therefore a watershed restoration only alternative was not developed.

A.2.3. Public Comments Received During Scoping

Three letters were received during scoping for the Hither and Yon Beetle proposal. Substantive comments and our responses are provided below. Copies of the letters are also provided.

Kootenai Environmental Alliance
P.O. Box 1598 Coeur d'Alene, ID 83816-1598

Joseph P. Stringer, District Ranger
Coeur d'Alene River Ranger District
Fernan Office
2502 East Sherman Avenue
Coeur d'Alene, ID 83814

January 26, 2002

Dear Mr. Stringer:

The following comments concern the proposed logging activities described in the Hither and Yon Beetle Project notice dated December 26, 2001.

Timber Sales:
The EA to be produced should include information regarding the extent of past logging in each of the four areas.
For the Spyglass Peak area, there should be accurate information that would indicate the extent of past logging in the Drexall and Halsey Creek drainages, in particular the logging that occurred after 1980. If one or more new units would be adjacent to units logged after 1980, there should be information regarding current unit locations.
For the Grassy Mountain area, there should be accurate information regarding previous logging in the Short Creek and Little Elk Creek drainages, in particular the logging that occurred after 1980. If one or more new units would be adjacent to units logged after 1980, there should be information regarding current unit locations.
For the Grizzly Mountain area, there should be accurate information regarding previous logging in project area, in particular logging that occurred after 1980. If any of the proposed 14 logging units would be adjacent to units logged after 1980, there should be information regarding current unit locations.
For the Dobson Pass area, there should be accurate information regarding previous logging in the Dudley Creek, Ferguson Creek and Dobson Gulch areas, in particular logging that occurred after 1980. If any of the proposed units would be placed adjacent to units logged after 1980, there should be information regarding current unit locations.

Cumulative effects analysis areas (CEAs):
The EA should supply accurate information regarding the boundaries of each CEA for each of the four areas proposed for logging. The cumulative effects analysis in each of the four areas should include information that would indicate if recent Monitoring data and written Evaluations exist regarding impacts to the watersheds from logging activities in each of the project areas.

Watersheds/Fisheries/ECA's:
The watershed analysis should indicate the current watershed condition, Not Properly Functioning, Functioning at Risk, or Properly Functioning, for each watershed in each project area. The fisheries analysis should provide information regarding the status and trends of the fisheries in the Creeks in each of the project areas and indicate whether historical fisheries information exists for each of the project areas.
The watershed analysis should also include data for the existing Equivalent Clearcut Acres in each of the project areas. The analysis should include data regarding the total allowable ECA for each of the drainages in the four areas proposed for logging, and data indicating the estimated number of years needed for full vegetative recovery for the drainages in each project area.

Old Growth:
There should be information that will indicate whether logging would occur where there are stands of trees with a dbh > 15 inches. The Old Growth analysis should indicate whether there are field verified Old Growth stands within or adjacent to any of the project areas.
If there are field verified Old Growth stands that are within the boundaries of any of the project areas, and R1 edit data exists for the field verified Old Growth stands, R1 edit data that indicates the dbh and age of the trees in the stands should be included in the project files. The project files should also indicate the OGMU that covers each project area.
There should be data that would show the estimated number of acres of dead Douglas fir that would be logged in each project area.

Large Organic Debris/soils:
If field surveys have been conducted in any of the analysis areas that analyzed soil conditions where there are large downed Douglas fir trees, a summary of the survey results should be included in the project files.

Mitigation work:
If there has been road or instream work performed after 1990 in any of the project areas that was a requirement included in NEPA analysis for timber sales, including Big Short Salvage, the EA should describe the mitigation work completed.

The comments are also being submitted on behalf of Ron Mitchell, Idaho Sporting Congress, P.O. Box 1136, Boise, ID 83701. We wish to receive a copy of the EA and request a copy be sent to Ron Mitchell, Idaho Sporting Congress.

Sincerely,

Mike Mihelich Forest Watch Coordinator

Response to comments provided by Mike Mihelich, Kootenai Environmental Alliance

Each resource analysis included past harvest activities as part of the existing condition. This information is generated by the TSMRS database. Maps displaying current vegetative conditions within the project areas and where the proposed units fall in relation to these areas are provided in the Project Files (Vegetation). A cumulative effects analysis has been conducted for each of the affected resources (Chapter 3). The cumulative effects analysis includes past, ongoing and reasonably foreseeable activities, including harvest treatments, mitigation treatments, and watershed restoration activities. The cumulative effects boundaries vary by the resource being analyzed. Watershed analysis boundaries are quite large, i.e. Tepee Creek above Trail Creek for the Grassy Mountain Area, all of Grizzly Creek (including Lindsey and Dewey) for the Grizzly Mountain Area, and Beaver Creek for the Dobson Pass area. Vegetation analysis was based on the project area boundaries. Wildlife analysis were initially be based on the project area boundary but were expanded as needed depending on the species being analyzed.

The environmental assessment displays the current classification of the watershed and the equivalent clearcut acres (ECA's) for each area in the watershed resources section (Chapter 3). Information on fisheries has been brought forward but was not discussed in detail if the watershed analysis did not conclude that there would be changes to factors that could affect stream channel conditions. A biological assessment will be completed for the alternative that is selected for implementation, and findings will be disclosed in the Decision Notice.

The Ecosystem Team for the Idaho Panhandle National Forests has developed a Forest Corporate Monitoring system to track our progress in restoring the ecosystems of the Idaho Panhandle and in being more consistent in the way we analyze effects to the ecosystems. The monitoring is tied closely to findings of the Interior Columbia Basin and Coeur d'Alene Basin Geographic Assessment. The items being monitored have been disclosed in Chapter 2. Changes brought about by the implementation of this project will be discussed in the decision document. Results of Forest level monitoring are published in an annual report; the report is available from the Supervisor's Office of the Idaho Panhandle National Forests, in Coeur d'Alene, Idaho.

Timber sales are monitored throughout the life of the sale through timber sale administration to ensure implementation is consistent with project design. Post harvest reviews are conducted on a sampling of the sales to monitor if desired end results were achieved. Forest level monitoring of watershed effects in relation to analysis models such as WATSED are published in the annual report mentioned above. Regeneration units are surveyed to monitor success of reforestation efforts. Written evaluations, if used by the specialists in the analysis process, are referenced within the appropriate sections of Chapter 3.

The number and acres of stands being managed for old growth habitat will be discussed in the Forest Vegetation section of the EA for each project area. Currently there is no soil sampling survey information available within the project areas. Forest Plan Soil Quality standards and recommendations of the Intermountain Forest Tree Nutrition Cooperative will be utilized to ensure soil productivity is maintained. Field reconnaissance surveys are available in the project files that display how the proposed treatment areas were affected by Douglas-fir beetles and other pathogens.

Alliance for the Wild Rockies
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Joseph Stringer
Coeur d'Alene River RD
P.O. Box 14
Silverton, ID 83867

1/03/02

Dear Mr. Stringer:

These are comments on behalf of the Alliance for the Wild Rockies (AWR) for the initial proposal to log on the Coeur d'Alene River Ranger District (the Hither and Yon Beetle Projects). Thank you for including us in the discussions and planning of this proposal.

AWR does not agree with or support the premise that salvaging dead and dying trees is a wise or appropriate action for the Forest Service to administer. In ecological terms there is a large and increasing body of research, science, and evidence to suggest that logging, regardless of whether the trees are alive or not, is not in the best interest of the land. Additionally, there are only rare circumstances that would justify logging to reduce fire severity (we assume this is the premise behind "fuel reduction" activity). As you know, one thing our forests require most is the cleansing and renewing effects of fire.

We are interested in the underlying reasons that support the purpose of this proposal. Again, ecologically there is absolutely no "forest health" justification to salvage log. From a fuels standpoint, the justification for logging is highly dependent upon the forest type, elevation, and aspect of the stands in question. We request that the environmental document for this project include this sort of data in regards to the stands in question so the public will understand where and why the Forest Service is logging. If there is no true ecological or fire related reason to log then we would hope the agency would be forward enough to acknowledge that this action is meant to accomplish economic ends only.

While we request that your environmental analysis cover the effects of all alternatives on all resources we ask that you pay special attention to Threatened and Endangered Species and roadless areas. We would argue that this sort of project is unacceptable if it were to impact the habitat of an imperiled species or impact the inherent quality of a roadless area. We also request that the analysis include a full economic breakdown of how much it will cost to administer the project and carry out all associated activities including monitoring.

We are opposed to these sorts of activities if they impact old growth habitat in the analysis area. Please disclose how much old growth is in the analysis area and how each alternative will affect this habitat.

Please keep AWR updated as you progress with this proposal.

Sincerely,

Ryan Shaffer

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PO Box 974 • Ketchum, Idaho • 83340
208-726-5293 • kaz@wildrockiesalliance.org

Ecosystem Defense Program:
406-542-0050
defense@wildrockiesalliance.org

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Response to comments provided by Ryan Shaffer, Alliance for the Wild Rockies

The underlying purpose and need for this project is to produce forest products with minimal effects to the forest environment. The Forest Service management policy is based on multiple use of the forest resource. Federal Code of Regulations (36 CFR 221.3) directs that management plans for national forest timber resources will be designed to aid in providing a continuous supply of national forest timber, be based on sustained yield, provide and even flow of timber in order to facilitate the stabilization of communities and employment, and be coordinated with other uses of national forest lands in accordance with the principles of multiple use management. In working to accomplish the purpose and need, other objectives can be accomplished. Fuels can be treated to reduce the long-term fire risks in the area. Existing historical ecosystem components can be enhanced through harvest treatments. And areas of low-stocking levels can be restored to healthy ecosystem conditions through harvest, prescribed fire, and planting to seral species.

This proposal is not within or immediately adjacent to roadless areas. Threatened, endangered, and sensitive plant, animal and fish species would be protected either through avoidance of habitat or through features designed into the project to protect TES species (Chapter 2, Section 2.5.1 Features Common to All Alternatives). These species may not be discussed in detail, but rationale for the conclusion on effects will be provided and will be supported in Biological Assessments and Evaluations.

Stands that are being managed for old growth habitat are disclosed in the forest vegetation section of the EA. Old growth is not be discussed in detail because this project is designed to avoid entry into these stands.

FOREST CONSERVATION COUNCIL

Western Regional Office
P.O. Box 22488
Santa Fe, NM 87502
505.986.1163

Joseph Stringer
Idaho Panhandle National Forest
Coeur d'Alene River Ranger District
P.O. Box 14
Silverton, ID 83867

January 10, 2002

Re: FCC and NFPA Scoping Comments on Hither and Yon Beetle Timber Sale

Dear Mr. Stringer,

We intend this letter to be an expression of our interest in the Hither and Yon Beetle Timber Sale. In addition, our organizations (Forest Conservation Council [FCC] and the National Forest Protection Alliance [NFPA]) would like to raise several issues concerning the project that should be addressed in subsequent environmental documentation. In general, the project will jeopardize the viability of species that thrive in forest ecosystems through activities associated with timber harvest and road building, intervene in natural disturbance processes that are vital to ecosystem sustainability, and degrade water quality and watershed condition. Further, the project will damage social and economic uses and values associated with natural forests (including forests that are affected by beneficial natural disturbance) for the benefit of the timber industry, even though non-timber uses and values are far more important to local communities and the regional economy.

More specifically, we are concerned with the adverse economic effects of commercial logging on public lands and the damage and loss of ecosystem service values associated with standing or otherwise intact forest ecosystems. The Forest Service's failure to quantify such effects at the project level or for the logging program as a whole is contrary to many federal and USFS regulations. The opportunity costs of the logging program, which include the value of uses forgone on areas logged plus the benefits associated with alternative uses of timber sale funds should be evaluated on a project basis. We request an impartial analysis of all values, both market and non-market associated with **each** alternative including the no-action and no commercial harvest alternatives. This includes employment and income (including multipliers) associated with non-timber uses.

This is not exclusively a "timber economics" issue. Certainly, we are concerned with the financial efficiency of the Hither and Yon Beetle Timber Sale, the so-called "below cost" or "deficit sale" issue. However, our concerns go beyond this issue to include the economic efficiency of the timber sale, whether or not the costs and benefits, beyond those to the federal government, meet the government mandate of net public benefit. In other words, are the greater values of standing forest ecosystems disregarded for the short-term financial benefit of the sale of trees to the timber industry?

The planned activities are likely to jeopardize the viability of species that find optimal habitat in interior forests, forests with well-developed structures, and forests naturally disturbed by physical and biological processes. For many of these species, the Forest Service has no up-to-date population data describing population numbers, locations, and trends, nor monitoring data on which the agency can rely to determine that the actions proposed in the context of the Hither and Yon Beetle Timber Sale will maintain numbers and distribution of these species sufficient for insuring long-term viability.

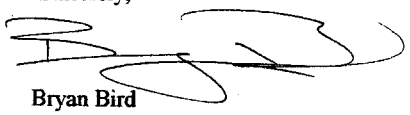
It is essential that the analysis include an in depth treatment of cumulative effects especially in regards to soils, water quality, fragmentation, old growth, TES, MIS, and neotropical migrant birds. All activities including past, present, and reasonably foreseeable future activities on each and every land ownership must be incorporated.

Finally, we request that a restoration only alternative, one emphasizing natural disturbance processes, be developed and given fair and adequate consideration. It is the duty of the Forest Service to develop a reasonable alternative that would exclude the harmful effects of commercial logging while encouraging natural recovery. The purpose and need of the project can be met more efficiently through means other than commercial timber harvest and those means must be given unbiased attention. Such a no-harvest, restoration alternative **is not** analogous to the no-action alternative.

Please consider these issues as you further develop environmental documentation related to the Hither and Yon Beetle Timber Sale.

Please also note that all USFS timber sale NEPA materials should now be sent to our Western Regional Office as listed above. This is a change of address notification.

Sincerely,



Bryan Bird
Western Regional Office

FCC/NFPA Scoping Comments, Hither and Yon Beetle Timber Sale, p. 2

Response to comments from Bryan Bird, Forest Conservation Council

In the case of this project, timber harvest is a management tool proposed as a means to create conditions necessary to rehabilitate a declining forest. The Forest Service management policy is based on multiple use of the forest resource. Federal Code of Regulations (36 CFR 221.3) directs that management plans for national forest timber resources will be designed to aid in providing a continuous supply of national forest timber, be based on sustained yield, provide and even flow of timber in order to facilitate the stabilization of communities and employment, and be coordinated with other uses of national forest lands in accordance with the principles of multiple use management. We look at trying to achieve a blend of resource and wildlife habitat needs consistent with public expectations and desires for the National Forest.

The human presence in the forest over the last 100 years has affected forest ecosystems. Road building, timber harvest, riparian usage, fire suppression, introductions of pathogens such as white pine blister rust have all had an effect on the existing forest ecosystem. Not all forest ecosystems are currently healthy and ecosystem health cannot be fully restored by just walking away. Some of the natural ecosystem disturbance processes of the past are not as acceptable now with the human presence in the forest and with the various expectations of what the forest should provide.

We maintain the viability of wildlife species by ensuring that we maintain various habitats for these species. It is not possible to provide habitat for every given species on every acre at any given moment in time. This habitat is dispersed across the forest. The wildlife analysis for the Hither and Yon Beetle proposal considered effects to species with habitat within the analysis areas, including black-backed woodpecker, fisher, Northern goshawk, and elk. The proposal's effect on other wildlife species is discussed in "Issues Not Addressed in Detail in this Environmental Assessment," in this appendix.

The cumulative effects analysis for this project considered effects of past, ongoing and reasonably foreseeable activities. Ongoing and reasonably foreseeable activities are identified in Chapter 2. Past activities are described in the existing condition discussions in Chapter 3, with additional past harvest information in the Project Files (Vegetation). The area considered for each cumulative assessment is based on the affected resource.

The analyses focus on issues considered as factors in the decision to be made (pages 2-6, A-1). This is consistent with NEPA direction to focus on a full and fair discussion of significant issues, and to identify and eliminate from detailed study the issues that are not significant (40 CFR 1501.7).

The proposed action is a restoration alternative. In order to restore the vegetative component of the area, pines and larch need to be reintroduced back into the ecosystem. In this case, we believe the most efficient and reasonable means is through a "light on the land" timber harvest followed by introduction of fire and planting to bring the area back to more historic conditions. Treatments to maintain and enhance existing historical ecosystem components are also being considered with this proposal. We are making an investment into the future ecosystem and its sustainability. Could this be done without commercial logging? Yes. But considering the diverse needs and desires of the public, it would not be a reasonable or efficient means to achieve that goal. Timber harvest is a way to reduce fuel loads, create conditions to allow for the maintenance and establishment of pines and larch, and help finance the vegetative restoration process.

The activities proposed under the action alternatives are consistent with the Forest Plan and other applicable regulatory direction.

APPENDIX B
THREATENED, ENDANGERED AND SENSITIVE PLANTS

B.1. REGULATORY FRAMEWORK

Federal legislation, regulations, policy and direction that require protection of species and population viability, evaluation and planning process consideration of threatened, endangered and other rare (Forest Service "sensitive") plants species include 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, Forest Plan (1987); and direction from the Regional Watershed, Wildlife, Fisheries and Rare Plants program and Washington Office.

B.2. METHODOLOGY

Assessment of the affected environment for sensitive species, Forest species of concern and suitable habitat occurrence was accomplished through review of the Coeur d'Alene River Ranger District sensitive plant records, Idaho Department of Fish and Game Conservation Data Center (ICDC 1999) element occurrence records, National Wetlands Inventory maps, timber stand examination records, aerial photographs and topographical maps, past field visits, personal knowledge and professional judgement of the project area by the District Botanist.

Analysis of effects was conducted using results of past sensitive plant surveys, current distribution and condition of sensitive plant species in habitats similar to those found in the proposed treatment sites, types of proposed treatments and the likely effects to existing populations and habitat from the proposed activity based on current knowledge and professional judgement. It included a broad-scale assessment (see Project Files – TES Plants) of the distribution and suitability of sensitive plant habitat in relation to proposed activities and a detailed analysis of each proposed activity and the need for mitigation. The analysis considered cumulative effects, as well as the effectiveness of mitigation proposed for the protection of species. The cumulative effects analysis area for TES plants was the vegetative analysis or project boundary.

Effects to sensitive plant species or suitable habitat from proposed activities are generally described as very low, low, moderate or high, with the following definitions:

- *Very low: no measurable effect on individuals, populations or habitat*
- *Low: individuals, populations 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 which could support sensitive plant species*
- *High: populations may be affected and/or habitat capability may over the long term be reduced below a level which could support sensitive plant species*

Effects to population viability from disturbance events (natural or man-caused) are difficult to quantify with certainty for all sensitive plant species and species of concern. Specific knowledge of population ecology is lacking for several species addressed in this analysis, particularly the sensitive moonworts and certain orchid species: round-leaved rein orchid and phantom orchid. Much of the current knowledge regarding sensitive plant species is based on observational and even anecdotal information. Recent literature and monitoring reports on several species, including: deerfern (Blake and Ebrahimi 1992), clustered ladies slipper (Greenlee 1997), Henderson's sedge and Constance's bittercress (Lichthardt 1998) and Idaho strawberry (Crawford 1980), provide a greater understanding of the relationship of habitat disturbance to the integrity of populations of these species.

As a beginning point, on habitats that are currently unsurveyed for plants, presence of the appropriate species is assumed. Protection of known large occurrences, and protection of contiguous, unoccupied highly suitable habitat is assumed to be an effective conservation strategy. The Features Common to All Action Alternatives section of Chapter II explains that populations would be protected, although some isolated individuals may be impacted by activities. Surveys will be conducted to ascertain the presence of Sensitive plants, prior to ground-disturbing activities. Mitigation measures will be designed by the project botanist to ensure populations are protected. Without mitigation, there exists a high likelihood of adverse effects to sensitive plants in highly suitable habitat, especially from moderate to high risk activities such as regeneration harvest, commercial thinning using tractor or skyline methods, road construction, fuel break construction, full road obliteration (return to contour), and fuels reduction (underburning and mechanical treatment). These effects could lead to loss of population viability, or trend toward Federal listing, especially for plant species in the moist, dry and wet guilds**.**

Sensitive Plant Surveys

No sensitive plant surveys have yet been conducted specifically for the Hither and Yon Beetle project. Surveys are planned to begin in the spring 2002, to be completed prior to implementation of ground-disturbing activities. We are committed to carrying out features and mitigation measures identified in Chapter II, and have had good results from using this approach in the past. For example, sensitive plant surveys were completed after the Decisions were issued but prior to implementation for the Ice Storm Salvage project (1997) and Douglas-fir Beetle EIS project (1999). Survey documentation for these two projects is located in their respective project files. Specific features of the alternatives (Chapter 2, Section 2.5.1. Features Common to All Action Alternatives) would be implemented to protect any newly documented population and its habitat.

Indicators used to measure effects on sensitive plants and suitable habitat include: predicted canopy reduction, because light and moisture regimes may change; the extent of each proposed activity, such as amount of ground disturbance, because mechanical disturbance can disrupt and destroy growing plants and regeneration potential; proximity of known sensitive plant occurrences because this indicates a high likelihood of plants being present; and the predicted reduction of heavy fuel loads, because fires can disrupt and destroy growing plants and their methods of reproduction.

For certain species, moderate to low risk activities such as selective harvest, low intensity fire, and road reconstruction are not likely to adversely affect population viability, even though individual plants may be affected. Observations and monitoring information indicate that some activities may have little effect or even a positive effect on species tolerant of low to moderate levels of disturbance, such as deerfern (Blake and Ebrahimi 1992), Idaho strawberry and Constance's bittercress (Crawford 1980).

Please refer to Project Files (TES Plants) for a comparison of the relative risks of various types of activities with respect to sensitive plants and habitat.

B.3. AFFECTED ENVIRONMENT

B.3.1. Threatened and Endangered Plant Species

A threatened species, as determined by the US Fish and Wildlife Service, is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Currently, the US Fish and Wildlife Service (USDI 1999) list two species as threatened for the Idaho Panhandle National Forests, water howellia (*Howellia aquatilis*) and Ute ladies'-tresses (*Spiranthes diluvialis*). There are no documented occurrences of these species on the Idaho Panhandle National Forests, although suitable habitat is suspected to occur. The recent Douglas-fir beetle outbreak has not affected suitable habitat for water howellia or Ute's ladies'-tresses. There is no proposed treatment within or adjacent

to potentially suitable habitat for water howellia. It was determined that implementation of any alternative would have no effect on water howellia or Ute ladies'-tresses or their habitat. Refer to the Biological Assessment in the project file for more information on water howellia and Ute ladies'-tresses.

Spalding's catchfly (*Silene spaldingii*) is suspected to occur on the IPNF and was recently listed as a threatened species for the Forest. Spalding's catchfly habitat cannot be accurately determined using Timber Stand Database information. Suitable habitat consists of grasslands dominated by Idaho fescue (*Festuca idahoensis*) or rough fescur (*F. scabrella*). Sites typically have few to no shrubs and only scattered individual ponderosa pine and Douglas-fir trees. Soils generally range from moderately deep to deep (USDA, 2000). Potential habitat within the analysis areas occurs mainly as patches within dry forest guild habitat. It is important to note that not all dry forest habitat includes potential sites for Spalding's silene. It is believed that potential habitat within the Hither and Yon project areas if present would be associated with units 2 and 3 in the Grizzly Mountain area and units 4, 5, 6, and 8 and the Dobson Pass area. These areas will be surveyed prior to implementation.

There are no Federally-listed endangered plants for the Idaho Panhandle National Forests.

B.3.2. Sensitive Plant Species and Forest Species of Concern

The subbasins of northern Idaho contain a wide array and diversity of habitats and plant communities, many of which contain plant species that are known or thought to be rare. Of the estimated 1,200 to 1,500 plant species known or thought to occur here, about 10% are considered rare or uncommon.

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 in habitat capability which would reduce the species' existing distribution. The Northern Regional Forester's sensitive species list for the IPNF contains 63 plant species. Twenty-nine species of sensitive plants are known or suspected to occur within the Coeur d'Alene subbasin.

Plant species identified as "Forest species of concern" are species which may not be at risk on a rangewide, regional or state scale, but may be imperiled within a planning area, such as a National Forest (USDA 1997). Forest species of concern are addressed in effects analysis to provide for maintenance of population viability as directed in NFMA.

B.3.3. Rare Plant Guilds

There is abundant habitat for moist, dry, and wet forest guild species in the analysis areas, as reflected in the table below. Moist and dry forest habitats and species have the greatest potential to be affected by proposed harvest activities, as these are the habitats most affected by the Douglas-fir beetles. Wet forest habitats occupy limited acreage within the analysis area, none of which is near or adjacent to any proposed treatment areas.

Table B-1. Extent of Suitable Sensitive Plant Habitat in the Project Areas.

Analysis Area	lpine Gui ıbitat Acı	Dry Guild [abitat Acre	Moist Guil abitat Acr	Wet Guild Habitat Acre	Total Acres Suitable Habit
Grassy Mountain	0	174	268	49	491
Grizzly Mountain	0	31	114	0	145
Dobson Pass	0	130	123	0	253
Total	0	335	505	49	889

Wet and Moist Forest Guilds

Species of wet to moist forest habitats that are likely to occur in the project areas include deerfern (*Blechnum*

spicant), moonworts (*Botrychium lanceolatum, B. minganense, B. paradoxum, B. pinnatum, and B. simplex*), phantom orchid (*Eburophyton austiniae*), Henderson's sedge (*Carex hendersonii*) Constance's bittercress (*Cardamine constancei*), clustered lady's slipper (*Cypripedium fasciculatum*), and Idaho barren strawberry (*Waldsteinia idahoensis*). The sensitive species maidenhair spleenwort (*Asplenium trichomanes*), and chickweed monkey flower (*Mimulus alsinoides*) may also occur in rock seep microsites within moist/wet forests.

Several of the sensitive species are known only from wet habitats (*Botrychium ascendens, B. crenulatum, B. montanum, B. pedunculosum*), green bug-on-a-stick moss (*Buxbaumia viridis*), clear moss (*Hookeria lucens*), and Sierra woodfern (*Thelypteris nevadensis*). There are no wet forest habitats represented in the project area.

There are two Forest species of concern found in moist to wet forest habitats that are either documented in the project areas or have a high likelihood to occur there based on the proximity of known occurrences and the presence of suitable habitat. These include, round-leaved rein orchid (*Platanthera orbiculata*) and western starflower (*Trientalis latifolia*).

Dry Forest Guild

The Dry Forest Guild encompasses sites occupied by relatively open stands of ponderosa pine and Douglas-fir with associated species such as ninebark (*Physocarpus malvaceus*), oceanspray (*Holodiscus discolor*), pinegrass (*Calamagrostis rubescens*), and bluebunch wheatgrass (*Agropyron spicatum*) to grand fir/ninebark occupied sites. Sites may be steep sloped and include microsites of rock or rock outcrops. Two sensitive species of the dry forest guild have the potential to occur within treatment areas. They are the clustered lady's slipper (*Cypripedium fasciculatum*) and chickweed monkeyflower *(Mimulus alsinoides*). Based on ground knowledge, the clustered lady's slipper is expected to have a higher likelihood of occurance than the monkeyflower in the activity area. In addition, one Forest species of concern, bank monkeyflower (*Mimulus clivicola*), though unlikely, has the potential to occur in activity areas.

Grassy openings of Idaho fescue (*Festuca idahoensis*) and bluebunch wheatgrass (*pseudoroegneria spicata*) within dry forest habitat may provide suitable habitat for Threatened species Spalding's catchfly (*Silene spaldingii*). There is potential for this habitat to occur within the project areas.

B.3.4. Changes in Sensitive Plant Habitat from Historic Conditions

The current condition of the vegetation in the project areas has changed, in many respects, as compared to the historic condition. Some of the most significant changes to vegetation that have occurred are loss of riparian habitats, fragmentation of habitat by timber harvest , and introduction of numerous non-native pathogens and plant species. Many of the Coeur d'Alene sensitive plants occupy habitats consisting of late seral or old growth forest in wet-to-moist habitat type series. Currently about 40 percent of these habitats remain intact. Overall, this habitat is fragmented by past harvest and vegetation changes brought on by root rots and blister rust. This fragmentation has lead to decreasing recolonization opportunities for rare plants from existing populations. One of the more important implications of habitat loss and fragmentation is the reduced ability of sensitive plants to respond to random events or disturbances in the environment, whether these be natural or human-caused.

The database shows that in the project areas, about 8 percent of National Forest System Lands have been regeneration harvested. Although there may be some double counting of acres, records also show that about 27 percent of the total National Forest System acres have had some other form of timber harvest (overstory removal, salvage, commercial thin). While precise data is not available on the amount of sensitive plant habitat and populations that have been impacted or lost due to past disturbances, it can be surmised that changes have occurred.

B.4. ENVIRONMENTAL CONSEQUENCES

Direct, indirect and cumulative effects were addressed at the Project Area scale only. Protective measures designed to be implemented at that scale preclude any added or cumulative effects at a larger scale.

B.4.1. Effects Common To All Action Alternatives

A. Direct and Indirect Effects Common to All Action Alternatives

No harvest or project-related activities are proposed within deciduous riparian, subalpine, peatland or aquatic habitats in the analysis areas. Therefore, there would be no direct or indirect impacts to any sensitive species occurring in these guilds (see Project Files – TES Plants). Most timber harvest would take place in dry and moist habitats, so most of the effects would be confined to dry and moist forest guild species. Since Riparian Habitat Conservation Area guidelines would be followed for all action alternatives, most wet forest habitat would be excluded from harvest activities, and burning would be controlled. The following table illustrates suitable sensitive plant habitat potentially affected by harvest treatment under each alternative.

Table B-2. Summary acres of suitable sensitive plant habitat potentially affected by harvest or prescribed fire treatment, by alternative.

Rare Plant Guild	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Moist Guild	0	12	12	12
Dry Guild	0	39	42	39
Wet Guild	0	0	0	0
Total Guild Acres	**0**	**51**	**54**	**51**

The actual effects of salvage harvest would be similar to the effects of mortality on Douglas-fir caused by the beetle as in Alternative 1, No Action. The main difference would be that under the action alternatives, fuel loadings are reduced over the long term, whereas in untreated stands (Alternative 1) the fuel loads are untreated, resulting in an increased risk to sensitive plants from future stand-replacing wildfires. Small openings created by this harvest method could have incidental, microsite effects to some plants. If tree mortality in the selective harvest are is high, effects could be similar to a regeneration harvest. There would be some direct effects from salvage harvest in suitable habitats for sensitive plants of the moist and dry guilds, especially those that are intolerant of changes in the moisture and light regime (i.e. mycotrophic species, moonworts and orchids).

Regeneration harvest would directly affect Moist sensitive plant habitat. The limited data and observations available indicate that most species in these Guilds are intolerant of major canopy removal. Mycotrophic species such as moonworts and sensitive orchids are very vulnerable to regeneration harvest. The most detrimental sort of regeneration harvest treatment appears to be with ground based equipment, followed by a hot burn, which consumes a lot of the organic matter on the site, or with mechanical fuels treatment. The least detrimental would be helicopter salvage logging, especially if it includes top attached yarding as the fuels treatment, though the potential for impacts due to alteration of the moisture regime would still be high. The action alternatives display various fuels treatment and harvest combinations. The changes in canopy cover would be similar under each however since most of the harvest is associated with the removal of dead trees. Prescribed fire treatments would vary by alternative.

Some damage to the live crowns of leave trees would be expected from harvest, but it would be minimal. Skyline would be intermediate in effect between helicopter and tractor yarding. Skyline would necessitate construction of corridors for yarding purposes in which long narrow canopy openings would be created. Some ground disturbance would result from the yarding process. Some damage to live crowns would occur with helicopter yarding but it would be more scattered in nature. Tractor yarding would cause the most detrimental and long lasting impacts to the sensitive habitat, but mainly on designated skid trails. Here, compaction and soil displacement would be the primary negative effects.

Threatened Species

There would be no effect to the listed Threatened species Ute ladies-tresses (*Spiranthes diluvialis*) or water howellia (*howellia aquatilis*) as a result of proposed activities, because there is a lack of suitable habitat in the project area. Refer to the Biological Assessment (Project Files) for additional information.

Spalding's catchfly (*Silene spaldingii*) has no documented occurrences in the project area, however, potential habitat is present in proposed activity areas under all action alternatives. Individuals and habitat of this species may be directly or indirectly impacted by ground-disturbing activities such as timber harvest, fuels treatment, and soil displacement from machinery used during the yarding and site-preparation processes (U.S. Fish and Wildlife Service, 2000). The potential effects to Spalding's catchfly and its habitat as a result of harvesting would be minimal because habitat areas are generally open grasslands, with little tree cover. There would be very little harvest in such open areas. Prescribed fire (particularly when it occurs in the spring) would have greater potential for effects to isolated individuals or habitat. Alternative design features and mitigation measures for Threatened and Sensitive plants would protect populations and species viability, although there may be some minor effects to habitat and possibly isolated individuals.

Sensitive Species

While informal observations have shown that many Botrychium species are dependent on some level of disturbance for reproduction, the nature of the disturbance is important. On the Mt. Hood National Forest in Oregon, natural disturbance areas favored by Botrychium species include floodplains in areas of intact, undisturbed vegetation, alluvial fans, trailsides and roadsides. On the IPNF plants are most often found on benches in the riparian zone of late-seral forests, though they are also known from moist subalpine habitats, glacial scours, young, regenerated stands, previously disturbed meadows next to game trails, or roadside ditches.

Though the amount of canopy cover is variable between different moonwort sites, the degree of moisture sites have in common suggests that it is an important requirement. Stream flow alteration due to changes in moisture regime may disturb plants and the fungal relationship necessary for reproduction. Zika (1992) noted that in Oregon, logging adjacent to existing moonwort sites has created problems with windthrow and microsite alteration. Moonworts are very sensitive to drought and may not appear in very dry, hot years (Lorain 1990). Striking changes in abundance and age structure in Botrychium populations have been observed from one year to the next (Zika 1992), and are probably related to moisture and the fungal relationship. Due to their small stature and tendency to occur singly or in small groups, and unpredictability of emergence, there is a possibility that moonwort plants could be missed even when field surveys are conducted.

The effects of harvesting and overstory removal on deerfern are not yet fully understood. Blake and Ebrahimi (1992) noted that deerfern populations in Washington state have withstood timber harvest and related treatment. Although populations studied in Idaho have been found to be genetically and phenologically similar to plants studied on the west coast (Cousens 1981), disjunct and peripheral populations may behave differently (Blake and Ebrahimi 1992). Stream rehabilitation and road reclamation work have the potential to impact deerfern habitat.

Constance's bittercress reacts favorably to openings in the forest canopy as long as the ground is not severely scarified by equipment (Crawford 1980). It does not tend to flower under shaded conditions, but may be able to maintain itself indefinitely by vegetative growth as long as competitive pressures are not too great (Lichthardt and Moseley 1994). Populations along the St. Joe and Selway rivers which were affected by crown fire have been observed to multiply vegetatively in response to increased sunlight, but successful flowering and seed set was low due to hot, dry conditions later in the summer. Indications are that survival of this species after canopy removal may be dependent on the availability of moist microsites.

Little is known of the biology of Henderson's sedge. However, observations of populations on the St. Joe Ranger District seem to indicate that this species may respond, at least vegetatively, to an increase in light due to partial canopy removal. While this species is often observed growing in highly shaded, mid to late seral forest habitats, on the Coeur d'Alene River Ranger District it has been observed growing along recreation and game trails, old roads, and in a recent clearcut that had been site prepped and burned. The plants observed in the clearcut appeared chlorotic, and unhealthy. It is not known what the reproductive capacity of plants is after regeneration harvest, or the long term potential for population survival.

In Oregon, Kagan (1990) found small populations of clustered lady's slipper tended to show no reproduction, possibly due to failure to establish the mycorrhizal relationship. Changes in climate or microsite moisture levels may be partly responsible for the limited germination or seedling survival. It is reported that clustered lady's slipper does not survive clearcutting; known populations in southwestern Oregon were extirpated due to clearcutting, yet individuals survived selective harvesting that did not significantly alter the moisture or shade regime (Kagan 1990). It is not known whether plants that survive selective logging can reproduce and therefore persist over time. Kagan reports that where individual plants survived selective logging they were often found within a short distance of large live trees or snags. The only documented population of clustered lady's slipper within the priority area occurs on private land near Coeur d'Alene Lake. This population, consisting of about 30 plants, has been observed to survive a decrease in canopy cover due to ice storm damage in 1996, and adjacent salvage logging. Long-term effects of the loss of canopy are not known.

Information on the effects of wildfire on clustered lady's slipper are limited. In California, clustered lady's slipper appeared to have disappeared following hot fires. Most Montana and some Idaho occurrences are in Douglas-fir/ninebark and grand fir/ninebark habitats, which historically experienced frequent low to moderate intensity surface fires that occasionally killed overstory trees (Greenlee 1997). Studies have found that, historically, fire intervals in these habitats ranged from 5 to 50 years. It appears that fire, as a natural disturbance, has been important in maintaining habitats suitable to clustered lady's slipper. The effects of the application of fire, outside the time when natural fires occurred historically in north Idaho, are not known.

While bank monkeyflower is adapted to disturbed mineral soils, disturbance from timber harvesting can lead to introduction of highly competitive weeds that could threaten populations. It is important to note that while certain management activities may harm existing individuals, they can help to disperse seed and create habitat for future populations (Lorain 1993). To a certain extent this taxon appears to tolerate and potentially benefit from disturbance. Several monkeyflower populations on the IPNF have been observed growing on old roadcuts, usually having spread from plants established upslope in natural openings. Though bank monkeyflower occurs in habitats, which, historically, have been subject to frequent underburning, the effects of applying fire in early spring during the germination and plant development period are not known. Considering the biology of this annual plant, it can be assumed that while individuals could suffer direct effects in a spring burn, a certain amount of seed would remain in soil for reestablishment. The long-term effects of prescribed fire on bank monkeyflower are not known.

Western starflower is associated with seral forest communities and is known to tolerate soil disturbance and an increase in sunlight on otherwise moist sites. Populations occur along certain roads and trails, and the species tends not to flower under a dense canopy (Lichthardt and Moseley 1994). On the Coeur d'Alene, western starflower is growing in a riparian area subject to seasonal flooding, while populations in the vicinity of the St. Joe River are located on the edge of a road and on the cutslope. The species seems to have an

affinity to light disturbance considering the sites that are currently known on the IPNF, however, its response to clearcutting is not known.

Idaho strawberry plants on the Coeur d'Alene have been known to survive, and do not seem to have been detrimentally affected by thinning of the canopy. Plants in the road right-of-way, which receive more sunlight, flower annually, seeming to have spread since the canopy reduction. This plant can increase vegetatively by means of underground stems (rhizomes), which likely gives it an advantage when there is a minor ground disturbance. Another occurrence of Idaho barren strawberry on the IPNF is in an ecotone between dry grand fir forest and a much drier and more open grand fir/Douglas-fir habitat. Plants in this location are not known to have been subjected to recent harvesting. However, their presence in such habitat indicates the species can tolerate drier, more open canopied forest conditions. Crawford (1980) reported that the abundance of Idaho barren strawberry increases after harvesting in clearcuts, seed-tree cuts, and shelterwood cuts on several different habitat types. Also, it was observed that broadcast burns in clearcuts did not appear to inhibit the growth of the species; however, prolonged heat generated from beneath deep slash piles would probably kill individuals of this plant, as it would any plant.

B. Cumulative Effects Common to All Action Alternatives

Cumulative effects would not differ between the action alternatives. A list of reasonably foreseeable and ongoing projects in the upper Tepee, Grizzly, and Beaver drainages is provided in Chapter 2. The effect of the project on sensitive plants has been described under alternative 1. Given the requirements for surveys and features for the protection of sensitive plant populations and habitat, additional impacts to sensitive species from proposed activities under the action alternatives would be low. A substantial reduction of fuel loads in treated areas would result in the reduction of some potential indirect effects, such as loss of habitats and populations during and after wildfire.

B.4.2. Effects Under Alternative 1 (No Action)

A. Direct and Indirect Effects Under Alternative 1 (No Action)

The current Douglas-fir beetle infestation, and associated tree mortality encompasses approximately 512 acres in the project areas based on aerial mapping and ground reconnaissance. Alternative 1 (the No-Action Alternative) reflects the extent of the bark beetle infestation in the project areas. Under Alternative 1, effects would be variable across the landscape, depending on environmental factors and stand conditions. These effects would be highest in stands with a high proportion of large Douglas-fir (greater than 14 inches in diameter). More open stands, and stands having low proportions of large Douglas-fir trees would, in general, have less mortality. The effects of the bark beetle will be most pronounced in dry to moist habitats, which may be suitable for dry and moist guild sensitive plants species. The following table displays the distribution of infestation across the various habitats.

Table B-3. Acres of Suitable Plant Habitat Potentially Affected by Douglas-fir Beetles under Alternative 1 (No Action), by Guild.

Rare Plant Guild	Acres of Suitable Habitat Potentially Affected by Douglas-fir Beetles
Moist Guild	47
Dry Guild	68
Wet guild	0
Subalpine	0
Total Acres	**115**

Direct and indirect effects from the beetle infestation on sensitive plant populations are likely for species that may be present within affected stands. In stands where a high percentage of the canopy (greater than 50%

loss of the basal area) will be lost due to mortality from the beetle infestation, certain sensitive plant species (such as Constance's bittercress) are likely to exhibit a beneficial response, due to factors like increased levels of light and available moisture. Other species, particularly clustered lady's slipper, are intolerant to factors like loss of shade and decrease in relative humidity, and may die or lose vitality.

Competitive weeds may increase in beetle-affected stands with greater than 50 % canopy loss. This competition may impact sensitive plants, and weed invasion into highly suitable habitat will generally have a negative effect on the native plants throughout the affected area.

There would be an increased risk of wildfire as dead woody fuels build up on beetle-infested areas. Fire could result in the death of undetected sensitive plants occupying these sites, and habitat components may change enough as a result of fires to exclude certain plants on large areas. The effect of fire would depend on factors like the intensity of the fire, and the species ability to survive the event and compete in early successional habitat. The current level of knowledge of species ecology limits our ability to analyze these direct effects for many of the sensitive plant species.

Should a high-intensity, duff-replacing wildfire occur in moist forest habitat, populations of obligate mycorrhizal species such as the moonworts, phantom orchid, clustered lady's slipper, and round-leaved rein orchid could be destroyed. The prospect of recolonization of affected habitat by any of these species would depend on the extent and duration of habitat alteration and the availability of an adjacent seed source.

Populations of certain species occur in earlier seral habitats established by fire within the last 50 years, or in habitats that likely had frequent historical fires. It appears that these species are at least tolerant of more open forest conditions, and natural disturbance events such as fire. One such species is Constance's bittercress, a moist to wet forest guild plant. This species has been observed to survive and multiply, at least vegetatively, after wildfire on the St. Joe Ranger District (Mousseaux 1998). Indications are that survival of Constance's bittercress after fire may be dependent on the availability of moist microsites. Lichthardt (1998) noted from monitoring data, that this species had the highest stem densities in the earliest seral stages of forest communities

Bank monkey-flower, a dry forest guild species, may be present in dry, open forest habitats in the project area. It favors steeply sloping (greater than 60%), southeast to southwest aspects with a thin soil layer. These habitats historically have had a higher frequency than the moist and wet habitats of non-stand replacing fires. This annual plant's reliance on a soil seed bank for reproduction may contribute to its ability to survive low intensity fire.

All the other moist forest, dry forest, and wet forest guild sensitive species have populations in mid- and later successional habitats, preferring more closed canopy conditions. Some of these species such as moonworts (*Botrychium* species), round-leaved rein orchid, phantom orchid, and clustered ladies' slipper, have factors like obligate soil mycorrhizae relationships that are likely to be affected by canopy reduction and moderate to intense (duff-replacing) fires. Stand-replacing fires were an important part of ecosystem processes in northern Idaho and the Coeur d'Alene Basin prior to the beginning of suppression efforts in the 1930s. While not much is known about the historic condition of rare plant communities, it is evident that with the decrease in the quality and amount of highly suitable habitats, and increase in fragmentation due to human activities, the ability of most rare plants to recolonize following disturbance has been reduced.

There would be no direct effects to Spalding's silene under Alternative 1. Indirectly, the increase in fuel loadings in beetle-affected areas and the subsequent increased risk of stand-replacing fire would pose a threat to individuals and suitable habitat. This risk would be due primarily to noxious weeds invading and outcompeting Spalding's silene plants. In some cases, fire could potentially benefit the species in areas where populations and habitat are being encroached upon by woody plants or that have an accumulation of litter (US Fish & Wildlife Service, 2000).

B. Cumulative Effects Under Alternative 1 (No Action)

A list of reasonably foreseeable and ongoing projects in the upper Tepee, Grizzly, and Beaver drainages is provided in Chapter II**.** It is probable that even with the increase in fuel loads, as a result of beetle mortality, and added risks of wildfire, suppression activities will be partially successful at moderating the effects to areas containing sensitive plant habitat. It is probable that foreseeable noxious weed treatments will have some level of positive effect by curtailing rampant weed invasion of some habitats. Watershed restoration activities generally occur in riparian areas where a higher incidence of sensitive plant species occur. Surveys are conducted prior to implementation of these activities to minimize impacts to sensitive plant species. Mining activities, depending on location, could affect sensitive plant species. Proposed mining activities in high potential habitat areas would be surveyed prior to implementation. Activities such as fuelwood gathering, scattered in nature and staying out of riparian zones, could affect individual plants but would unlikely affect populations.

Moist Forest Guild: Impacts to highly suitable moist forest habitat related to loss of canopy cover are predicted to be moderate where insects have affected stands to the point that promotes establishment of early seral understory vegetation. The likeliest impacts would be to those species with a broader habitat range (moonworts, round-leaved rein orchid, phantom orchid and clustered lady's slipper) which seem to require dense shade and/or soil mycorrhizae and which may not compete successfully with early seral forbs.

Cumulative impacts would result if the thinning of canopy in moist forest habitat is compounded by subsequent high-intensity, duff-replacing wildfires from predicted high fuel loading in untreated areas. Such a fire, if it were to occur, would be detrimental to the same obligate mycorrhizal species (moonworts, phantom orchid, clustered lady's slipper, and round-leaved rein orchid). Populations of these species could be destroyed if such a fire were intense enough to remove a significant amount of duff and organic material. The prospect of recolonization of affected habitat by any of these species would depend on the extent and duration of habitat alteration and the availability of an adjacent seed source. Cumulative impacts to these species related to stand-replacing wildfire would be predicted to be low to moderate.

Long-term impacts to deerfern could occur in the event of a stand-replacing wildfire as a result of heavy fuel loads. Deerfern is apparently able to survive light surface fires, and may recolonize by sprouting from rhizomes or by spores from adjacent populations. Its response to severe wildfire is not known. Fire intervals in its cool, wet forest preferred habitat are estimated to be several hundred years, so that large-scale fires are usually catastrophic. Cumulative impacts on deerfern from a potential future wildfire would be difficult to predict.

Dry Forest Guild: Cumulative effects to dry forest guild species and habitat with Alternative 1 are expected to be low to moderate. The effects to dry habitats, especially those with a high proportion of Douglas-fir, would be slightly greater than in the wet and moist guilds because of the greater extent of beetle infestation in these habitats. Canopy reduction could be greater in some stands and the associated risk of stand replacing fire in beetle affected dry habitats would increase with increased fuel loads. Since dry forest species are adapted to habitats which, historically, experienced a greater fire frequency, some would likely survive a stand replacing fire in scattered microsites. Successful recolonization for species after such disturbance events would be more difficult than it was historically due to fragmentation and overall habitat reduction.

B.4.3. Direct, Indirect and Cumulative Effects Under Alternative 2 (Proposed Action)

Alternative 2 would harvest approximately 184 acres with salvage, thinning, improvement and regeneration harvest systems. Twenty-three acres of selective salvage harvest would occur using helicopter yarding systems, so effects on habitat in these units would be similar to those of the action of bark beetles alone, as in Alternative 1. Another form of selective cutting is improvement harvesting. This treatment would selectively harvest encroaching live trees from around ponderosa pine and larch to favor these species. The effects of this treatment would be the similar to salvage harvests. Commercial thinning is predicted to remove approximately 30% of the canopy cover, similar to other selective harvests. Commercial thinning would, however, result in a more uniform spacing of trees than with salvaging, but small openings could still result due to the activity of the beetles. Effects of commercial thinning to sensitive plants would be similar to those of other selective harvest systems.

The harvesting would impact a total of 51 acres of potential sensitive plant habitat, 39 acres on dry guilds. There would be no impacts to documented occurrences of sensitive plants from timber harvesting with this alternative. Approximately 37% of the acres proposed harvesting would utilize regeneration harvest treatments and associated site preparation burning methods which are considered of higher risk to sensitive plants and habitat. An additional 10% of the harvest acres would involve prescribed fire treatment after improvement or salvage harvests. If conducted in the spring, burning poses a direct risk of negative effects to moist and dry forest plants and habitat. If burning is conducted later in the season after most plants have set seed, the risk of effects to individuals would be much less, and would reduce fuel loadings and the potential related effects of wildfire in sensitive plant habitats. The risk to moist forest habitat and species would be generally low because drainages would be buffered from fire application. The risk to dry site species, including Spalding's catchfly, from burning activities would be considered to be high, without mitigation measures, since there is burning scheduled in potential habitat.

Grassy Mountain Unit 5 and Grizzly Mountain Units 11, 12, and 13 would be surveyed for moist guild sensitive species prior to implementation of this alternative. Grizzly Mountain Units 2 and 3 and Dobson Pass Units 4, 5, 6, and 8 would be surveyed for dry guild sensitive species prior to implementation. The entire dry guild habitat in the vicinity of Grizzly Mountain Units 1, 2, and 3 and areas adjacent to Dobson Pass Units 4, 5, 6, and 8 would be surveyed for dry guild species. Extra precautions would be employed during burning operations if plants are discovered in these adjacent areas. The above listed dry guild units and adjacent areas would also be surveyed for Spalding's catchfly. Cumulative effects have been discussed under Effects Common to All Action Alternatives.

B.4.4. Direct, Indirect and Cumulative Effects Under Alternative 3

Alternative 3 proposes the same harvest units and treatments as alternative 2 except for additional treatments in the Grizzly Mountain area. Under alternative 3, ecoburning treatments would occur on 72 acres in the Grizzly Mountain area. Prior to ecoburning, an understory removal treatment would occur to salvage material expected not to survive the ecoburn and trees fading to other causal agents. The reduction of canopy would be similar to other selective harvest treatments although expected to be somewhat less. Effects of burning would be similar to that described in alternative 2, though the burns would be expected to be lower in fire intensity. This alternative would impact a total of 54 acres of sensitive plant habitat, 42 acres on dry guilds. There would be no impacts to documented occurrences of sensitive plants with this alternative.

Unit 5 in the Grassy Mountain area and units 11, 12, and 13 in the Grizzly Mountain area would be surveyed for moist guild sensitive species prior to implementation of this alternative. Units 2 and 3 in the Grizzly Mountain area and Dobson Pass Units 4, 5, 6, and 8 would be surveyed for dry guild sensitive species prior to implementation of this alternative. In addition, approximately 3 acres of dry guild habitat would be surveyed above Unit 1 prior to implementation of the understory removal or ecoburning treatment. The entire dry guild

habitat in the vicinity of Grizzly Mountain Units 1, 2, and 3 and areas adjacent to Dobson Pass Units 4, 5, 6, and 8 would be surveyed for dry guild species. Extra precautions would be employed during burning operations if plants are discovered in these adjacent areas. All the above listed dry guild areas would also be surveyed for Spalding's catchfly. Cumulative effects have been discussed under Effects Common to All Action Alternatives.

B.4.5. Direct, Indirect and Cumulative Effects Under Alternative 4

Alternative 4 proposes the same harvest units and treatments as alternative 2 except for additional treatments in the Grizzly Mountain area. Under alternative 4, ecoburning treatments would occur on 34 acres in the Grizzly Mountain area. There would be no understory removal or salvage treatments within these 34 acres prior to the ecoburn. No canopy reduction would occur prior to treatment. However, burning operations will likely result in a similar residual canopy component over the longer term with mortality during the burning operation. Effects of burning would be similar to that described under Alternative 3, though the burns would be expected to be lower in fire intensity. This alternative would impact a total of 51 acres of sensitive plant habitat, 39 acres on dry guilds. There would be no impacts to documented occurrences of sensitive plants with this alternative.

Grassy Mountain Unit 5 and Grizzly Mountain Units 11, 12, and 13 would be surveyed for moist guild sensitive species prior to implementation of this alternative. Grizzly Mountain Units 2 and 3 and Dobson Pass Units 4, 5, 6, and 8 would be surveyed for dry guild sensitive species prior to implementation of this alternative. The entire dry guild habitat in the vicinity of Grizzly Mountain Units 1, 2, and 3 and areas adjacent to Dobson Pass Units 4, 5, 6, and 8 would be surveyed for dry guild species. Extra precautions would be employed during burning operations if plants are discovered in these adjacent areas. All the above listed dry guild areas would also be surveyed for Spalding's catchfly. Cumulative effects have been discussed under Effects Common to All Action Alternatives.

B.4.6. Effects of Opportunities

Any watershed restoration work would need to be surveyed prior to implementation to assess potential impacts to sensitive plant species in the moist and wet guilds. Noxious weed treatments will have some level of positive effect by curtailing rampant weed invasion of some habitats.

B.4.7. Consistency With the Forest Plan and Other Applicable Regulatory Direction

One of the Forest Plan management goals 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 IPNF" (Forest Plan, II-18). All of the proposed activities with the requirements for surveys and implementation of mitigation measures would meet the intent of the Forest Plan. The No-Action Alternative would also meet the intent of the Forest Plan.