United States Department of Agriculture

Forest Service

Idaho Panhandle National Forest

Coeur d'Alene River Ranger District

P. O. Box 14
Silverton, ID 83867

2502 East Sherman Avenue
Coeur d' Alene, ID 83814

File Code: 1950

Date: April 6, 2001

Hello,

Enclosed is your copy of the Coeur d'Alene River Ranger District's Small Sales Final Environmental Impact Statement (EIS). The Draft EIS was distributed for public review in April 2000. After considering all of the information and comments, we found that there were only minor changes needed for the Final EIS. As provided in Forest Service Handbook 1909.15, Chapter 20, Section 24.2(2), we prepared a Supplement that served as an Errata to the Draft EIS, consisting of specific changes to the Draft EIS and response to public comments, which served as the Final EIS. Copies of the Supplement and Record of Decision were issued in In July 2000, announcing implementation of Alternative 4 (with modification). The decision was appealed by environmental groups. Upon review, the Appeal Deciding Officer reversed the decision, citing inadequate documentation of cumulative effects analysis. Based on that review, we have prepared the enclosed revised Final Environmental Impact Statement (EIS) for the Small Sales Project on the Coeur d'Alene River Ranger District.

One of the primary changes is that the information is presented in an EIS format, rather than the Supplement format that was used earlier. Because of this, we are providing the public a 30-day review of the document prior to issuing a decision. Any comments must be received within 30 days of publication of the Notice of Availability in the Federal Register (by May 14, 2001).

For the convenience of our interested public and in an effort to conserve paper and reduce publication costs, documents related to this proposal will be made available to the public on our Forest's internet web page:

http://www.fs.fed.us/ipnf/eco/manage/nepa

The documents are also available on compact disk (CD). This format offers a number of very convenient features. For example, the document is bookmarked so the viewer can easily navigate from one section of the document to another. The viewer can also "zoom" in on maps and other materials, which make them considerably easier to read. In addition, the color features of the map are visible (the printed maps do not display color). I would encourage you to try the CD format if you have access to a computer. If not, printed copies will be provided to those who request them. If you received a CD but need to have a printed copy, please contact Kerry Arneson at our Fernan Office (208-769-3021).

If you have any questions concerning this project, please feel free to contact Project Team Leader Bob Rehnborg or Ecosystems Staff Officer Steve Bateman at (208) 664-2318.

Joseph P. Stringer

JOE STRINGER
District Ranger

Enclosures

United States
Department of
Agriculture

Forest Service

Northern Region

April 2001

Coeur d'Alene River Ranger District Small Sales Project

Final Environmental Impact Statement [Revised]

SMALL SALES
FINAL ENVIRONMENTAL IMPACT STATEMENT
April 2001

COEUR D'ALENE RIVER RANGER DISTRICT
IDAHO PANHANDLE NATIONAL FORESTS
Kootenai and Shoshone Counties, Idaho

Lead Agency: **USDA Forest Service**

Deciding Official: **Joseph Stringer**
District Ranger

For further information, contact: **Bob Rehnborg, Project Team Leader**
Steve Bateman, Ecosystems Staff Officer

Coeur d'Alene River Ranger District
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ABSTRACT

Timber damage and mortality have occurred in numerous stands on the Coeur d'Alene River Ranger District as a result of ice storms, wind events, diseases, and insect infestations. Several adjacent landowners have expressed concern with the increased fire risks associated with the amount of dead or dying timber in the vicinity of private ownership. Some of the stands adjacent to private ownership are currently managed for their old-growth characteristics. Other stands in need of treatment are within an inventoried roadless area. Activities are proposed which would allow recovery of the economic value of dead and damaged timber; reduce fuels in areas of timber mortality to lower fire hazard (especially adjacent to private ownership); and promote long-term vegetative restoration in areas of timber mortality.

This environmental impact statement 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 Alternatives 2 and 3, harvest and fuels treatment would occur on approximately 1,433 acres, with a portion of those activities occurring in allocated old growth adjacent to private ownership and in a small part of an inventoried roadless area. However, Alternative 2 would use a combination of harvest prescriptions (including improvement harvest, regeneration, salvage and thinning) and fuel treatments, and would include approximately 438 acres of ecosystem burning to improve winter forage for big game and to re-introduce fire into the ecosystem. Alternative 3 would rely entirely on salvage harvests, without the ecosystem burn. Alternative 4 proposes timber harvest (using a combination of prescriptions) and fuel treatment activities on approximately 1,160 acres, without entering allocated old growth or inventoried roadless areas, and without any ecosystem burn. Approximately 0.8 miles of temporary road construction would occur under any action alternative; no new permanent road construction would occur.

Alternative 2 represents the proposed action. Alternative 4 is the alternative preferred by the Forest Service at this time.

Copies of this EIS 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/).

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COEUR D'ALENE RIVER RANGER DISTRICT

SMALL SALES
FINAL ENVIRONMENTAL IMPACT STATEMENT

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SMALL SALES
FINAL ENVIRONMENTAL IMPACT STATEMENT

SUMMARY

PURPOSE AND NEED

Timber damage and mortality have occurred in numerous stands on the Coeur d'Alene River Ranger District as a result of ice storms, wind events, diseases, and insect infestations. Over the last two years, a widespread Douglas-fir beetle infestation has caused significant mortality to Douglas-fir trees. This mortality is scattered across the district, with concentrations on the western half of the district. Last year, the Forest Service addressed larger areas of mortality through the Douglas-fir Beetle Environmental Impact Statement (EIS) and Record of Decision (USDA Forest Service, 1999). Since that time, field and aerial reconnaissance have identified additional acres of mortality. These areas are generally smaller and more scattered than those identified under the Douglas-fir Beetle EIS.

The scope of that large project, time constraints due to the magnitude of lost timber value, differing rates of the visual detection, and additional beetle flights did not allow for these new areas to be considered under the Douglas-fir Beetle EIS effort. In addition, the Douglas-fir Beetle Project did not allow for treatment within stands being managed for old-growth timber characteristics, since it was believed that the infestation had not changed the character of the old-growth stands on the Coeur d'Alene River Ranger District at that time. The project did not allow for treatment within inventoried roadless areas either, in the interests of accomplishing the analysis process in a reasonably timely manner.

Several adjacent landowners have expressed concern with the increased fire risks associated with the amount of dead or dying timber in the vicinity of private ownership. Some stands adjacent to private ownership are currently managed for their old-growth characteristics. Several stands adjacent to private ownership are within an inventoried roadless area.

The purpose of this proposal is to allow recovery of the economic value of dead and damaged timber; reduce fuels in areas of timber mortality to lower fire hazard (especially adjacent to private ownership); and promote long-term vegetative restoration in areas of high timber mortality.

PROPOSED ACTION

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

1) *Harvest dead and dying trees in areas attacked by bark beetles or that have sustained ice and snow damage using salvage and regeneration harvest methods;*
2) *restore long-lived seral tree species such as white pine, western larch and ponderosa pine in stands where bark beetles, root disease, and storm damage have killed a substantial portion of the basal area of the stand, through timber harvest and associated planting;*
3) *enhance growth and vigor of existing ponderosa pine and larch through improvement cutting or thinning to reduce competition for light and nutrients; and*

4) *reduce the potential for stand-replacing fires (especially adjacent to private ownership) through timber harvest and a combination of fuels treatment methods.*

Under the Proposed Action, timber harvest and fuels treatment would occur on a total of 1,433 acres. Approximately 438 acres of ecosystem burning would occur to further reduce fuels, improve winter forage for big game and to re-introduce fire as an integral part of the ecosystem. Less than one mile of temporary road would need to be constructed to facilitate removal of harvested timber. Approximately 159 acres of timber harvest are in stands of allocated old growth and 52 acres are within an inventoried roadless area. No road construction would occur within the roadless area or allocated old-growth areas. For more specific information regarding activities of the proposed action (acres by prescription, yarding methods, fuels treatment, etc.) refer to Chapter II and the enclosed maps.

ANALYSIS DIRECTION AND GUIDANCE

This analysis and documentation was guided by a number of plans, policies, and regulations, including:

- *National Environmental Policy Act (NEPA)*
- *Natural Resources Agenda*
- *Interim Road Rule*
- *Roadless Area Conservation Rule*
- *Interior Columbia Basin Ecosystem Management Project*
- *Northern Region Overview*
- *Forest Plan for the Idaho Panhandle National Forests*
- *Coeur d'Alene River Basin Geographic Assessment*

A number of other legal mandates specific to each resource were also used. For example, the National Forest Management Act, Forest Practices Act, Clean Water Act, Endangered Species Act, Migratory Bird Treaty Act and Executive Order, and others. These are identified and discussed by resource in Chapter III.

The Douglas-fir Beetle Final EIS (USDA Forest Service, 1999) is referenced throughout this document. The Small Sales EIS does not tier to the Douglas-fir Beetle Final EIS (as defined by 40 CFR 1502.20 and 1502.28), since it did not include all of the same geographic area covered by this Small Sales EIS. However, applicable information and analyses from the Douglas-fir Beetle Final EIS project was incorporated into the analysis for this Small Sales EIS where appropriate, as provided by 40 CFR 1502.21.

SCOPE OF THE PROPOSAL

The scope of this environmental impact statement 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 impact statement documents analysis of site-specific, on-the-ground activities. It is not a general management plan for the Coeur d'Alene River Basin.

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, which 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. These include:

- *Forest vegetation (including old growth)*
- *Fire/Fuels*
- *Economic values (finances)*
- *Watershed resources*
- *Fisheries*
- *Wildlife*
- *Scenery*
- *Roadless Area*

During the course of this analysis, other issues were identified by the public and project resource specialists which are related to the project, but which were not key to alternative development and for which there would be no significant difference in effects under the alternatives. Based on the assessment of effects and public comment, the agency determined that these other issues could be adequately mitigated or addressed by design features or other aspects of the proposed activities. Issues not addressed in detail in this environmental impact statement are briefly discussed in Chapter II, with supporting information in Appendix A and the Project Files.

ALTERNATIVES

Alternatives Considered in Detail

This EIS describes four alternatives to meet the purpose and need. Alternative 1 is the No-Action Alternative 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 in Chapter II would still occur. Because there would be no recovery of the economic value of dead and damaged timber, no reduction of fuels, and no activities to promote long-term vegetative restoration in areas of high timber mortality, this alternative would not meet any of the objectives identified under the purpose and need. The No-Action Alternative was analyzed in detail to display the effects of not addressing these needs.

Under Alternatives 2 and 3, harvest and fuels treatment would occur on approximately 1,433 acres, with a portion of those activities occurring in allocated old growth adjacent to private ownership and in a small part of an inventoried roadless area. Alternative 2 would use a combination of harvest prescriptions (including improvement harvest, regeneration, salvage and thinning) and include two ecosystem burns (totaling 438 acres) to improve winter forage for big game and to re-introduce fire

into the ecosystem. Alternative 3 would rely entirely on salvage harvests, without the ecosystem burn. **Alternative 2 represents the proposed action.**

Alternative 4 proposes timber harvest (using a combination of prescriptions) and fuel treatment activities on approximately 1,160 acres, without entering allocated old growth or inventoried roadless areas. Approximately 0.8 miles of temporary road construction would occur under any action alternative; no new permanent road construction would occur. **Alternative 4 is the alternative preferred by the Forest Service at this time.**

Alternatives Considered But Eliminated From Further Consideration

In addition to the alternatives considered in detail (described above), six other proposals were considered but dismissed from further analysis:

1. *Salvage all of the beetle-killed and infested timber*
2. *Use conventional harvest equipment only*
3. *No new roads*
4. *Re-install culverts in the Little Tepee Creek drainage to facilitate timber removal*
5. *Replace nutrients through fertilization*
6. *Watershed restoration only*

A brief description of these proposals and the reasons for their dismissal are provided in Chapter II with additional discussion in Appendix A (Alternatives Considered But Eliminated).

DECISIONS TO BE MADE

This EIS 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 a Record of Decision. 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*

CHANGES MADE BETWEEN THE DRAFT AND FINAL EIS

Changes have been made to the Final EIS based on review of the Draft EIS, both by the public and within the agency, and during the appeal review process. Correction of typographical or factual errors have been made as necessary. Editorial changes have been made for clarification and readability throughout the document. In addition, the following substantive changes have been made:

- *The changes have been documented in an EIS format, rather than the Draft EIS Errata format that was used earlier in the process, to make the document easier for the public to review.*
- *The analyses and documentation have been supplemented, improved or modified in the resource discussions (Chapter III), the reasonably foreseeable activities (Chapter II), comparison of alternatives (Chapter II), and analysis area maps (enclosed map packet).*
- *Response has been made to an additional comment received after notification of our intent to prepare a revised Final EIS (Appendix A – Public Involvement).*

District Ranger Joseph Stringer is the responsible official for this proposal. For further information regarding the proposal, please contact project team leader Bob Rehnborg or Ecosystems Staff Officer Steve Bateman at the Fernan Office of the Coeur d'Alene River Ranger District, (208) 664-2318.

CHAPTER I
PURPOSE AND NEED FOR ACTION

PURPOSE AND NEED

Timber damage and mortality have occurred in numerous stands on the Coeur d'Alene River Ranger District as a result of ice storms, wind events, diseases, and insect infestations. Over the last two years, a widespread Douglas-fir beetle infestation has caused significant mortality to Douglas-fir trees. This mortality is scattered across the district, with concentrations on the western half of the district. In 1999, the Forest Service addressed larger areas of mortality through the Douglas-fir Beetle Environmental Impact Statement (EIS) and Record of Decision (USDA Forest Service, 1999). Since that time, field and aerial reconnaissance have identified additional acres of mortality. These areas are generally smaller and more scattered than those identified under the Douglas-fir Beetle EIS. The scope of that large project, time constraints due to the magnitude of lost timber value, differing rates of the visual detection, and additional beetle flights did not allow for these new areas to be considered under the Douglas-fir Beetle EIS effort. In addition, the Douglas-fir Beetle Project did not allow for treatment within stands being managed for old-growth timber characteristics, since it was believed that the infestation had not changed the character of the old-growth stands on the Coeur d'Alene River Ranger District at that time. The project did not allow for treatment within inventoried roadless areas either, in the interests of accomplishing the analysis process in a reasonably timely manner.

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3) *enhance growth and vigor of existing ponderosa pine and larch through improvement cutting or thinning to reduce competition for light and nutrients; and*
4) *reduce the potential for stand-replacing fires (especially adjacent to private ownership) through timber harvest and a combination of fuels treatment methods.*

Under the Proposed Action, timber harvest and fuels treatment would occur on a total of 1,433 acres. Approximately 438 acres of ecosystem burning would occur to further reduce fuels, improve winter forage for big game and to re-introduce fire as an integral part of the ecosystem. Less than one mile of temporary road would need to be constructed to facilitate removal of harvested timber. Approximately 159 acres of timber harvest are in stands of allocated old growth and 52 acres are within an inventoried roadless area. No road construction would occur within the roadless area. For more specific information regarding activities of the proposed action (acres by prescription, yarding methods, fuels treatment, etc.) refer to Table II-14 and the Alternative Descriptions in this chapter, and the enclosed maps.

SCOPE OF THE PROPOSAL

The scope of this environmental impact statement 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 (including ecosystem burns), and reforestation activities. This environmental impact statement documents analysis of site-specific, on-the-ground activities. It is not a general management plan for the Coeur d'Alene River Basin.

DECISIONS TO BE MADE

This environmental impact statement 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 Record of Decision. 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*

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 II presents the key resource issues within the area and describes the alternatives considered. Chapter III 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 impact statement. A List of References provides the full citation for those references

noted in the environmental impact statement. 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 impact statement 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 explains 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 Small Sales EIS are available for review by the public. **To review the project files, please contact the Project Team Leader or the NEPA Coordinator at the Fernan Office of the Coeur d'Alene River Ranger District, by telephoning (208) 664-2318.**

CHANGES MADE BETWEEN THE DRAFT AND FINAL EIS

Changes have been made to the Final EIS based on review of the Draft EIS, both by the public and within the agency, and during the appeal review process. Correction of typographical or factual errors have been made as necessary. Editorial changes have been made for clarification and readability throughout the document. In addition, the following substantive changes have been made:

- *The changes have been documented in an EIS format, rather than the Draft EIS Errata format that was used earlier in the process, to make the document easier for the public to review.*
- *The analyses and documentation have been supplemented, improved or modified in the resource discussions (Chapter III), the reasonably foreseeable activities (Chapter II), comparison of alternatives (Chapter II), and analysis area maps (enclosed map packet).*
- *Response has been made to an additional comment received after notification of our intent to prepare a revised Final EIS (Appendix A – Public Involvement).*

District Ranger Joseph Stringer is the responsible official for this proposal. For further information regarding the proposal, please contact project team leader Bob Rehnborg or Ecosystems Staff Officer Steve Bateman at the Fernan Office of the Coeur d'Alene River Ranger District, (208) 664-2318.

CHAPTER II
ALTERNATIVES

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.

ANALYSIS DIRECTION AND GUIDANCE

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 Small Sales project followed the guidelines of NEPA as provided by the Council on Environmental Quality (CEQ).

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 alternatives have been designed to be consistent with the goals and tentative direction provided under the Natural Resources Agenda to date.

Interim Road 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. Simultaneously, the Forest Service published a proposed interim rule (63 CFR 4351) to temporarily suspend permanent and temporary road construction and reconstruction in certain unroaded areas of National Forest System lands. The purpose of the interim rule was to take a "timeout" for 18 months while the Forest Service developed a revised road management policy and analytical tools to provide a more ecological approach to existing and future road needs. The final

interim rule, issued on February 12, 1999 (64 CFR 7289) continued the temporary suspension until development of a revised Forest System road system policy.

After considering public input and identifying actions to help find an appropriate balance between safe and efficient access for all forest road users and protection of healthy ecosystems, the Forest Service proposed specific revisions to the road system rules at 36 CFR part 212 and to Forest Service administrative directives governing transportation analysis and management. 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 officer consideration about possible road construction, reconstruction, and decommissioning needs and opportunities.

This analysis tool was not available to us at the time the Small Sales proposal was being developed and analyzed. Consequently, the transportation analysis was conducted based on existing information and guidelines provided in the Forest Plan. The management of each road was determined based on the logging systems plan under each alternative.

Access management is ongoing District program. A new Travel Plan has recently been developed for the Coeur d'Alene River Ranger District, and changes in access will be implemented over a period of several years through both administrative changes to transportation management and through specific documentation in a written decision under the NEPA. All alternatives were designed to be consistent with the new Travel Plan. For additional information, please refer to the discussions of "Reasonably Foreseeable Activities" in this Chapter, "Transportation Planning" under "Issues Not Addressed in Detail in this EIS," in Appendix A, and in the Project Files (Transportation).

Roadless Area Conservation Rule

On October 13, 1999, President Clinton directed the Forest Service to develop a proposal for managing some 50 million acres of roadless areas in the National Forests. The Roadless Area Conservation Rule was published in the Federal Register on January 5, 2001, and will be effective May 12, 2001. Essentially, the Final Rule prohibits new road construction and reconstruction and prohibits the cutting, sale and removal of timber in inventoried roadless areas on National Forest System lands (with specific exceptions).

Timber harvest is proposed in the Skitwish Ridge Roadless Area #01135. Effects to the roadless area and consistency with the Roadless Area Conservation Rule are described under the "Roadless Area" discussion in Chapter III.

Interior Columbia Basin Ecosystem Management Project

This analysis was guided by integrated ecological assessments and strategies that began in 1993 by direction from President Clinton to "develop a scientifically sound and ecosystem-based strategy for

management of eastside forests." This direction resulted in the combined Bureau of Land Management and Forest Service project known as the Interior Columbia Basin Ecosystem Management Project (ICBEMP). The assessment covers the "interior" portion of the Columbia River Basin and those portions of the Klamath and Great Basins within Oregon. This includes the states of Oregon and Washington 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. Further findings show low forest integrity throughout, mixed low to moderate aquatic integrity, and mixed low, moderate and high integrity hydrologic conditions.

All of the area analyzed under the Small Sales EIS is within ICBEMP Forest Cluster #4, which emphasizes reducing risk to ecological integrity and species viability (USDA Forest Service, 1996, Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin). The primary risks to ecological integrity within Forest Cluster #4 (Integrated Scientific Assessment, page 113) are to hydrologic and aquatic systems (from fire potential); late and old forest structures in managed areas; and risks in forest compositions that are susceptible to insect, disease, and fire (Integrated Scientific Assessment, page 113). Proposed activities under the Small Sales EIS would address these primary risks in a manner consistent with Chapter 8 of the Integrated Scientific Assessment. The effectiveness of each alternative in addressing those risks is discussed for each appropriate resource in Chapter III, and summarized in the Comparison of Alternatives section of this chapter.

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 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 have been made using this direction; however, the science behind the Interior Columbia Basin EIS is used extensively in the analysis for the Small Sales 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 Small Sales EIS is necessary, in compliance with the Forest Service Handbook 1909.15 (Chapter 18).

Northern Region Overview

The Northern Region Overview, 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)

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. Each resource discussion in Chapter III addresses consistency with Forest Plan standards and other legal mandates.

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 Forest. 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.

Coeur d'Alene River Basin Geographic Assessment

The Geographic Assessment for the Coeur d'Alene River basin (USDA Forest Service, 1998. Toward an Ecosystem Approach: An Assessment of the Coeur d'Alene River Basin. Idaho Panhandle National Forests, Ecosystem Paper #4) was conducted to gain a better understanding of the "big picture;" the conditions at this level in relation to those at the Upper Columbia River Basin scale. In addition, the Geographic Assessment will facilitate revision of the Forest Plan, which is scheduled to be accomplished in 2002. The Geographic Assessment supplements the Forest Plan, but is not a Forest Plan amendment. At this time, the Geographic Assessment is treated as new information that is incorporated into the environmental documentation and shared with the public.

The recommendations and strategies presented in the Geographic Assessment were based on three major groups of findings: social and economic, landscape and terrestrial, and aquatic. The findings of the assessment proved to be 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 priorities for active restoration become 1) non-functioning watersheds with serious terrestrial problems; and 2) functioning-at-risk watersheds with serious terrestrial problems.

Douglas-fir Beetle EIS

The Douglas-fir Beetle Final EIS (USDA Forest Service, 1999) is referenced throughout this document. The Small Sales EIS does not tier to the Douglas-fir Beetle Final EIS (as defined by 40 CFR 1502.20 and 1502.28), since it did not include all of the same geographic area covered by this Small Sales EIS. However, applicable information and analyses from the Douglas-fir Beetle Final EIS project was incorporated into the analysis for this Small Sales EIS where appropriate, as provided by 40 CFR 1502.21.

Other Legal Mandates

In addition to compliance with Forest policy, each resource discussion in Chapter III 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"). Compliance with the Environmental Justice Act is addressed in Chapter III.

SCOPING AND ALTERNATIVE DEVELOPMENT

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 first notified of this project through the "Quarterly Schedule of Proposed Actions" for the Idaho Panhandle National Forests, beginning in the January 2000 issue and continuing through the current issue. Scoping activities also included legal ads, a Notice of Intent to prepare an environmental impact statement (published in the EPA's Federal Register on January 5, 2000), and newspaper articles. A field trip occurred with members of the Audubon Society to view and discuss proposed harvest in stands currently managed for old-growth habitat adjacent to private ownership. During scoping, six comment letters were received from members of the public. Their concerns were identified and addressed in the Small Sales Draft EIS (please refer also to the Project Files, Public Involvement – Scoping). In addition to the letters, we received telephone calls from other landowners who identified similar concerns and had questions regarding possible management of national forest stands adjacent to their property. Documentation of these conversations is provided in the Project Files ("Public Involvement"). The team considered concerns identified by the public and incorporated their ideas into alternative design whenever possible. A more complete description of the scoping process for the Small Sales EIS project is provided in Appendix A ("Scoping and Issue Identification").

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. These include:

- *Forest vegetation (including old growth)*
- *Fire/Fuels*
- *Economic values (finances)*
- *Watershed resources*
- *Fisheries*
- *Wildlife*
- *Scenery*
- *Roadless Area*

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. These include:

- *Threatened, Endangered and Sensitive plants*
- *Specific Threatened, Endangered and Sensitive wildlife species*
- *Noxious weeds*
- *Air quality*
- *Soils*
- *Recreation*
- *Heritage resources*
- *Grazing allotments*
- *Transportation planning*
- *Public safety*
- *Social values*

A brief discussion of each of these issues is provided in Appendix A ("Issues Not Addressed in Detail").

Alternative Development and Modification

The project team used the 6-step process outlined in the "Federal Guide to Watershed Analysis - Environmental Analysis at the Watershed Scale" (USDA Forest Service, August 1995) to focus on proposed activity areas, describe current conditions, and identify possible treatment alternatives. Documentation related to the process is provided in the project files ("Alternative Development"). In addition to the No-Action Alternative, three action alternatives were initially developed and are analyzed in detail in this document (Alternatives 2, 3 and 4).

The Draft EIS was released for public review in April 2000. The 45-day comment period ended on May 22, 2000. A total of 15 letters provided comments based on review of the Draft EIS. Although no new issues were identified by the public, they provided comments that helped to further define the analysis of effects and proposed activities. For more information related to the public review period and public comments, please refer to Appendix A.

Six alternative concepts were developed by the project interdisciplinary team and considered during early scoping and project development, but dismissed from further study as explained briefly below, with further detail in Appendix A (Alternatives Considered But Eliminated).

- **Salvage all of the beetle-killed and infested timber:** This alternative was dismissed as not economically feasible or desirable from a resource standpoint. Field reconnaissance identified areas of timber mortality concentrations that were thought to be economically feasible to remove given the full range of yarding system options including helicopter. Very small or isolated patches of timber mortality were often dismissed during reconnaissance as not being economically feasible. Harvest of mortality within riparian areas was dismissed during reconnaissance because the trees carry more value as potential recruitment for stream channel stability. Salvage of beetle-killed timber was not considered in old-growth stands that were not adjacent to private ownership.

- **Use conventional harvest equipment only**: 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 pattern of the beetle mortality in many areas, the concern of unacceptable impacts to watershed, wildlife, and fisheries of significant roading, and the time frames needed to design and engineer road systems and costs to build long road segments to access small harvest units, this option was not considered feasible.

- **No new roads:** There is no permanent road construction proposed under this project. Each action alternative contains six scattered locations for new temporary road, for a total of 0.8 miles of construction. Since the new temporary road spurs are all of such minimal impact to other resources and would not be part of the forest road system increasing maintenance needs, the construction of these spurs does not warrant analysis of a separate alternative.

- **Re-install culverts in the Little Tepee Creek drainage to facilitate timber removal:** Three options were considered in relation to roads in the Tepee Creek drainage.

  1) *Consideration was given to reopening Road 209A. This would have allowed for the location of a helicopter landing approximately one-quarter mile south of Little Tepee Unit 1 and would allow for a downhill short flight from the largest cluster of units in that area. However, use of Road 209A would have required six culvert reinstallations. This option was eliminated from further consideration based on anticipated effects to the Little North Fork of the Coeur d'Alene River.*

  2) *Another option that was considered was to reopen the southern half of Road 1521 that is in the County Creek drainage. This option was eliminated from further consideration because it would have required the re-installation of six drainage crossings within face drainages of the Little North Fork. This route also had deep fills at the crossing locations which would have required significant amounts of dirt to be moved.*

  3) *A third option was considered that would access the same landing area by coming in from the north end of Road 1521. This option was eliminated from further consideration because watershed concerns would have likely forced the removal of these crossings from this road. The cost of installing and subsequently removing the 5 crossings for the small amount of timber in this area is not economically sound.*

- **Replace nutrients through fertilization:** Consideration was given to flying green tops that were created as a result of daylighting efforts and replacing the lost nutrients with a fertilization treatment. This option was dropped due to poor road access and expense. Some thought was given to aerial application of fertilizer using a helicopter but again the costs would be high and it would be difficult to get the fertilizer to exact areas where the nutrients were reduced.

- **Watershed Restoration Only:** The purpose and need for this Small Sales project is to recover the economic value of dead and damaged timber, fuels reduction in areas of timber mortality especially adjacent to private ownership, and to promote long-term vegetative objectives in areas of timber mortality. Salvage of this timber may provide the funding to finance some additional watershed restoration opportunities that have been identified during project development. To propose a watershed only alternative that did not consider timber salvage would not meet the purpose and need for this project and was therefore dismissed from further consideration.

Additional discussion of these alternatives considered but eliminated from further study is provided in Appendix A.

Reasonably Foreseeable Activities

To address cumulative effects, activities within the analysis area that have a reasonable chance of occurring have been identified. This helps to establish the appropriate geographic and temporal (time) boundaries for the cumulative effects analysis. Tables II-1 through II-15 provide information about the projects that are either ongoing or reasonably foreseeable, and the resources they would potentially affect.

During the revision of the Small Sales EIS, the reasonably foreseeable and ongoing activities tables were updated. The following changes occurred:

- *Projects that were completed in 2000 were removed from the list. Some projects were dropped since they did not occur in 2000 nor are they likely to occur in the near future. They include the special use permit for a tower site at Fourth of July Pass with American Tower Corp, Crinkle ecosystem burning, the Winkler ceramic clay minerals project, and the Deerfoot Ridge and Nilsen fuelwood gathering projects.*

- *Some projects that were not completed in 2000, especially related to minerals, grazing, and fuelwood gathering, were extended through 2001. Six ongoing minerals projects were removed as their operating plans have terminated. Six mining projects were added as foreseeable activities. Three new commercial fuelwood gathering projects were also added.*

- *Precommercial thinning projects planned for 2001 were added to the list of foreseeable actions.*

- *Salvage sales occurring under the Douglas-fir Beetle Project were moved from the list of foreseeable to ongoing timber projects as they were sold. Salvage acres were adjusted in the list of ongoing timber projects as treatment acres expanded with additional beetle mortality.*

The existing condition baseline for vegetative and watershed resources is based on actual treatment acres under the Douglas-fir Beetle Project. The analysis of effects to wildlife used the acres identified by Alternative D of the Douglas-fir Beetle EIS, which analyzed effects of more activities than are actually being accomplished.

- *Four small timber sale projects, mostly related to beetle-kill salvage, were added to the list of foreseeable timber sale projects. Two timber projects on other federal, state, and private ownership lands were added to the list of ongoing or reasonably foreseeable activities.*

Tables II-1 through II-15 display information about the projects that are either ongoing or reasonably foreseeable, and the resources they would potentially affect. The analysis incorporated the effects of these activities as appropriate (please refer to the cumulative effects discussions for each resource in Chapter III). The tables do not include routine activities such as general fuelwood gathering, road maintenance, and existing special use permits. If the resource and analysis area are not listed in the column "Resource and Area Potentially Affected," then the activity was either outside of the cumulative analysis boundaries for that resource or the activity did not have a cumulative effect on that resource. In general, activities that affect water resources affect fisheries, therefore the fisheries resource was not listed separately in this table. Activities that are of a unique concern to fisheries are discussed separately in the Fisheries section of Chapter III.

In the following table of ongoing district-wide projects, the District's new Travel Plan is identified as an ongoing project. An environmental assessment (EA) was used to document proposed changes and analysis of effects for the public to review (USDA Forest Service, 1998). The assessment has been completed, and a new Travel Plan developed that identifies suitable routes for public access using an existing system of roads and trails (Project Files, Transportation). Changes in access will be implemented over a period of several years, through both administrative changes to transportation management (documented in an updated closure order signed by the Forest Supervisor) and through specific documentation in a written decision under the NEPA. A new Travel Plan map has been printed and is being distributed to the public with the Forest Supervisor's updated closure order and specific NEPA decisions. Proposed changes to access management under the Small Sales EIS project are consistent with access management under the District's new Travel Plan. A copy of the District's Travel Plan and the Noxious Weed Final EIS and Record of Decision are available upon request. Effects of various road management practices on the watershed resources are discussed in Chapter III ("Effects Common to All Alternatives, page III-96).

Maps showing cumulative effects boundaries for each resource are included in the map packet. Please refer to the Project Files for a map showing location of these ongoing and foreseeable activities in relation to the resource analysis boundaries (Project Files, Alternative Development).

Projects that have not yet been analyzed and documented under the NEPA (reasonably foreseeable projects) will consider the effects of any activities approved under this Small Sales EIS as part of their cumulative effects analysis, along with other past, ongoing and reasonably foreseeable activities within their cumulative effects analysis area.

Table II-1. Ongoing General Projects.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
Access Management/ Travel Plan	District-wide road and trail management	Vegetation, water and wildlife[1] (all areas)	Ongoing
Noxious Weeds Treatment Program	Integrated noxious weed treatment (338 acres)	Vegetation and water[2] (all areas)	Until 2005

[1] *Please refer to the Fisher discussion in Chapter III, (Effects Common to All Action Alternatives).*
[2] *There would be no cumulative effects to these resources; please refer to the Project Files (Noxious Weeds) and the Noxious Weed EIS.*

The following table displays currently ongoing timber projects within the cumulative effects analysis areas. The vegetative removal and site-preparation activities are already included in the modeling of existing conditions for wildlife in this Small Sales EIS analyses. For the watershed analysis, these activities were already included in the modeling of Alternative D under the Douglas-fir Beetle Project EIS. Alternative D was used in the assessment of cumulative effects of the proposed activities under the Small Sales Project.

Table II-2. Ongoing Timber Projects.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
Fernan Beetle Heli	Timber salvage (429 total acres), road construction (2.2 miles permanent, 1.5 miles temporary), fuels treatment (18 acres underburning, 132 acres jackpot burning, 33 acres grapple piling, 10 acres hand piling, 14 acres ecosystem burning), planting, riparian road obliteration (1.6 miles), road recontouring (2 miles), upgrading of 2 culverts, removal of 34 culverts, improvement of recreation opportunities, noxious weed treatment	Vegetation, water (Fernan Creek), wildlife (CDA North)	Timber salvage – 12/2002 Other – 2007
Windy Buttes Beetle Heli	Timber salvage (549 total acres), road construction (0.6 miles temporary), fuels treatment (15 acres underburning, 236 acres jackpot burning, 50 acres grapple piling), improvement of recreation opportunities, noxious weed treatment	Vegetation (Blue Creek), water (Blue Creek, Fernan), wildlife (CDA North)	Timber salvage – 12/2002 Other – 2007
Yellow Horse Beetle Heli	Timber salvage (417 total acres), road construction (0.9 miles temporary), fuels treatment (8 acres underburning, 16 acres jackpot burning, 30 acres grapple piling, 2 acres hand piling, ecosystem burning), planting, riparian road obliteration (1.5 miles), upgrading of 10 culverts, , noxious weeds treatment	Wildlife (Hayden)	Timber salvage – 12/2002 Other – 2007
Cherry Heli Bug	Timber salvage (720 total acres), road construction (1.3 miles permanent, 1.4 miles temporary), fuels treatment (136 acres underburning, 32 acres jackpot burning, 45 acres grapple piling, ecosystem burning), planting, road recontouring (5 miles), upgrading of 6 culverts, removal of 27 culverts, noxious weed treatment	Vegetation, water, wildlife (Hayden)	Timber salvage – 12/2002 Other – 2007

Table II-2. Ongoing Timber Projects, continued.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
Nilsen Beetle	Timber salvage (49 total acres), fuels treatment (9 acres underburning, 4 acres ecosystem burning), planting, one road closure, noxious weed treatment	Wildlife (Hayden)	Timber salvage – complete Other – 2006
Stumpjumper Heli Bug	Timber salvage (362 acres), fuels treatment (20 acres ecosystem burning), upgrading of 2 culverts, road recontouring (0.2 miles), removal of 1 culvert, noxious weeds treatment	Water, wildlife (Hayden)	Timber salvage – complete Other – 2007
Search for Horizon Heli Bug	Timber salvage (933 total acres), road construction (1.6 miles temporary), fuels treatment (173 acres jackpot burning), planting, closure of six roads, removal of 15 culverts, noxious weeds treatment	Water (Wolf Lodge), wildlife (CDA North)	Timber salvage – 12/2002 Other – 2007
Alder Beetle	Timber salvage (82 total acres) fuels treatment (29 acres jackpot burning), planting, one road closure, upgrading of 3 culverts, noxious weeds treatment	Vegetation, water (Cedar), wildlife (CDA North)	Timber salvage – 12/2001 Other – 2006
Beaver Heli Bug	Timber salvage (243 total acres), fuels treatment (106 acres underburning), planting, upgrading of 2 culverts, noxious weed treatment	Water (Beaver), wildlife (Potosi)	Timber – 12/2002 Other – 2007
West Rutherford Heli Bug	Timber salvage (56 acres), fuels treatment (10 acres jackpot burning)	Vegetation (East Rutherford), water (Wolf Lodge), wildlife (CDA North)	Timber salvage – complete Other – 2001
Hogback Beetle	Timber salvage (69 acres), road construction (1 mile), fuels treatment (11 acres underburning, 33 acres jackpot burning), one road closure, removal of 1 culvert, noxious weed treatment	Wildlife (Chain Lakes)	Timber – 12/2001 Other – 2006
Killarney Beetle	Timber salvage (34 acres), fuels treatment (8 acres jackpot burning), planting, upgrading of 1 culvert, noxious weed treatment	Water (4th of July), wildlife (CDA North)	Timber – 12/2001 Other – 2006
Ward Ridge Heli Bug	Timber salvage (107 total acres), road construction (0.3 miles temporary), fuels treatment (11 acres jackpot burning, 26 acres grapple piling) replacement of 4 culverts, removal of 3 culverts, noxious weed treatment	Wildlife (Chain Lakes)	Timber – 12/2002 Other – 2007
Blue Swan Beetle Heli	Timber salvage (150 acres), road construction (0.3 miles temporary), fuels treatment (48 acres jackpot burning, 16 acres grapple piling), removal of 22 culverts, noxious weed treatment	Vegetation, water (Thompson), wildlife (Chain Lakes)	Timber 12/2002 Other – 2007
Avista Beaver	Timber salvage along powerline corridor (14 acres), brush disposal	Vegetation, wildlife (Potosi), water (Beaver)	Timber – 10/2001 Other – 2002
Ruby Red Heli Bug	Timber salvage (47 acres), fuels treatment (23 acres jackpot burning, 3 acres hand piling	Water (Fernan), wildlife (CDA North)	Timber – 12/2001 Other – 2003

The following table identifies ongoing activities related to timber sales where harvest is completed and the sales have closed. For information related to effects on wildlife resources, please refer to Chapter III, Wildlife, "Assessing Cumulative Effects."

Table II-3. Ongoing Timber sale-related projects on closed sales.

Project	Activities	Resource and Area Potentially Affected[1]	Approximate Duration
Alder Kid	6 road closures and a snag creation project	Wildlife (Potosi)	Through 2001
Aphrodite	Site prep burning on 33 acres, planting, exams	Wildlife (Shoshone)	Through 2004, exams 2008
Backdoor Ice	Noxious weed treatment, 2 channel restoration sites	None	Through 2004
Capitol Hill	Noxious weed treatment, 15 road closures, snag creation project	Wildlife (Potosi)	Through 2004
Cougar Salvage	Site prep burning on 2 acres, underburning 59 acres, planting, exams, 2 road closures	Vegetation (Cougar), wildlife (Scatterwall)	Through 2004, exams 2009
Crinkle Kut	Site prep burning on 17 acres, underburning 63 acres, exams, planting, thinning 8 acres, noxious weed treatment, 13 road closures, fish habitat improvement at 7 structures, 27 stream channel restoration sites	Water (4th of July), wildlife (CDA North, Chain Lakes)	Through 2003, exams til 2008
Crown Heli Ice	Noxious weed treatment	None	Through 2004
Deer Forks	Site prep burning on 11 acres, exams, planting, noxious weed treatment, 1 road closure, brush disposal	Water, wildlife (Hayden)	Through 2001, exams till 2006
Deer Forks Ice	Brush disposal	None	Through 2005
Dry Ice Salvage	Jackpot burning 73 acres, 2 miles of trail reconstruction	Wildlife (Hayden)	Through 2003
Eighty One Ice	Brush disposal	None	Through 2004
English Ice Salvage	Noxious weed treatment, exams	None	Through 2003
Fernan Heli Ice	Jackpot burning 40 acres, exams	Wildlife (CDA North)	Through 2003, exams 2008
Flat Angle	Planting, exams	None	Through 2004, exams 2008
Hayden Fuelbreak	Recreation, noxious weed treatment, 1 road closure	Wildlife (Hayden)	Through 2003
Hayden Salvage	Brush disposal, 1 mile of log placement, one road closure, noxious weed treatment	Wildlife (Hayden)	Through 2002
High Horse Ice	Noxious weed treatment	None	Through 2005
Horizon Sun	Site prep burning on 182 acres, underburning 346 acres, thinning 127 acres, noxious weed treatment, 60 culvert removals, 1.2 miles road obliteration, exams, browse burning on 30 acres, wildlife vegetation, planting 30 ac., 18 road closures, 1 mile trail rehab	Water (Wolf Lodge), wildlife (CDA North)	Through 2005, exams 2010
Ice Hayden Heli	Noxious weed treatment, 1 culvert replacement, jackpot burning 73 acres, exams	Water , wildlife (Hayden)	Through 2004

Table II-3. Ongoing Timber sale related projects on closed sales, continued.

Project	Activities	Resource and Area Potentially Affected[1]	Approximate Duration
Idaho Gulch	Planting, exams	None	Through 2008
I-90 Heli Ice	Site prep burning on 55 acres, jackpot burning 34 acres, burn grapple piles on 18 acres, noxious weed treatment, exams	Wildlife (CDA North)	Through 2004
King's Ridge	Planting, exams, thinning 23 acres, 8 miles of road obliteration, 19 channel restoration sites	Water (Beaver, Prichard), wildlife (Potosi)	Through 2004, exams 2008
King's Ridge Salvage	Exams	None	Exams 2005
Lower White	Noxious weed treatment, exams, 2 road closures	Wildlife (Potosi)	Through 2002, exams 2007
McLeans/Nilsen Ice	Noxious weed treatment, planting, exams, 3 road closures, 1 channel restoration site	Wildlife (Hayden)	Through 2003, exams 2008
Millrose Curran	Site prep burning on 9 acres, underburning 206 acres, jackpot burning 14 acres, planting, exams, thinning 6 acres, noxious weed treatment, 5 fish habitat improvement sites	Vegetation, water (4th of July), wildlife (Scatterwall)	Through 2004, exams 2009
Night Owl	Exams	None	Through 2009
Now or Never Salvage	Noxious weed treatment, exams	None	Through 2002
Prado	Browse burning on 30 acres, 3 road closures	Wildlife (Scatterwall)	Through 2002, exams 2007
Prichard Peak	Planting, exams, site prep burning on 14 acres	Vegetation (Prichard), wildlife (Potosi)	Through 2004, exams 2008
Rantenan	Exams	None	Through 2004
Rantenan Blowdown	Brush disposal	None	Through 2002
Rustic Rehab	Snag creation project, exams	Wildlife (Chain Lakes)	Through 2002
Sage Marie Heli	Noxious weed treatment, 1 road closure	Wildlife (Chain Lakes)	Through 2002
Stacel Rehab	Exams	None	Through 2005
Studer Lightner	Planting, exams	Vegetation (Studer)	Through 2004
Swan Rehab	Brush disposal, 1 road closure, exams	Wildlife (Chain Lakes)	Through 2001, exams 2006
Unknown Pony	Planting, exams, installation of 50 bedload traps, erosion control dips on 12 miles of road, wood debris placement 20, 50 stream stepdowns, 4 road closures, browse burning on 190 acres	Vegetation, wildlife (Potosi), water (Beaver)	Through 2003, exams 2008
West Cherry Ice	Noxious weed treatment	None	Through 2003
Yellowdog Downey	Site prep burning on 14 acres, underburning 121 acres, 49 channel restoration sites, 5 miles of riparian road removal, 42 miles of road obliteration, 200 stream stepdowns, fish cover security 30, planting, exams	Vegetation, water (Downey), wildlife (Shoshone)	Through 2005, exams 2010

Table II-4. Ongoing Recreation Projects.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
Thompson Lake Viewsite	Wildlife viewing at the parking lot	None	Summer 2000

Table II-5. Ongoing Grazing Allotment Projects.

Project	Activities	Affected Resource in Cumulative Effects Area[1]	Approximate Duration
Iron Mokins	Grazing allotment	Wildlife (Hayden)	10 years - 2009
Hayden	Grazing allotment	Vegetation, water, wildlife (Hayden)	10 years - 2009
Lancaster	Grazing allotment	Vegetation, water, wildlife (Hayden)	10 years - 2009
Searchlight	Grazing allotment	Water (Wolf Lodge), wildlife (CDA North)	10 years - 2009
Blue Lake	Pasture permit (4 cows)	Wildlife (Chain Lakes)	1 year - 2001
Killarney	Pasture permit (not active)	None	1 year - 2001
Thompson	Pasture permit (4 cows)	Vegetation, water (Thompson), wildlife (Chain Lakes)	1 year - 2001
Hollister	Pasture permit (8 cows)	Water, wildlife (Hayden)	1 year - 2001
Beaver Pony	Pasture permit (9 cows – occasional use)	Vegetation, wildlife (Potosi), water (Beaver)	1 year - 2001

[1] *There would be no cumulative effects to watershed resources; please refer to the Coeur d'Alene River Ranger District Grazing EA. For effects to wildlife, please refer to the Wildlife section in Chapter III ("Assessing Cumulative Effects," under the Affected Environment discussion).*

The following table displays currently ongoing minerals projects. The anticipated duration of all ongoing projects listed in the table is through 2001; all of the projects are extendable.

Table II-6. Ongoing Minerals Projects.

Project	Activities	Resource and Area Potentially Affected
Graffenberger	Placer-Gold Mine – exploration, several trenches on hillside	Water (Beaver)
McPeak	Placer-Gold Mine – small production, less than 1 acre disturbance on hillside	Water (Beaver), wildlife (Potosi)
Miller	Placer-Gold Mine – exploration, several trenches within 300 feet of stream	Water (Beaver)
Stutzke	Placer-Gold Mine – production, less than 1 acre disturbance within 500 feet of stream	Water (Beaver), wildlife (Potosi)
GPAA/Curtis	Placer-Gold Mine – exploration, trench/processing within 300 feet of stream	Water (Beaver)
Hulse	Placer-Gold – exploration, several trenches within 500 feet of stream	Water (Beaver)
Morse	Placer-Gold – recreational, storage cabin within road obliteration prism	Water (Prichard)
Scobey	Placer-Gold – production, small dredge in intermittent stream	Water (Beaver)
Hendricks	Placer-Gold – exploration, trench along road with no nearby streams	Water (Beaver)
Corbit	Placer-Gold – exploration, trench along road with no nearby streams	Water (Beaver)
Killian	Placer-Gold – exploration, several trenches within 200 feet of stream	Water (Beaver)
Stutzke	Placer-Gold – exploration, several trenches within 500 feet of stream	Water (Prichard)
Miller	Placer-Gold – production, 1 acre of disturbance near intermittent stream	Water (Prichard), wildlife (Potosi

The following tables provide information about reasonably foreseeable activities. As stated earlier, projects which fall under the NEPA process that have not yet been analyzed and documented (reasonably foreseeable projects) will consider the effects of any activities approved under this Small Sales EIS as part of their cumulative effects analysis, along with other past, ongoing and reasonably foreseeable activities within their cumulative effects analysis area.

Table II-7. Reasonably Foreseeable General Projects.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
Canfield Ecosystem Burning	Natural fuels reduction	Water (Canfield), wildlife (CDA North)	Spring 2001/2002
AT&T Fiber Optic Line	Installation of fiber-optic line along existing road sections	None	Summer 2002
Road 436 project	Capital Investment reconstruction	Water (Trail Creek)	Scheduled 2003

Table II-8. Reasonably Foreseeable Timber Projects.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
Nordic Beetle	Timber salvage (10 acres), brush disposal, noxious weed treatment	Water (Cedar)	Timber – 12/2001 Other - 2006
Little Ucelly Bug	Timber salvage (45 acres), site prep burning, noxious weed treatment	Water (Prichard), wildlife (Potosi)	Timber – 12/2002 Other - 2007
Missouri Bug	Timber salvage (40 acres), site prep burning, noxious weed treatment	Water (Beaver), wildlife (Potosi)	Timber – 12/2002 Other - 2007
Mill Pine Salvage	Timber salvage (130 acres), road reconstruction (0.3 miles), brush disposal, noxious weed treatment,	Water (4th of July)	Timber 12/2002 Other - 2003
Prichard Clee Bug	Timber salvage (204 acres),road reconstruction (0.8 miles), brush disposal, noxious weed treatment.	Wildlife (Potosi) [1]	Timber 12/2002 Other - 2007
Horizon Moon	Vegetative, aquatics, and wildlife habitat restoration	Water (Wolf Lodge), wildlife (CDA North)	2002-2010
Teratoid Tepee	Vegetative, aquatics, and wildlife habitat restoration	Vegetation, wildlife (Callis), water (Trail Creek)	2002-2010
Beaver Creek	Vegetative, aquatics, and wildlife habitat restoration	Vegetation, wildlife (Potosi), water (Beaver)	2003-2011

[1] *The vegetative removal and site-preparation activities of this project are already included in the modeling of the existing condition, which was used in the assessment of cumulative effects for this Small Sales EIS.*

The following table identifies reasonably foreseeable preferred and commercial fuelwood gathering projects. For a discussion of effects to wildlife habitat as a result of fuelwood gathering, please refer to the "Snags and Dead Down Woody Habitat" discussion in the Wildlife section of Chapter III.

Table II-9. Reasonably Foreseeable Preferred Fuelwood Gathering Projects.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
Fernan Saddle	Preferred public fuelwood gathering (open Road 6849)	Wildlife (CDA North)	Summer 2001
Fernan Hill	Preferred public fuelwood gathering	Wildlife (CDA North)	Spring 2001
Blue Lake Creek	Commercial fuelwood gathering (open Road 1578)	Wildlife (Chain Lakes)	Summer 2002 (after Blue Swan Heli Bug)
Nettleton Gulch	Commercial fuelwood gathering (open Spur Roads 1562J, 1562P, and 1562R)	Wildlife (CDA North)	Summer 2001
Unknown Creek	Commercial fuelwood gathering	Wildlife (Potosi)	Summer 2002 (after Potosi Beetle Heli)
Jungle Gulch	Preferred public fuelwood gathering (open Roads 2337, 2338, 2339)	Wildlife (CDA North)	Summer 2002 (after Ruby Red Heli)
Griffith Pk/Snowbird Meadows	Commercial fuelwood gathering	Wildlife (Callis)	Summer 2001

Table II-9. Reasonably Foreseeable Preferred Fuelwood Gathering Projects, continued.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
Lower Prichard Peak	Preferred public fuelwood gathering (open Road 343)	Wildlife (Potosi)	Summer 2003 (after Eagle Beetle Heli)
Avery-Clee Creek	Preferred public fuelwood gathering (open Roads 343, 979)	Wildlife (Potosi)	Summer 2003 (after Prichard Clee Bug)
Nocelly Gulch	Preferred public fuelwood gathering	Wildlife (Potosi)	Summer 2003 (after Eagle Beetle Heli)
Bumblebee Peak	Preferred public fuelwood gathering	Wildlife (Scatterwall)	Summer 2002 (after Lil' Bum Tee Bug Heli)
Lost Creek	Commercial fuelwood gathering	Wildlife (Shoshone)	Summer 2001
Windy Ridge	Commercial fuelwood gathering (Road 612)	Wildlife (CDA North)	Spring 2001
Skitwish Creek	Preferred public fuelwood gathering (Roads 202, 813, 813A through 813D)	Wildlife (CDA North)	Summer 2001
Yellowdog Creek	Preferred public fuelwood gathering	Wildlife (Shoshone)	Summer 2001

Table II-10. Reasonably Foreseeable Recreation Projects.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
Independence Trail #22	Trail construction	Wildlife (Callis)	2005-2007
Fish Ponds	Development of fish ponds at Clee Creek and Bumblebee Meadows	Water (Lower Little North Fork), wildlife (Potosi, Scatterwall)	2001-2004
Bumblebee Meadows	Dispersed recreation site protection	Water (Lower Little North Fork), wildlife (Scatterwall)	2003
Marie Creek #241	Trail reconstruction	None	2001-2002
Huckleberry/Spades	Trail construction	Wildlife (CDA North)	2001-2002

Table II-11. Reasonably Foreseeable Grazing Allotment Projects.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
CDA Grazing Allotment EA	Analysis of existing grazing activities	Vegetation (Hayden), water (Hayden, Wolf Lodge, Thompson, Beaver), wildlife (Hayden, CDA North, Chain Lakes, Potosi)	2001

Table II-12. Reasonably Foreseeable Minerals Projects.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
CERCLA Repository	Repository	Water (Prichard), wildlife (Potosi)	Through 2009
Numerous Mine Closure Projects	Safety closures of abandon mine sites	Wildlife (Potosi)	2001-2005

The following table identifies reasonably foreseeable timber stand improvement (TSI) projects; all three consist of precommercial thinning. Please refer to Chapter III for a discussion of effects to watershed ("Effects Common to All Alternatives") and wildlife (Methodology, "Effects Analysis").

Table II-13. Reasonably Foreseeable TSI (Thinning) Projects.

Project	Activities	Resource and Area Potentially Affected	Approximate Duration
Cherry Creek	20 acres of precommercial thinning	Water, wildlife (Hayden)	Through 2001
White Peak	10 acres of precommercial thinning	Water (Beaver), wildlife (Potosi)	Through 2001
Shoshone Ridge/Dam Creek	218 acres of precommercial thinning	Water, wildlife (Shoshone)	Through 2001

The following table identifies reasonably foreseeable timber sale projects that could occur on other federal, state or private lands adjacent to the project areas. Please refer to Chapter III for a discussion of effects to watershed ("Cumulative Effects for Non-Forest Service Lands") and wildlife (Methodology, "Effects Analysis").

Table II-14. Ongoing or Reasonably Foreseeable Timber Sale Projects on other Federal, State, and Private Ownership.

Ownership	Activities	Resource and Area Potentially Affected	Approximate Duration
Idaho Department of Lands	350 acres of beetle-kill timber salvage; tractor and cable yarding; underburning and planting	Water (Wolf Lodge), wildlife (CDA North)	Salvage and burning complete
Idaho Department of Lands	277 acres of regeneration timber harvest; tractor and cable yarding; 100 acres of underburning; planting; 4.2 miles of road construction	Water (Thompson), wildlife (Chain Lakes)	Through 2001
Crown Pacific	1,000 acres of scattered timber salvage	Water (Blue Creek), wildlife (CDA North)	Salvage annually
Stimson Lumber Company	70 acres of timber salvage, 10 acres of regeneration harvest	Wildlife (Chain Lakes)	2001
Idaho Department of Lands	30 acres timber salvage, 0.2 miles of road construction	Water (Wolf Lodge), wildlife (CDA North)	2001-2002

The following table identifies both ongoing and reasonably foreseeable land exchange projects. The change in ownership is not in itself an effect. However, acquiring these parcels may have a long-term positive effect on resources, depending on future actions.

Table II-15. Ongoing and Reasonably Foreseeable Land Exchange Projects.

Parcel	Acres[1]	Resource and Area Potentially Affected[2]	Exchange Date
Wolf Lodge Creek	121	None	Summer 2001
Rantenan Creek	80	None	Summer 2001
Rose Creek	160	None	Summer 2001
McGinnis Creek	160	None	Summer 2001
Blue Lake Creek	283	None	Summer 2001
Thompson Creek	163	None	Summer 2001
North Fork Coeur d'Alene River	40	None	Summer 2001

[1] *Acres to be acquired by the Forest Service. In each of these watersheds, the exchange activities are limited to lands to be acquired by the Forest Service.*

In addition to those identified in the tables above, other future site-specific proposals at the subbasin level are foreseeable based on recommendations of the science-based Interior Columbia River Basin Ecosystem Management Project, IPNF Forest Plan, and the Geographic Assessment for the Coeur d'Alene River Basin. Two such projects are the Teratoid Tepee EIS and Beaver Creek EIS, identified for consideration in 2002 and 2003. It is anticipated that they will address restoration of vegetation, aquatics, and wildlife habitat, but the extent and potential treatment methods are unknown at this time. There is not sufficient information about these future activities to be able to analyze their anticipated effects under the scope of the Small Sales project. At the time they are proposed, any such activities will be presented for public review and comment under NEPA, 36 CFR 215, and Forest Service Handbook 1909.15 (Chapter 30).

Opportunities

The following are projects that could complement and improve resource conditions within the project areas. These projects are not considered mandatory for project implementation nor guaranteed to be implemented, but they may be accomplished if funding becomes available. There is not a great deal of funding expected to be available to accomplished these opportunities. The timber to be salvaged under the Small Sales EIS is widely scattered over many areas of the district. The salvage volume per acre is generally low and much of the wood to be removed is defective to a degree, with the risk of even further deterioration prior to when sales can be implemented. With an emphasis on fire hazard reduction and associated costs, there is not expected to be large margins between costs and returns. The determination of which opportunities are accomplished is dependent upon available funding and priority.

Opportunities to Improve Watershed Conditions

Fernan Creek: Within the Fernan Creek analysis area there is an old historical road that runs up along the edge of a stream channel for approximately 0.4 miles in a side tributary of Rondo Gulch. Obliteration of this road would benefit aquatic resources in the watershed. This area was previously under private ownership but recently became part of the national system under a land exchange agreement. This site would have to be accessed by crossing private ownership.

Fourth of July Creek: Road 3097 is a main arterial road that runs from Fourth of July Pass to Curran Saddle. This is an open system road in good condition. The stream channel crossings along the lower end of this route have been field checked. Above this point the road gains significantly in elevation. Culverts at these sites are in good condition and appear to be functioning well even after large water flow events over the last several years. All three of these culverts are 24-inch diameter sizes. These crossings were analyzed using the Q100 model to determine adequacy for 100-year flood events. Two of the three rated out as more than adequate. One site rated out for a 33-inch diameter culvert to handle a 100-year flood event. There is an opportunity to upgrade the one crossing from a 24-inch diameter culvert to a 36-inch diameter culvert to meet RF-4 of the standards and guidelines under the Inland Native Fish Strategy. This item is being shown as an opportunity and not a feature since there is no need to reconstruct Road 3097 for removal of timber under this project, and because watershed restoration is not part of the purpose and need for this project.

Prado Creek: Road 806E has two riparian crossings. Based on surveys, neither of these crossings have or appear to need culverts. There is an opportunity to pull back road fill from these areas to reduce risk of sediment movement should flow occur in these ephemeral draws. Road 806E is a drivable road and not in need of reconstruction in order to remove timber under this project. This road is located behind a functioning gate and is still accessible for maintenance needs should they arise. Therefore, this item is being shown as an opportunity and not a feature under this project. This riparian resotration would meet RF-3 of the standards and guidelines under the Inland Native Fish Strategy, benefitting the aquatics resource.

Studer Creek: The Small Sales project would use the lower end of Road 966 to access 3 salvage units on the south side of the Cougar Creek drainage. The southern end of Road 966 runs into private ownership, has an earth barrier, then goes on down to the frontage road along the Coeur d'Alene River. The Forest Service no longer has an easement on the section of road through private ownership but has made contact with private landowners and the likelihood of a road use agreement is good. The northern end of Road 966 ties in with Road 796 near Bumblebee Peak. That section of Road 966 is open but use is becoming limited due to brush encroachment. Under this Small Sale proposal, the the lower section of Road 966 would be brushed and bladed so that logs could be hauled to the south and out through private ownership. Since this is no longer a through route, the opportunity exists for stream channel restoration on five crossings on the southern end of Road 966. There is also an opportunity for stream channel restoration on two crossings on an old historic road off of Road 966. These crossings are even lower in the drainage than the crossings on Road 966. All of these crossings are located within a quarter section that used to be private ownership but is now part of the national forest system as a result of a land exchange. This stream channel restoration would meet RF-3 of the standards and guidelines under the Inland Native Fish Strategy, benefitting the aquatic resource.

Potosi Gulch: Road 1505 was constructed as a capital investment project in the 1980's. The lower half of this road would be used to haul timber identified for salvage under this Small Sales project. This section of roadway would need to be surface bladed and brushed to allow for safe log transport. Culverts in this roadway were analyzed using the Q100 model to determine adequacy for 100-year flow events. The main Potosi crossing has a 71-inch by 47-inch "squash" pipe. The Q100 model indicates this crossing should have an 87-inch by 63-inch pipe. An opportunity exists to construct an armored overflow in this area to avoid erosion when capabilities of the existing pipe are exceeded during a 100-year flow event and meet RF-4 under the standards and guidelines of the Inland Native

Fish Strategy. There are also two 18-inch diameter culverts in this roadway that have a Q100 rating for 20-inch diameter culverts. The opportunity exists to construct headwalls for both of these crossings to increase flow efficiency to a level that would make them adequate for 100-year flow events. There are three other crossings in the drainage that have an opportunity for improvement. These would involve upgrading pipes from an 18-inch to a 24-inch culvert in two locations and from a 24-inch to a 36-inch culvert in another location. The remainder of the crossings are adequate based on analysis using the Q100 model.

There is an old riparian road that runs up the Unknown Gulch drainage for approximately 1.4 miles. There is evidence that ATV's have been using this route to gain access into the area during hunting season, even though there is a legal closure on motorized vehicles in this area. The opportunity exists to obliterate this roadway to benefit watershed and wildlife resources and meet RF-3 of the standards and guidelines under the Inland Native Fish Strategy.

Opportunities to Improve Access Management

Cedar Creek: Under the Access Management EA and District Travel Plan, Road 3094 was identified for closure using methods that would allow accessibility by ATV's at the junction with Road 3097 and at the junction with Road 413. The east half of Road 3094 is proposed for use to access a helicopter landing and for log transport, though the purchaser may choose to fly all the wood down to Road 3098 to avoid an uphill flight. An opportunity exists to establish a gate on this east end, to be followed later with a gate at the junction of Roads 413 and 3094 to close this entire segment of Road 3094. This closure would improve wildlife security in the area.

Cataldo: The activities under this Small Sales EIS provide an opportunity to install the gate closures in this area (on the Road 259 loop around Wall Peak instead of on the Road 3010 loop), which would improve wildlife security.

The Access Management EA identified Road 807 that runs down Hardy Gulch from Hardy Saddle to be closed year-round with gates. With activity in this area identified under this Small Sales EIS, the opportunity exists to get these gates installed on Road 807 to improve wildlife security.

Callis Creek: Under the Access Management EA and District Travel Plan, Road 407 was identified for year-round closure with a gate. With the salvage treatment proposed in this area under this Small Sales EIS, the opportunity exists to get this gate installed to improve wildlife security.

Opportunities to Treat Noxious Weeds

A cost allowance to treat noxious weeds along system roads used by this project was built into the economic model. Many areas affected by the proposed activity, especially road segments and landings, will likely be surveyed and monitored to assess the establishment and spread of noxious weeds, especially new invader species. However, the exact extent of surveying, monitoring and treatment, and the availability of funds is not known at this time, therefore these activities are classified as opportunities. Treatments would be conducted under the guidelines of the Noxious Weed EIS for the Coeur d'Alene River Ranger District.

Alternative Descriptions

The No-Action Alternative and three action alternatives are described in detail in this section, including features common to all action alternatives, mitigation measures, and monitoring. 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). Specific unit information is provided in Appendix B of this document. Please refer to the enclosed alternative maps for location of the proposed activities.

Comparing a range of alternatives will help determine which activities, if any, should occur under this project. The range of alternatives considered is reasonable given the characteristics of the area, the current conditions, the purpose and need for action, and the desired conditions.

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 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

Timber harvest and fuels treatment: Alternative 2 represents the Proposed Action. From a vegetation standpoint, the objective of this alternative is to harvest dead and dying trees in areas attacked by bark beetles or that sustained ice and snow damage in 1996/97, 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 storm damage have killed a substantial portion of the basal area of the stand. In some stands, growth and vigor of existing ponderosa pine and larch would be enhanced through improvement cutting or thinning to reduce competition.

Most stands would be treated by salvage of trees killed by bark beetles (this includes trees that are attacked by beetles and have crown symptoms indicating the trees will die) and associated trees killed by root disease, other pathogens or ice and snow damage. Douglas-fir and western larch with heavy dwarf mistletoe infestations could also be removed from stands with beetle mortality. Incidental green trees may need to be removed from skyline corridors or skid trails, or for safety reasons.

Regeneration harvests would be used in stands where most trees have been killed and retention of the residual live trees is not necessary to meet visual quality and wildlife objectives. Some green trees not affected by bark beetles may be removed from these stands in order to create a suitable environment for the establishment of seral species. Logging slash and competing vegetation would be burned, or piled and burned, prior to planting with the desired species. Regeneration harvests

would range from two to approximately 12 acres in size, depending on the extent of Douglas-fir beetle mortality and existing root disease and ice storm damage. These openings would retain groups of trees and/or scattered individual trees that have been unaffected by the bark beetle infestation. Generally, these regeneration harvests would retain less than 30 percent of the stand basal area.

Ecosystem burning would occur on a total of approximately 438 acres to improve winter forage for big game in Management Area 4, and to re-introduce fire into the ecosystem. This could also provide some sites for natural regeneration of early seral species, particularly ponderosa pine and western larch. However, the residual overstory would likely inhibit establishment and growth of these species. This burning would likely decrease the risk of stand-replacing fires, because accumulated woody debris and understory vegetation would be reduced.

Activities in allocated old growth: Timber harvest would occur in five of the analysis areas (Hayden Lake, Canfield Face, Fernan Creek, Blue Creek, and Thompson Creek). Of the total 448 acres of allocated old growth in these areas, harvest would occur on a total of 159 acres. Because the Forest Plan standard for retaining 5 percent existing oldgrowth in an Old Growth Unit (page II-29) could not be met with this alternative, a site-specific amendment to revise this standard of the Forest Plan would need to accompany the decision to implement this alternative.

Activities in roadless areas: A portion of one of the analysis areas (East Rutherford) is located within the Skitwish Ridge Roadless Area (please refer to the enclosed East Rutherford and Cedar Creek analysis areas map). Approximately 52 acres of timber harvest and fuels treatment (32 acres lop and scatter, 20 acres jackpot burning) would occur within the roadless area boundary, 49 acres of which would utilize helicopter yarding (the remaining 3 acres would be cable yarded to an existing road on private ownership). An estimated 225 acres of ecosystem burning would occur to further reduce fuels, improve winter forage for big game, and to re-introduce fire as an integral part of the ecosystem. There would be no road construction or reconstruction within the roadless area.

Alternative 3

Timber harvest and fuels treatment: The objective of this alternative is to harvest only dead and dying trees in areas with mortality caused by Douglas-fir beetles or where there is substantial ice and snow damage. No additional green trees would be harvested to create suitable conditions for planting. Planting of seral species could be done where bark beetle mortality, root disease, and other factors have created adequate canopy openings for successful establishment of shade intolerant species. Harvest openings would range from two to approximately twelve acres in size, depending on the extent of Douglas-fir beetle mortality and existing root disease and ice storm damage. These openings would retain groups of trees and/or scattered individual trees that have been unaffected by the bark beetle infestation. Openings to be planted would range from 4 to 12 acres in size.

Openings created by bark beetles in areas that will not be planted would be allowed to regenerate naturally. There would be no site preparation in these stands, so shade-tolerant species would likely dominate this natural regeneration.

In this alternative, there would be 1,433 acres of salvage of dead and dying trees only. Of this amount, 44 acres would be naturally regenerated, and 89 acres would be planted following fuel

reduction treatments. Planting would improve species composition and long-term forest structure on 89 acres.

Activities in allocated old growth: As under Alternative 2, timber harvest would occur in five of the analysis areas (Hayden Lake, Canfield Face, Fernan Creek, Blue Creek, and Thompson Creek). Of the total 448 acres of allocated old growth in these areas, harvest would occur on a total of 159 acres. Because the Forest Plan standard for retaining 5 percent existing oldgrowth in an Old Growth Unit (page II-29) could not be met with this alternative, a site-specific amendment to revise this standard of the Forest Plan would need to accompany the decision to implement this alternative.

Activities in roadless areas: As described for Alternative 2, a portion of one of the analysis areas (East Rutherford) is located within the Skitwish Ridge Roadless Area (please refer to the enclosed analysis area map). The same timber harvest and fuels treatment activities would occur under Alternative 3.

Alternative 4

Timber harvest and fuels treatment: To address the issue of harvesting in old growth and roadless, Alternative 2 was modified so that no harvesting would take place in any allocated or recruitment old growth stands or in any inventoried roadless areas; the modified alternative was identified as Alternative 4. Dead and dying trees would be harvested from other areas attacked by bark beetles or that sustained ice and snow damage in 1996/97, and long-lived seral tree species such as white pine, western larch and ponderosa pine would be regenerated in stands where bark beetles**,** root disease, and storm damage have killed a substantial portion of the basal area of the stand. In some stands, growth and vigor of existing ponderosa pine and larch would be enhanced through improvement cutting or thinning to reduce competition.

Most stands would be treated by salvage of trees killed by bark beetles (this includes trees that are attacked by beetles and have crown symptoms indicating the trees will die) and associated trees killed by root disease, other pathogens or ice and snow damage. Douglas-fir and western larch with heavy dwarf mistletoe infestations could also be removed from stands with beetle mortality. Additional incidental green trees may need to be removed from skyline corridors or skid trails, or for safety reasons.

Regeneration harvests would be used in stands where most trees have been killed and retention of the residual live trees is not necessary to meet visual quality and wildlife objectives. Some green trees not affected by bark beetles may be removed from these stands in order to create a suitable environment for the establishment of seral species. Logging slash and competing vegetation would be burned, or piled and burned, prior to planting with the desired species. Regeneration harvests would range from two to approximately 12 acres in size, depending on the extent of Douglas-fir beetle mortality and existing root disease and ice storm damage. These openings would retain groups of trees and scattered individual trees that have been unaffected by the bark beetle infestation. Generally, these regeneration harvests would retain less than 30 percent of the stand basal area.

Activities in allocated old growth: No harvesting or fuels treatement activities would take place in any allocated or recruitment old growth stands.

Activities in roadless areas: No harvesting, fuels treatment or ecosystem burning activities would take place in any inventoried roadless areas under Alternative 4.

The following table displays a comparison of the activities that would occur under each of the alternatives. Please refer to the enclosed alternative maps and the Project Files for additionl information.

Table II-16. Proposed activities, by alternative.

Feature	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Proposed Harvest (Acres):				
Improvement harvest	0	258	0	123
Regeneration	0	133	0	101
Salvage	0	1,009	1,433	903
Thinning	0	33	0	33
Total harvest acres	0	1,433	1,433	1,160
Proposed fuels treatment (Acres)				
Grapple pile	0	35	35	35
Handpile	0	25	25	10
Jackpot	0	510	533	324
Lop and scatter	0	517	587	450
Top-attached	0	253	254	247
Underburning	0	94	0	94
Total burning acres	0	1,433	1,433	1,160
Proposed ecosystem burning	0	438	0	0
Proposed harvest and fuel treatment in allocated old growth (acres)	0	159	159	0
Proposed harvest and fuel treatment in inventoried roadless (acres)	0	52	52	0
Proposed ecosystem burning in inventoried roadless	0	225	0	0
Proposed Road Work (Miles)				
New road construction	0	0	0	0
Temporary road construction	0	0.8	0.8	0.8
Yarding Systems (Acres)				
Cable	0	226	226	223
Helicopter	0	662	662	397
Horse	0	7	7	7
Skyline	0	369	369	369
Tractor	0	169	169	163
Expected Harvest Volume:				
Timber volume (CCF) *1*	0	12,254	11,154	9,275
Timber volume (MMBF) *2*	0	6.3	5.7	4.7

1 CCF = 1 cunit (one hundred cubic feet)
2 MMBF = million board feet

Features Common to All Action Alternatives

Alternatives were designed to protect natural resources while implementing project activities.

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 boundary on those roads used for harvesting or hauling of timber. Roads that are proposed for closure to maintain big-game security goals would comply with the Inland Native Fish Strategy prior to closure. Streamside buffers would be applied along regeneration harvest units in all action alternatives. 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 of the maximum pool elevation of constructed ponds and reservoirs or 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 ncludes features with high variability in size and site-specific characteristics. At a minimum, the interim RHCA's must include:
    - *The extent of landslides and landslide-prone areas*
    - *The intermittent stream channel and the area to the top of the inner gorge*

- *The intermittent stream channel or wetland and the area to the outer edges of the riparian vegetation*
- *For Priority Watersheds, the area from the edges of the stream channel, wetland, landslide or landslide-prone area to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest*
- *For watersheds not identified as Priority Watersheds, the area from the edges of the stream channel, wetland, landslide or landslide-prone area to a distance equal to the height of one-half site potential tree, or 50 feet slope distance, whichever is greatest*

Instream work would be avoided prior to July 15 each year. Instream work can cause increased sedimentation (fines) while the work is being conducted. Timing guidelines are used to reduce impacts to eggs and fry.

To minimize erosion and ensure compliance with State water quality standards, all road construction and timber harvest associated with the Small Sales 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. Site-specific soil and water conservation practices that have been identified for implementation specific to this sale are part of the Project Files. Other 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).

Features Designed to Improve 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 would be maintained to all regeneration units, including past regeneration harvest areas in which early seral species, particularly white pine, have been planted. Precommercial thinning and pruning has been shown to decrease mortality due to white pine blister rust in non-resistant stock (Schwant, Marsden, McDonald, 1994) and are important tools in managing for this species.

Features Designed to Protect Rare Plants

No harvest activity would occur which would adversely impact 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 in riparian habitat. Site-specific surveys would be conducted as necessary for in-stream watershed work in highly suitable 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.

Features Designed to Protect Air Quality

The Idaho Panhandle National Forest is a 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.

Features Designed to Protect Wildlife Habitat

Leave trees in regeneration and rehabilitation areas would be reserved from harvest to provide size class diversity and long-term snag recruitment. Forest Plan snag guidelines will be met. In proposed harvest units which currently contain quality snag densities, 6 of the largest dead trees per acre would be maintained in old growth, with 2 to 5 dead trees maintained in non-old growth.

In all harvest units, some down logs would be retained to protect long-term site productivity and maintain soil organic matter. On moist sites, 15 to 20 logs per acre would be retained on the site. On dry sites, 3 to 6 logs per acre would be retained. These logs would be at least 12 inches in diameter and six feet long.

To reduce effects to ground-nesting birds, timing restrictions would be implemented during burning activities to maintain potential nest sites in suitable habitat.

If active flammulated owl nest sites are found, the Forest Service may cancel timber harvest and road construction activities within 200 feet of the nest site. If active goshawk nest sites are found, the nest site would be protected with a 30-acre no-harvest buffer. No tree felling, skidding, road construction 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 Timber Sale Contract clause C6.251.

The following currently open roads would be closed with earth barriers by the purchaser to improve wildlife security under all action alternatives: Roads 259A, 259C, 259H, 3010A and 1521-UD.

The purchaser would install gates on Roads 259D and 1516 under all action alternatives to meet direction of the new Travel Plan. The purchaser would close all new temporary roads with earth barriers after use is complete, with the exception of the road accessing Unit 8 in the Potosi project area, which would be closed using KV-funds in order to allow completion of post-sale activities.

An earth barrier would be used to close Roads 259E and 259G (which are currently open) after post-sale activities are complete. A front-end obliteration will be implemented on Road 1569B (currently gated) after post-sale activities to provide additional security for suitable fisher habitat in the Downey project area.

Gates would be installed on currently barriered roads that would be opened for sale-related activities for more than a month. Existing and newly-installed gates would be closed at the end of each day's activities.

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.

Schedule of Activities

If any of the action alternatives are selected for implementation, the following schedule of activities would likely occur. The season of work and acres treated would depend upon the alternative selected, availability of funding, and operating schedule. Please refer to Chapter III, Finances, for a discussion of the types of funding.

Table II-17. Approximate schedule of activities proposed under the action alternatives.

Activity	Alt. 2, 3 and 4
Temporary road construction	2001
Timber harvest	2001-2002
Prescribed burning	2002-2003
Tree planting	2003-2004

MITIGATION

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

Wildlife

Under Alternatives 2 and 3, helicopter activity associated with proposed timber harvest in the Chain Lakes analysis area could cause the goshawk just west of the analysis area to abandon the nest. To avoid this impact, yarding would only be allowed to occur in the analysis area between September 1 and March 1. There are no units proposed within the 600-acre post-fledgling area or nest area.

A goshawk pair and fledgling were sighted in the Shoshone analysis area in 1999. Because the exact nesting location has not been located, goshawk surveys would occur in the analysis area prior to implementing harvest activities proposed under Alternatives 2, 3 and 4.

Rare (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. The table below displays the approximate number of acres by alternative within proposed activity areas (harvest units, road construction, and road obliteration areas) which must be surveyed prior to project implementation. Survey acres were based on habitat queries (refer to the project file), aerial photograph and topographical map interpretation, previous sensitive plant surveys, risk of adverse impacts to sensitive plants and suitable habitat from the proposed activity, and professional judgement. Lists of specific units which must be surveyed are contained in the project file. It should be noted that, in some cases, potential habitat occurs only in portions of units, and the entire unit would not be surveyed. Other highly suitable habitat adjacent to proposed units may be surveyed based on the potential risk of adverse effects from proposed activities. 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. There are no areas to be surveyed in the wet, deciduous riparian, peatland, or subalpine guilds, therefore they are not included in the table.

Table II-18. Acres of land and miles of road to be surveyed for TES plants.

Habitat Guild	Alt. 2	Alt. 3	Alt. 4
Moist forest guild	351 acres 0.28 miles	351 acres 0.28 miles	256 acres 0.28 miles
Dry forest guild	312 acres 0 miles	312 acres 0 miles	177 acres 0 miles
Total	663 acres 0.28 miles	663 acres 0.28 miles	433 acres 0.28 miles

Should rare plants be located during surveys, one or more of the following protective measures would be implemented:

- *Drop proposed units from activity*
- *Modify the proposed unit or activity*
- *Implement a minimum of 100 feet slope distance buffers around rare plant occurrences as necessary to minimize effects and maintain population viability*
- *Implement, if necessary, Timber Sale Contract provisions C(T)6.251 (Protection of Endangered Species) and C(T)9.52 (Settlement for Environmental Cancellation).*

These measures are estimated to be highly effective. The requirement to survey, identify and protect populations from adverse effects and to buffer habitat for Threatened species from all activities would be implemented prior to the award of the contract. The maintenance of any buffers protecting populations would be administered in the contract.

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 Small Sales project, all alternatives would comply with specific monitoring requirements identified by the Forest Plan (Forest Plan, Chapter IV). The length of time that monitoring is needed will be determined by the results and evaluation of what is being monitored. When it is certain that regulations and standards are being met, monitoring of a particular element will cease. If monitoring evaluations show that regulations or standards are not being achieved at the desired level, management intervention will occur.

Forest Corporate Monitoring

In December 1999, the Ecosystem Team for the Idaho Panhandle National Forests facilitated development of a Corporate Monitoring System. The emphasis is on monitoring 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 Geographic Assessment. The data that will be tracked for long-term monitoring is provided in the table below.

Table II-19. 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.)

Changes to the core data elements will be described in the Record of Decision for the Selected Alternative. Further information regarding corporate monitoring is provided in the Project Files ("Monitoring").

Monitoring Specific to This Project

In addition to the above, the following monitoring activities would occur specific to this project:

Vegetation: All regeneration and rehabilitation units would be monitored for regeneration success. All regeneration would be complete in 5 years to meet the NFMA requirements. All intermediate treatments would be monitored to assess achievement of prescription objectives.

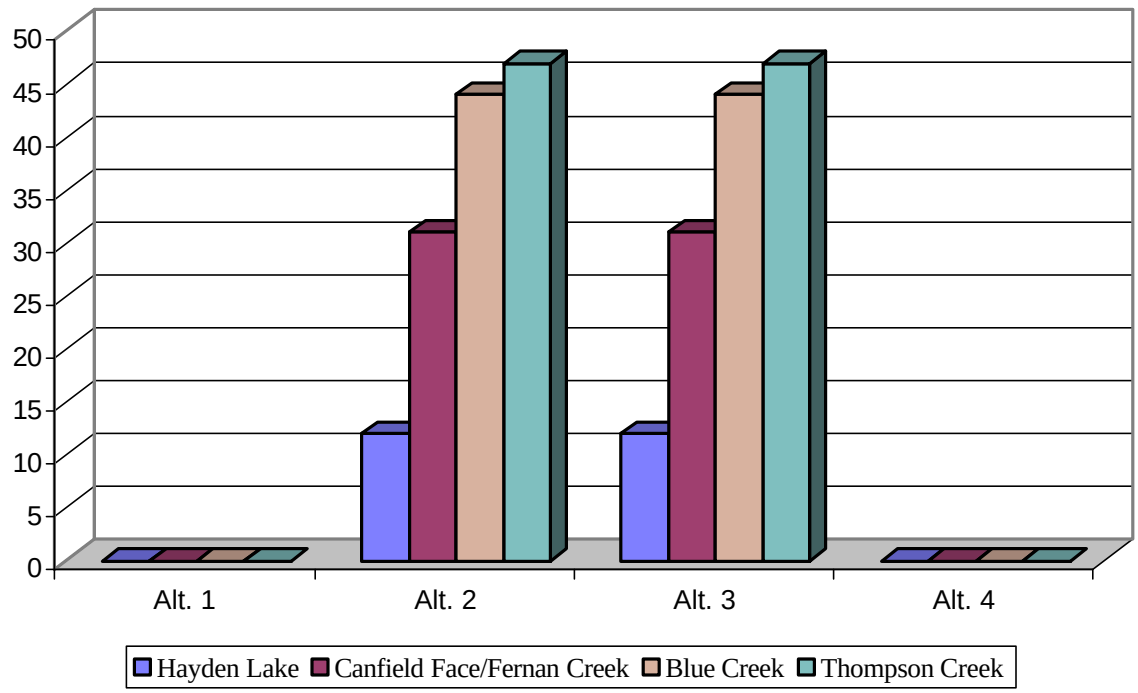
COMPARISON OF ALTERNATIVES

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 III, by resource.

Forest Vegetation (including Old Growth)

The following table compares the existing allocated old growth and amount of proposed harvest in allocated old growth stands. Harvest of old growth is only proposed in those analysis areas displayed in the table; no harvest is proposed in old growth in the remaining analysis areas. Refer to Appendix D for a table displaying the acres of allocated and recruitment old growth in all of the analysis areas.

Figure II-1. Comparison of estimated harvest acres in allocated old growth stands, by analysis area.



There would be no difference between the existing percent of stands in each structural stage and cover type class under any of the alternatives (including the No-Action Alternative). Even though bark beetle mortality is occurring in some old growth stands, they continue to provide some characteristics of old growth. Harvest would occur in some allocated old growth stands adjacent to private ownership, but they would continue to be managed to provide old-growth structure.

Fire/Fuels

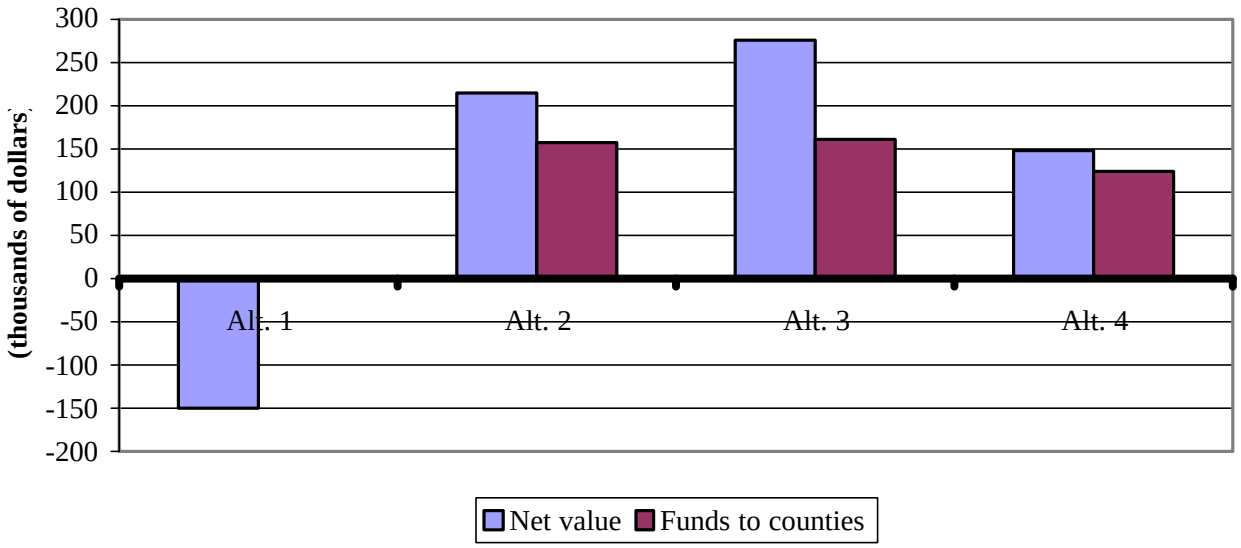
Under the No-Action Alternative, the prolonged buildup of fuel may lead to fires more catastrophic and destructive to the site than typically occurred in the native forest. The combination of more fine fuels such as grasses and shrubs regenerating in openings, new understory trees serving as ladder fuels, and continuing accumulation of heavy fuels from down logs and snags all contribute to changes in fuels and towards more severe fire behavior, which in turn threaten future fire control, increase the danger to firefighters, and place neighboring forest ecosystems and private property at risk. The fuel conditions that enable a fast moving wildfire of higher than normal intensity could persist for several decades.

Alternative 2 would best meet Forest Plan goals, objectives, and standards for fuels management, based on the amount and type of fuels treatment and silvicultural prescriptions (please refer to Table II-16). Alternative 4 would not do as well as Alternative 2 because it would not address fuels treatment in old-growth stands near private lands. Even though Alternative 3 would treat fuels in old-growth stands near private lands, the silvicultural method used (salvage only) would not trend affected stands toward long-range goals of restoring more historic stand densities and species compositions that would be more fire-resilient than is currently existing.

Finances

Proposed timber harvest 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 table provides a comparison of the net value under each alternative. The net value reflects the anticipated income from the sale of timber minus the costs of activities, planning, sale preparation and administration. A portion (25 percent) of gross timber receipts go directly to local counties for public schools and roads. Alternative 1 would incur an estimated $150,000 in planning and analyses costs, with no revenues generated from the sale of timber.

Figure II-2. Comparison of net value and contributions to counties.



Watershed/Fisheries

At the tributary scale, no direct or indirect effects to beneficial uses are anticipated under any of the alternatives, including the No-Action Alternative. The short-term increase in sediment associated with activities under the action alternatives would be minimal, would not be expected to have an effect on channel conditions, and would not be measurable at the tributary scale. 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 the majority of the sediment associated with these activities.

The cumulative effects from management activities most likely would not be discernible at this 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. Additional mortality due to harvest of trees that are dying would not result in a measurable increase in magnitude or quantity of flows for any of the alternatives. No measurable effects would occur in stream channel conditions.

Sediment Yield: There would be no measureable change in sediment yield in any of the analysis area watersheds except Trail Creek. The existing sediment yield is 243 percent; this would increase by 2% under Alternatives 2, 3 and 4.

Peak Flow: There would be no measureable change in peak flow in any of the analysis area watersheds under any alternative.

Stream Crossings: There would be no change in the number of stream crossings in any of the analysis area watersheds except the Lower Little North Fork of the Coeur d'Alene River. As a result of ongoing and reasonably foreseeable activities (the cumulative effects), there would be 2 more stream crossing rehabilitation sites under the action alternatives than would occur under the No-Action Alternative.

Sediment risk: There would be no change in sediment risk in any of the analysis area watersheds, in comparison to the No-Action Alternative.

Net Reduction in Roads: There would be no change in the anticipated net reduction in road miles in any of the analysis area watersheds except the Lower Little North Fork of the Coeur d'Alene River. As a result of ongoing and reasonably foreseeable activities (the cumulative effects), there would be one less road mile in the drainage under the action alternatives than there would under the No-Action Alternative.

Net Encroaching Roads: There would be no change in the net reduction of encroaching roads in any of the analysis area watersheds under any alternative.

Vegetation Removal in RHCA's: There would be no change in the amount of vegetation removed from Riparian Habitat Conservation Areas in any of the analysis area watersheds under any alternative.

Increased Fish Passage: There would be no change in the amount of increased fish passage in any of the analysis area watersheds under any alternative.

Wildlife

Fisher: There would be a reduction in security during activities scheduled under the action alternatives. This loss of security would be lessened with requirements to gate barriered roads that are open for longer than 1 month and the requirement to close existing and installed gates at the end of daily activities. Alternative 4 would have the least reduction in security of the action alternatives because it does not proposed activities in several of the analysis areas. Post sale, all action alternatives would have a slight increase in security over the no action alternative because of additional road closures. There would be less than 5% difference in canopy closure between the No-Action Alternative and any of the action alternatives, resulting in no measurable change in effects as a result of harvest activities.

Flammulated owl: There would be no changes to suitable flammulated owl habitat as a result of beetle infestation and proposed activities, in comparison to the No-Action Alternative. Due to harvest of optimal flammulated owl habitat in old growth and lack of flammulated habitat in the

ecosystem, Alternatives 2 and 3 would impact individuals or habitat in the Hayden and Chain Lakes analysis areas and could trend the species toward listing.

Goshawk: In most cases, units proposed for salvage harvest under all action alternatives would not impact canopy closure beyond the effects from the bark beetle. Live canopy closure would vary little from the No-Action Alternative. Stands that are proposed for regeneration harvest show that mortality from the bark beetle already have reduced canopies below acceptable levels for goshawk.

Under Alternatives 2, 3, and 4, there would be a loss of snags and downed wood. These are important features in relation to prey availability for the goshawk. Design features for snags and downed woody material would ensure some prey availability in salvage and improvement harvest units, but not as much as the No-Action Alternative.

Alternative 2 would reduce suitable goshawk habitat in the Chain Lakes area more than the other alternatives. This would be a loss of 47 acres versus a loss of 8 acres under the other alternatives, including the No-Action Alternative.

Table II-20. Reduction in acres of northern goshawk habitat in comparison to the existing condition.

Analysis Area	Habitat	Existing	Alts. 1, 3 and 4	Alt. 2
Hayden	Capable	6,160	-8	-8
Hayden	Suitable	1,112	0	0
Chain Lakes	Capable	6,083	0	0
Chain Lakes	Suitable	1,846	-8	-47
Coeur d'Alene Lake North	Capable	18,624	0	0
Coeur d'Alene Lake North	Suitable	6,625	-66	-66
Callis	Capable	4,185	-22	-22
Callis	Suitable	956	0	0
Shoshone	Capable	6,945	-4	-4
Shoshone	Suitable	1,388	0	0
Scatterwall	Capable	10,063	-40	-40
Scatterwall	Suitable	3,114	-21	-21
Potosi	Capable	5,404	-17	-17
Potosi	Suitable	1,072	0	0
Total Capable Habitat	--	57,464	-91	-91
Total Suitable Habitat		17,061	-95	-134

Elk: There would not be a measureable change in cover:forage ratios or loss of thermal cover due to either beetle activity or proposed harvest under any alternative. Changes in elk habitat potential would primarily be the result of changes in road management during and after sale activities.

Under the action alternatives, temporary roads would cause a minor decrease in elk habitat over the long term, with less than one mile of temporary road proposed throughout all Elk Habitat Units (EHU's). The effects would be so slight as to not be measurable.

There would be a slight reduction (approximately 1 percent) in elk habitat potential during sale activities in areas where roads are being opened, under all action alternatives. This reduction would be minimized by use of gates to restrict public travel on barriered roads that are opened, and by the requirement to close gates at the end of daily activities on all existing and installed gates.

Alternative 4 would also minimize reductions in habitat potential during sales, because no activities are proposed in three of the EHU's that would be entered under the other action alternatives.

Elk habitat potential returns to at least existing condition after sale activities under all action alternatives. There would be a slight increase in potential in 2 EHU's under the action alternatives, post sale.

Scenery

Collectively, the proposed activities would have negligible effects on the overall scenic character of the Coeur d'Alene River Basin under any alternative. The proposed regeneration harvest units would, to a certain extent, mimic naturally-occurring openings in tree cover, which is in character with this ecosystem. Alternative 1 would be consistent with the visual quality objectives. All action alternatives would meet the assigned Visual Quality Objectives, with the following exceptions:

- *Under Alternative 2: Unit 4 in the Cougar Creek drainage, Unit 12 in the Fernan Creek drainage, and Units 23 and 24 in the Prichard Creek drainage*

- *Under Alternative 4: Unit 4 in the Cougar Creek drainage*

These units include regeneration harvests, which would not meet Visual Quality Objectives for a period of 20 to 25 years. The units could meet the Visual Quality Objectives if modified to use a salvage or light improvement harvest prescription.

Roadless Area

Neither Alternatives 1 nor 4 propose activities within the Skitwish Ridge Roadless Area. There would be no effect on the status of the roadless area under these two alternatives. Alternatives 1 and 4 would be consistent with the Roadless Area Conservation Rule as currently stated, because neither proposes any activities within the roadless area.

Alternatives 2 and 3 each propose 52 acres of timber salvage and fuels treatment within the roadless area. Alternative 2 proposes a 225-acre ecosystem burn within the roadless area. These activities would result in a short-term change to the vegetative characteristics (including stand densities and species composition) of the treated area along the edge of the roadless area. Over time, these vegetative changes would not be noticeable to the average viewer. The proposed activities would not change the size or boundaries of the current unroaded portion of the Skitwish Ridge Roadless Area. Based on the location of the salvage units, the established uses in this area, and the changes that have already occurred to the forested character as a result of beetle infestation, storm-related damage, and past management activities, the proposed salvage activities would not affect the existing characteristics of this inventoried roadless area.

Alternatives 2 and 3 both propose timber harvest within the roadless area, so neither would appear to be consistent with the Roadless Area Conservation Rule as currently stated. However, there are specific exceptions to the Roadless Area Conservation Rule; if either Alternative 2 or 3 were selected for implementation, there would need to be additional analysis to determine whether the proposed harvest activities meet the criteria to be exempted from the rule.

CHAPTER III
EXISTING CONDITIONS, ENVIRONMENTAL CONSEQUENCES

FOREST VEGETATION

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) (USDA, 1983), 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 (USDA, 1990) 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 (USDA, 1990) 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 (Forest Plan, II-8).

Protection of timber stands from insect and disease problems will center on the silvicultural treatments prescribed for timber management activities (Forest Plan, II-10).

Proposed activities will be consistent with Management Area objectives (Forest Plan, II-32). Descriptions and objectives of these Management Areas are included in the Forest Plan (III-3,17,39).

Affected Environment

This section will cover the affected environment of the project area and relevant information for the Coeur d'Alene Basin. Major areas of discussion include 1) characteristics of habitat types and habitat type groups for the project area; 2) pertinent findings from the Coeur d'Alene Geographic Assessment including disturbance and successional patterns and the current situation at the sub basin scale; and 3) existing condition information for each analysis area in the project area (please refer to

the enclosed maps). Ongoing projects, including general projects, timber projects, projects related to closed timber sales, recreation and grazing, as well as foreseeable projects are listed in Chapter II (Tables II-1 through II-15). This vegetative analysis includes vegetative conditions that resulted to all except the foreseeable projects.

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 (IPNF 1998). The inland maritime airflow provides northern Idaho with abundant moisture and moderate temperatures.

The sub basins 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. There are no documented occurrences of these species although suitable habitat is thought to occur. There is a third species of plant that is being considered for listing as threatened for the Forest. This 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.

Habitat Types

The vegetation in the Coeur d'Alene sub basin 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.

Within the project areas, the most common habitat types are western hemlock/queencup beadlily and grand fir/queencup beadlily, which account for approximately 37 percent and 35 percent respectively of National Forest System lands. Douglas-fir/ninebark habitat types are present on approximately 8 percent of the area. Western hemlock/wild ginger and grand fir/ninebark are present on 4 and 3 percent of the area respectively. The remaining 13 percent is made up of a variety of other habitat types.

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 (see Appendix C for specific plant guild descriptions).

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, 1996).

The majority of the habitat types within the project area are in the Dry and Moist Habitat Type Groups. The lowest elevations on the western edge of the Coeur d'Alene Basin are the warmest and driest.

Warm, Dry Habitat Type Group

Within the Small Sales EIS project area the habitat types of this group consist primarily of Douglas-fir/ninebark and grand fir/ninebark types. The current forest cover types in this habitat type group are dominated by Douglas-fir (81 percent), with grand fir and ponderosa pine being the major species on eight percent and four percent, respectively, of the dry habitat types. Historically, many of these sites were maintained in open-grown stands of ponderosa pine and Douglas-fir with grass and brush understories (USDA Forest Service, Region One, 1996). The natural fire-free interval was approximately five to 50 years. Stand replacement fires were relatively infrequent under natural disturbance regimes. Approximately 27% percent of the bark beetle mortality occurs within this habitat type group, although the group is only present on about 17 percent of the project area. There are several reasons for this. The ice storm damage that initiated the current outbreak occurred mainly at lower elevations where most of these drier habitat types exist. Douglas-fir is often a major component of these drier habitat types, and Douglas-fir on these sites may have been more susceptible to successful attack due to the relatively hot, dry conditions that existed during beetle flight in 1998. Sensitive plants of the dry forest guild are most likely to be located within these habitat types.

Warm, Moist Habitat Type Group

The habitat types of this group within the Small Sales EIS project area consist primarily of western hemlock/queencup beadlily and grand fir/queencup beadlily. The current forest cover types are dominated by Douglas-fir (41 percent) and grand fir (34%). Western hemlock and lodgepole pine are the major species on 7 percent and 5 percent, respectively, of the area within the moist habitat type group. Prior to the introduction of blister rust, with over 40 percent of these areas dominated by white pine, the area was known as the "white pine type". Currently, 3 percent of the Small Sales project area is classified as 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 82% of the project area and has approximately 73 percent of the bark beetle mortality. Sensitive plants of the moist and wet forest guilds are most likely to be located within these habitat types.

Cool, Moist and Cool, Dry Habitat Type Groups

These habitat type groups account for about one percent of the Small Sales EIS project area. The major types in the group include subalpine fir/beargrass, subalpine fir/queencup beadlily and

subalpine fir/menziesia. There are only six acres of Douglas-fir beetle attacks within these habitat types. Sensitive plants of the subalpine forest guild are most likely to be located within these habitat types.

Table III-1. Habitat type group distribution within analysis areas and beetle outbreak areas.

	Dry Habitat Type Group	Moist Habitat Type Group	Other Habitat Type Groups
Percent of All Analysis Areas by Habitat Type Group	17%	82%	1 %
Percent of Douglas-fir Beetle Areas by Habitat Type Group	27%	73%	0%

Coeur d'Alene River Basin Geographic Assessment

Because of the local variation in landscape change throughout the Columbia Basin, the IPNF has completed a Geographic Assessment for the Coeur d'Alene River sub basin (IPNF, 1998). This assessment provides a description of the historic and current ecological, social and economic conditions of the sub basin. The condition descriptions were used to characterize the analysis areas infested by Douglas-fir beetles. 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 the 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 in 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.

Findings of the ICBEMP and the Geographic Assessment also indicate that there is an increased risk of stand replacement fire on the drier habitat types due to fuel accumulations resulting from fire exclusion. Most of the fuels are in the form of green trees within overstocked stands, where dense crowns can now support crown fires. This green undergrowth provides fuel ladders, which increase the risk of crown fires.

Disturbance and Successional Patterns

Fire

Prior to European settlement in the Coeur d'Alene River sub basin, fire was the most important disturbance occurring across the landscape. Zack (1994) described fire history within the Coeur d'Alene sub basin and indicated that fires covering greater than five percent of this forest occurred on an average of approximately once every 20 years.

It is probable that Native Americans (primarily in the Rathdrum valley and lower major river valleys) used fire to create better forage for horses and wildlife (improve hunting) and to remove brush and shrubs from camping sites (IPNF 1998, pg 19). These fires were set quite frequently, resulting in low intensity fires that probably covered large areas. Prevailing westerly winds would tend to push these fires into the mountains to the east. At higher elevations, topography and improved moisture regime would tend to create a mixed severity fire with some creeping underburn and some crowning that killed small groups of trees. In particularly dry years, fires may have caused mortality over extensive areas.

In the denser forested environment further removed from Native American settlements, lightning-caused fires were probably more important in determining vegetation patterns across the landscapes. Lightning is a common occurrence in the Coeur d'Alene subbasin. These fires probably burned in a variable pattern depending on weather conditions preceding and following the fire starts. In "normal" years these fires may have burned one to 100 acres before being stopped by summer rains. In particularly dry years when fire starts were followed by high wind events, high intensity fires could cover tens of thousands and hundreds of thousands of acres. These fires often killed most trees and ground vegetation within the fire perimeter, leaving islands of trees and widely scattered individual trees in moist areas or where recent low intensity fires had removed ladder fuels from the understory. This mixture of moderately frequent, mixed severity fires and infrequent high intensity fires created a landscape of large blocks of old and mature forest with smaller areas of younger age classes. It also created large blocks of younger forests with smaller areas of mature and old age classes (IPNF 1998, pg 29).

Forest vegetation in north Idaho was historically dominated by species such as ponderosa pine, western larch and western white pine. These long-lived tree species typically establish after some form of disturbance and have the potential to occupy a site for two to three hundred years. Stands of these trees were adapted to the variable intensity fire regimes common to the area. Natural levels of insect populations, along with wind and winter storm damage, contributed to stand mortality and, over time, created conditions for large stand replacing fires.

In the mesic upland areas, the mosaic created by moderately frequent, variable intensity burns with infrequent high intensity fires has been altered. Fire suppression efforts have largely eliminated the low intensity and small, variable intensity fires from the system. Drier south facing slopes that would have contained mixed open stands of ponderosa pine, larch and Douglas-fir with little understory now have denser tree cover with a higher component of Douglas-fir and grand fir and understories of dense shrubs or shade- tolerant reproduction. In general, drier sites have become more susceptible to stand replacing fires because of dense multi-storied structures. The shift to more Douglas-fir and grand fir has also made stands much more susceptible to root diseases.

Logging

Euro-settlement since the latter part of the 1800's has also influenced forest vegetation. In some cases, trees were cut to clear land for agricultural uses, and in other cases the objective was to provide a variety of wood products. Through the early part of this century, most trees harvested for wood products were the largest and most valuable; generally white pine, western larch and ponderosa pine. White pine mortality, caused by white pine blister rust and mountain pine beetle, led to an aggressive effort to salvage this species to recover its economic value. These species-selective harvests tended to leave stands of poor quality grand fir, Douglas-fir and western hemlock. Only in stands that were burned accidentally or to treat slash did early seral species have an opportunity to regenerate. Even where white pine seedlings became established, they were often quickly killed by blister rust, thus allowing other species to dominate the site.

In the latter part of this century, timber harvests have often tended to remove the lower quality species as well as the more valuable ones. These types of harvests were on a smaller scale than natural disturbance regimes, creating a highly fragmented landscape of old growth patches adjacent to newly regenerated stands of 20 to 100 acres in size. Before the introduction of blister rust-resistant white pine, these regenerated stands were often planted with Douglas-fir. Once blister rust-resistant stock became available and the insect and disease problems of Douglas-fir were recognized, planting shifted to white pine, ponderosa pine and western larch.

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. Root disease is currently the most prominent landscape-altering process in the Coeur d'Alene subbasin (IPNF 1998, pg 30).

Douglas-fir Beetle

Douglas-fir beetles have 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. Short-term increases in fuel loading may have led to increased crowning of moderate severity fires and created small to large openings for the reintroduction of seral species. In some cases, these insect infestations may have contributed to large stand replacing fires (IPNF 1998, pg 30).

Loss of White Pine

White pine blister rust was 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.

Current Situation

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 Small Sales EIS project area.

Long-lived seral species (western white pine and western larch) have declined within the Coeur d'Alene sub basin 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 white pine cover type has declined by more than 94 percent in the past 100 years. Grand fir/western hemlock cover types increased by 677 percent. Larch forest types have decreased by 68 percent, and the Douglas-fir type has shown a 40 percent increase (IPNF 1998, pg 37).

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 to less than four percent (Figure III-2). This was generally the result of the aggressive harvest of white pine and larch and the loss of white pine to blister rust. The large fires in the first half of the last century also played an important part in reducing the old forest component. Today, old growth on National Forest System lands within the Coeur d'Alene subbasin tends to be in areas not burned in the 1910 fires; it also tends to be fragmented by past timber harvest and road construction. Stands of grand fir and Douglas-fir that have replaced white pine and larch in the ecosystem and that are encroaching on the ponderosa pine on drier sites 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 Coeur d'Alene River Ranger District. Although these 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 remnant white pine and larch will be missing.

Figure III-1. Historic and current cover types, Coeur d'Alene River Basin.

PP = ponderosa pine	WWP = western white pine	WL = western larch
DF = Douglas-fir	GF/WH = grand fir/western hemlock	WRC = western red cedar
LP = lodgepole pine	SAF/MH = sub-alpine fir/mountain hemlock	HRDWD = hardwood

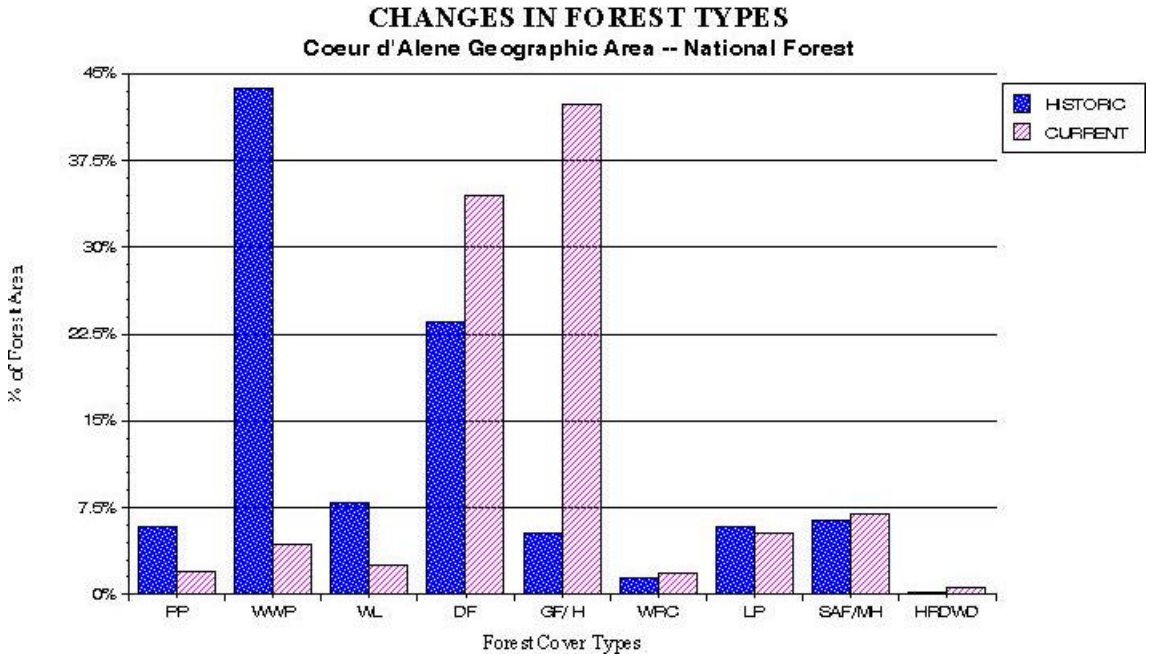
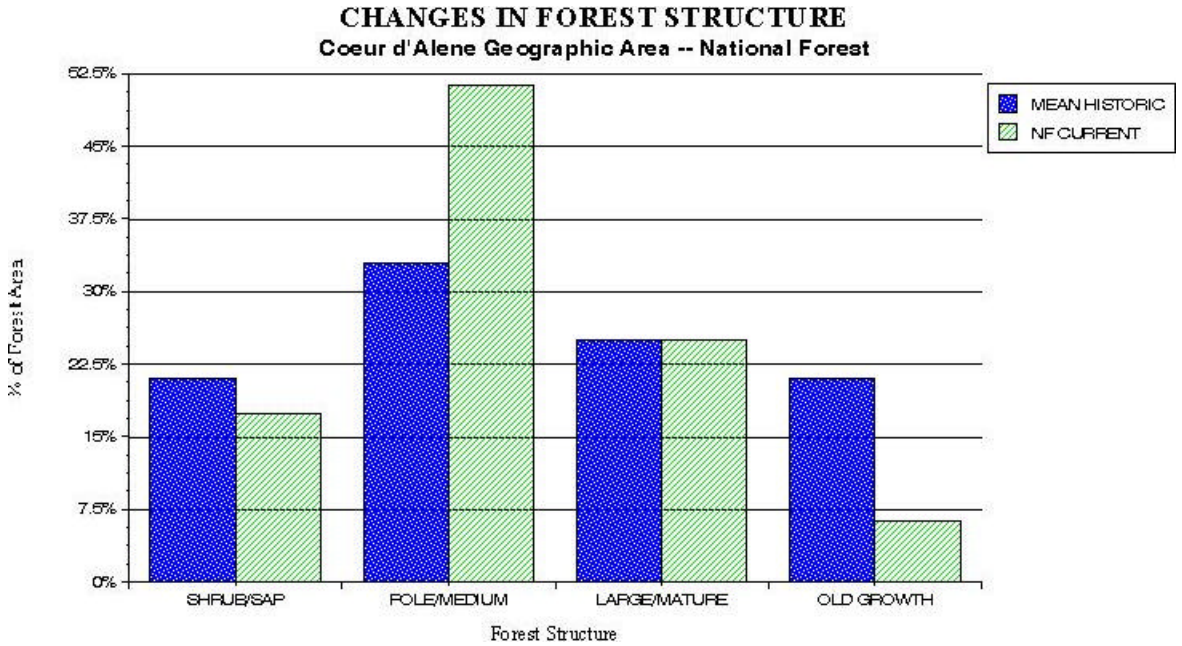


Figure III-2. Historic and current size classes, Coeur d'Alene River Basin.



Current Douglas-fir Beetle Outbreak

As stated previously, the current Douglas-fir beetle outbreak began in Douglas-fir damaged by wind, snow and ice during the winter of 1996-97. The Douglas-fir beetle prefers larger diameter, mature trees (Schmitz and Gibson 1996, Flanagan 1998) and the results of sampling completed on the IPNF 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 are dead or dying (Kegley et al. 1999). For trees attacked by beetles in 1999, this percentage dropped to about 71 percent (Kegley, 2000).

Douglas-fir beetles are currently active across much of the National Forest System lands in the Coeur d'Alene sub basin. The 1999 aerial detection flight indicates there are approximately 63,100 acres infested on the Coeur d'Alene District. 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, kill more than 50 percent of the existing stand. Within the project area these openings are expected to range from 2 to 15 acres in size. The larger openings are likely to appear as a mosaic, with individual live trees and groups of live trees, in an area where most other trees have been killed by the bark beetle, root disease or ice and snow damage. These openings will have irregular shapes and edges.

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 Small Sales EIS analysis area infested trees tend to occur in small groups of less than 20 acres in size.

The peak year of the beetle epidemic was probably in 1998, but additional mortality occurred in 1999. Some additional mortality is expected in 2000 and 2001, but beetle populations tend to decrease rapidly when down and/or damaged trees are no longer available in large numbers.

Existing Condition

Methodology

Stand examinations and/or walk through exams were completed in May, 2000 within allocated old growth stands in the Hayden Lake, Canfield Face, Fernan Creek, Blue Creek, and Thompson Creek Analysis Areas to evaluate the effect of beetle caused mortality on the old growth character of the stands. Stand examinations and/or walk through exams were also completed in stands proposed for replacement old growth in the Stella Creek, Cedar Creek, and Fortier Creek areas.

The information provided below comes from a variety of sources. The extent and location of current bark beetle infestations were based on aerial insect detection flights conducted in late summer of 1998 and 1999 and field surveys (Coeur d'Alene River RD 1998, 1999) of sites with active beetle populations. No attempt has been made to project areas of additional mortality because bark beetle activity is expected to decline in subsequent years. 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. Changes to vegetation indicators associated with harvest covered in the Douglas-fir Beetle Project FEIS and ROD, 1999, are considered as existing condition.

Based on aerial detection flights and field surveys (Coeur d'Alene River Ranger District, 1998-1999; Project Files, Vegetation), there are currently about 7,250 acres that have mortality caused by Douglas-fir beetle within the project area. There may have been some areas where trees attacked in 1999 were not yet showing symptoms and were therefore not mapped during the flight. Most of these areas have very light infestations but some areas have been heavily attacked.

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 event 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 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 100 to 150 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 old forest structure includes stands of trees that are 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.

Information on other ownership lands within the project area is limited. Private lands tend to have more of the drier habitat types because they are generally lower in elevation and receive less moisture. Although regeneration harvests have created openings in the forest canopy, existing openings are mostly a result of permanent land clearing for homes and pastures. Timber harvests on private lands often tend to be selective removal of trees of highest economic value (usually the largest), and natural regeneration is relied on to fill in any created openings. This tends to favor shade-tolerant Douglas-fir and grand fir over early seral species such as pine and larch and typically removes any old forest structure. Douglas-fir beetles are active on other ownerships within the analysis areas wherever Douglas-fir of sufficient size and density are present.

Hayden Lake Analysis Area

The Hayden Lake analysis area includes approximately 163 acres in the Lancaster Creek drainage, all of which is National Forest System lands.

Warm, moist grand fir habitat types and warm dry Douglas-fir and grand fir habitat types comprise 56 and 44 percent of the area respectively.

Douglas-fir is the dominant forest cover on the entire analysis area.

The entire Hayden Lake area is in the small-to-medium saw timber structural stage in stands that are 85 to 100 years old. There are 65 acres of allocated old growth of which 66 percent is on moist grand fir habitat types. Douglas-fir is the dominant species in these old growth stands. Trees in these old growth stands are generally less than 100 years old.

There may have been harvests early in the century that removed only the large pine and larch and left stands of poor quality Douglas-fir and grand fir but these harvests are not recorded. Approximately 2 acres were salvage logged in 1999 to remove beetle killed trees as part of the Cherry Heli Bug timber sale analyzed in the Douglas-fir Beetle Project 1999.

About 132 acres within the analysis area have beetle-caused mortality.

Table III-2. Vegetative conditions in the Hayden Lake analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	72	44
Warm/Moist (Groups 4, 5, and 6)	91	56
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	163	100
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	0	0
Poles/small-medium timber	163	100
Mature/large timber	0	0
Old Forest	0	0
Allocated old growth	65	40
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	0	0
Seed Tree & Shelterwood	0	0
Overstory Removal	0	0
Sanitation/Salvage	16*	3*
Commercial Thinning	0	0
Selection Harvest	0	0
Fires since 1950	0	0

** This represents stand acres so actual acreage treated may be less.*

Canfield Face Analysis Area

The Canfield area encompasses approximately 144 acres, all of which is National Forest System lands.

Most (82 percent) of this area is in the mature structural stage in stands that are 100 to 150 years old. Approximately 14 percent of the area is in the pole and immature timber structural stage with the remaining 4 percent being seedling/sapling sized stands. No stands were identified that are over 150 years old but there are 84 acres of allocated old growth. The old-growth stands are dominated by Douglas-fir and are 100 to 120 years old.

Although there are no records, much of this watershed was probably harvested early in the century due to its close proximity to Coeur d'Alene. 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.

A small portion of one stand was harvested to create a fuel break that will be maintained in a relatively open forested condition. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires. Approximately 9 acres were salvage harvested in the last 2 years to remove beetle killed trees as part of theWindy Buttes timber sale analyzed in the Douglas-fir Beetle Project 1999

There are approximately 76 acres within the Canfield area that have beetle-caused mortality.

Table III-3. Vegetative conditions in the Canfield Face analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2)	144	100
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	111	77
Ponderosa Pine	33	23
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	6	4
Poles/small-medium timber	20	14
Mature/large timber	118	82
Old Forest	0	0
Allocated old growth	84	58
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	0	0
Seed Tree & Shelterwood	0	0
Overstory Removal	0	0
Sanitation/Salvage	0	0
Commercial Thinning	0	0
Selection Harvest	33*	23*
Fires since 1950	0	0

** Only a portion of this stand was actually treated.*

Fernan Creek Analysis Area

The Fernan area encompasses approximately 234 acres, all of is National Forest System lands.

About 61 percent (5,950 acres) of the area is in warm, moist grand fir and hemlock habitat types, and 39 percent is in warm, dry Douglas-fir and grand fir habitat types.

Douglas-fir and grand fir are the dominant forest cover types within the watershed, accounting for 81 and 19 percent respectively of the forested land.

Approximately 44 percent of the area is in the pole and small-to-medium saw timber structural stage in stands that are 85-100 years old. Old, mature, and seed/sapling stand structures each make up about 19 percent of the area. There are 30 acres of allocated old growth stands within the area. These stands are about 160 years old and occur on warm, dry habitat types with Douglas-fir being the major forest species.

Much of this watershed was probably harvested early in the century due to its close proximity to Coeur d'Alene. 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.

More intensive management began in the 1970s, with approximately 19 percent of the area having been treated with regeneration harvests. The most recent harvests occurred in 1998 and 1999 to harvest ice and snow damage that occurred during the winter of 1996-97 and subsequent bark beetle mortality. Approximately 13 acres were salvage harvested in the last 2 years to remove beetle killed trees as part of timber sales analyzed in the Douglas-fir Beetle Project 1999. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires. There are approximately 112 acres of beetle-caused mortality.

Table III-4. Vegetative conditions in the Fernan Creek analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	91	39
Warm/Moist (Groups 4 and 5)	143	61
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	190	81
Grand fir	44	19
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	44	19
Poles/small-medium timber	104	44
Mature/large timber	43	18
Old Forest	44	19
Allocated old growth	30	13
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	0	0
Seed Tree & Shelterwood	44	19
Overstory Removal	0	0
Sanitation/Salvage	70	29
Commercial Thinning	0	0
Selection Harvest	0	0
Fires since 1950	0	0

Blue Creek Analysis Area

The Blue Creek area encompasses approximately 462 acres, all of which is National Forest System lands.

Warm, dry habitat types of Douglas-fir and grand fir dominate approximately 93 percent of this area. Warm, moist habitat types account for the remainder. The dominant tree species on 95 percent of the area is Douglas-fir with the remaining 5 percent being grand fir.

Most (71 percent) of this watershed is in the mature and large saw timber structural stage in stands that are 100-150 years old. Approximately 20 percent is old forest structure that is over 150 years old, and the remaining 9 percent is in the pole and immature sawtimber structural stage that is 70 to 90 years old. There are approximately 71 acres of allocated old growth within the watershed. Douglas-fir is the major species in these old growth stands, which are 150 to 170 years old.

There are few records of early harvesting but white pine and larch were probably harvested from the uplands early in this century.

This area has not had any regeneration harvests. The most recent harvests have been associated with the salvage of trees damaged by ice and snow in 1996/97 and subsequent beetle-caused mortality. This consisted of approximately 28 acres in the Windy Buttes timber sale. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires.

There are approximately 375 acres of that have beetle-caused mortality.

Table III-5. Vegetative conditions in the Blue Creek analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	431	93
Warm/Moist (Groups 4, 5, and 6)	31	7
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	438	95
Grand fir	24	5
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	0	0
Poles/small-medium timber	39	9
Mature/large timber	328	71
Old Forest	95	20
Allocated old growth	73	16
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	0	0
Seed Tree & Shelterwood	0	0
Overstory Removal	0	0
Sanitation/Salvage	151	33
Commercial Thinning	0	0
Selection Harvest	0	0
Fires since 1950	0	0

Thompson Creek Analysis Area

The Thompson Creek area encompasses approximately 726 acres, all of which is National Forest System lands. Warm, moist habitat types of western hemlock, grand fir, and some western redcedar make up 60 percent of the area with warm, dry habitat types constituting the remainder. Douglas-fir is the dominant forest cover type on 70 percent of the area. Eleven percent of the area is not forested; the south facing slopes of Carril peak being generally devoid of trees. Grand fir is the major species on 10 percent of the area and larch, ponderosa pine, and cedar account for the remainder.

Mature and large timber stands that are 100-150 years old are the dominant structural stage (47 percent), with old forest structure and immature timber present on 18 and 14 percent of the area respectively. Ten percent of the area is made up of seedling and sapling sized trees that resulted from recent regeneration harvests. Eleven percent is not forested. There are 198 acres of allocated old growth, which occurs on the warm, moist habitat types and are dominated by Douglas-fir. Trees in these allocated old growth stands are generally about 120 years old. There are no records of early cutting in this area but these harvests were probably quite selective in nature, removing only the largest and best cedar, white pine and larch. More intensive management began in the 1970s. Approximately 10 percent of the area has been treated with regeneration harvests. The most recent harvests occurred in the early 1990s. Approximately 66 acres in the project area are being salvage harvested to remove beetle killed trees as part of the Blue Swan timber sale analyzed in the Douglas-fir Beetle Project 1999. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires. There are approximately 363 acres that have beetle-caused mortality.

Table III-6. Vegetative conditions in the Thompson Creek area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	288	40
Warm/Moist (Groups 4 and 5)	438	60
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	507	70
Grand fir	69	10
Ponderosa Pine	26	4
Western Larch	34	4
Western Redcedar	7	1
Non Forest	82	11
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	69	10
Poles/small-medium timber	102	14
Mature/large timber	342	47
Old forest	131	18
Non Forest	82	11
Allocated old growth	198	27
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	34	5
Seed Tree & Shelterwood	35	5
Overstory Removal	0	0
Sanitation/Salvage	66	9
Commercial Thinning	32	4
Selection Harvest	0	0
Fires since 1950	0	0

East Rutherford Gulch Analysis Area

The East Rutherford Area encompasses approximately 556 acres, all of which is National Forest System lands.

This analysis area is dominated by warm, moist habitat types of grand fir and western hemlock. The remaining 27 percent consists of warm, dry habitat types.

Douglas-fir is the dominant forest cover type, accounting for 81 percent of the area. Grand fir is the major species on the remaining 19 percent.

Approximately 4 percent of the area has been salvage harvested to remove dead and damaged trees and another 4 percent has been commercially thinned to create a fuel break on the ridge between Rutherford Gulch and Marie Creek. Approximately 13 acres in the project area are being salvage harvested to remove beetle killed trees as part of theWest Rutherford timber sale analyzed in the Douglas-fir Beetle Project 1999. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires.

There are approximately 402 acres of beetle-caused mortality within the analysis area.

Table III-7. Vegetative conditions in the East Rutherford analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	151	27
Warm/Moist (Groups 4 and 5)	405	73
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	452	81
Grand fir	104	19
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	0	0
Poles/small-medium timber	129	23
Mature/large timber	427	77
Old forest	0	0
Allocated old growth	0	0
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	0	0
Seed Tree & Shelterwood	0	0
Overstory Removal	0	0
Sanitation/Salvage	35	6
Commercial Thinning	21	4
Selection Harvest	22	4
Fires since 1950	0	0

Cedar Creek Analysis Area

The Cedar Creek watershed encompasses approximately 1,051 acres, all of which is National Forest System lands.

Warm, moist habitat types of western hemlock and grand fir, with some western redcedar dominate the watershed, covering 77% of the area. Warm, dry Douglas-fir and grand fir habitat types cover the remaining portions of the watershed.

Douglas-fir and grand fir are the dominant forest cover types, accounting for 47 and 39 percent of the forested land respectively. Western hemlock and cedar account for the remainder

Intensive forest management in the Cedar Creek watershed began in the late 1980s. Approximately 7 percent of the area has been treated with regeneration harvests. Approximately 18 acres in the project area are being salvage harvested to remove beetle killed trees as part of the Alder Beetle timber sale analyzed in the Douglas-fir Beetle Project 1999. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires.

There are approximately 280 acres within the Cedar Creek Analysis Area that have beetle-caused mortality.

Table III-8. Vegetative conditions in the Cedar Creek area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	237	23
Warm/Moist (Groups 4. 5, and 6)	814	77
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	501	47
Grand fir	406	39
Western Hemlock	115	11
Western Redcedar	28	3
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	93	9
Poles/small-medium timber	118	11
Mature/large timber	828	79
Old Forest	12	1
Allocated Old growth	0	0
Recruitment Old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	23	2
Seed Tree & Shelterwood	49	5
Overstory Removal	0	0
Sanitation/Salvage	321	31
Commercial Thinning	0	0
Selection Harvest	0	0
Fires since 1950	0	0

Fourth of July Creek Analysis Area

The Fourth of July Creek Analysis Area includes two separate areas. One area is east of Mason Saddle in the Mason Creek drainage. The other area is east of Curran Creek and includes the Curran, Service, Fern, Rantenan and Bentley Creek drainages. It encompasses approximately 5,047 acres, of which about 4,727 acres is National Forest System lands. There are approximately 320 acres of private lands.

Warm, moist habitat types of western hemlock and grand fir, with some western redcedar are the dominant (87%) types on National Forest lands within this watershed. Warm, dry Douglas-fir and grand fir habitat types cover the remainder of the area. Douglas-fir and grand fir are the dominant forest cover types, accounting for 69 and 17 percent respectively of the forested land. Ponderosa pine is the dominant species on 7 percent of the area and hemlock, cedar and larch account for the remainder.

Intensive forest management began in the 1980s with the most recent harvests occurring in the mid 1990s. Approximately 12 percent of the area has been treated with regeneration harvests. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires.

There are approximately 916 acres of National Forest System lands within the Fourth of July analysis area that have beetle-caused mortality. Private lands within the area are dominated by Douglas-fir but these tend to be smaller trees in the pole and immature sawtimber structural stage. About 25 acres of private land have beetle-caused mortality.

Table III-9. Vegetative conditions in the Fourth of July Creek analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	614	13
Warm/Moist (Groups 4, 5, and 6)	4,113	87
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	3,275	69
Grand fir	810	17
Western Hemlock	174	4
Western Redcedar	63	1
Western Larch	78	2
Ponderosa Pine	327	7
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	370	8
Poles/small-medium timber	2,676	56
Mature/large timber	1,550	33
Old forest	130	3
Allocated old growth	384	8
Recruitment old growth	130	3
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	415	9
Seed Tree & Shelterwood	156	3
Overstory Removal	11	0
Sanitation/Salvage	169	4
Commercial Thinning	0	0
Selection Harvest	0	0
Fires since 1950	0	0

Cataldo Face Analysis Area

The Cataldo Face watersheds include several face drainages flowing into the Coeur d'Alene River. Hardy and Hayden Gulches are the main drainages. These watersheds represent face drainages that are too small to analyze separately or were deemed appropriate to group together for analysis purposes. This area includes approximately 2,061 acres, all of which is National Forest System lands.

National Forest lands within these watersheds have a fairly even mix of warm, dry Douglas-fir and grand fir habitat types and warm, moist habitat types of western hemlock and grand fir. Dry habitats comprise 53 percent and moist habitats 47 percent of the area.

Douglas-fir and grand fir are the dominant forest cover types, accounting for 79 and 12 percent respectively of the forested land. Ponderosa pine is the dominant species on 7 percent of the area with western hemlock, cedar and larch accounting for the remainder.

Intensive forest management in these watersheds generally began in the 1980s. Approximately 5 percent of the area has been treated with regeneration harvests. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires.

There are approximately 321 acres of National Forest System lands within these watersheds that have beetle-caused mortality.

Table III-10. Vegetative conditions in the Cataldo Face analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	1,099	53
Warm/Moist (Groups 4, 5, and 6)	962	47
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	1,607	79
Grand fir	250	12
Western Redcedar	26	1
Western Larch	5	0
Ponderosa Pine	144	7
Western Hemlock	20	1
Non Forest	7	0
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	65	3
Poles/small-medium timber	608	30
Mature/large timber	1,276	62
Old forest	103	5
Allocated old growth	1	0
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	34	2
Seed Tree & Shelterwood	67	3
Overstory Removal	0	0
Sanitation/Salvage	59	3
Commercial Thinning	45	2
Selection Harvest	0	0
Fires since 1950	0	0

Prado Creek Analysis Area

The Prado Creek analysis area encompasses approximately 1,268 acres, all of which is National Forest System lands. This analysis area includes a portion of Prado Creek and an unnamed face drainage of the Coeur d'Alene River.

Warm, moist habitat types of western hemlock and grand fir that cover about 80% of the area dominate these watersheds. Warm, dry Douglas-fir and grand fir habitat types cover the remaining 20 percent. Douglas-fir and grand fir are the dominant forest cover types accounting for 50 and 25 percent respectively of the forested land. Western hemlock is the dominant species on 9 percent of the area while ponderosa pine and lodgepole pine cover 7 and 4 percent respectively. White pine, larch, and cedar make up the remaining 5 percent. Most (52 percent) of this analysis area is in the pole and small-to-medium saw timber structural stage in stands that are 35-100 years old, but a substantial portion (34 percent) is also in mature and large saw timber. Only one percent is in old forest structure and 13 percent is shrubs, seedlings, or saplings. There are no allocated old or recruitment old growth stands within the watershed.

Intensive forest management in the analysis area began in the 1970s but most harvesting was done in the mid 1990s. Approximately 17 percent of the area has been treated with regeneration harvests. The most recent harvests have been regeneration harvests associated with the Prado Timber Sale. There have been no fires in recent history that would have altered stand structure, although there have been small lightning fires. There are approximately 209 acres of within the analysis area that have beetle-caused mortality.

Table III-11. Vegetative conditions in the Prado analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	257	20
Warm/Moist (Groups 4, 5, and 6)	1,011	80
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	637	50
Grand fir	317	25
Western Hemlock	121	9
Western Redcedar	21	2
Western Larch	13	1
Ponderosa Pine	85	7
Western White Pine	27	2
Lodgepole Pine	47	4
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	162	13
Poles/small-medium timber	654	52
Mature/large timber	438	31
Old Forest	13	1
Allocated Old growth	0	0
Recruitment Old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	25	2
Seed Tree & Shelterwood	190	15
Overstory Removal	0	0
Sanitation/Salvage	0	0
Commercial Thinning	14	1
Selection Harvest	0	0
Fires since 1950	0	0

Cougar Analysis Area

The Cougar analysis area encompasses approximately 1,313 acres, all of which are National Forest System lands. This analysis area includes two separate areas that are in the Cougar Creek drainage as well as some unnamed face drainages of the Coeur d'Alene River. Cougar Creek and November Creek are the major drainages.

Ninety-two percent of the area is comprised of warm, moist habitat types of western hemlock and grand fir. The remainder of the area consists of warm, dry Douglas-fir and grand fir habitat types.

Douglas-fir and grand fir are the dominant forest cover types, accounting for 52 and 37 percent respectively of the forested land. Western hemlock is the dominant species on 6 percent of the area and lodgepole pine is the major species on 4 percent. Larch accounts for the remainder.

Most (80%) of this analysis area is in the mature and large timber structural stage in stands that are 100-150 years old. About 11 percent of the area is in old forest structure. Shrubs, seedlings, and saplings are dominant on 7 percent of the area while poles and immature timber comprise only 2 percent of the forest land. There are 333 acres of allocated old growth within the analysis area.

Intensive forest management in the Cougar analysis area began in the 1970s. Approximately 8 percent of the area has been treated with regeneration harvests. The most recent harvests were regeneration treatments completed in the early 1990s. There have been no fires in recent history that would have altered stand structure, although there have been small lightning fires.

There are approximately 148 acres within the Cougar area that have beetle-caused mortality.

Table III-12. Vegetative conditions in the Cougar analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	101	8
Warm/Moist (Groups 4, 5, and 6)	1,212	92
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	685	52
Grand fir	488	37
Western Hemlock	71	6
Western Larch	14	1
Lodgepole	54	4
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	88	7
Poles/small-medium timber	24	2
Mature/large timber	1,047	80
Old Forest	152	11
Allocated old growth	333	25
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	32	2
Seed Tree & Shelterwood	81	6
Overstory Removal	60	4
Sanitation/Salvage	729	56
Commercial Thinning	0	0
Selection Harvest	0	0
Fires since 1950	0	0

Lower Little North Fork Analysis Area

This analysis area combines three separate watershed areas and encompasses approximately 11,717 acres, of which about 11,697 acres are National Forest System lands. The remainder includes approximately 20 acres of private lands. Private lands in the analysis area lie along the Little North Fork and are generally open with few trees. Within this analysis area, the Owl watershed area includes Owl Creek, Williams Draw, and Browns Gulch. The Gimlet watershed includes Gimlet Creek and the Little Teepee watershed includes Little Teepee and Little Bumblebee Creeks.

Warm, moist habitat types of western hemlock and grand fir, with some western redcedar cover 91 percent of this analysis area, while warm, dry habitat types are found on only 9 percent of the area. Grand fir and Douglas-fir are the dominant forest cover types, accounting for 57 and 23 percent respectively of the forested land. Western hemlock is the dominant species on 8 percent of the area. Larch, cedar, lodgepole pine, cottonwood, and ponderosa pine constitute the remainder. Most (55%) of this watershed is in the mature and large sawtimber structural stage in stands that are 100 to 150 years old, but poles and immature sawtimber represent 28 percent of the area. Fourteen percent of the forest land is in shrubs, seedlings, or saplings and the remaining three percent has been identified as being in old forest structure. There are 283 acres of allocated old growth within the analysis area.

Intensive forest management in the Lower North Fork analysis area began in the 1960s, but some harvesting occurred in the 1930s. It is likely that earlier harvest removed trees, particularly cedar and white pine, along the Little North Fork of the Coeur d'Alene River. Approximately 15 percent of the area has been treated with regeneration harvests. The most recent harvests were regeneration cuts completed in the early 1990s. There have been no fires in recent history that would have altered stand structure, although there have been small lightning fires. There are approximately 1,620 acres of National Forest System lands within the Lower Little North Fork analysis area that have beetle-caused mortality.

Table III-13. Vegetative conditions in the Lower Little North Fork analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	1,072	9
Warm/Moist (Groups 4, 5, and 6)	10,625	91
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	2,721	23
Grand fir	6,634	57
Western Hemlock	1,003	8
Western Redcedar	426	4
Western Larch	344	3
Ponderosa Pine	54	0
Cottonwood	195	2
Lodgepole	310	3
Non Forest	10	0
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	1,634	14
Poles/small-medium timber	3,301	28
Mature/large timber	6,463	55
Old Forest	290	3
Allocated old growth	283	2
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	1,464	13
Seed Tree & Shelterwood	243	2
Overstory Removal	416	4
Sanitation/Salvage	702	6
Commercial Thinning	191	2
Selection Harvest	0	0
Fires since 1950	0	0

Beaver Creek Analysis Area

The Beaver Creek analysis area contains two separate areas (Potosi and White) encompassing approximately 10,880 acres, of which 99 percent is National Forest System land. The remainder is privately owned. The major watersheds within the Potosi Creek area are Potosi Creek, Placer Gulch, Cleveland Gulch, Pony Gulch, No Name Gulch and Unknown Gulch. There are also numerous unnamed face drainages flowing directly into Beaver Creek. The major watersheds within the White Creek area are White and Alder Creeks.

Eighty-seven percent of National Forest lands are warm, moist habitat types of western hemlock and grand fir, with some western redcedar. Warm, dry habitat types of Douglas-fir and grand fir cover 9 percent of the area, and the remaining portions are cool, moist or cool, dry habitat types occurring at higher elevations. Most of the dry habitat types occur on the south and west facing slopes in the Potosi area.

Douglas-fir is the dominant forest cover type, accounting for 54 percent of the forested land. Grand fir is the dominant species on 14 percent of the area. White pine is the major species on 9 percent of the area (mainly recent plantings) and western larch and lodgepole pine are the major species on 6 percent of the area each. Cedar, western hemlock, ponderosa pine, and subalpine fir account for the remainder.

Most (78 percent) of this watershed is in the mature and large saw timber structural stage in stands that are 100 to 150 years old, mainly as a result of fires in the 1890s. Approximately 14 percent of the area is in the shrub/seedling/ or sapling structural stage as a result of recent regeneration harvests. Poles or immature forest are present on 7 percent of the area and old forest structure represents only 1 percent of the area. There are about 178 acres of allocated old growth within the analysis area, all within the Potosi area.

Intensive forest management in the analysis area began in the late 1970s. Most of this area probably avoided harvesting early in the century due to the young age of the stands resulting from the 1890s fires. Approximately 18 percent of the area has been treated with regeneration harvests. There have been no fires in recent history that would have altered stand structure, although there have been small lightning fires.

The private land is located along Beaver and Potosi Creeks, and are probably cedar habitat types. Some lands have been permanently cleared for pasture on the private lands along Beaver Creek, and there are some home sites along the stream.

There are approximately 1,616 acres of National Forest System lands within the Beaver analysis area that have beetle-caused mortality.

Table III-14. Vegetative conditions in the Beaver Creek analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	944	9
Warm/Moist (Groups 4, 5, and 6)	9,326	87
Cool/Moist (Groups 7 and 8)	355	3
Cool/Dry (Groups 9 and 10)	136	1
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	5,802	54
Grand fir	1,480	14
Western Hemlock	404	4
Western Redcedar	400	4
Western Larch	653	6
Ponderosa Pine	257	2
Lodgepole	668	6
Mtn. Hemlock/Subalpine Fir	101	1
White Pine	982	9
Non Forest	13	0
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	1,553	14
Poles/small-medium timber	748	7
Mature/large timber	8,339	78
Old forest	105	1
Allocated old growth	178	2
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	1,374	13
Seed Tree & Shelterwood	290	3
Overstory Removal	0	0
Sanitation/Salvage	705	7
Commercial Thinning	292	3
Selection Harvest	224	2
Fires since 1950	0	0

Prichard Creek Analysis Area

The Prichard Creek analysis area encompasses approximately 1,313 acres, all of which are National Forest System lands. This analysis area includes three separate areas. Prichard Creek, West Fork of Eagle Creek, and Nocelly Gulch are the major drainages.

Sixty-nine percent of the area is comprised of warm, moist habitat types of western hemlock and grand fir. The remainder of the area consists of warm, dry Douglas-fir and grand fir habitat types.

Douglas-fir and grand fir are the dominant forest cover types, accounting for 59 and 30 percent respectively of the forested land. Western larch is the dominant species on 6 percent of the area, ponderosa pine on 4 percent, and lodgepole pine is the major species on 2 percent of the area.

Mature and large timber structural stage occupies about 40 percent of the area and old forest structure occupies 39 percent. About 14 percent of the area is in poles and immature forest structure and shrubs, seedlings and saplings occupy the remainder. There are no stands of allocated or recruitment old growth within the analysis area.

Intensive forest management in the Prichard analysis area began in the 1960s but most harvesting has occurred in the 80s and 90s. Approximately 26 percent of the area has been treated with regeneration harvests. There have been no fires in recent history that would have altered stand structure, although there have been small lightning fires. There are approximately 286 acres within the Prichard area that have beetle-caused mortality.

Table III-15. Vegetative conditions in the Prichard analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	439	31
Warm/Moist (Groups 4, 5, and 6)	954	69
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	820	59
Grand fir	420	30
Western Larch	78	5
Lodgepole Pine	24	2
Ponderosa Pine	25	2
White Pine	34	2
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	102	7
Poles/small-medium timber	190	14
Mature/large timber	553	40
Old Forest	547	39
Allocated old growth	0	0
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	102	7
Seed Tree & Shelterwood	4	0
Overstory Removal	226	16
Sanitation/Salvage	36	2
Commercial Thinning	60	4
Selection Harvest	271	19
Fires since 1950	0	0

Shoshone Creek Analysis Area

This analysis area encompasses approximately 1,169 acres, all of which are National Forest System lands. This analysis area includes two separate areas in the Shoshone Creek watershed. Shoshone and Falls Creeks are the major drainages.

Warm, moist habitat types of western hemlock and grand fir, with some western redcedar cover 90 percent of this analysis area, while warm, dry habitat types are found on only 10 percent of the area. Grand fir and Douglas-fir are the dominant forest cover types, accounting for 45 and 32 percent respectively of the area. Western hemlock and larch are the dominant species on 6 percent each of the area. White pine, cedar, cottonwood, and non forest area constitute the remainder. Poles and immature sawtimber represent 39 percent of the area and shrubs, seedlings, and saplings cover 32 percent of the area. Eighteen percent is in old forest structure and eleven percent is mature forest. The remaining 1 percent is non forest. There are no allocated or recruitment old growth stands within the analysis area.

Intensive forest management in the Shoshone analysis area began in the 1970s, but salvage harvesting occurred shortly after the 1910 fire. Approximately 21 percent of the area has been treated with regeneration harvests. The most recent harvests were selection harvests completed in the mid 1990s. There have been no fires in recent history that would have altered stand structure, although there have been small lightning fires. There are approximately 151 acres within the analysis area that have beetle-caused mortality.

Table III-16. Vegetative conditions in the Shoshone Creek analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	111	10
Warm/Moist (Groups 4, 5, and 6)	1,058	90
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	370	32
Grand fir	524	45
Western Hemlock	74	6
Western Redcedar	40	3
Western Larch	67	6
White Pine	62	5
Cottonwood	20	2
Non Forest	12	1
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	370	32
Poles/small-medium timber	455	39
Mature/large timber	126	11
Old Forest	206	18
Allocated old growth	0	0
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	143	12
Seed Tree & Shelterwood	35	3
Overstory Removal	145	12
Sanitation/Salvage	940	80
Commercial Thinning	0	0
Selection Harvest	67	6
Fires since 1950	0	0

Downey Creek Analysis Area

The Downey Creek area encompasses approximately 408 acres, all of which is National Forest System lands.

One hundred percent of the area consists of warm, moist habitat types of western hemlock and grand fir, with some western redcedar.

Grand fir, lodgepole pine, and western hemlock are the major forest cover types; occupying 33, 29, and 27 percent of the area respectively. Douglas-fir is dominant on 10 percent of the area and white pine makes up the remainder.

Most (59 percent) of this watershed is in the mature and large saw timber structural stage in stands that are 100 to 150 years old. Approximately 18 percent of the area is in the shrub, seedling, or sapling structural stage as a result of recent regeneration harvests, and old forest structure represents about 19 percent of the area. Poles and immature sawtimber make up the remainder. There are no allocated or recruitment old growth stands within the analysis area.

Intensive forest management in the Downey Creek area began in the 1980s. Approximately 20 percent of the area has been treated with regeneration harvests. There have been no fires in recent history that would have altered stand structure, although there have been small lightning fires.

There are approximately 68 acres within the Downey Creek analysis area that have beetle-caused mortality.

Table III-17. Vegetative conditions in the Downey analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Moist (Groups 4, 5, and 6)	408	100
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	41	10
Grand fir	133	33
Western Hemlock	110	27
Lodgepole	119	29
White Pine	5	1
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	73	18
Poles/small-medium timber	18	4
Mature/large timber	240	59
Old forest	78	0
Allocated old growth	0	0
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	73	18
Seed Tree & Shelterwood	0	0
Overstory Removal	0	0
Sanitation/Salvage	169	41
Commercial Thinning	0	0
Selection Harvest	7	2
Fires since 1950	0	0

Callis Creek Analysis Area

The Callis Creek area encompasses approximately 5,626 acres, of which 5,464 acres is National Forest System lands. The remainder is private land.

Warm, moist habitat types of western hemlock and grand fir, with some western redcedar constitute 79 percent of the habitat types in the watershed; with warm, dry Douglas-fir and grand fir habitat types on the remaining area.

Douglas-fir and grand fir are the dominant forest cover types, accounting for 46 and 23 percent respectively of the forested land. Lodgepole pine is the dominant species on 18 percent of the area and western hemlock on 11 percent. Larch is dominant on the remaining acres.

Most (79 percent) of this area is in the pole and immature timber structural stage in stands that are 35 to 100 years old. Seedling and sapling sized stands are present on 10 percent of the area and mature and old forest structure are present on 6 and 5 percent respectively of the area. There are 247 acres of allocated old growth and 75 acres of recruitment old growth within the analysis area.

Intensive forest management in the Callis Creek area began in the 1960s. Approximately 18 percent of the area has been treated with regeneration harvests. There have been no fires in recent history that would have altered stand structure, although there have been small lightning fires.

There are approximately 92 acres within the Callis Creek area that have beetle-caused mortality.

Table III-18. Vegetative conditions in the Callis Creek analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	1,126	21
Warm/Moist (Groups 4 and 5)	4,338	79
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	2,536	46
Grand fir	1,232	23
Western Hemlock	604	11
Lodgepole Pine	999	18
Western Larch	92	20
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	551	10
Poles/small-medium timber	4,288	79
Mature/large timber	352	6
Old Forest	273	5
Allocated old growth	247	4
Recruitment old growth	75	1
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	812	15
Seed Tree & Shelterwood	0	0
Overstory Removal	0	0
Sanitation/Salvage	0	0
Commercial Thinning	0	0
Selection Harvest	168	3
Fires since 1950	0	0

Studer Creek Analysis Area

The Studer Creek area encompasses approximately 413 acres, all of which is National Forest System lands.

Habitat types with the area are fairly evenly divided between warm, moist habitat types (56 percent) and warm, dry habitat types (44 percent).

Douglas-fir and grand fir are the dominant forest cover types, accounting for 54 and 39 percent respectively of the forested land. Larch is dominant on the remaining acres.

Pole and immature timber structural stage and shrub, seedling and sapling structural stage occupy 47 and 40 percent respectively of the analysis area. Mature and large timber structural stage accounts for the remainder. There was no old forest structure identified. There are no allocated or recruitment old growth stands within the analysis area.

Intensive forest management in the Studer Creek area began in the 1960s although much of the area was salvage harvested in the early 1940s. Many of these stands have since been regenerated. Approximately 46 percent of the area has been treated with regeneration harvests. There have been no fires in recent history that would have altered stand structure, although there have been small lightning fires.

There are approximately 95 acres within the Studer Creek area that have beetle-caused mortality.

Table III-19. Vegetative conditions in the Studer Creek analysis area.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 1,2,3)	181	44
Warm/Moist (Groups 4 and 5)	232	56
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	222	54
Grand fir	161	39
Western Larch	29	7
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	167	40
Poles/small-medium timber	193	47
Mature/large timber	53	13
Old Forest	0	0
Allocated old growth	0	0
Recruitment old growth	0	0
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	147	36
Seed Tree & Shelterwood	42	10
Overstory Removal	0	0
Sanitation/Salvage	271	66
Commercial Thinning	0	0
Selection Harvest	0	0
Fires since 1950	0	0

Environmental Consequences

This section discloses the environmental effects to vegetation in the analysis areas and relevant information for the project area. Major areas of discussion include 1) methodology; 2) direct, indirect and cumulative effects for each alternative at the analysis area scale; 3) cumulative effects at the small sales project scale; 4) effects of opportunities for all alternatives; and 5) consistency with the Forest Plan and other applicable regulatory direction. Please refer to Appendix B for unit-by-unit descriptions of harvest prescriptions, logging systems and fuels treatments proposed under each alternative.

Methodology

The Geographic Assessment for the Coeur d'Alene River Basin found that most watersheds within the Small Sales EIS project area were a high priority for vegetation restoration due to the effects of white pine blister rust, past harvest activities, and fire exclusion (USDA Forest Service, 1998). The Hayden Lake, Canfield Face, Fernan Creek, Thompson Creek, East Rutherford, Cedar, Fourth of July, Lower Little North Fork, Beaver Creek and the upper portion of the Callis Creek areas are considered to have serious problems due to species mix, age classes, and fragmentation problems. The Cataldo Face, Prado Creek, Cougar, Prichard Creek, Shoshone and Downey Creek analysis area have moderate problems from a terrestrial/vegetation perspective. The lower portion of the Callis Creek area is considered to be in relatively good condition. 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 stands have been fragmented by harvests or road construction. Remaining old growth is often lacking the component of large, old seral remnants such as white pine and larch. Stands have been allocated to old growth management based on criteria in the North Idaho Old Growth Characteristics. The Forest Plan (page II-29) set a standard of maintaining at least 10 percent of the forested portions of the IPNF as old growth. Old Growth Units (OGU) were established on the Forest with the objective of maintaining at least five percent of each OGU as old growth (and 5 percent as replacement stands) where old growth was available. The preferred size for old growth stands was greater than 80 acres but could be as small as 25 acres. Old growth was to be allocated on different habitat types to approximate the distribution of habitat types on the IPNF. Within many OGUs on the Coeur d'Alene River Ranger District, particularly on the west side of the district, there were not enough stands that met the old-growth criteria. In OGUs that lacked stands meeting the old growth criteria, some stands were selected that might provide old growth at a future date. The effect of beetles on old growth will be discussed at the analysis area and OGU scales.

From a vegetation standpoint, the effects of the Douglas-fir beetle epidemic and resulting proposed harvest activities on species composition and stand structure will be used to determine environmental consequences.

Analysis of the action alternatives includes the effects of infestation, both in areas proposed for treatment and areas that would be untreated. Fragmentation analysis using FRAGSTATS modeling

was not completed for this analysis because there were no differences in effects to forest structure between alternatives.

The reasonably foreseeable time frame for the beetle epidemic and activities associated with the action alternatives would be approximately five to seven years.

Direct, Indirect and Cumulative Effects at the Analysis Area Scale

Effects Common to All Alternatives

For all alternatives, the number of acres affected by Douglas-fir beetles will remain the same. The extent of bark beetle activity is based on aerial detection flights and on-the-ground surveys conducted during 1998 and 1999. Based on these surveys and stand exam information concerning forest species composition; estimates were made on the impact of bark beetles on tree species composition and forest structure. The vegetative effects of activities covered in the Douglas-fir Beetle Project FEIS and ROD, 1999, are considered as part of the existing condition.

Typically, Douglas-fir beetle outbreaks last 2 to 4 years in this area (Schmitz, 1996). Although there may be some additional mortality in subsequent years, bark beetle populations are expected to drop back to endemic levels within the next few years. 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 1999 aerial detection flights, bark beetle attacks in 1998 were usually associated with areas that sustained ice and snow damage in 1996-97 but some attacks occurred in areas not severely impacted by ice and snow (Project Files, Vegetation, Aerial Detection Flight Map 1998-99). Because beetle populations are dropping, no attempt was made to incorporate future beetle infestation that may occur outside currently known locations into any alternative.

Effects Common to All Action Alternatives

For all the action alternatives (2 through 4), proposed activities would not reduce the beetle populations. 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.

Although green trees would be removed in some stands for some alternatives, this would not create changes to the structural stage category beyond that caused by the bark beetles, root disease and/or ice and snow breakage (Project Files, Vegetation, June 19, 2000 Marking Guide). Additional incidental green trees may need to be removed from skyline corridors or skid trails or for safety reasons.

At this time, there is no known literature displaying Douglas-fir beetle-infested timber that has been transported to milling facilities, causing further infestation. Although no literature exists, other species of beetles transported in timber to milling sites have been known to serve as a source for 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. This timber would cause 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. In most cases, prior to the beetles' emergence from the timber, logs would be processed (i.e. debarked), which would kill the beetle and larvae. If milling is not completed prior to emergence, the possibility of beetle spread

could exist. Techniques such as water sprinklers set on log decks, using pheromone attractants in traps, and anti-attractants in susceptible stands surrounding mill sites could reduce the chance of beetles leaving the log processing plants.

Alternative 1- No Action

The harvest proposed in this EIS of trees killed by the Douglas-fir beetle or other pathogens or trees damaged by wind, ice, and snow would not take place under this alternative. Stands with a high component of large Douglas-fir (greater than 14 inches in diameter) are most susceptible to attack and are likely to lose the greatest number of trees (Lockman and Gibson 1998, Flanagan 1998). 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, all large Douglas-fir were killed over greater areas. Smaller diameter trees may also have been attacked when they occur near these groups, especially in denser stands.

The Douglas-fir beetle is a major agent of change across this ecozone, with stands affected by the beetle having a high probability of experiencing 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 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.

In those stands in which ponderosa pine or western larch are an important component, there would be an improvement in stand condition over the short term as competition between Douglas-fir and these species is reduced. However, in the absence of further disturbance, regeneration of shrubs or shade-tolerant Douglas-fir and grand fir is likely to proliferate. This, in conjunction with high fuel accumulations that would result as the dead Douglas-fir fall to the ground, could lead to higher intensity fires that the normally fire-resistant pine and larch may not survive.

The Douglas-fir beetle has caused dramatic changes in structure in some stands. However, most beetle mortality occurred in small groups scattered throughout a stand. Although these stands have a more open appearance and lower density canopy, the basic stand age/structure will be retained. Losses of less than 25 percent of the basal area of a stand would not impact stand structure. 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 join together, and more of the associated small diameter Douglas-fir may be attacked. The entire stand would have a more open appearance.

In many stands, even if 50 percent of the basal area has been killed, the stand would still be dominated by the residual overstory. As the number of trees killed increases, 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, ice

storm damage, or previous harvests 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.

For all Analysis Areas there would be little change in forest cover types under the No-Action Alternative that would lead to an increase in seral species composition. This type of disturbance (bark beetle mortality) is likely to lead to regeneration of shade-tolerant species in any created openings. Some ponderosa pine and western larch within these stands may incur temporary benefits due to the mortality of Douglas-fir and resulting reduced competition.

As dead trees decay and begin falling to the ground there will be an increase in fuel loading that could effect fire intensity. In most 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. This is of particular concern adjacent to private property.

Many allocated and recruitment old growth stands have sustained mortality due to bark beetles within and outside the analysis areas. The Douglas-fir beetle has had a detrimental effect on these stands in that the large tree component has been reduced by beetle mortality. This is particularly true in those old growth stands in which Douglas-fir is the major species. These areas may also be at increased risk of stand replacing fire as the snags fall to the ground and increase the potential for higher severity fires. On the other hand the increase in snag density will likely enhance the old growth character of the stands, particularly if there is a substantial large, old tree component remaining.

Effects within the analysis areas below are those for Alternative 1 *in addition to* Effects Common to All Alternatives above. Changes associated with the Douglas-fir Beetle Project 1999 were discussed and considered in the analysis found in the existing condition section.

Hayden Lake Analysis Area Under Alternative 1

The Hayden analysis area is approximately 163 acres in size (all National Forest System lands). Aerial detection flights indicate approximately 81 percent of the area has beetle-caused mortality. Most areas affected by beetles have light, scattered mortality but about 18 acres have sustained a 30% reduction in canopy due to the beetles, ice storm damage, or root disease.

Within the Hayden analysis area there is expected to be no change in forest structural stage as a result of the bark beetle attacks. Approximately 57 acres of allocated old growth within the analysis area has Douglas-fir beetle-caused mortality. Attacks in most of the old growth are causing light mortality but approximately 12 acres of allocated old growth will sustain a 30 percent loss in crown closure. These allocated old growth stands are dominated by Douglas-fir and are approximately 90 to 100 years old.

These stands are part of Old Growth Unit (OGU) 21. This OGU is approximately 8,310 acres in size with 96 acres of allocated old growth or about 1 percent. About 88 acres of the allocated old growth within the OGU has beetle-caused mortality.

Canfield Face Analysis Area Under Alternative 1

The Canfield Face Analysis Area is approximately 144 acres in size (all National Forest System lands) and has beetle-caused mortality on nearly 53 percent of the area. Most areas affected by beetles have sustained light to moderate mortality, but about 4 acres have experienced a 50% or greater reduction in canopy due to the beetles, ice storm damage, or root disease.

Douglas-fir beetles have created about 4 acres of openings within the mature and large sawtimber structural stage, but this change in stand structure is unlikely to increase the component of early seral species.

Approximately 60 acres of allocated old growth have been impacted by bark beetle mortality within the analysis area. Canopy reduction of 35 percent or greater has occurred on about 22 acres. These allocated old growth stands are approximately 100 to 120 years old with Douglas-fir being the dominant species.

As the dead trees fall to the ground, fuel loading will increase dramatically. Natural regeneration will provide a fuel ladder into the crowns of residual trees, creating an increased potential for stand-replacing fires on these dry habitat types.

These stands are part of Old Growth Unit (OGU) 26. This OGU is approximately 10,360 acres in size with 272 acres of allocated and recruitment old growth or about 3 percent of the OGU. About 105 acres of the allocated old growth within the OGU has beetle-caused mortality.

Fernan Analysis Area Under Alternative 1

The Fernan analysis area is approximately 235 acres in size and the entire analysis area is National Forest System lands. The Fernan analysis area has beetle-caused mortality on about 47 percent of the area. Most areas affected by beetles have sustained light to moderate mortality, but about 9 acres has sustained a 50 percent reduction in canopy.

Within the Fernan analysis area, it is estimated that bark beetles have created about 9 acres of openings in the old forest structural stage and will move these stands into the seedling/sapling stage, although they may go through an extended period when shrubs are the major component.

About 30 acres of allocated old growth within the watershed has mortality caused by bark beetles. Most of this mortality is light to moderate but there are 9 acres in which mortality is 50 percent or greater. These allocated old growth stands are approximately 150 to 170 years old with Douglas-fir being the major species. As the dead trees fall to the ground, fuel loading will increase dramatically. Natural regeneration will provide a fuel ladder into the crowns of residual trees, creating an increased potential for stand-replacing fires on these dry habitat types.

These stands are part of the same OGU as the Canfield Analysis Area.

Blue Creek Analysis Area Under Alternative 1

This area includes approximately 462 acres and the entire analysis area is National Forest System lands. This analysis area has approximately 80 percent has beetle-caused mortality. Most areas have sustained only light to moderate mortality, but more than 50% of the stand has been lost on about 12 acres due to the beetles, ice storm damage, or root disease.

Within this analysis area it is estimated that bark beetles have created about 8 acres of openings in the mature/large timber and old forest structural stages. An additional 5 acres of openings will be created in the small/medium sawtimber structural stage. These stands will move into the seedling/sapling stage, although they may go through an extended period when shrubs are the major component.

Douglas-fir bark beetles have impacted about 60 acres of allocated old growth within the analysis area. Most of this old growth has sustained moderate to heavy mortality from a combination of ice storm damage, root disease, Douglas-fir beetle, and western pine beetle. There are an average of only 6 trees per acre over 20 inches in diameter remaining within the stand and it has lost most of its' old-growth character. These allocated old growth stands are approximately 120 years old with Douglas-fir being the major species. As the dead trees fall to the ground, fuel loading will increase dramatically. Natural regeneration will provide a fuel ladder into the crowns of residual trees, creating an increased potential for stand-replacing fires on these dry habitat types.

These stands are part of Old Growth Unit 28. This OGU is approximately 8,820 acres in size with 413 acres of allocated old growth or about 5 percent of the OGU. About 80 acres of the allocated old growth within the OGU has beetle-caused mortality.

Thompson Creek Analysis Area Under Alternative 1

This analysis area includes approximately 725 acres and the entire analysis area is National Forest System lands. About 50 percent of the Thompson Creek analysis area has mortality caused by beetles. Mortality is light to moderate on most areas affected by beetles, but about 8 acres have sustained a 50 percent reduction in canopy due to the beetles, ice storm damage, or root disease.

Bark beetles have impacted about 150 acres of allocated old growth within the analysis area. Most of the old growth has lost less than 30% of the canopy, but about 50 percent of the trees on 8 acres have died due to the beetles, ice storm damage, or root disease. These allocated old growth stands are approximately 120 years old**..**

The stands had high levels of down woody debris prior to the Douglas-fir beetle attacks, due to mortality caused by root disease, dwarf mistletoe and competition. This, along with live fuel ladders to carry fires into the crowns of larger trees, created a potential for stand-replacing fire. This is not unusual for the moist habitat types. Beetle mortality will exacerbate the problem.

The Thompson analysis area is part of Old Growth Unit 33. This OGU is approximately 13,990 acres in size with 1,279 acres of allocated and recruitment old growth or about 9 percent of the OGU. About 320 acres of the allocated old growth within the OGU has beetle-caused mortality.

Approximately 189 acres within the analysis area is scheduled to be harvested as part of the Douglas-fir Beetle Project but no trees have actually been harvested at the time of this writing. This

harvesting will not increase the seral species component within the analysis area or change the stand structural stages. None of the harvesting associated with the Douglas-fir Beetle Project occurs in allocated or recruitment old growth stands.

East Rutherford Analysis Area Under Alternative 1

The East Rutherford analysis area encompasses approximately 556 acres, all of which is National Forest System lands. About 72 percent (402 acres) of the East Rutherford analysis area has mortality caused by beetle. Mortality is light in most areas affected by beetles, but about 61 acres will sustain a reduction in canopy closure of between 30 and 40 percent due to the beetles, ice storm damage, or root disease.

No openings were created by beetle mortality but there will be substantial reductions in canopy closure in some areas. There is no allocated or recruitment old growth within the analysis area.

The East Rutherford analysis area is within OGU 30. This OGU is approximately 9,910 acres in size with 2,684 acres of allocated and recruitment old growth or about 27 percent of the OGU. About 320 acres of the allocated old growth within the OGU has beetle-caused mortality.

Approximately 13 acres within the project area were salvage harvested as part of the Douglas-fir Beetle Project. This harvest did not increase the seral species component within the analysis area or change the stand structural stages.

Cedar Creek Analysis Area Under Alternative 1

The Cedar Creek analysis area encompasses approximately 1,051 acres, all of which is National Forest System lands. About 27 percent, 280 acres, of the Cedar Creek analysis area has beetle-caused mortality. Most areas affected by beetles have sustained only light mortality, but about 5 acres have a reduction in canopy closure of about 50 percent due to the beetles, ice storm damage, or root disease.

Within this analysis area, it is estimated that bark beetles have created about 5 acres of openings in the mature/large timber structural stage and moved these stands into the shrub/seedling/sapling stage. There is no allocated or recruitment old growth within the analysis area. The Cedar Creek analysis area is within the same OGU as East Rutherford analysis area.

Fourth of July Creek Watershed Area Under Alternative 1

The Fourth of July analysis area encompasses approximately 5,047 acre, 4,727 of which is National Forest System lands. About 20 percent of National Forest System lands within the Fourth of July Creek analysis area have beetle-caused mortality. Most of the area has 10 percent or less mortality, but about 10 acres have lost about 50 percent of the canopy due to the beetles, ice storm damage, or root disease.

Douglas-fir beetles have created about 10 acres of openings within the watershed, but this change in stand structure is unlikely to increase the component of early seral species. There are approximately 51 acres of allocated old growth and 20 acres of recruitment old growth within the analysis area that have been impacted by bark beetles due to a substantial component of large Douglas-fir.

The Fourth of July Creek analysis area is within Old Growth Unit (OGU) 19. This OGU is approximately 12,550 acres in size with 753 acres of allocated and recruitment old growth or about 6 percent of the OGU. About 84 acres of the allocated old growth within the OGU has beetle-caused mortality.

There are about 320 acres of private lands within the Fourth of July Creek area, of which about 20 acres have bark beetle infestation with light mortality. There is expected to be no change in species composition or stand structural stage.

Cataldo Face Analysis Area Under Alternative 1

The Cataldo Face analysis area encompasses approximately 2,061 acres, all of which is Natioanl Forest System lands. About 16 percent of the Cataldo Face analysis area has beetle-caused mortality. Most of the areas affected by beetles have 10 percent or less mortality, but about 25 acres have experienced a 50 to 60 percent reduction in canopy closure due to the beetles, ice storm damage, or root disease.

Within this analysis area, it is estimated that bark beetles have created about 13 acres of openings in the mature/large timber and old forest structural stages and another 12 acres of openings in the small/medium sawtimber structural stage. These stands will move into the seedling/sapling stage, although they may go through an extended period when shrubs are the major component.

There are no allocated or recruitment old growth stands within the analysis area. The Cataldo Face analysis area is within OGU 18. This OGU is approximately 12,040 acres in size with 239 acres of allocated and recruitment old growth or about 2 percent of the OGU. About 15 acres of the allocated old growth within the OGU has beetle-caused mortality.

Prado Creek Analysis Area Under Alternative 1

The Prado analysis area encompasses approximately 1,268 acres, all of which is National Forest System lands. About 20 percent of National Forest System lands within the Prado Creek analysis area have beetle-caused mortality. Over 90 percent of the areas affected by beetles have very light mortality and no areas are expected to lose more than 40 percent of the existing canopy.

There are expected to be no changes in forest structural stage due to bark beetle attack. There are no allocated or recruitment old growth stands impacted by beetles within the analysis area. The Prado analysis area is in the same OGU as Cataldo.

Cougar Analysis Area Under Alternative 1

The Cougar analysis area encompasses approximately 1,313 acdres, all of which is National Forest System lands. About 14 percent of the Cougar analysis area has beetle-caused mortality. About 80 percent of the beetle- infested areas have very light mortality and only 6 acres have lost more than 50 percent of the canopy due to the beetles, ice storm damage, or root disease.

Within this analysis area, it is estimated that bark beetles have created about 6 acres of openings in the mature/large timber structural stage and moved these stands into the seedling/sapling stage, although they may go through an extended period when shrubs are the major component.

Bark beetles are impacting approximately 26 acres of allocated old growth within the analysis area. These stands are generally experiencing about a 10 percent reduction in canopy closure.

The Cougar analysis area is within OGUs 125 and 129. These OGUs combined are approximately 24,360 acres in size with 2,592 acres of allocated old growth or about 11 percent of the OGU. About 500 acres of the allocated old growth within the OGU has beetle-caused mortality.

Lower Little North Fork Analysis Area Under Alternative 1

The Lower Little North Fork Area includes the Gimlet, Owl, and Little Teepee analysis areas.

This analysis area encompasses approximately 11,717 acres, 11,697 of which is National Forest System lands. About 14 percent of National Forest System lands within the Lower Little North Fork analysis area have beetle-caused mortality. About 93 percent of the areas affected by beetles have very light mortality and no areas are expected to lose more than 40 percent of the existing canopy.

No openings were created by beetle mortality but there have been substantial reductions in canopy closure in some areas. Bark beetles are impacting approximately 83 acres of allocated old growth within the analysis area. These stands are generally experiencing about a 5 to 20 percent reduction in canopy closure.

The Lower Little North Fork analysis area is within OGUs 16, 17 and 18. These OGUs combined are approximately 36,460 acres in size with 1,932 acres of allocated and recruitment old growth or about 5 percent of the OGUs. About 174 acres of the allocated old growth within the OGU has beetle-caused mortality.

Private lands in the analysis area are not at risk of beetle-caused mortality.

Beaver Creek Area Under Alternative 1

The Beaver Creek Area includes the Potosi and White analysis areas.

This analysis area encompasses approximately 10,880 acres, of which 99 percent is Natioanl Forest System lands. About 15 percent of National Forest System lands within the Beaver Creek analysis have beetle-caused mortality. About 90 percent of the areas affected by beetles have very light mortality, but approximately 14 acres have lost at least 50 percent of the canopy due to the beetles, ice storm damage, or root disease.

Approximately 14 acres of openings have been created by beetle mortality in the mature/large timber structural stage and these stands will move into the seedling/sapling stage, although they may go through an extended period when shrubs are the major component. Bark beetles are impacting approximately 4 acres of allocated old growth within the analysis areas.

The Beaver Creek analysis area is within OGUs 115, 116 and 122. These OGUs combined are approximately 32,750 acres in size with 1,956 acres of allocated old growth or about 6 percent of the OGUs. About 178 acres of the allocated old growth within the OGUs has beetle-caused mortality.

Approximately 35 acres of private lands in the analysis area have beetle-caused mortality. Generally, 5 percent or less of the canopy is affected.

Prichard Creek Analysis Area Under Alternative 1

The Prichard analysis area encompasses approximately 1,313 acres, all of which is National Forest System lands. About 22 percent of the Prichard Creek analysis area has beetle-caused mortality. Most areas affected by beetles have sustained light mortality, but approximately 34 acres have lost at least 50 percent of the canopy due to the beetles, ice storm damage, or root disease.

Approximately 34 acres of openings have been created by beetle mortality. Sixteen acres of opening have been created in mature and old forest structures and eighteen acres in immature and small sawtimber structural stage. There are no allocated old growth stands within the analysis area being impacted by bark beetles.

The Prichard Creek analysis area is within OGUs 110 and 116. These OGUs combined are approximately 22,530 acres in size with 3,248 acres of allocated and recruitment old growth or about 14 percent of the OGUs. About 183 acres of the allocated old growth within the OGU has beetle-caused mortality.

Shoshone Creek Analysis Area Under Alternative 1

This analysis area encompasses approximately 1,169 acres, all of which is National Forest System lands. About 13 percent of the Shoshone Creek analysis area has beetle-caused mortality. Over 70 percent of the areas affected by beetles have very light mortality, but approximately 9 acres have lost at least 50 percent of the canopy due to the beetles, ice storm damage, or root disease.

Approximately 9 acres of openings have been created by beetle mortality in old forest structure that will move these stands to a seedling/sapling structural stage. There is no allocated old growth being impacted by bark beetles within the analysis area at this time.

The Shoshone analysis area is within OGUs 105 and 107. These OGUs combined are approximately 18,080 acres in size with 2,031 acres of allocated old growth or about 11 percent of the OGUs. About 82 acres of the allocated old growth within the OGU has beetle-caused mortality.

Downey Creek Analysis Area Under Alternative 1

This analysis area encompasses approximately 408 acres, all of which is Natioanl Forest System lands. About 17 percent of the Downey Creek analysis area has beetle-caused mortality. Over 75 percent of those areas affected by beetles have very light mortality and the remaining areas have moderate mortality.

No openings were created by beetle mortality but there will be substantial reductions in canopy closure in some areas. There is no allocated or recruitment old growth being impacted by bark beetles within the analysis area.

The Downey Creek analysis area is within OGU 128. This OGU is approximately 11,380 acres in size with 1,688 acres of allocated and recruitment old growth or about 15 percent of the OGU. About 75 acres of the allocated old growth within the OGU has beetle-caused mortality

Callis Creek Analysis Area Under Alternative 1

The Callis Creek analysis area encompasses approximately 5,626 acres, of which 5,565 acres are Natioanl Forest System lands. About 2 percent of the Callis Creek analysis area has beetle-caused mortality. In general, this area has sustained light mortality due to bark beetles but some small groups of dead trees are present. There is also a substantial amount of down and damaged timber that resulted from ice and snow damage in 1996/97.

No openings were created by beetle mortality or ice and snow damage. Approximately 10 acres of allocated and 1 acre of recruitment old growth are being impacted by bark beetles within the analysis area. However, mortality is very light.

The Callis analysis area is within OGU 8. This OGU is approximately 12,566 acres in size with 322 acres of allocated and recruitment old growth or about 2 percent of the OGU. About 11 acres of the allocated old growth within the OGU has beetle-caused mortality.

Studer Creek Analysis Area Under Alternative 1

The Studer Creek analysis area encompasses approximately 413 acres, all of which is National Forest System lands. About 2 percent of the Studer Creek analysis area has beetle-caused mortality. Over 90 percent of the areas affected by beetles have very light mortality with only a few areas having moderate mortality.

No openings were created by bark beetles. There is no allocated or recruitment old growth being impacted by bark beetles within the analysis area.

The Studer Creek analysis area is within OGU 25. This OGU is approximately 12,842 acres in size with 1,479 acres of allocated and recruitment old growth or about 12 percent of the OGU. About 92 acres of the allocated old growth within the OGU has beetle-caused mortality.

Alternative 2

From a vegetation standpoint, the objective of this alternative is to harvest dead and dying trees in areas attacked by bark beetles or that sustained ice and snow damage in 1996/97, 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 storm damage have killed a substantial portion of the basal area of the stand (Project Files, Vegetation, June 19, 2000 Marking Guides). In some stands, growth and vigor of existing ponderosa pine and larch would be enhanced through improvement cutting or thinning to reduce competition. Riparian Habitat Conservation Areas (RHCAs), known locations of sensitive plants and special wildlife habitat areas were excluded.

Most stands would be treated by salvage of trees killed by bark beetles (this includes trees that are attacked by beetles and have crown symptoms indicating the trees will die) and associated trees killed by root disease or other pathogens. Trees with crowns severely damaged by ice and snow will also be removed. Douglas-fir and western larch with heavy dwarf mistletoe infestations could also be removed from stands with beetle mortality. Additional incidental green trees may need to be removed from skyline corridors or skid trails, or for safety reasons.

Regeneration harvests would be used in stands where most trees have been killed and retention of the residual live trees is not necessary to meet visual quality and wildlife objectives. Some green trees not affected by bark beetles may be removed from these stands in order to create a suitable environment for the establishment of seral species. Logging slash and competing vegetation would be burned, or piled and burned, prior to planting with the desired species. Regeneration harvests would range from two to approximately 12 acres in size, depending on the extent of Douglas-fir beetle mortality and existing root disease and ice storm damage. These openings would retain groups of trees and/or scattered individual trees that have been unaffected by the bark beetle infestation. Generally, these regeneration harvests would retain less than 30 percent of the stand basal area.

Approximately 134 acres, or 9 percent of the area to be harvested, would achieve the desired species composition through timber harvest and associated planting. This includes 5 acres of salvage harvest and 129 acres of regeneration harvests that will be planted. These stands would also be more likely to provide the desired long-term forest structure since the planted species would be more resistant to root disease.

Approximately 258 acres, or 18 percent of the area to be harvested, would be treated with an improvement harvest to maintain or improve the vigor of ponderosa pine and larch. In addition to salvage of dead and dying trees, green Douglas-fir and grand fir adjacent to ponderosa pine and larch would also be harvested. Generally, these would be smaller diameter trees that are less than 16 inches in diameter. The objective is to retain 80 to 140 square feet of residual stocking with an average tree spacing of 20-40 feet depending on the size of the retained trees.

Larch will commonly grow two to three times faster in height than its more shade-tolerant associates. This advantage lasts 30 to 40 years, at which time the gap in growth rate begins to narrow (Schmidt and Shearer 1995). Because larch is shade-intolerant, increased competition with Douglas-fir, grand fir and hemlock will cause lower portions of larch crowns to die. Larch can maintain itself in mixed stands only as long as it holds a dominant position in the crown canopy (Schmid, Shearer and Roe 1976). As tree vigor declines, mortality can be expected to increase. About 33 acres, or about 2 percent of the area to be harvested, would be thinned to improve the vigor and growth of the residual western larch. In addition to salvage of dead and dying trees; green trees, generally smaller diameter Douglas-fir and grand fir, would be removed to leave a somewhat regularly spaced residual stand dominated by western larch. Western larch with less than 25 percent live crowns or with heavy mistletoe may also be removed.

Improvement harvests in conjunction with salvage of dead and dying trees may also reduce the potential for stand replacing fires. These areas would otherwise have an increased potential for higher severity fires as the snags fall to the ground. Harvesting some of the understory trees may also reduce the potential for ladder fuels carrying fire into the crowns of the larger trees.

Approximately 1,013 acres, or about 71 percent of the area to be harvested, would be treated through salvage of dead and dying trees, but this would not improve species composition or long-term stand structure. However, salvage may reduce the potential for stand replacing fires, particularly in areas with moderate to heavy mortality.

Ecosystem burning would occur on approximately 438 acres to improve winter forage for big game in Management Area 4 and to re-introduce fire to the ecosystem. This may also provide some sites for natural regeneration of early seral species, particularly ponderosa pine and western larch.

However, the residual overstory is likely to inhibit establishment and growth of these species. This burning is likely to decrease the risk of stand replacing fires as accumulated woody debris and understory vegetation are reduced.

Effects within the analysis areas below are those for Alternative 2 *in addition to* Effects Common to All Alternatives, Effects Common to All Action Alternatives, and effects of Alternative 1-No Action.

Hayden Lake Analysis Area Under Alternative 2

Treatments in the Hayden Lake analysis area include 19 acres of salvage of dead and dying trees. Approximately 12 acres of this salvage would occur in allocated old growth stands. Harvest of dead and dying trees within these allocated old growth stands is likely to have a detrimental impact on the old growth character of the stand. Even though some snags are retained within the harvest units, there would still be a reduction in overall number of snags available, and this component could be important to portions of allocated old growth stands that are outside the harvest units.

As shown in Table D-2 (Appendix D), there is an average of 15 dead trees per acre within the old-growth stands proposed for harvest. Harvesting dead trees may reduce the potential for stand-replacing fires although mortality is concentrated in only a few areas. There is still a substantial component of large trees, although they are generally less than 100 years old.

Salvage of dead and dying trees on 19 acres would not improve species composition or long-term forest structure.

Canfield Face Analysis Area Under Alternative 2

All of this analysis area is in Management Area (MA) 9. In the IPNF Forest Plan this management area designation consists of areas of non-forest lands, lands not capable of producing industrial products, and lands capable of timber production but isolated by the above type lands or nonpublic ownership. Also included in Management Area 9 are the highly sensitive visual areas around Lake Pend Oreille and Hayden Lake. These lands are in the immediate foreground of the viewshed and form the backdrop to the lake area. Vegetation is continuous and manipulation would be highly visible. Maintaining the existing visual situation of these areas in an unchanged condition is a major concern (Forest Plan III-39). Salvage and removal of miscellaneous products is allowed within a MA-9 (Forest Plan III-40). The MA-9 around Hayden Lake is physically suitable for timber production and forest regeneration, but was designated MA-9 in order to protect the visual resources near the lake. In this alternative, harvests in MA-9 are on sites suitable for timber production. Planting will occur where bark beetles have killed enough of the stand to create an opportunity to plant early seral species.

Treatments in the Canfield Face analysis area include 4 acres of salvage harvests and 30 acres of improvement harvests. All of the salvage harvest acres and 27 acres of the improvement harvest would occur in allocated old growth. Harvest of dead and dying trees within these allocated old growth stands is likely to have a short-term detrimental impact on the old growth character of the stand. Even though some snags are retained within the harvest units, there would still be a reduction in overall number of snags available, and this component could be important to portions of allocated old growth that are outside the harvest units. However, as shown in Table D-2; there are an average of 36 dead trees per acre within the allocated old growth stands proposed for entry. These dead trees

will increase fuel loading and the potential for a stand replacing fire. Removal of these dead trees will substantially reduce this potential on these dry sites. Large trees (>20”) are still a major component of the stands although they are generally only about 100 years old.

Improvement harvests (excluding removal of dead and dying trees) within these old growth stands will have a beneficial effect by improving the vigor of ponderosa pine to help maintain the species in these stands. Ponderosa pine is longer lived and less susceptible to root disease than Douglas-fir and grand fir, so is more likely to provide the large, old tree structure on these dry habitat types than other species. Unfortunately, ponderosa pine is not the major component of these stands.

Planting of long-lived seral tree species would provide the desired species composition on 4 acres, which is about three percent of the analysis area. Because this stand is in a highly sensitive visual area; logging debris will be treated by hand piling and burning. This will protect the residual stand while reducing fuel loading and preparing a site for planting of ponderosa pine and larch. Long term stand structure and composition would be improved on about 30 acres through improvement harvests in stands with a component of ponderosa pine and larch. This is about 21 percent of the analysis area.

Fernan Creek Analysis Area Under Alternative 2

Proposed treatments in the Fernan analysis area include 25 acres of salvage of dead and dying trees and 9 acres of regeneration harvests. All of the regeneration harvests and approximately 16 acres of the salvage harvests occur in allocated old growth. Harvest of dead and dying trees within these allocated old growth stands is likely to have a short-term detrimental impact on the old growth character of the stand due to the reduction of the dead and dying component. Even though some snags are retained within the harvest units, there would still be a reduction in overall number of snags available. However, as shown in Table D-2; there are an average of 27 dead trees per acre within the allocated old growth stands proposed for entry. These dead trees will create the potential for a stand replacing fire and removal of this material will substantially reduce the fuel loading. Large, old trees are still a major component of this stand and reducing the potential for stand replacing fires will help retain the old growth character of the stand into the future. Old growth in the Fernan Analysis Area will continue to be managed to provide old growth characteristics.

Planting of long-lived seral tree species would provide the desired species composition on 9 acres, which is about 4 percent of the analysis area. These regenerated stands would also be more likely to provide the desired long-term forest structure, since the planted species would be more resistant to root disease. Salvage of dead and dying trees on 25 acres would not improve species composition but will help retain long-term forest structure.

Blue Creek Analysis Area Under Alternative 2

Treatments in the Blue Creek analysis area include 12 acres of regeneration harvests and 66 acres of improvement harvests. Approximately 3 acres of regeneration harvests and 41 acres of improvement harvests would occur in allocated old growth stands. Harvest of dead and dying trees within these allocated old growth stands is likely to have a detrimental impact on the old growth character of the stand due to the reduction of the dead and dying component. Most of the large tree component of this stand has been killed by a combination of ice storm damage, root disease, Douglas-fir beetle, and western pine beetle. There are no longer enough trees greater than 20 inches to meet old growth

requirements. The presence of root disease and the potential for additional beetle mortality indicate that this stand will probably not provide old growth character for some time.

Improvement harvests (excluding removal of dead and dying trees) within these old growth stands will have a beneficial effect by improving the vigor of ponderosa pine and larch to help maintain these species in these stands. Ponderosa pine is longer lived and less susceptible to root disease than Douglas-fir and grand fir, so is more likely to provide the large, old tree structure on these dry habitat types than other species. Unfortunately, ponderosa pine is not the major component of these stands.

Planting of long-lived seral tree species would provide the desired species composition on 12 acres, which is about three percent of the analysis area. Long term stand structure and composition would be improved on about 66 acres through improvement harvests in stands with a component of ponderosa pine and larch. This is about 14 percent of the analysis area.

Old growth areas have been identified in the Stella Creek watershed to replace the stands harvested in the Blue Creek Analysis Area. Approximately 102 acres of replacement old growth have been selected adjacent to existing allocated old growth stands. Table D-3 provides information on these replacement stands. An additional 144 acres of recruitment old growth is identified to "block up" the area. Although these replacement stands are not within the Blue Creek Analysis Area, they are in the same Old Growth Unit.

Thompson Creek Analysis Area Under Alternative 2

Treatments in the Thompson Creek analysis area include 8 acres of regeneration harvests and 39 acres of improvement harvests. All of these harvests units are in allocated old growth. Harvest of dead and dying trees within these allocated old growth stands is likely to have a detrimental impact on the old growth character of the stand. Even though some snags are retained within the harvest units, there would still be a reduction in overall number of snags available, and this component could be important to portions of allocated old growth that are outside the harvest units. Due to existing high down woody debris levels and live fuel ladders to carry fires into the crowns of larger trees, harvest of beetle-killed trees will not substantially reduce the potential for a stand replacing fire.

Improvement harvests (excluding removal of dead and dying trees) within these old growth stands will have a beneficial effect by improving the vigor of ponderosa pine and larch to help maintain these species in these stands. Ponderosa pine is longer lived and less susceptible to root disease than Douglas-fir and grand fir, so is more likely to provide the large, old tree structure than other species. Unfortunately, ponderosa pine is not the major component of these stands.

Planting of long-lived seral tree species would provide the desired species composition on 8 acres, which is about three percent of the analysis area. Long term stand structure and composition would be improved on about 39 acres through improvement harvests in stands with a component of ponderosa pine and larch. This is about 14 percent of the analysis area.

Old growth areas to replace the stands harvested in the Canfield Face and Thompson Creek Analysis Areas have been identified in the Fortier Creek watershed. Approximately 343 acres of replacement old growth have been selected. Table D-3 provides information on these replacement stands. An additional 98 acres of recruitment old growth is identified to link old growth stands together. Most of these stands were probably harvested prior to 1960 to remove large white pine. Roads built to

access the area have since become brushed in and are no longer drivable. Although these replacement stands are not within the analysis areas, they are in the same Old Growth Unit as Thompson Creek.

East Rutherford Gulch Analysis Area Under Alternative 2

Treatments in the East Rutherford analysis area include 62 acres of salvage harvests. Approximately 225 acres would be burned to improve winter forage for big game in Management Area 4 and to re-introduce fire to the ecosystem.

Salvage of dead and dying trees on 62 acres would not improve species composition or long-term forest structure. Ecosystem burning may provide some sites for natural regeneration of early seral species, particularly ponderosa pine and western larch. However, the residual overstory is likely to inhibit establishment and growth of these species. This burning is likely to decrease the risk of stand replacing fires as accumulated woody debris and understory vegetation are reduced.

Cedar Creek Analysis Area Under Alternative 2

Treatments in the Cedar Creek analysis area include 14 acres of salvage harvests, 5 acres of regeneration harvests and 10 acres of improvement harvests.

Planting of long-lived seral tree species would provide the desired species composition on 5 acres, which is less than one percent of the analysis area. Long term stand structure and composition would be improved on about 10 acres through improvement harvests in stands with a component of ponderosa pine and larch. This is about one percent of the analysis area.

An old growth area has been identified in the Cedar Creek watershed to replace the stands harvested in Hayden Lake Analysis Area. Approximately 66 acres of replacement old growth have been selected. Table D-3 provides information on these replacement stands.

Fourth of July Creek Analysis Area Under Alternative 2

Proposed treatments in the Fourth of July analysis area include 43 acres of salvage of dead and dying trees, 9 acres of regeneration harvests, and 15 acres of improvement harvest.

Planting of long-lived seral tree species would provide the desired species composition on 9 acres, which is less than one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease. Long term stand structure and composition would be improved on about 15 acres through improvement harvests in stands with a component of ponderosa pine and larch. This is also less than one percent of the analysis area.

Cataldo Face Analysis Area Under Alternative 2

Approximately 475 acres (23 percent) within this analysis area is in Management Area (MA) 9. In the IPNF Forest Plan this management area designation consists of areas of non-forest lands, lands not capable of producing industrial products, and lands capable of timber production but isolated by the above type lands or nonpublic ownership. Also included in Management Area 9 are the highly sensitive visual areas around Lake Pend Oreille and Hayden Lake. Salvage and removal of

miscellaneous products is allowed within a MA-9 (Forest Plan III-40). The MA-9 lands within the Cataldo analysis area do contain large areas unsuitable for timber harvest. In this alternative, harvests in MA-9 are on sites suitable for timber production. About 5 acres of salvage and 7 acres of improvement harvests will occur within MA-9, but these stands will not be managed for timber production. Areas in which improvement harvests are proposed, are physically suitable for timber production.

Proposed treatments in the Cataldo Face analysis area include 13 acres of salvage of dead and dying trees, 25 acres of regeneration harvests, and 7 acres of improvement harvest.

Planting of long-lived seral tree species would provide the desired species composition on 25 acres, which is about one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease. Long term stand structure and composition would be improved on about **7** acres through improvement harvests in stands with a component of ponderosa pine and larch. This is less than one percent of the analysis area.

Prado Creek Analysis Area Under Alternative 2

Proposed treatments in the Prado Creek analysis area include 2 acres of salvage of dead and dying trees and 15 acres of improvement harvests.

Long term stand structure and composition would be improved on about 15 acres through improvement harvests in stands with a component of ponderosa pine and larch. This is less than one percent of the analysis area.

Cougar Analysis Area Under Alternative 2

Proposed treatments in the Cougar analysis area include 32 acres of salvage of dead and dying trees and 6 acres of regeneration harvests.

Planting of long-lived seral tree species would provide the desired species composition on 6 acres, which is about one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease.

Lower Little North Fork Analysis Area Under Alternative 2

Approximately 650 acres (5.5 percent) of this analysis area is in Management Area (MA) 9. In the IPNF Forest Plan this management area designation consists of areas of non-forest lands, lands not capable of producing industrial products, and lands capable of timber production but isolated by the above type lands or nonpublic ownership. Also included in Management Area 9 are the highly sensitive visual areas around Lake Pend Oreille and Hayden Lake (Forest Plan III-39). Salvage and removal of miscellaneous products is allowed within a MA-9 (Forest Plan III-40). Most of the MA-9 lands within the Lower Little North Fork analysis area are unsuitable for timber production and forest regeneration. About 12 acres of salvage harvests will occur within MA-9, but these stands will not be managed for timber production.

Proposed treatments in the Lower Little North Fork analysis area include approximately 186 acres of salvage of dead and dying trees, 27 acres of improvement harvests, and 9 acres of commercial thinning.

Long term stand structure and composition would be improved on about 36 acres through improvement harvests and commercial thinning in stands with a component of ponderosa pine and larch. This is less than one percent of the analysis area.

Beaver Creek Analysis Area Under Alternative 2

Proposed treatments in the Beaver Creek analysis area include approximately 210 acres of salvage of dead and dying trees, 14 acres of regeneration harvests, 10 acres of improvement harvests, and 23 acres of commercial thinning.

Planting of long-lived seral tree species would provide the desired species composition on 14 acres, which is about one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease. Long term stand structure and composition would be improved on about 33 acres through improvement harvests and commercial thinning in stands with a component of ponderosa pine and larch. This is also less than one percent of the analysis area.

Prichard Creek Analysis Area Under Alternative 2

Proposed treatments in the Prichard Creek analysis area include approximately 39 acres of salvage of dead and dying trees, 33 acres of regeneration harvests, and 40 acres of improvement harvests. Approximately 213 acres would be burned to improve winter forage for big game in Management Area 4 and to re-introduce fire to the ecosystem.

Planting of long-lived seral tree species would provide the desired species composition on 33 acres, which is about 3 percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease. Long term stand structure and composition would be improved on about 40 acres through improvement harvests in stands with a component of ponderosa pine and larch. This is also about 3 percent of the analysis area. Ecosystem burning of 213 acres may provide some sites for natural regeneration of early seral species, particularly ponderosa pine and western larch. However, the residual overstory is likely to inhibit establishment and growth of these species in most areas. This burning is likely to decrease the risk of stand replacing fires as accumulated woody debris and understory vegetation are reduced.

Shoshone Creek Analysis Area Under Alternative 2

Proposed treatments in the Shoshone Creek analysis area include approximately 30 acres of salvage of dead and dying trees, 9 acres of regeneration harvests, and 2 acres of commercial thinning.

Planting of long-lived seral tree species would provide the desired species composition on **9** acres, which is about one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease. Long term stand structure and composition would be improved on about **2** acres through

improvement harvests and commercial thinning in stands with a component of ponderosa pine and larch. This is less than one percent of the analysis area.

Downey Creek Analysis Area Under Alternative 2

Proposed treatments in the Downey Creek analysis area include approximately 16 acres of salvage of dead and dying trees.

Salvage of dead and dying trees on 16 acres would not improve species composition or long-term forest structure.

Callis Creek Analysis Area Under Alternative 2

Proposed treatments in the Callis Creek analysis area include approximately 312 acres of salvage of dead and dying trees. Most of this consists of trees that blew down or were severely damaged by ice and snow during the winter of 1996/97, but there are some small areas of bark beetle mortality.

Salvage of dead and dying trees on 312 acres would not improve species composition or long-term forest structure.

Studer Creek Analysis Area Under Alternative 2

Proposed treatments in the Studer Creek analysis area include approximately 7 acres of salvage of dead and dying trees.

Salvage of dead and dying trees on 7 acres would not improve species composition or long-term forest structure.

Alternative 3

The objective of this alternative is to harvest only dead and dying trees in areas with mortality caused by Douglas-fir beetles or where there is substantial ice and snow damage. No additional green trees would be harvested to create suitable conditions for planting. Planting of seral species could be done where bark beetle mortality, root disease, and other factors have created adequate canopy openings for successful establishment of shade intolerant species. Harvest openings would range from two to approximately twelve acres in size, depending on the extent of Douglas-fir beetle mortality and existing root disease and ice storm damage. These openings would retain groups of trees and/or scattered individual trees that have been unaffected by the bark beetle infestation. Openings to be planted would range from 4 to 12 acres in size.

Openings created by bark beetles in areas that will not be planted would be allowed to regenerate naturally. There would be no site preparation in these stands, so shade-tolerant species would likely dominate this natural regeneration.

In this alternative, there would be 1,433 acres of salvage of dead and dying trees only. Of this amount, 44 acres, or about 3 percent of the area harvested, would be naturally regenerated, and 89 acres, or about 6 percent of the area harvested, would be planted following fuel reduction treatments. Planting would improve species composition and long-term forest structure on 89 acres.

Salvage may reduce the potential for stand replacing fires by removing some of the dead fuel. Those areas with moderate to heavy mortality would otherwise have an increased potential for higher severity fires as the snags fall to the ground and increase fuel accumulations.

Effects within the analysis areas below are those for Alternative 3 *in addition to* Effects Common to All Alternatives, Effects Common to All Action Alternatives and effects of Alternative 1 above.

Hayden Lake Analysis Area Under Alternative 3

As shown in Table D-2, there are an average of 15 dead trees per acre within the old growth stands, portions of which are proposed for harvest. Harvesting dead trees may reduce the potential for stand replacing fires although mortality is concentrated in only a few areas. There is still a substantial component of large trees although they are generally less than 100 years old.

Treatments in the Hayden Lake analysis area include 19 acres of salvage of dead and dying trees. Approximately 12 acres of this salvage would occur in allocated old growth stands. Harvest of dead and dying trees within these allocated old growth stands is likely to have a detrimental impact on the old growth character of the stand. Even though some snags are retained within the harvest units, there would still be a reduction in overall number of snags available, and this component could be important to portions of old growth that are outside the harvest units.

Salvage of dead and dying trees on 19 acres would not improve species composition or long-term forest structure.

Canfield Face Analysis Area Under Alternative 3

All of this analysis area is in Management Area (MA) 9. In the IPNF Forest Plan this management area designation consists of areas of non-forest lands, lands not capable of producing industrial products, and lands capable of timber production but isolated by the above type lands or nonpublic ownership. Also included in Management Area 9 are the highly sensitive visual areas around Lake Pend Oreille and Hayden Lake. These lands are in the immediate foreground of the viewshed and form the backdrop to the lake area. Vegetation is continuous and manipulation would be highly visible. Maintaining the existing visual situation of these areas in an unchanged condition is a major concern (Forest Plan III-39). Salvage and removal of miscellaneous products is allowed within a MA-9 (Forest Plan III-40). The MA-9 around Hayden Lake is physically suitable for timber production and forest regeneration, but was designated MA-9 in order to protect the visual resources near the lake. In this alternative, harvests in MA-9 are on sites suitable for timber production. Planting will occur where bark beetles have killed enough of the stand to create an opportunity to plant early seral species.

Treatments in the Canfield Face analysis area include 34 acres of salvage harvests. About 27 acres of these treatments would occur in allocated old growth. Harvest of dead and dying trees within these allocated old growth stands is likely to have a short-term detrimental impact on the old growth character of the stand. Even though some snags are retained within the harvest units, there would still be a reduction in overall number of snags available, and this component could be important to portions of old growth that are outside the harvest units. However, as shown in Table D-2, there are an average of 36 dead trees per acre within the allocated old growth stands, portions of which are proposed for harvest. These dead trees will increase fuel loading and the potential for a stand replacing fire. Removal of these dead trees will substantially reduce this potential on these dry sites.

Large trees (greater than 20 inches in diameter) are still a major component of the stands although they are generally only about 100 years old.

About 4 acres has very high mortality and there is an opportunity to plant early seral species in some beetle created openings. Because this stand is in a highly sensitive visual area; logging debris will be treated by hand piling and burning. This will protect the residual stand while reducing fuel loading and preparing a site for planting of ponderosa pine and larch.

All of this analysis area is in Management Area (MA) 9. On the IPNF this management area designation is used to denote lands around Hayden Lake that are highly sensitive visual areas or lands that are not suitable for timber production. Although salvage and removal of miscellaneous products is allowed, scheduled timber harvest is not. The MA-9 around Hayden Lake is physically suitable for timber production and forest regeneration, but was designated MA-9 in order to protect the visual resources near the lake. In this alternative, harvests in MA-9 are on sites suitable for timber production. Planting will occur where bark beetles have killed enough of the stand to create an opportunity to establish early seral species.

Planting of long-lived seral tree species would provide the desired species composition on 4 acres, which is about three percent of the analysis area.

Fernan Creek Analysis Area Under Alternative 3

Proposed treatments in the Fernan analysis area include 34 acres of salvage of dead and dying trees. Approximately 25 acres of these harvests would occur in allocated old growth. Harvest of dead and dying trees within these allocated old growth stands is likely to have a short-term detrimental impact on the old growth character of the stand because some of the standing and down dead/dying material would be removed. Even though some snags are retained within the harvest units, there would still be a reduction in overall number of snags available, and this component could be important to portions of old growth that are outside the harvest units. However, as shown in Table D-2, there are an average of 27 dead trees per acre within the allocated old growth stands, portions of which are proposed for entry. These dead trees will increase fuel loading and create the potential for a stand replacing fire. Removal of this material will substantially reduce this potential hazard. Large, old trees are still a major component of this stand and reducing the potential for stand replacing fires will help retain the old growth character of the stand into the future. Old growth in the Fernan Analysis Area will continue to be managed to provide old growth characteristics.

Planting of long-lived seral tree species would provide the desired species composition on 9 acres, which is about 4 percent of the watershed. These regenerated stands would also be more likely to provide the desired long-term forest structure, since the planted species would be more resistant to root disease.

Blue Creek Analysis Area Under Alternative 3

Treatments in the Blue Creek analysis area include 78 acres of salvage harvests. Approximately 44 acres of these salvage harvests would occur in allocated old growth stands. Most of the large tree component of this stand has been killed by a combination of ice storm damage, root disease, Douglas-fir beetle, and western pine beetle. There are no longer enough trees greater than 20 inches in diameter to meet old growth requirements. The presence of root disease and the potential for

additional beetle mortality indicate that this stand will probably not provide old growth character for some time.

Planting of long-lived seral tree species would provide the desired species composition on 1**2** acres, which is about three percent of the analysis area.

Old growth areas to replace the stands harvested in the Blue Creek Analysis Area have been identified in the Stella Creek watershed. Approximately 102 acres of replacement old growth have been selected adjacent to existing allocated old growth stands. Table D-3 provides information on these replacement stands. An additional 144 acres of recruitment old growth is identified to "block up" the area. Although these replacement stands are not within the Blue Creek Analysis Area, they are in the same Old Growth Unit.

Thompson Creek Analysis Area Under Alternative 3

Treatments in the Thompson Creek analysis area include 47 acres of salvage harvests. Harvest of dead and dying trees within these allocated old growth stands is likely to have a detrimental impact on the old growth character of the stand because some of the standing and down dead/dying material would be removed. Even though some snags are retained within the harvest units, there would still be a reduction in overall number of snags available, and this component could be important to portions of old growth that are outside the harvest units. Due to existing high down woody debris levels and live fuel ladders to carry fires into the crowns of larger trees, harvest of beetle-killed trees will not substantially reduce the potential for a stand replacing fire.

Planting of long-lived seral tree species would provide the desired species composition on 8 acres, which is about three percent of the analysis area.

Old growth areas to replace the stands harvested in the Canfield Face and Thompson Creek Analysis Areas have been identified in the Fortier Creek watershed. Approximately 343 acres of replacement old growth have been selected. Table D-3 provides information on these replacement stands. An additional 98 acres of recruitment old growth is identified to link old growth stands together. Most of these stands were probably harvested prior to 1960 to remove large white pine. Roads built to access the area have since become brushed in and are no longer drivable. Although these replacement stands are not within the analysis areas, they are in the same Old Growth Unit as Thompson Creek.

East Rutherford Gulch Analysis Area Under Alternative 3

Treatments in the East Rutherford analysis area include 62 acres of salvage harvests.

Salvage of dead and dying trees on 62 acres would not improve species composition or long-term forest structure because this treatment does not include planting of desirable long lived seral species.

Cedar Creek Analysis Area Under Alternative 3

Treatments in the Cedar Creek analysis area include 29 acres of salvage harvests. Openings created by bark beetles in areas that will not be planted would be allowed to regenerate naturally. There would be no site preparation in these stands so less desirable shade-tolerant species would likely dominate this natural regeneration.

Approximately 5 acres of beetle-created openings would naturally regenerate to less desirable shade tolerant species, mostly grand fir and Douglas-fir.

An old growth area to replace the stands harvested in Hayden Lake Analysis Area has been identified in the Cedar Creek watershed. Approximately 66 acres of replacement old growth have been selected. Table D-3 provides information on these replacement stands.

Fourth of July Creek Analysis Area Under Alternative 3

Proposed treatments in the Fourth of July analysis area include 67 acres of salvage of dead and dying trees. Planting will occur where bark beetles, root disease, and other factors have killed enough of the stand to create an opportunity to establish early seral species and where adequate site preparation can be attained without the removal of green trees.

Planting of long-lived seral tree species would provide the desired species composition on **4** acres, which is less than one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease.

Natural regeneration would occur in approximately 5 acres of beetle created openings. Most of the natural regeneration will be less desirable grand fir or Douglas-fir.

Cataldo Face Analysis Area Under Alternative 3

Approximately 475 acres (23 percent) within this analysis area is in Management Area (MA) 9. In the IPNF Forest Plan this management area designation consists of areas of non-forest lands, lands not capable of producing industrial products, and lands capable of timber production but isolated by the above type lands or nonpublic ownership. Also included in Management Area 9 are the highly sensitive visual areas around Lake Pend Oreille and Hayden Lake (Forest Plan III-39). Salvage and removal of miscellaneous products is allowed within a MA-9 (Forest Plan III-40). The MA-9 lands within the Cataldo analysis area do contain large areas unsuitable for timber harvest. In this alternative, harvests in MA-9 are on sites suitable for timber production. About 12 acres of salvage harvests will occur within MA-9, but these stands will not be managed for timber production.

Proposed treatments in the Cataldo Face analysis area include 45 acres of salvage of dead and dying trees. Planting will occur where bark beetles, root disease, and other factors have sufficiently changed canopy closure enough of the stand to create an opportunity to establish early seral species and where adequate site preparation can be attained without the removal of green trees.

Planting of long-lived seral tree species would provide the desired species composition on 19 acres, which is about one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease. . Natural regeneration would occur in approximately 6 acres of beetle created openings. Most of the natural regeneration will be grand fir or Douglas-fir.

Prado Creek Analysis Area Under Alternative 3

Proposed treatments in the Prado Creek analysis area include 17 acres of salvage of dead and dying trees.

Salvage of dead and dying trees on 17 acres would not improve species composition or long-term forest structure.

Cougar Analysis Area Under Alternative 3

Proposed treatments in the Cougar analysis area include 38 acres of salvage of dead and dying trees. Planting will occur where bark beetles, root disease, and other factors have killed enough of the stand to create an opportunity to establish early seral species and where adequate site preparation can be attained without the removal of green trees.

Planting of long-lived seral tree species would provide the desired species composition on 6 acres, which is about one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease.

Lower Little North Fork Analysis Area Under Alternative 3

Approximately 650 acres (5.5 percent) of this analysis area is in Management Area (MA) 9. In the IPNF Forest Plan this management area designation consists of areas of non-forest lands, lands not capable of producing industrial products, and lands capable of timber production but isolated by the above type lands or nonpublic ownership. Also included in Management Area 9 are the highly sensitive visual areas around Lake Pend Oreille and Hayden Lake (Forest Plan III-39). Salvage and removal of miscellaneous products is allowed within a MA-9 (Forest Plan III-40). Most of the MA-9 lands within the Lower Little North Fork analysis area are unsuitable for timber production and forest regeneration. About 12 acres of salvage harvests will occur within MA-9, but these stands will not be managed for timber production.

Proposed treatments in the Lower Little North Fork analysis area include approximately 222 acres of salvage of dead and dying trees.

Salvage of dead and dying trees on 222 acres would not improve species composition or long-term forest structure because it will not allow establishment of long lived seral species.

Beaver Creek Analysis Area Under Alternative 3

Proposed treatments in the Beaver Creek analysis area include approximately 257 acres of salvage of dead and dying trees. Planting will occur where bark beetles, root disease, and other factors have removed sufficient canopy closure of the stand to create an opportunity to establish early seral species and where adequate site preparation can be attained without the removal of green trees.

Planting of long-lived seral tree species would provide the desired species composition on 14 acres, which is about one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease.

Prichard Creek Analysis Area Under Alternative 3

Proposed treatments in the Prichard Creek analysis area include approximately 112 acres of salvage of dead and dying trees. Planting will occur where bark beetles, root disease, and other factors have removed sufficient canopy closure of the stand to create an opportunity to establish early seral species and where adequate site preparation can be attained without the removal of green trees.

Planting of long-lived seral tree species would provide the desired species composition on 4 acres, which is less than one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease.

Shoshone Creek Analysis Area Under Alternative 3

Proposed treatments in the Shoshone Creek analysis area include approximately 41 acres of salvage of dead and dying trees. Planting will occur where bark beetles, root disease, and other factors have removed sufficient canopy closure of the stand to create an opportunity to establish early seral species and where adequate site preparation can be attained without the removal of additional green trees.

Planting of long-lived seral tree species would provide the desired species composition on 9 acres, which is about one percent of the analysis area. These stands would also be more likely to provide the desired long-term forest structure, since the planted species would be resistant to root disease.

Downey Creek Analysis Area Under Alternative 3

Proposed treatments in the Downey Creek analysis area include approximately 16 acres of salvage of dead and dying trees.

Salvage of dead and dying trees on 16 acres would not improve species composition or long-term forest structure because long lived seral species will not be established.

Callis Creek Analysis Area Under Alternative 3

Proposed treatments in the Callis Creek analysis area include approximately 312 acres of salvage of dead and dying trees. Most of this consists of trees that blew down or were severely damaged by ice and snow during the winter of 1996/97, but there are some small areas of bark beetle mortality.

Salvage of dead and dying trees on 312 acres would not improve species composition or long-term forest structure because long lived seral species will not be established.

Studer Creek Analysis Area Under Alternative 3

Proposed treatments in the Studer Creek analysis area include approximately 7 acres of salvage of dead and dying trees.

Salvage of dead and dying trees on 7 acres would not improve species composition or long-term forest structure because long lived seral species will not be established.

Alternative 4

From a vegetation standpoint, the objective of this alternative is the same as Alternative 2 except that no harvesting would take place in any allocated or recruitment old growth stands or in any Rare II roadless areas. Dead and dying trees would be harvested from other areas attacked by bark beetles or that sustained ice and snow damage in 1996/97, and long-lived seral tree species such as white pine, western larch and ponderosa pine would be regenerated in stands where bark beetles**,** root disease, and storm damage have killed a substantial portion of the basal area of the stand. In some stands, growth and vigor of existing ponderosa pine and larch would be enhanced through improvement cutting or thinning to reduce competition. (Riparian Habitat Conservation Areas (RHCA), known locations of sensitive plants and special wildlife habitat areas were excluded.

Most stands would be treated by salvage of trees killed by bark beetles (this includes trees that are attacked by beetles that show symptoms of crown fade) and associated trees killed by root disease, other pathogens or ice and snow damage. Douglas-fir and western larch with heavy dwarf mistletoe infestations could also be removed from stands with beetle mortality. Additional incidental green trees may need to be removed from skyline corridors or skid trails, or for safety reasons.

Regeneration harvests would be used in stands where most trees have been killed and retention of the residual live trees is not necessary to meet visual quality and wildlife objectives. Some green trees not affected by bark beetles may be removed from these stands in order to create a suitable environment for the establishment of seral species. Logging slash and competing vegetation would be burned, or piled and burned, prior to planting with the desired species. Regeneration harvests would range from two to approximately 12 acres in size, depending on the extent of Douglas-fir beetle mortality and existing root disease and ice storm damage. These openings would retain groups of trees and scattered individual trees that have been unaffected by the bark beetle infestation. Generally, these regeneration harvests would retain less than 30 percent of the stand basal area.

Approximately 101 acres, or 9 percent of the area to be harvested, would achieve the desired species composition through timber harvest and associated planting. These stands would also be more likely to provide the desired long-term forest structure since the planted species would be more resistant to root disease.

Approximately 123 acres, or 10 percent of the area to be harvested, would be treated with an improvement harvest to maintain or improve the vigor of ponderosa pine and/or larch. In addition to salvage of dead and dying trees, green Douglas-fir and grand fir adjacent to ponderosa pine and larch would also be harvested. Generally, these would be smaller diameter trees that are less than 16 inches in diameter.

About 33 acres, or 3 percent of the area to be harvested, would be thinned to improve the vigor and growth of the residual western larch. In addition to salvage of dead and dying trees; green trees, generally smaller diameter Douglas-fir and grand fir, would be removed to leave a somewhat regularly spaced residual stand dominated by western larch. Western larch with less than 25 percent live crowns or with heavy mistletoe may also be removed.

Approximately 903 acres, or about 78 percent of the area to be harvested, would be treated through salvage of dead and dying trees, but this would not improve species composition or long-term stand structure.

Effects within the analysis areas below are those for Alternative 4 *in addition to* Effects Common to All Alternatives, Effects Common to All Action Alternatives and effects of Alternative 1 above.

Hayden Lake, Canfield Face, Fernan Creek, Blue Creek, Thompson Creek, and East Rutherford Analysis Area Under Alternative 4

In this alternative no harvesting would take place in the Hayden Lake, Canfield Face, Fernan Creek, Blue Creek, Thompson Creek, and East Rutherford Analysis Areas. The environmental effects would be the same as discussed under Alternative 1.

All Other Analysis Areas Under Alternative 4

The areas to be harvested and the prescribed treatments are the same as for Alternative 2. Environmental Effects within these analysis areas would be the same as discussed for Alternative 2.

Cumulative Effects at the Small Sales EIS Project Area Scale

The following table provides summary information on how each alternative would affect stand structure and species composition within the Small Sales EIS project area. The action alternatives will have little impact on beetle populations so the effect of the beetles on stand basal areas is expected to be the same for all alternatives. Even though green trees would be harvested in some stands in some alternatives, there are expected to be no changes in stand structure categories beyond that caused by the bark beetle and associated mortality so the stand structures resulting from Alternative 1 would also apply to all other alternatives. Changes in species composition from Douglas-fir and grand fir to ponderosa pine, white pine and larch would occur at the time of planting in harvested stands. These seral species would be expected to be managed throughout the life of the stand and would, therefore, be more likely to provide the desired mature and old forest structure than more root disease-susceptible species such as Douglas-fir and grand fir.

In the following tables, "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; it also includes ongoing activities, such as active timber sales and associated planting. Changes shown to existing condition under each alternative would be the result of the proposed action and also of other reasonably foreseeable future actions.

Table III-20. Approximate acres of structural stages and cover types, Small Sales EIS Project area.

Structural Stage	Existing		No Action		Alternative 2		Alternative 3		Alternative 4	
	Appx. Acres	%[1]	Appx. Acres	%[1]	Appx. Acres	%[1]	Appx. Acres	%[1]	Appx. Acres	%[1]
Shrub/Seedling/Sapling	5,320	12	5,454	12	5,454	12	5,454	12	5,454	12
Pole/Small-medium Timber	13,835	31	13,795	31	13,795	31	13,795	31	13,795	31
Mature/Large Timber	22,670	52	22,612	52	22,612	52	22,612	52	22,612	52
Old Forest	2,181	5	2,145	5	2,145	5	2,145	5	2,145	5
Allocated old growth	1,873[2]	4	1,873[2]	4	1,987[3]	4	1,987[3]	4	1,873[2]	4
Recruitment old growth	205	.5	205	.5	447	.5	447	.5	205	.5
Cover Type										
Douglas-fir	21,081	48	21,081	48	20,966	48	20,992	48	20,999	48
Grand fir	13,094	30	13,094	30	13,075	30	13,094	30	13,075	30
Western Hemlock	2,696	6	2,696	6	2,696	6	2,696	6	2,696	6
Western Redcedar	1,011	2	1,011	2	1,011	2	1,011	2	1,011	2
Ponderosa Pine	953	2	953	2	993	2	992	2	969	2
Western Larch	1,407	3	1,407	3	1,407	3	1407	3	1,407	3
Lodgepole Pine	2,220	5	2,220	5	2,220	5	2,220	5	2,220	5
Western White Pine	1,103	3	1,103	3	1,197	3	1,153	3	1,188	3
Mtn. Hemlock/Subalpine fir	101	.2	101	.2	101	.2	101	.2	101	.2
Cottonwood	214	.5	214	.5	214	.5	214	.5	214	.5
Non-Forest	124	.3	124	.3	124	.3	124	.3	124	.3

[1] *Percentage represents the percent of National Forest Land affected.*

[2] *Even though bark beetle mortality is occurring in some old growth stands, with the exception of 72 acres in the Blue Creek Analysis Area they continue to provide some old growth characteristics.*

[3] *Approximately 397 acres of currently allocated old growth will no longer be managed as old growth and will be replaced by 511 acres of newly allocated replacement old growth.*

As can be seen from the previous tables, changes in stand structure and species composition as a result of the proposed alternatives would affect less than 0.5 percent of the project area. This is to be expected since mortality is generally light and most of the areas proposed for treatment do not have enough mortality to warrant a regeneration harvest. However, there would be improvements to long-term species composition and structure in some areas and with some alternatives.

Effects Common to All Alternatives

Cumulative Effects on Private and Other Public Agency Lands

The effects of Douglas-fir beetle mortality on private lands within the project area are minimal. Of the approximately 700 acres of private land in the vegetative analysis areas approximately 160 acres of private land have some level of beetle mortality. About 130 acres had an estimated 10 percent or less mortality while the remainder had 30 percent or less. While is cannot be assured that harvest will or will not occur in these areas, if harvest does take place and is based on the limited amount of mortality present, it will have a minimal effect on overall stand structure and species composition. This is because harvest will likely be salvage harvest and will not involve establishment of long lived seral species. As another test as to whether mortality in these areas were harvested, was to track if there were any road use access requests to haul timber on National Forest roads from these areas. The private lands within the analysis areas are generally 'landlocked' or surrounded by National Forest. Based on personal conversation with Craig Ely, District Roads Manager, there were no requests for road use permits in those areas, therefore it is unlikely that these areas were salvaged.

Bark beetle mortality on private ownership adjacent to the National Forest and/or adjacent and outside the vegetative analysis areas of this EIS was in general quite variable. Overall, the reasonable assumption to make, is that in most cases if beetle mortality occurred on private, it was individual tree salvaged. This would not have changed stand structure or species composition but would have reduced the dead component in these stands. Of the areas adjacent to the vegetative analysis areas, this is what is known. The private ownership to the west of the Hayden Lake analysis area did receive considerable scattered beetle mortality. The landowner salvaged this material and placed anti-aggregate pheromones on his land to disrupt additional beetle damage. The private ownership to the west of the Canfield analysis area was salvage harvested to capture scattered beetle mortality. Private ownership adjacent to the Fernan Creek analysis area has not been salvage harvested. This is primarily because stands were of a young age class and too small to be desirable to beetles- therefore very little mortality occurred. Adjacent to the Blue Creek analysis area the private ownership to the west was not believed to have received much beetle mortality, again due to the young age class of the stands. Private ownership to the south received light to moderate beetle mortality and was salvage harvested. Again, this treatment did not change the stand structure or species composition appreciably however the dead component was reduced. In Thompson Creek, the private ownership to the south did not receive much beetle mortality because of the young age class of the stands. The private ownership adjacent the East Rutherford analysis area received light to moderate beetle mortality and was salvage harvested. Along the Cataldo Face, beetle mortality was generally thought to be light, but some mortality did occur. Tree ages also tend to be younger on this private ownership and were less attractive to the beetles. In areas where roads were already present, beetle mortality was salvaged, such as Fern Creek. If roads were not present, it was likely not salvaged since mortality was not high. The private lands adjacent the Beaver Creek analysis area

are within the moist river bottoms of Beaver Creek and did not receive more than incidental beetle morality or salvage harvest activities. None of the other analysis areas has immediately adjacent to private properties. Timber salvage on other agency or industrial timberlands was originally disclosed and is still tracked under reasonably foreseeable activities in Chapter II.

Cumulative Effects of Grazing

Based on our local experience, the amount of grazing currently occurring is not significant enough to adversely impact reforestation objectives or vegetation. Foreseeable grazing will be assessed under the Grazing Allotment EA.

Cumulative Effects of Ongoing Timber Sale related Projects on Closed Sales

The effects of ongoing reforestation efforts are already assessed in the existing condition. Effects of road obliteration may reduce our ability to accomplish stand-tending treatments on immature stands.

Cumulative Effects for Alternative 1

It is estimated that approximately 7,200 acres of National Forest System lands within the Small Sales EIS project area has incurred some mortality due to the current bark beetle epidemic. Most of this mortality will have little impact on stand structure, but about 134 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, ice storm damage, or root disease. 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. The Potosi and Callis analysis areas are however included in the foreseeable project areas of the Teratoid Tepee and Beaver and future treatments will have to accessed in a separate analysis.

The stands of grand fir and Douglas-fir that have replaced white pine and larch in the ecosystem and that are encroaching on the ponderosa pine on drier sites are very susceptible to root disease. Some ponderosa pine and western larch stands may incur temporary benefits due to the mortality of Douglas-fir and resulting reduced competition. In the absence of further disturbance, however, these benefits would be expected to be lost as shade tolerant species regenerate and again dominate the stands. Increased fuel loading as a result of beetle-caused mortality and fuel ladders created by regeneration could put these stands at increased risk of stand replacing fires.

Currently, 8 percent of National Forest System lands within the project area are dominated by early seral species including ponderosa pine, white pine and western larch, compared to an historic level of 57 percent for the Coeur d'Alene basin. Alternative 1 would not increase the area in early seral species.

Currently, 57 percent of National Forest System lands within the project area are in mature and old forest structural stages, which compares favorably to 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, ponderosa pine, and larch. The current beetle infestation will decrease the old and mature forest structure by less than 0.5 percent within the project area.

Approximately 551 acres of allocated and/or recruitment old growth within the project area have bark beetle activity. In most areas, there will be little impact to old growth quality. Portions of some stands have moderate to heavy mortality with substantial losses of the large tree component. This is particularly important in stands that exhibited marginal old growth character to begin with. Conversely, these stands have also experienced an increase in the large snag component. Although old growth characteristics have been negatively impacted in portions of some stands, most stands maintain their old growth character. The exception to this are old growth stands in the Blue Creek Analysis Area which have sustained so much mortality due to ice and snow damage, root disease, Douglas-fir beetles and western pine beetles; that they no longer have a sufficient large live tree component. Additionally, dry site old growth stands in the Canfield Face and Fernan Creek Analysis Areas are at increased risk of stand replacing fire due to the substantial dead tree component.

Cumulative Effects for Alternative 2

Early seral species would be planted on approximately 134 acres (9 percent of the harvest acres), and harvests that improve existing ponderosa pine and western larch stands would be completed on about 291 acres (20 percent of the harvest acres) with this alternative. These stands would be more likely to provide a long-term improvement in stand structure, since early seral species are less susceptible to root disease than Douglas-fir and grand fir. Dead tree removal and thinning in ponderosa pine and larch stands would create conditions where these areas would be at reduced risk of stand replacing fires. Additionally, 1,013 acres (71 percent of the harvest acres) would be salvage harvested to remove dead and dying trees. This type of harvest would not improve seral species composition or affect forest structure.

Approximately 159 acres would be harvested within about 427 acres of old growth stands. Salvage of dead and dying trees within allocated old growth stands in this alternative is likely to have a detrimental affect on the quality of old growth characteristics in the Hayden Lake and Thompson Creek Analysis Areas. Even though snags are retained within the harvest units, there would still be a reduction in overall number of snags available, and these snags could be important to portions of old growth that are outside the harvest units. In the Thompson Creek old growth stand there are already high levels of down woody debris and live fuel ladders, so harvest of beetle killed trees will not substantially reduce the potential for stand replacing fires. There would be a short-term detrimental affect on old growth characteristics in the Canfield Face and Fernan Creek old growth stands due to removal of some of the snag component, but the risk of stand-replacing fire on these dry sites would be substantially reduced. The Blue Creek old growth stands no longer have enough of the large tree component to meet old growth requirements. Improvement harvests within old growth may be somewhat beneficial in that they will help maintain the existing ponderosa pine and larch within these stands. However, pine and larch are generally a very minor component of these stands. Planting of ponderosa pine, larch, and white pine in openings may provide a long-term benefit to the old growth character of the stands, as these species are more resistant to root disease. Approximately 511 acres of forestland would be allocated for old growth management to replace 397 acres of currently allocated old growth in which harvest occurs. An additional 242 acres of recruitment old growth would also be allotted to old growth management.

Ecosystem burning would occur on approximately 438 acres (0.7 percent of the project area) to improve forage for big game in Management Area 4 and to re-introduce fire to the ecosystem. This burning may create some sites suitable for natural regeneration of early seral species, particularly

ponderosa pine and larch, but the residual overstory is likely to inhibit establishment and growth of these species. This burning is likely to decrease the risk of stand replacing fires as accumulated woody debris and understory vegetation are reduced.

Timber harvest and associated reforestation efforts would improve species composition on about 0.3 percent of National Forest System lands within the project area. An additional 0.7 percent would be treated to improve future stand structure through thinning and improvement harvests. There would be no additional decrease in mature and old forest structure beyond that caused by the current beetle infestation.

Cumulative Effects for Alternative 3

Early seral species would be planted on approximately 89 acres (6 percent of the harvest acres) where bark beetles and subsequent harvest of dead and dying trees have created adequate openings for seedling establishment and growth, and where site preparation activities can be accomplished with minimal losses to residual green trees. These planted stands would be more likely to provide a long-term improvement in stand structure, since early seral species are less susceptible to root disease than Douglas-fir and grand fir. An additional 1,344 acres (94 percent of the harvest acres) would be salvage harvested to remove dead and dying trees, but no planting would occur. Of the 1,344 acres, approximately 45 acres (3 percent of the harvest acres) would be in openings that would be allowed to naturally regenerate. This type of harvest would not improve seral species composition or long-term stand structure.

Approximately 159 acres would be harvested within about 427 acres of old growth stands. Salvage of dead and dying trees within allocated old growth stands in this alternative is likely to have a detrimental affect on the quality of old growth characteristics in the Hayden Lake and Thompson Creek Analysis Areas. Even though snags are retained within the harvest units, there would still be a reduction in overall number of snags available, and these snags could be important to portions of old growth that are outside the harvest units. In the Thompson Creek old growth stand there are already high levels of down woody debris and live fuel ladders, so harvest of beetle killed trees will not substantially reduce the potential for stand replacing fires. There would be a short-term detrimental affect on old growth characteristics in the Canfield Face and Fernan Creek old growth stands due to removal of some of the snag component, but the risk of stand-replacing fire on these dry sites would be substantially reduced. The Blue Creek old growth stands no longer have enough of the live large tree component to meet old growth requirements. Planting of ponderosa pine, larch, and white pine in openings may provide a long-term benefit to the old growth character of the stands, as these species are more resistant to root disease. Approximately 511 acres of forestland would be allocated for old growth management to replace 397 acres of currently allocated old growth in which harvest occurs. An additional 242 acres of recruitment old growth would also be allotted to old growth management.

Timber harvest and associated reforestation would improve species composition on about 0.2 percent of National Forest System lands within the project area. There would be no additional decrease in mature and old forest structure beyond that caused by the current beetle infestation.

Cumulative Effects for Alternative 4

Early seral species would be planted on approximately 101 acres (9 percent of the harvest acres), and harvests that improve existing ponderosa pine and western larch stands would be completed on about 156 acres (13 percent of the harvest acres). Dead tree removal and thinning in ponderosa pine and larch stands would create conditions where these areas would be at reduced risk of stand replacing fires. Additionally, 903 acres (78 percent of the harvest acres) would be salvage harvested to remove dead and dying trees.

Timber harvest and associated reforestation would improve species composition on about 0.2 percent of National Forest System lands within the project area. An additional 0.3 percent would be treated to improve future stand structure through thinning and improvement harvests. There would be no additional decrease in mature and old forest structure beyond that caused by the current beetle infestation.

Effects of Opportunities on All Alternatives

Precommercial Thinning and Pruning – Opportunities for vegetation restoration include approximately 344 acres of precommercial thinning within the project area (see project file). The effect of these treatments would be to improve growth and vigor of trees planted after past regeneration harvests or natural regeneration that resulted after past harvests. Stands are prioritized to treat those areas with a large component of early seral species first. This would allow these species to better compete with the more shade tolerant species so the stands can better provide the desired forest structure and composition. Even though early seral species are favored in thinning operations, other species are maintained in the stands.

Watershed and Wildlife Restoration - Roads proposed for permanent closure or obliteration in some action alternatives, or shown as opportunities in Chapter II, would eventually provide forest cover, although they would be likely to go through a prolonged period of grass, forb and/or shrub dominance. Closure of some roads would restrict access to some areas, making stand-tending operations such as pruning and precommercial thinning more difficult.

Noxious Weed Treatments - 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.

Consistency With the Forest Plan and Other Applicable Regulatory Direction

Forest Plan direction 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 (Forest Plan II-8).

In most stands proposed for harvest, only dead and dying trees would be designated for removal. This is consistent with Forest Plan direction that 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" (Forest Plan II-32).

Regeneration activities are proposed for stands in which the majority of the trees have been killed. 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" (Forest Plan II-10) and that "reforestation will feature seral tree species" (Forest Plan II-32). 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 (IPNF Monitoring, 1998, page 7). 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 is one clearcut of approximately 7 acres in size proposed as part of alternatives 2 and 4. This unit is in the Potosi area of the Beaver Analysis Area. This stand has been so heavily hit by the Douglas-fir beetles that there are few live trees remaining in the stand. Although an effort will be made to retain some green overstory trees, the appearance of the stand will be of a clearcut with some reserve trees. Because of the heavy beetle infestation; clearcutting is the optimal silvicultural treatment in this stand and regeneration activities resulting in resilient, long lived seral species will take place.

The Forest Plan states “openings created by even aged silviculture will be shaped and blended to forms of the natural terrain to the extent practicable; in most situations they will be limited to 40 acres. Creation of larger openings must conform with current Regional guidelines” (Forest Plan II-32). The Northern Region Guide and FSM 2400-R1 Supplement 2400-96-3 state that “where natural catastrophic events such as fire, windstorms, or insect and disease attacks have occurred, 40 acres may be exceeded without 60 day public review and Regional Forester approval, provided that the public is notified in advance and the environmental analysis supports the decision” (FSM 2471.1). In two cases the level of beetle mortality has forced regeneration of openings that are adjacent or very close to existing openings resulting in openings greater than 40 acres. These cases are part of alternatives 2, 3 and 4 and occur in the White area of the Beaver Creek analysis area and Shoshone analysis areas. Although damage caused by a combination of Douglas-fir beetles, root disease and ice/wind damage have resulted in canopy openings similar to a shelterwood and regeneration activities are now appropriate. In the White analysis area, the proposed group shelterwood unit in alternatives 2 and 4 (salvage unit in alternative 3) of 7 acres is very close (within 150 feet) to a previously regenerated unit of 44 acres. The previously harvested unit was harvested in 1992, certified regenerated in 1993 and will remain an opening hydrologically until 2007 and in terms of wildlife until 2072 depending on wildlife species. In the Shoshone analysis area, the proposed shelterwood treatments in alternatives 2 and 4 (salvage unit in alternative 3) has resulted in 2 openings, one 5 acres and the other 4 acres, adjacent to a previously regenerated unit of 43 acres. The previously harvested unit was harvested in 1988, certified regenerated in 1990 and will remain an opening hydrologically until 2003 and in terms of wildlife until 2068 depending on wildlife species. The FEIS will notify the public of this situation.

Improvement harvest and commercial thinning are proposed for some stands in some alternatives where ponderosa pine and/or western larch are a major component. The purpose is to improve vigor of the remaining trees and to maintain or enhance the diversity of plant communities. The Forest Plan for the IPNF states that planting, precommercial thinning, and commercial thinning will be an integral part of management of future timber stands (Forest Plan II-8).

Alternatives 2 and 3 are not consistent with Forest Plan direction. These alternatives propose the harvesting of trees from within allocated old growth stands in the Hayden Lake, Canfield Face, Fernan Creek, Blue Creek and Thompson Analysis Areas. Only the Thompson Analysis Area is within an Old Growth Unit that contains more than 5 percent allocated old growth. As stated in the Forest Plan on page II-29, "Old growth stands may be harvested when there is more than 5 percent in an old growth unit, and the Forest total is more than 10 percent. Therefore, harvesting allocated old growth stands within The Hayden Lake, Canfield Face, Fernan Creek, and Blue Creek analysis areas does not meet the Forest Plan standard. Please refer to Appendix D for a list of Old Growth Units by Analysis Areas and the amount of allocated and recruitment old growth in each.

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. All stands proposed for regeneration harvests are on lands suitable for timber production and could be adequately restocked within five years of the final harvest. This project will meet these management objectives.

Improvement harvest and commercial thinning are proposed for some stands in some alternatives where ponderosa pine or western larch are a component. The purpose is to improve vigor of the remaining trees and to maintain or enhance the diversity of plant communities. NFMA provides for these treatments where they increase the growth rate of residual trees, favor commercially valuable species, favor species valuable to wildlife, or achieve some other multiple use objective.

FIRE/FUELS

Introduction

Because of effective wildfire suppression since the 1930s and the broad scale change in species composition of the forest, fuel levels have been building for the last several decades that are 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, recent winter storms damaged many stands below 3,500 feet elevation and subsequent insect attacks (especially Douglas-fir bark beetle) have killed even more trees which are adding to these fuel levels. This is especially of concern in areas where private lands are close to National Forest. Due to the increased number of snags, a wildfire could be more 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 (a stand-replacing fire), and possibly destroy private forests and homes. Potential high-intensity wildfires could also have severe consequences to other vegetation, soils, stream networks, and the visual quality of landscapes.

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

Forest Service Manual (FSM) 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 the Small Sales 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 and 1996, 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.)

Existing Conditions

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 EIS.

In the discussion that follows "severity" refers to the amount of damage a fire actually causes and "return interval" refers to how often a particular type of fire occurs.

The following is a summary of the types of fires that occur in forested ecosystems:

- *Nonlethal fires (fires that kill 10% or less of the dominant tree canopy). A much larger percentage of small understory trees, shrubs and forbs may be burned back to the ground line. These are commonly low severity surface and understory fires, often (but not always) with short return intervals (a years to a few decades).*
- *Mixed severity fires (fires that kill more than 10%, but less than 90% of the dominant tree canopy): These fires are commonly patchy, irregular burns, producing a mosaic of different burn severities. Return intervals on mixed severity fires may be quite variable.*
- *Lethal fires (fires that kill 90% or more of the dominant tree canopy): These are often called "stand replacing" fires and they often burn with high severity. They are commonly (but not always) crown fires. In general, lethal fires have long return intervals (140 to 250 years or more apart), but affect large areas when they do occur. Local examples of these types of fires would be the Sundance and Trapper Peak fires of 1967 that burned over 80,000 acres in a relatively short time period during late summer drought conditions.*

The Coeur d'Alene drainage historically had a variable fire regime of long interval large lethal fires mixed with shorter return interval non lethal and mixed severity fires. Fires were more frequent in watersheds on the periphery of the Coeur d'Alene Basin, adjacent to and downwind from the drier, pine dominated, Rathdrum Prairie (Zack and Morgan, 1994).

The fire history analysis of the Coeur d'Alene Basin conducted by Zack and Morgan in 1994 drew the following conclusions:

- *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 nonlethal 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 nonlethal 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.*
- *Regional climate change operating on the scale of decades and centuries may be implicated in the major fire patterns observed. The historical record shows that some relatively recent fires were quite large. In particular, the 1919, 1910, and 1889 burns were very large and severe both in the Coeur d'Alene Basin and throughout the Northern Rocky Mountains. Other dates such as 1542, 1738, 1764, 1772, 1814, 1830, and 1859 appear to be regional episodes. This strongly suggests that regional climate patterns are responsible for many of the major fire episodes in the Coeur d'Alene Basin.*

There are several reasons for the departure from historic stand structure now evident in the Coeur d'Alene basin. Timber harvesting began in the 1890's. While ponderosa pine, white pine, and cedar were most valuable, larch and Douglas-fir were used extensively for railroad ties and mine timbers. Other species had little value. By 1900 a major portion of mature ponderosa pine stands had been harvested and either converted to other uses or were regenerating to dense (often mixed species) stands. Prior to 1960 many upland areas had been "high-graded", removing only the valuable species, resulting in major stand conversions to grand fir, hemlock, and Douglas-fir. Accounts of early-day logging are presented in more detail in the vegetation section of this FEIS.

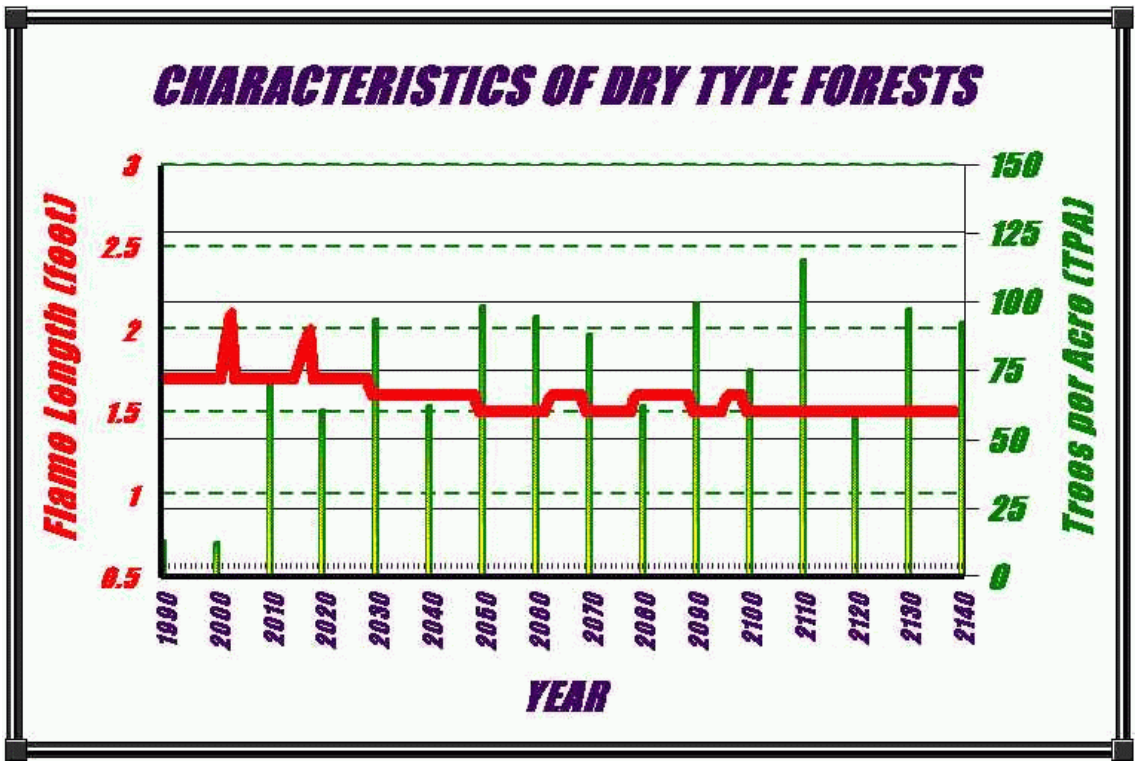
Since the late 1930's, fire control efforts have become much more effective. The primary impact of fire control has been to eliminate underburns and mixed severity fires which served as the thinning agents that favored larch and ponderosa pine. With the lack of thinning described above, western larch starts a rapid decline by age 80 and ponderosa pine by age 130 (USDA 1994, PNW-GTR-320). These mixed severity fires also generated some large fuels, and did not occur frequently enough to maintain open understories across large landscapes. Overall, in northern Idaho, moist habitat types tended to be a mosaic of forest stand structures and densities, but dense stands were common. In 1909 white pine blister rust was accidentally introduced to western North America. This Eurasian disease devastated white pine forests throughout the United States (Zack, 1995), and especially in the Northern Rockies.

The cumulative effects of 100 years of past activities has created many young stands comprised of shade tolerant and fire intolerant species. With effective exclusion of underburning in this century, warm dry forests quickly became overstocked, often exceeding carrying capacity of the land. In the absence of fire, native insects and pathogens regulate stocking by killing susceptible individuals and species. Frequent underburning also prevented excess accumulation of carbon and nutrients in woody biomass. The balance between fire and biological decomposition in regulating carbon accumulations in these forests has been disrupted and excessive amounts of fuels have accumulated.

A current danger is stand-replacing wildfire where fuel accumulations are so high that burns would be extremely hot, resulting in critical reductions of stored nutrients, with accompanying loss in potential productivity. The effectiveness of fire prevention and suppression has permitted increased ground fuel accumulations and stratified fuels (both living and dead) to the point where many fires can not be contained or confined as easily as in the past. They now burn hotter and more extensively than even 10 years ago. This affect has been especially evident in dry forests that historically burned frequently (Harvey, 1984). Dry forest stands that have been designated as “old growth” are by definition in the latter stages of successional development. Where fire has been excluded, snags, heavy down fuels, and ladder fuels are already at elevated levels. Any natural process that increases fuel accumulations will increase the risk of lethal fires in these stands even more than stands in the “normal” successional stages.

Data collected on the IPNF suggests that the historic fire return interval on the Idaho Panhandle National Forests is highly variable on dry sites (Zack and Morgan 1994). Data from Priest Lake on small isolated dry sites indicate a fire return interval of approximately 60 years. On the Bonners Ferry Ranger District, fire return intervals were approximately 25 years on Hall Mountain dry sites (please refer to the supporting data in the Douglas-fir Beetle FEIS, Project Files, "Fuels/Fire"). The figure below displays modeled simulations of the effects that a 20-year fire return interval could have on a typical old-growth ponderosa pine forest. Values displayed represent potential flame lengths over time should a wildland fire occur, and the number of trees per acre that could occupy the site over time. Predictions were made using the Fire and Fuels Extension-Forest Vegetation Simulator (FFE-FVS) model, described in detail under the Environmental Consequences, methodology section, later in this chapter.

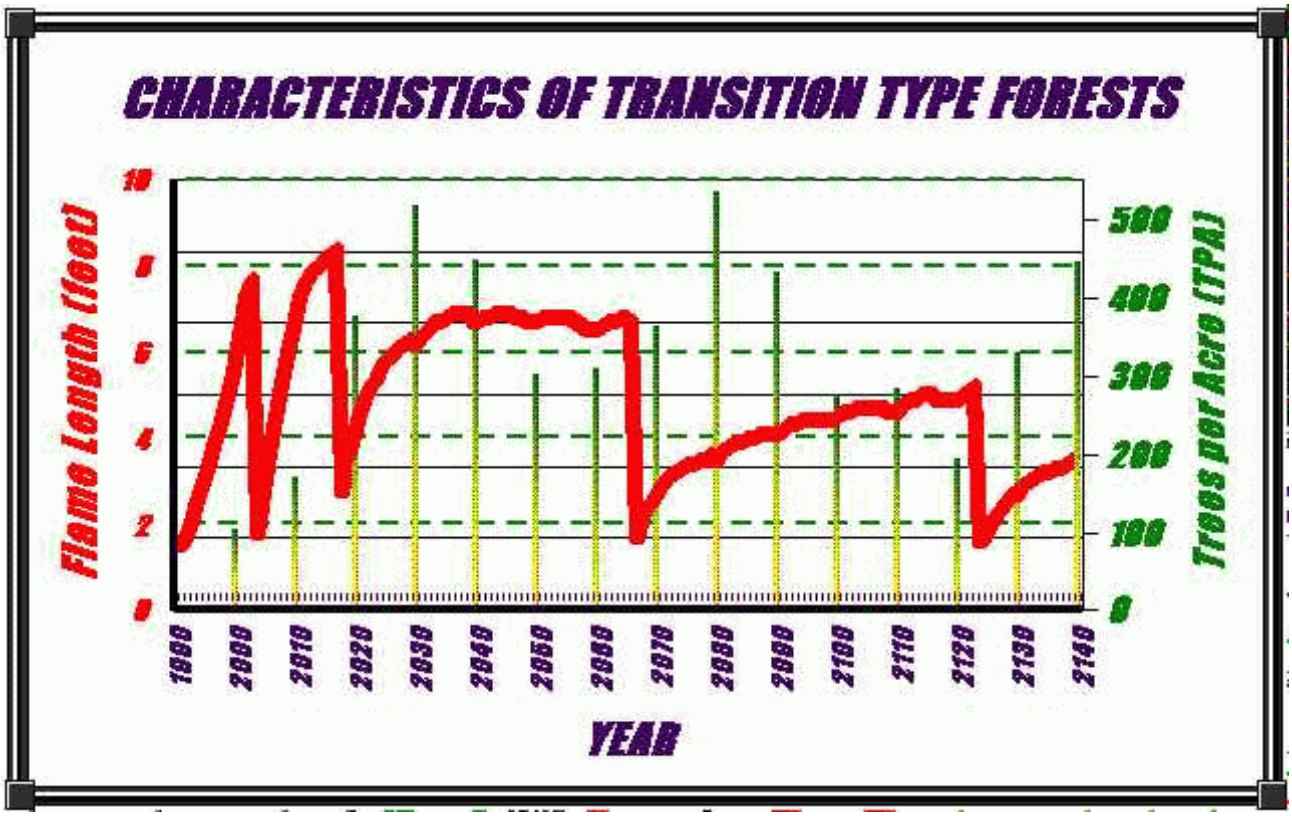
Figure III-3. Estimated trees per acre under a 20-year fire return interval in dry-type forests, and predicted flame length should a wildland fire occur.



In contrast with warm, dry forests, biological decomposition in warm, moist forests is substantial and the role of fire in nutrient cycling is reduced. 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 nonlethal 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). Data collected on the IPNF suggests that the historic fire return interval on the Idaho Panhandle National Forests is highly variable (Zack and Morgan 1994). On the Bonners Ferry Ranger District, fire return intervals in transition forests ranged from approximately 23 to 63 years on Hall Mountain and Skin Creek transition sites (please refer to the Douglas-fir Bark Beetle FEIS). The figure below displays modeled simulations of the effects that a 50 to 60-year fire return interval could have on a mixed species forest over a 140-year time period. Values displayed represent potential flame lengths over time should a wildland fire occur, and the number of trees per acre that could occupy the site over time.

Figure III-4. Estimated trees per acre under a 50 to 60-year fire return interval in transition-type forests, and predicted flame length should a wildland fire occur.



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).

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). The Government Accounting Office (GAO) report and testimony address the extent and seriousness of problems related to the health of national forests in the interior West, the status of efforts by the Department of Agriculture's Forest Service to address the most serious of these problems, and barriers to successfully addressing these problems and options for overcoming them.

From the landscape perspective, between 1540 and 1931, there was an average of one major fire episode every 19 years, somewhere in the Coeur d'Alene River basin. Since 1931 there has not been any major fire episodes recorded within the basin (Zack and Morgan, 1994). Mapping of the fire history on the Idaho Panhandle National Forests supports this finding also (please refer to the supporting maps and records located in the Project Files, "Fuels/Fire", in the Douglas-fir Beetle

FEIS). Currently, fire occurrence on the Idaho Panhandle National Forests averages 163 fires per year, with a burned acreage average of 665 acres (IPNF annual fire reports; Fire Stat Database). With the exception of the Sundance and Trapper Peak fires in 1967, fires on the Idaho Panhandle since 1931 have not been to the same scale as historic fires.
Most stands within the Coeur d'Alene analysis area are the result of fire occurrence in the 1870's, 1889, and in 1910. On particular sites where there have been weather and insect-related disturbances, fuel is accumulating. The same types of disturbances under historic conditions would have led to similar fuel accumulations. Historically, that was often a precursor to stand-replacing fires that followed when suitable weather conditions presented themselves (Spurr and Barnes, 1980).

Between 1540 and 1992, the mean fire return interval within the Interior North Fork of the Coeur d'Alene River was 84 years. The mean fire return interval on the Rathdrum Prairie face and the Hayden Lake watershed was 62 years (Zack and Morgan, 1994). Most areas sampled were moist forest types; little data came from dry forest types.

Environmental Consequences

Methodology

Fuel loading: 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. Prior to the Douglas-fir Beetle EIS (IPNF, 1999), a team of specialists was convened on the IPNF to assess the Douglas-fir beetle epidemic. The "Outbreak Incident Assessment" team was brought together to assess the magnitude of the current outbreak, project its future behavior, and develop both short and long-term strategies for treatment. A report documents the assessment team's findings and recommendations (USDA,1998c). The purpose of the Fuel Loading analysis conducted for the broadscale assessment was to project the total additional fuel tonnage, on a per acre basis, that could potentially be made available in stands where there is potential for Douglas-fir beetle mortality.

Site-specific analysis done for the Douglas-fir Beetle FEIS followed the same process outlined in the report, but was based on the actual observed and predicted extent of mortality to determine the potential increase in fuel loading and the number of snags created per acre (detailed results are located in the Fuels/Fire portion of the Douglas-fir Beetle FEIS project file). The total tonnage of fuel that would be removed through harvest was calculated for each alternative. Ten-year old Douglas-fir beetle areas were studied and fuel surveys were completed as a check of assumptions made in the outbreak assessment report. Those findings and the analysis process were documented in a report (USDA,1998a). A sample of stands was selected that represent the full range of habitat type groups and a full range of predicted fuel load increases within the area due to the Douglas-fir beetle infestation.

Forest Vegetation Simulator: The Forest Vegetation Simulator (FVS), widely used by forest managers throughout the United States and Canada to predict the effects of various vegetation management actions on future forest conditions, was used for this additional analysis. The Fire and Fuels Extension to FVS (FFE-FVS) integrates FVS with elements from existing models of fire behavior and fire severity. Model output displays fuels, stand structure, snags, and potential fire behavior over time and provides a basis for comparing proposed fuel treatments (USDA, 1998b; USDA 1997c). A full description of the model is contained in the Fuels/Fire portion of the Douglas-fir Beetle FEIS project file.

Behave Model: Fire behavior depends on forest density, composition, amount of surface fuel, its arrangement, moisture content, prevailing weather, and physical setting. To characterize surface fire behavior, 13 stylized fire behavior fuel models are available that describe the fuel complex, fuel loading, fuel bed depth, and moisture of extinction (upper limits of fuel moisture beyond which a fire will no longer spread with a uniform burning front) in dead and live fuels for grass, shrub, timber, and logging slash groups. These models in combination with dead and live fuel moisture content, slope angle, and wind speed provide a basis for predicting both fire spread rate and intensity (USDA, 1999a).

Fire spread rates and intensities can be predicted for various fuel types using the BEHAVE model. BEHAVE is an interactive computer model designed to predict or estimate fire behavior characteristics needed for fire management purposes. It is composed of the latest state-of-the-art simulation models developed for fire and associated fuel and environmental parameters. BEHAVE has evolved over several years in conjunction with the material developed for training fire behavior officers at the National Advanced Resource Technology Center in Marana, Arizona. The parameters that forest pests affect are the fuel models, as affected timber stands go through successional changes, fuel models that describe how a fire would react within the stand would also change in a predictable manner.

First Order Fire Effects Model (FOFEM): Although fire was a significant disturbance on the landscape, its intensity and severity was variable as discussed above. It is important to separate fireline intensity from fire severity. Intensity is the energy release rate per unit length of fireline, and is a physical parameter that can be related to flame length. It can be determined from the product of biomass consumption (energy) and rate of spread of the fire. Fire severity is an ecological parameter that measures, albeit somewhat loosely, the effects of the fire to the burned area. Two fires of the same fireline intensity can have quite different effects between an old-growth mixed-conifer forest and a young plantation of similar species because the smaller plantation trees will be more easily scorched and have thinner bark. The fire in the old-growth may be of low severity while the plantation fire is of high severity. Land managers are generally more interested in fire severity, but must approach severity first by estimating fireline intensity and then using models such as FOFEM to predict tree mortality from fireline intensity (Agee, J.K. 1996).

Direct, Indirect and Cumulative Effects

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. Stands reviewed on the Idaho Panhandle National Forests (USDA 1998a) ten years following a Douglas-fir beetle infestation demonstrated the expected surface fuel changes. In adjacent portions of the stands that were unaffected by the Douglas-fir beetle, weather damage, or other high levels of forest pests, the stands represented closed canopy timber stands (fuel models 8 and 10). Fire in the portions of these stands affected by the Douglas-fir beetle 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.

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. Decay rates for material greater than 3 inches in diameter can be expected to be near 1.5 percent per year; decay rates for limbs in the 1 to 3 inch size class should be near 9 percent per year (USDA 1998b). 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.

Values in the table 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 III-21. Estimated rate of fire spread and flame length, during normal and drought conditions.

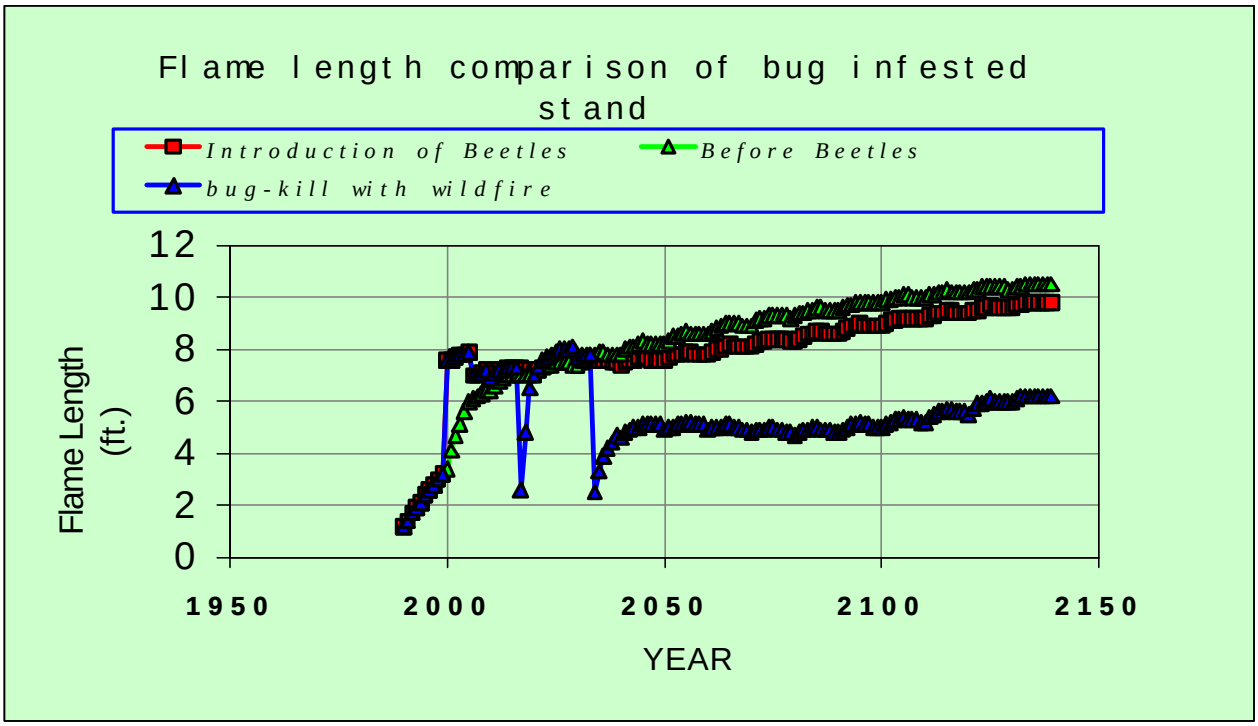
Fuel Model	Rate of spread[1] (chains per hour) normal/drought	Flame length[2] (feet) normal/drought
2	25/32	5.3/6.3
5	11/27	3.4/6.7
6	28/34	5.6/6.4
8	2/2	1.0/1.2
10	7/10	4.5/5.7
11	6/7	3.4/3.7
12	13/15	7.9/9.0

*1 **Rate of spread**. Forward rate of spread of the fire, expressed in chains per hour. One chain equal 66 feet.*
*2 **Flame Length**. The distance measured from the tip of the flame to the middle of the flaming zone at base of the fire, is valuable in determining type o f 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.*

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. Proposed activities associated with the Small Sales EIS Project (timber harvest, fuels reduction treatments, and reforestation activities) would not be initiated at this time. Current management and ongoing activities associated with other projects would continue. The effects analysis reflects existing conditions and the anticipated effects if no actions are taken. The trends displayed in the figure below represent effects of a natural process of fuel accumulation and change in stand structure over time. 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. Where the disturbance regime was repeated, the historic fuel loading and potential flame length pattern for ecosystem fires would have been erratic, similar to the line shown in the figure below for a series of wildfires that could burn in fuel conditions created by Douglas-fir beetle. The graph should not be interpreted as displaying a prediction as to when such a disturbance might occur, but rather a representation of changes such an event could cause on stand characteristics that influence fire intensity and severity. 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 several years as forests became reestablished. This same process controls stand density levels and species composition.

Figure III-5. Flame-length comparison in stands before and after beetle infestation.



The figure above displays the results of the FFE-FVS model outputs for a typical stand on the Coeur d'Alene District. These results are typical for stands modeled and represent a mid range effect (Reinhardt, 1999). As depicted, 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 model depicts 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. Intuitively, fire professionals know that heavy fuels increase flaming and smoldering time periods, thus increasing severity, even though the existing generation of fire behavior models do not account for this characteristic (Reinhardt, pers. comm, 1999).

As discussed previously under the Characterization and Existing Conditions section, maintaining seral species is an important step in sustaining forested environments that can adapt and sustain disturbances within the range of natural variability. Changes to structural stage and species composition are discussed in the Vegetation section of this Draft EIS.

Direct and Indirect Effects Common to All Action Alternatives

The Douglas-fir beetle outbreak in the analysis area presents long-term fire and fuels consequences. Significant accumulations of additional fuel and increased mortality result in an increase in snag density. With the beetle induced thinning in the overstory, regeneration of species tolerant to insects and disease will begin to occur. This provides the fine fuels necessary for a faster moving fire and heavy down fuel loadings which would contribute to higher than normal fire intensities. These conditions could persist for several decades; combined they present serious safety hazards to firefighters when suppressing fires in affected stands.

It is not possible or desirable to "fireproof" fire dependant ecosystems, but the potential of severe fire can be reduced by proactive land management. Federal land management agencies can mimic natural disturbances, but it is essential for managers to consider that current conditions may be considerably different than those conditions that occurred historically. Reintroduction of native processes such as fire without modification of structural patterns, fuel loadings, and spatial distributions can produce unpredictable and undesirable effects (USDA, USDI, 1996). Multiple treatments will be needed to regulate vegetation structure, composition, and associated biomass loadings. Long management horizons may be required to restore unhealthy ecosystems to more sustainable conditions. The most effective means to restore long-term forest health will be density and fuels management, plus regulation of species composition to improve the dominance and distribution of seral species (Harvey, et.al. 1995, USDA 1999a). The use of prescribed fire alone for stand restoration would be largely ineffective (with spring burns), or downright harmful and wasteful (dry season burns) (Barrett, S. W. 1994). In the case of the Coeur d'Alene River Ranger District, the lack of an adequate seral species seed source would assure long term failure of vegetative restoration efforts without artificial regeneration of seral species.

Timber harvest has and would continue to significantly affect both short and long-term fuel loading. 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. 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. Natural stands and particularly partial-cut stands that are not treated for fuels reduction, could experience greater fuel buildup over time than treated managed stands. Treating risk areas where harvest takes place in a timber sale entry provides an opportunity to reduce fuel loading and continuity within stands over the entire analysis area. 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 will 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.

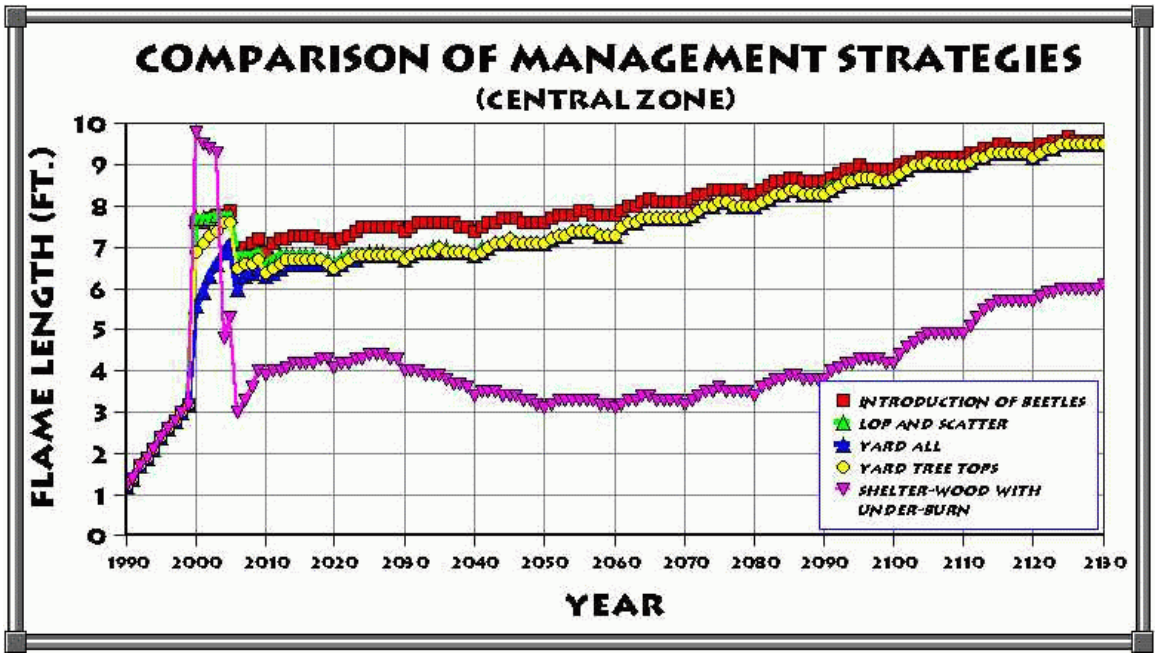
While these alternatives would treat some areas where fuel accumulation and presence of snags would be a concern, they do not treat all stands. The preferred fuels treatment for all units that contain fire resistant species is underburning or jackpot burning. In some units, slash would be piled and burned where slopes permit. Where the size of the harvested area is very small, very isolated, or contains a significant component of fire intolerant species, fuels treatment may be limited to lop and scatter or top attached yarding. The latter treatments would also be used in areas where relatively few trees are removed.

Refer back to Figure III-5 which displays the results of the FFE-FVS model outputs for one stand on the Coeur d'Alene District. These results are typical for stands modeled and represent a mid-range effect (Reinhardt, 1999). As depicted, 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 the Douglas-fir 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 model depicts 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. Heavy fuels increase the open flame and smoldering time periods, increasing severity.

The Douglas-fir Beetle FEIS 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. As displayed in the figure below, salvage logging 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, thus increase the rate of decomposition and decreasing the length of time that these fuels could contribute to potential increased severity should a wildland fire occur. Yarding tops would reduce fuel loadings and potential flame lengths somewhat but would not eliminate the increases seen with other options because of breakage and increased solar and wind penetration into the stand. It was estimated that yarding tops would only remove 50 percent of the tops of harvested trees as dead Douglas-fir would be more brittle than green trees so breakage of tops and limbs would be significant. 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.

Figure. III-6. Comparison of effects of management strategies for treatment of fuel accumulations.



Regeneration harvesting, followed with underburning appears to be the best treatment to reduce fuel loads and reestablish seral species. As discussed previously, under the Characterization and Existing Conditions section, maintaining seral species is an important step in sustaining forested environments that can adapt and sustain disturbances within the range of natural variability. (Effects of these action alternatives on changes to structural stage and species composition are discussed in the Vegetation section of this EIS.) 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 salvaged and risks to other values compared to the cost of the treatments.

Silvicultural and fuels treatments (by alternative) are displayed in Chapter II, Table II-16.

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 Coeur d'Alene District is confined to approximately 63,000 acres within a Ranger District of 726,990 acres. As a percentage, this is rather insignificant and would not in itself lead to catastrophic large stand-replacing wildfires. As stated earlier, most large stand-replacing fires on the Idaho Panhandle National Forests are wind driven or the result of regional climactic patterns, higher fuel loadings from beetle killed trees would have minimal affect on such an event.

Cumulative Effects At The Overall Project 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. Timber harvesting began in the 1890s. By 1900 a major portion of mature ponderosa pine stands had been harvested and either converted to other uses or were regenerating to dense, often mixed species stands. 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 takes no steps to interrupt this trend. Under the action alternatives and reasonably foreseeable projects, 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, improve the health and vigor of some stands containing higher stocking of larch and ponderosa pine, and makes progress towards reducing potential intensities and severities of wildfire in some stands. Even with this treatment, untreated areas and areas treated with salvage harvest only (Alternative 3) will continue to trend toward conditions that favor potential high intensity wildland fires. Only the action alternatives will reduce high snag densities and address the problem of firefighter safety.

Cumulative Effects of Activities on Private Lands

The amount of private land ownership within each analysis area was addressed in the previous vegetation section. The effects of Douglas-fir beetle mortality on other ownerships within the project area would be difficult to ascertain due to a lack of detailed information on current conditions and on how private land owners will treat beetle killed trees. In very general terms, non-industrial forest owners and industrial forest owners are likely to aggressively harvest dead and dying trees because of their commercial value. Owners of small home sites and recreational property are less likely to harvest their timber, but may remove individual dead and dying trees for safety reasons or for firewood. Private landowners that do harvest trees are less likely to invest money in reforestation, so most regeneration will be from natural seeding.

The Douglas-fir Beetle FEIS detailed information on vegetation and fuel conditions and planned treatments on private lands. That information was obtained from aerial photos, satellite imagery and personal knowledge. Some information on past and planned harvest and road building was been gathered from industrial owners and on state lands, but generally no specific information is available for non-industrial private landowners. In general, most private lands are on lower elevations and receive less moisture and are comprised of a higher percentage of dry sites than National Forest System lands. There are industrial timberlands in some of the higher elevations. Some past harvests have been regeneration harvests that have created some openings in the forest canopy and have resulted in regeneration of seral species. But many existing openings, particularly in the lowlands, are a result of land clearing for homes and pastures. Other private lands are natural openings or meadow lands acquired through homesteading or other means.

More often, timber harvests on private lands tend to be partial cuts that remove trees of the highest economic value (usually the largest) and typically removes large fire resistant seral species. Natural regeneration is relied on to fill most created openings. This tends to favor shade tolerant Douglas-fir and grand fir over early seral species such as pine and larch. As previously discussed, the historic fire adapted vegetation structure was lost early in the century. With increased rural/urban development, it is probably safe to say that inherent disturbance regimes and historic vegetation patterns will never be reestablished on a landscape scale. This pattern of vegetation change has led to increased fire intensities and severities and is expected to continue. Private lands are expected to be managed similar to the past.

Since private lands often include residences and other developments, fire will continue to be aggressively suppressed, although the potential for increased ignitions continues to rise as human use increases. 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 (i.e. “Fire Storm 91”) have not been acceptable to the public. For this reason, adjacent landowners have expressed considerable concern over untreated stands near private holdings throughout the analysis area.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions are listed in Chapter II (Tables II-1 through II-15). These future actions are not individually or cumulatively of a scale similar to historic disturbance patterns. 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. Foreseeable future actions would only result in vegetation restoration at the stand scale.

The cumulative effects area for the fire/fuels analysis included the entire Coeur d’Alene River Ranger District. Individually, most of these projects do not warrant a discussion of cumulative effects in relation to the Small Sales EIS project. Timber sale-related projects, though occurring at a stand scale, are reducing long-term fuel loads and converting stand species types to those that are better able to withstand a fire or are more likely to retain trees on the site after a fire event. These

stand harvest and fuels reduction treatment generally produce localized direct effects mentioned above. At a district level scale, the effects are often insignificant, but it does represent a trend in the direction. The new District Travel Plan should reduce the risk of human-caused fires by restricting public access across the district, but it will also likely increase our response time to lightning-caused fires as roads are closed and begin to grow over. This may reduce successful initial attack on a fire when it is small and result in greater resource losses and greater fire suppression costs. Activities such as mining, firewood gathering, and recreation projects do increase the risk of a human-caused fire. Precommercial thinning operations do represent a short-term increase in fire intensity and rate of spread in locations where that is occurring. Thinning to create a more healthy and vigorous stand may reduce fuel load build-up over time reducing fire intensity but again it would be at the stand level. Salvage efforts on other ownership, will reduce fuel loads over the long term, but in some cases may increase the short term risk as there is sometimes less investment made in fuels reduction treatments on private lands after harvest.

Effects of Opportunities

Timber Stand Improvement (Precommercial Thinning and Pruning): Stands identified as future thinning needs are identified in the project file. Thinning redistributes growth and adjusts species composition for the future. Thinning would favor healthy trees of desired species adapted to the various habitat types. The seral species of ponderosa pine, western larch, and white pine would be favored when present on the appropriate growing sites. The effects of this action in the long run will be to move stands towards historic species composition and make them more resilient to disturbances such as wildfire. In the short run, increases in dead fine fuels would increase wildfire intensity should one occur.

Watershed and Wildlife Restoration: Restoration opportunities that may be accomplished are predominately road obliteration. The ignition density analysis for the Coeur d'Alene River District shows that most of the highest ignition densities are in developed areas. Decreasing the road density may result in a small decrease in human caused wildland fires, although the change may not be noticeable because there would not be a significant change in road densities or use patterns on the travel zones that have the highest ignition density. On the opposite side, any road obliteration will tend to decrease efficiency of fire suppression access, potentially allowing fires to grow in size and intensity prior to the arrival of initial attack resources.

Noxious Weed Treatment and Monitoring: 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.

Ecosystem Burning: Stands where the opportunity exists for ecosystem burning were included and analyzed under Alternative 2. The objective of these burns is reduction of existing natural fuels, big game habitat improvement, or maintaining existing open stand structures. Some of the stands are dry site stands and others are brushfields.

Consistency With the Forest Plan

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 vegetation growth, fuels buildup, 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. Action alternatives propose various forms of fuels treatment and make progress towards reducing the potential intensities of wildfire. Even with this treatment, untreated areas and areas treated with salvage harvest alone will continue to trend toward vegetative characteristics that exceed the goals, objectives and standards established in the Forest Plan even with activity fuels treatments included in the action alternatives. Treatment of the activity fuels will moderate the near term fire risk due to the bark beetle attacks, however failure to apply vegetative manipulation techniques to shift stand composition to fire resilient species will not appreciably alter long term fire risk and consequences

FINANCES

Regulatory Framework

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

Affected Environment

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 and the 25% fund expenditures.

Stumpage prices were noticeably down across the United States starting several years ago, largely due to financial problems in the Asian nations. However, timber markets in the northwest did not seem to have been depressed as much as those in the rest of the United States. This is probably due to the growth that the region experienced.

Another factor that had dampen the local market for timber was the raising of interest rates by the

Federal Reserve Board during 1999 and 2000. Higher interest rates meant fewer housing starts and less demand for timber. This depressed the local timber market to some extent but delivered log prices at local mills still remained within 25% of record high prices.

All the Douglas-fir beetle-killed timber sales offered on the Coeur d'Alene River Ranger District during 1999 and 2000 were sold. Bids averaged $126 per thousand board feet. This figure represents a reasonable return considering the high proportion of helicopter yarding, high brush disposal collections (averaging over $30 per thousand board feet), the depressed timber market over that period, and purchaser required watershed restoration work. Some sales that did not contain any helicopter yarding exceeded $300 per thousand board feet in bid price. The brush disposal (BD) collection in effect reduces bid price by that amount. One sale had a BD collection that was almost double the bid price of the timber. These high BD collections show the Forest Service's commitment to fuels reduction treatments with these projects.

In January of 2001, the Federal Reserve Board reduced interest rates a full percentage point. This is expected to have a positive effect on the timber markets. Higher delivered log prices are expected to result in higher bid rates. This may counteract the expected decrease in volumes as the timber associated with this project continues to deteriorate from when it was originally analyzed. During the revision of this EIS, it was determined that this balancing effect (less timber but higher prices) negated the need to rerun the economic analysis. The analysis still provides a good comparison of the alternatives, which is what it is intended to do, and hence will remain unchanged.

Environmental Consequences

Methodology

This analysis deals only with project level financial attributes (predicted costs and revenues) of each alternative; and approached the analysis as though each alternative that contained timber harvesting was a group of timber sales. The timber sales were grouped based on drainage location, juxtaposition, and yarding systems to represent logical groups of proposed harvest units. An effort was made to generate conventional sales (those not requiring helicopter yarding), where feasible, to allow for bidding opportunities for small operators. An appraisal was then preformed for each group of units as though they were actually being offered for sale at this time. Also, the analysis was made as real as possible in order to ascertain the probability of an alternative/timber sale actually being financially viable; and not a tool that only compares the alternatives against each other. In order to maintain the probability of financially viable timber sales, the units may be regrouped based on actual field measurements and the timber market at appraisal time.

Different revenues and costs are associated with the management activities under each action alternative. To arrive at the expected stumpages a computer program was used to determine the potential stumpage (i.e. gross bid value) of timber harvested, on a sale by sale basis. The program runs the same regression equation that is contained in the Transactions Evidence (TE) appraisal model, used for appraising actual timber sales. The 1999 second-quarter Transactional Evidence model was used to arrive at the expected stumpage value for those action alternatives proposing harvest. The TE appraisal method predicts the value of timber (referred to as "stumpage") through

the use of several independent variables developed from recent similar sales within Region 1 of the Forest Service (northern Idaho and western Montana). Since the information used is from actual bidding, current local market conditions, and production costs for logging and milling are reflected in the predicted rate.

Other costs, such as road maintenance, fuel reduction/site preparation (burning), and planting, were developed based on experienced District costs. Temporary road construction and system road reconditioning costs were based on past costs in the project area and updated to today's costs. The project file (Finances) contains detailed documentation of costs estimates. These costs were then deducted from the expected stumpage value.

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 II was used for the financial analysis (Table II-16). The average diameter of harvested trees used for the analysis was 17 inches.

The following table presents costs used for sales anticipated to last 2 years. The smaller sales that did not require helicopter yarding were anticipated to last only 1 year and the costs used on the 1 year sales were slightly lower due to less inflation.

Table III-22. Cost Estimated for Project Activities, Small Sales EIS.

Project Activity	Cost	Per Unit
Roads: Timber Sale*		
Maintenance (During Sale)	$0.54	/mile/mbf
Maintenance (Presale) (Blading plus Brushing, Cutslope)	$1,050	/mile
Reconstruction		
a) Brush Roadway and Cutslope, remove stumps, etc.	$5,000	/mile
b) Upgrade Existing Culverts	$6,000	/each
c) Install & Remove Culverts in Closed Roads	$3,000 - $4,500	/each
d) Install Gates	$500	/each
New Road Construction		
a) Permanent	$ 30,000	/mile
b) Temporary	$ 5,700	/mile
Culvert Removal/Road Storage	$1,300 - $3,500	/each
Fuel Treatment: Purchaser		
Helicopter Yarding Tops:	$40.00	/MBF
Skyline Yarding Tops	$5.21	/MBF
Slash Unmerchantable and Brush/Prep. for Underburning	$61.98	/Acre
Grapple Pile slash with a machine (excavator)	$335.00	/Acre
Pile slash at landings:	$689.01	/Acre
Fire Line constructed by hand	$82.58	/Chain
Fire Line constructed by machine	$26.42	/Chain
Lop and scatter (cost reduced for low volumes per acre)	$25.83	/Acre
Fuel Treatment: Forest Service**		
Burn slash at landings:	$147.79	/Acre
Underburn in units for slash reduction and site preparation	$788.32	/Acre
Jackpot burn in units for slash reduction	$259.59	/Acre
Hand Pile	$1,970.57	/Acre
Burn Hand piles	$152.63	/Acre
Erosion Control		
Seed Skidtrails & Landings (Purchaser)	$59.00	/Acre
Seed & Waterbar Roads	$200.00	/mile
Noxious Weeds Control (Purchaser)	$281.00	/Acre
Wildlife Security		
Earth barrier (Purchaser)	$1,229.27	/Each
Front end Oblit (Purchaser)	$1,581.52	/Each
Gate (FS)	$1,760.87	/Each
Essential Regeneration**		
Plant (8x8 ft spacing)	$703.08	/Acre
Stocking Surveys (3 each per acre planted)	$72.59	/Acre

** Road Maintenance terms are defined on the Terminology insert included with the Final EIS document.*
*** Includes overhead.*

Direct, Indirect and Cumulative Effects

Timber harvest from the action alternatives would contribute 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 through employment created through restoration opportunities identified outside of the timber sale contracts. Additionally, 25 percent of gross timber receipts goes directly to Kootenai and Shoshone Counties, Idaho, for public schools and roads.

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 will receive for their timber because the timber in this proposal would be part of the IPNF's normal timber program which constitutes only 10 to 12 percent of the local market.

The following table provides a summary of the financial appraisal of each alternative.

Definitions

*The **stumpage value** in the table reflects the size of timber harvested (average diameter), volume per acre, species composition, planned yarding method (helicopter, skyline, cable or tractor) and hauling distance (on paved and unpaved roads). **Timber sale costs** are those other costs that are considered in the timber purchaser's bid including contractual requirements. The timber purchaser is billed for Forest Service slash treatment to be completed after the sale.*

*The **predicted bid** is the stumpage price, minus the total of the other contractual costs. The estimated bid per thousand board feet is calculated by dividing the predicted bid by the estimated volume.*

*The **value of timber sale projects** was determined by adding all the contractual items, plus the cost of regeneration. This number indicates how much "cushion" is available in the bid before some of the projects would not be funded. It shows how much the price of a bid could fall, on the average, due to market forces and still cover anticipated work. On a sale by sale basis, this number was used to determine below cost sales when the value of timber sale projects was higher than the predicted bid sale area, by alternative.*

Table III-23. Cost/revenue summary.

Timber Sale Revenue	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
(1) Stumpage Value (gross)	NA	$1,199,000	$1,095,000	$961,000
Total MMBF	none	6.3	5.7	4.7
(2) Total CCF	none	12,254	11,154	9275
Timber Sale Costs Affecting Predicted Bid	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
(3) Road maintenance (during sale)	$0	$37,000	$34,000	$33,000
(4) Road reconditioning	$0	$52,000	$52,000	$49,000
(5) New road construction				
a) Permanent road construction	$0	$0	$0	$0
b) Temporary road construction	$0	$5,000	$5,000	$5,000
(6) Road reconstruction				
a) Brushing, ditch and shoulder earth work:	$0	$0	$0	$0
b) Upgrading existing culverts:	$0	$0	$0	$0
c) Install/remove culverts in closed roads	$0	NA	NA	NA
d) Install gates on roads presently closed	$0	$3000	$3000	$2000
(7) Road obliteration and wildlife-related road closures (Sale Contract)	$0	$36,000	$36,000	$31,000
(8) Seed skid trails and landings	$0	$5,000	$5,000	$5000
(9) Slash disposal/site prep (Purchaser)	$0	$129,000	$94,000	$116,000
(10) Slash disposal/site prep (FS)	$0	$263,000	$189,000	$188,000
(11) Noxious weed control (Purchaser)	$0	$37,000	$37,000	$35,000
(12) Total sale contract costs (sum of lines 3 through 11)	NA	$567,000	$455,000	$463,000
(13) Predicted (net) bid value (subtract line 12 from line 1)	NA	$632,000	$640,000	$497,000
(14) Predicted bid/CCF (line 13 divided by line 2)	NA	$52	$57	$54
Other Project Costs	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
(15) Reforestation	$0	$112,000	$72,000	$83,000
(16) Road obliteration and instream work (FS) for watershed restoration	$0	$0	$0	$0
(17) Road closures for wildlife security (FS)	$0	$5000	$5,000	$4,000
(18) Total Other Project Costs (subtract line 17 from line 15)	$0	$117,000	$77,000	$87,000
(19) Minimum bid (per mbf) that would fund all other projects (divide line 18 by line 2)	NA	$19	$13	$18
(20) Difference between predicted and minimum bid (per CCF) (Subtract line 19 from line 14)	NA	$33	$44	$35
Other Forest Service Costs	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**
(21) Planning	$150,000	$150,000	$150,000	$150,000
(22) Sale preparation	$0	$126,000	$115,000	$95,000
(23) Harvest and engineering administration	$0	$22,000	$20,000	$17,000
(24) Net value (subtract lines 18, 21, 22, and 23 from line 13)	-$150,000	$214,000	$275,000	$147,000
(25) Present net value (discounted)	-$150,000	$259,000	$307,000	$183,000
(26) 25% Fund (County) (multiply line 13 by 25%)	$0	$158,000	$160,000	$124,000

Alternatives 2, 3, and 4 would produce forest products over both the short and long terms; traditional employment opportunities in the woods product industry would be similarly affected. Employment opportunities would also occur from planned reforestation work and restoration opportunities under all action alternatives.

Alternative 2 contains ecosystem burning activities. Costs associated with these activities would be carried by natural fuels or appropriated funds and are not being shown as a KV opportunity.

Alternative 3, the salvage only alternative, still carries reforestation activities in many of the areas. This was because mortality from the beetle infestation has taken these sites to stocking levels so low that even a pure salvage harvest still results in a need to reforest the site. Generally in these locations, fuel treatment was changed from an underburn to a jackpot burn and planting will occur in areas where adequate site preparation was accomplished. The economics of the salvage only alternative may be seen as having a better return, but that is because less reinvestment was made into the treatment areas and because fuel treatment costs were reduced. This is especially true in the urban interface areas (where the desire to daylight ponderosa pine in conjunction with the need to retain the nutrients on poor soil types) often resulted in a need to treat the fuels more aggressively than a pure salvage harvest.

Effects of the Opportunities

Implementation of the opportunities identified in Chapter II would not have an effect on the financial viability of the proposed timber sales. However, implementation of the proposed timber sales could have an effect on how many of the activities identified as opportunities could be implemented, if those activities are dependent upon sale-related funding. As stated in the discussion of financial viability below, it is likely that there would be enough funding to finance opportunities for sale area improvements, though funding would be limited if these sales are used to meet the 25% gross revenue obligations to the counties.

Timber Management Financial Viability

Implementing stand-management treatments would depend on having financially viable timber sales that the local forest products industry is willing to purchase. Generating funds to help finance watershed and wildlife projects while having sales that are not below cost is also desirable. For such an analysis, all identifiable costs associated with timber sales (including administration, mitigation, sale preparation, and sale execution) were included.

The difference between the predicted and minimum bid per CCF (Line 20 in Table III-23) indicate how far the timber market could fall before the funding of the other projects/features (such as road closure or obliteration) that would be accomplished through contracts let by the Coeur d' Alene River Ranger District, are in jeopardy of not being funded by sale generated monies. Modeling indicates that, based on alternative analysis, stumpage is expected to finance reforestation and other projects shown as features under all action alternatives. It is also likely that there will be enough funding to finance opportunities for sale area improvements identified under this project, though it will be limited if these sales are used to meet the 25% gross revenue obligations to the counties.

The following list shows how the watershed-based analysis area units were combined into sale areas for the economic analysis.

Good Neighbor Heli =	Hayden Lake (Units 1-5) Canfield (Units 6-10, 19) Fernan (Units 11-12) Blue Creek (Units 13, 14 20-22) Thompson (Units 15-18, 23)
East Rutherford Heli Bug =	East Rutherford (1-3)
Saddle Bug Heli =	Cedar (Units 1-10) Fourth of July (Units 48-50)
Scatterwall Beetle Heli =	Fourth of July (Units 1-25, 44-47) Cataldo Face (Units 26-43)
Bug Downey =	Downey (Unit 1)
Bug Lite Salvage =	Prado (Units 1-6) Studer (Units 10-11) Cougar (Units 7-9)
Cougar Bug Heli =	Cougar (Units 1-3)
Bug Omelet Heli =	Gimlet (Units 1-21) – Lower Little NF analysis area
Owly Heli Bug =	Owl (Units 1-35) - Lower Little NF analysis area
Lil Bum Tee Bug Heli =	Little Tepee (Units 1-21) - Lower Little NF analysis
Callis Bug Ice =	Callis (Units 1-17)
Eagle Beetle Heli =	Prichard (Units 1-22)
Little King Bug =	Prichard (Units 23-24)
Potosi Beetle Heli =	Potosi (Units 1-32) - Beaver analysis area
Little White Bug =	White (Units 1-7) - Beaver analysis area
Shoshone Beetle Heli =	Shoshone (Units 1-7)

Table III-24. Cost/Revenue Summary by Sale, Small Sales EIS (dollars).

	Stumpage (gross) value			Stumpage minus contractual costs			Balance minus planting costs			Balance minus sale prep. costs		
Analysis Area	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 2**	**Alt. 3**	**Alt. 4**
Good Neighbor Heli	192,132	157,360	0	107,669	90,167	0	44,031	59,530	0	18,335	8,551	0
East Rutherford Heli	46,132	46,132,	0	26,998	26,998	0	26,998	26,998	0	11,972	11,267	0
Saddle Bug Heli	19,998	17,933	19,988	1,247	4,493	1,547	-3,159	4,493	-3,159	-9733	-1,406	-10,782
Scatterwall Beetle Heli	90,168	82,194	90,168	9,112	40,359	9,112	-18,419	22,519	-18,419	-40,019	1,871	-43,466
Bug Lite Salvage	46,816	43,016	46,816	35,455	31,694	35,455	35,455	31,694	35,455	27,942	24,320	26,743
Cougar Heli Bug	19,019	16,150	19,019	9,968	12,839	9,968	5,314	8,185	5,314	149	3,269	-675
Owl Heli Bug	76,632	74,896	76,632	41,078	39,595	41,078	39,317	37,834	39,317	22,884	21,056	20,037
Bug Omelet Heli	30,008	29,216	30,008	14,220	13,537	14,220	14,220	13,537	14,220	5,768	5,180	4,419
Lil' Bum Tee Bug Heli	70,452	57,865	70,452	36,227	24,626	36,227	35,419	23,817	35,419	12,879	3,170	9,283
Potosi Beetle Heli	110,894	98,397	110,894	54,268	54,917	54,268	46,534	49,995	46,534	16,950	21,974	12,230
Little White Bug	47,580	43,798	47,580	23,678	23,720	23,678	18,420	18,462	18,462	9,028	9,613	7,530
Little King Bug	20,,770	16,080	20,770	6,395	12,976	6,395	-1,867	12,976	-1,867	-5,624	10,027	-6,223
Eagle Beetle Bug	78,840	65,043	78,840	46,774	39,033	46,774	29,709	35,931	29,709	3,883	13,317	-238
Shoshone Beetle Heli	34,865	32,300	34,865	12,276	18,274	12,275	3,218	9,217	3,218	-5,704	368	-7,128
Bug Downey	19,296	19,296	19,296	12,709	12,709	12,709	12,709	12,709	12,709	8,953	8,776	8,353
Callis Bug Ice	295,218	295,596	295,218	193,920	194,298	193,920	193,920	194,298	193,920	138,043	135,755	128,976

Brush disposal and site preparation are included in contractual costs. If negative after planting costs, it represents a deficit sale. If negative after sale prep costs, it represents a below cost sale.

Below-cost Sales

Each action alternative, as a whole, shows a positive net value and therefore would not be below cost. Returns are modest as a result of low volumes per acre carrying slash disposal, site preparation and reforestation costs. When viewed as individual potential sales, all action alternatives have one or more below cost sales, i.e.; where projected costs for planning, field prep, and sale administration are not fully covered by projected stumpage. Under Alternative 2 (proposed action) four out of the sixteen sales (Saddle Bug Heli, Scatterwall Beetle Heli, Little King Bug, and Shoshone Beetle Heli) would be below cost. Of these, Saddle Bug Heli, Scatterwall Beetle Heli, and Little King Bug would actually be deficit sales where stumpage would not fully cover contractual and reforestation costs. Under Alternative 3 (salvage only) only one of the sixteen sales (Saddle Bug Heli) would be below cost. As explained above, Alternative 3 would be less aggressive on brush disposal and reforestation. Under Alternative 4 (no entry in old growth or roadless) six of the sixteen sales would be below cost. Alternative 4 shows less of a positive net value than Alternative 2 as a result of a lower amount of volume carrying the same level of planning costs.

In potential sale areas where contractual, planting, and sale prep costs exceed stumpage value, the opportunity exists to combine sales to improve the financial condition at the time of sale package preparation. It would be likely that Saddle Bug Heli, Scatterwall Beetle Heli, Owl Heli Bug, and Bug Omelet Heli would be combined into one sale offering of approximately 1.1 million board feet. All these sales would have a portion of their log haul route on the same road. This would reduce the cost of road maintenance that was displayed in the model if combined. Also, historical bidding and the appraisal program will reflect a higher bid price as the sale volume increases. This would likely make this sale grouping a breakeven or positive sale. It would also be likely that the sales on the east side would be offered to combine as much helicopter yarding units together as one sale, and break out as much conventional (tractor, cable, skyline yarding) into separate sales where feasible. Again, the larger the helicopter sale, the better the economics. And the more that conventional yarding can be separated from helicopter yarding, the better overall return versus weighting helicopter and conventional systems together.

Cumulative Effects

Timber sales offered 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 adversly affect the regional timber market, and thereby private landowners with timber to sell. Not managing the timber resource in these areas (as under Alternative 1 and a portion of the area in Alternative 4) would result in a loss of mature timber value. The majority of this timber component is dead as a result of insect infestation or storm damage. 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. All 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.

Consistency With the Forest Plan

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," (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.

WATERSHED RESOURCES

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.

Existing Conditions

Introduction

The assessment of existing condition describes the current condition of the project area 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), hydrologic response techniques and models such as WATSED, and other watershed and aquatic data derived by the Forest Service and other sources. 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.)

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)

Watersheds and Analysis Units: The project areas were first subdivided into manageable watershed units. Two types of units were identified: true watersheds and composite watersheds. True watersheds are areas of land in which all of the streams are interconnected and drain through a

single point. In a true watershed, all of the surface water from the watershed and its tributaries eventually converge to a mainstem channel and leave the watershed through a distinct outlet or "pore point." For example, the Beaver Creek watershed consists of Dudley Creek, Ferguson Creek, Moore Gulch, Alder Creek and all of the other small drainages that contribute water to Beaver Creek. A watershed can also drain into a lake, as in the case of Hayden Lake. True watersheds identified in the project areas include Hayden Lake, Fernan Lake, Wolf Lodge Creek, Cedar Creek, Thompson Creek, Fourth of July Creek, Cougar Creek, Shoshone Creek, Prichard Creek, Trail Creek and Beaver Creek.

For purposes of analysis, some "composite watersheds" also were used. These consist of smaller independent watersheds grouped together. Streams in composite watersheds are not as directly interconnected as those in true watersheds. For example, Hardy Gulch and Hayden Gulch are small independent streams that were grouped into the Cataldo Face analysis areas. Composite watersheds in the project area include the Canfield face drainages, Lower Little North Fork and Cataldo Face. These are referred to as "watershed areas."

Each of 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 areas.

Methodology Used to Describe the Existing Conditions

Each watershed or watershed area that was analyzed in the project is characterized in the tables of Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances. The following descriptors are used in the tables to describe the existing watershed.

Physical Characteristics

HUC (Hydrologic Unit Code): The HUC is a hierarchal watershed classification. The first 8 digits of the HUC number (17010304) represents 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.

- Not properly functioning: Watershed systems that are not properly functioning often exhibit rapid adverse trends and may not fully support beneficial uses.

Hydrologic 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

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 (ICBEMP science assessment findings).

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

Road Encroaching at Bankfull Stage (mi): The length of road in miles that impinge on stream channels at the bankfull ($Q_{1.5}$) stage.

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.

Stream Crossings

Number of Inventoried Stream Crossings: The total number of inventoried stream crossings in the watershed or watershed area.

Risk of Failure for Inventoried Crossings (t/yr): The risk of failure for each inventoried crossing is calculated as the probability of failure (p) in a given year times the fill volume (v). Risk estimates are summed for each watershed or watershed area.

Number of Estimated Crossings: The number of uninventoried stream crossings in a watershed or watershed area estimated from GIS maps and field data.

Risk of Failure for Uninventoried Crossings (t/yr): A risk estimate for the uninventoried crossings in a watershed or watershed area.

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.

Environmental Consequences

Introduction

As stated earlier in the Affected Environment portion of this section, each of the analysis areas assessed were analyzed on at least two scales: the local site or tributaries where activities occur 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 drainage area for the watershed or watershed area is identified in square miles as derived from GIS analyses. Cumulative effects analyses were addressed for the entire watershed at this level. In order to facilitate supportable assessment of forest practices and logging effects, particularly the portion of those assessments that involved watershed modeling, the downstream limit of the analysis watershed was defined at a point where the watershed is essentially defined by National Forest System (NFS) lands. The reason for this adjustment was to maintain the use of the models within the scope that they were calibrated and validated, which is on NFS lands where landtypes have been mapped and disturbance histories (roading and logging) are known to the necessary resolution. The interpretations of modeled estimates for NFS watersheds are combined with other data, analyses, inventories, and other information and professional judgement to address the entire watershed, including that portion downstream of NFS lands.

In every case, the adjustments of the watershed to any effects of the project activities individually or cumulatively are expected to remain within tributaries of the cumulative effect watersheds or watershed areas. No physical response would extend to or be measurable in the Coeur d'Alene River or Coeur d'Alene Lake below the project watersheds or in the Spokane River.

Lake Coeur d'Alene flows into the Spokane River which eventually combines with the Upper Columbia River far downstream. No effects would reach either point.

Effects Common to All Alternatives

There are several effects common that would occur with any 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 is discussed.

Effects of Encroaching Roads

Effect on Stream Condition: Encroaching roads impinge on the stream channel. They reduce stream capacity at high flow, increase local velocities, and redistribute sediment loads. 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, which can compromise the support of beneficial uses. During flood flows, increased flow depth can undercut the opposite bank. Mass failure can occur and introduce sediment into the stream if the slope is destabilized.

Effect of Roadfill: Encroaching roads are prone to failure and sediment delivery due to roadfill erosion (especially during high flows) and proximity to these stream. The closer a road is to the stream, the smaller the expanse of forest floor 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.

During and after road removal, some fine sediment would be delivered to the water. The majority of sediment delivered to the stream would be in the form of suspended sediment. The suspended sediment would route through the stream system quickly and the primary effect would be short-term turbidity (loss of clarity of the water). The increase in turbidity would be measurable for a short time immediately following disturbance and would be evident for short distances downstream from the fill removed (generally less than 1,000 feet). The amount of sediment from road fill removal would be low compared to the long-term effects of non-removal. Standard Best Management Practices (including silt fences, mulch, and coffer structures to de-water the work site) as well as other erosion control techniques would minimize the amount of sediment delivered in the short-term. The re-establishment of effective vegetation would essentially eliminate long-term sediment inputs.

Tree Mortality and its Effect on Stream Temperature

At the tributary scale, stream temperature would not be change in most 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. The loss of shade from this mortality would not be expected to increase water temperatures locally or downstream due to high mixing capacity of most mountain streams, inflow of subsurface water, and/or the low amount mortality of shade trees in riparian areas.

Effects of Stream Crossing Failures on Abandoned or Unmaintained Roads

Extensive road networks were constructed in the 1960's throughout the analysis area. Typically these older roads were designed for a useful life of 20 years, including the crossing structures. The majority of these roads presently are 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, will fail over time. These failures usually occur during large, infrequent hydrologic 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 Sediment from Temporary Road Construction

Temporary roads are equivalent to system roads in that they are designed and planned as part of the transportation network. The difference is that a temporary road is intended to be restored to a hydrologically inert state after use. Slope stability would be restored, surface erosion would be eliminated, and all crossings (if present) and associated fill would be removed from the channel and floodplain and stabilized. The site should need no future maintenance after this restoration. The restoration of the site of a temporary road would be the responsibility of the timber sale purchaser before the end of the timber sale contract (approximately 2 years), except where roads are needed for reforestation.

Temporary roads would cause the same risk to water resources as any other road when they are in place. There would be some additional risk with temporary roads in that they are not designed to the same specifications as a system road. Locations, however, would either be specified or agreed upon between the timber sale purchaser and the timber sale administrator or engineer, to reduce impacts as much as possible, and shorten the period that the road is on the landscape.

Effects of Stream Crossings

Stream crossing or pipe upgrades: The risk of crossing failure would be reduced by 1) increasing the size of a culvert/crossing structure, 2) removing the structure, or 3) providing flow relief/overflow culverts in the event of excess streamflows or blockages. Effects avoided would include increased turbidity, increased sediment, loss of quality habitat, and decreased channel stability.

Armored bypass installation: Armored bypass dips reduce the risk that the fill would enter the stream if a culvert plugs or flow exceeds its capacity. The armored dip allows water to flow over the road without eroding the fill. As with any construction or restoration activity, incidental fine sediment could enter the stream in the short term. This incidental loading would be far overshadowed by the long-term and pronounced reduction of risk from the failure of the crossing.

Stream crossing maintenance or upgrade: Regular maintenance of stream crossings would reduce sediment delivery to streams. Additional cross drainage structures installed away from the live stream would capture sediment coming from the road surface and ditch and reroute it to the forest floor. This would not eliminate sediment delivery, but would reduce the amount currently delivered to the stream.

Effects of Installation of Relief Culvert Crossings

Installation of relief culverts would reduce the timing, magnitude and quantity of surface runoff because runoff from the ditch line would be dispersed and allowed to infiltrate into the forest floor. The dispersion of surface runoff would help "normalize" the flow regime of a basin by recharging the groundwater. The groundwater would slowly release into the live streams.

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.

Effects of Stream Crossing Failures on 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 of Stream Crossing and/or Large Fill Failures

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.

General Localized/Site Scale Effects to Sediment Delivery

No sediment would be expected to be delivered to streams from logging yarding activities because of the implementation of Best Management Practices. Yarding activities also 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. These mitigation measures are included in Chapter II.

Protecting Desirable Stream Temperatures

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 Small Sales project. Therefore, the proposed Small Sale project activities would not impact existing stream temperatures.

General Effects of Grazing

The effects of grazing in the Small Sale EIS Project Areas have been documented in the Environmental Assessment for Coeur d'Alene River Grazing Allotments (2001). Grazing allotments within the project areas are identified in the Reasonably Foreseeable Activities section in Table II-5. 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. Direct effects to stream conditions in the project areas would consist of localized areas of bank trampling and erosion, primarily in the lower reaches of Hayden, Marie and Mokins Creeks (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).

Methodology

The effects of proposed management (including restoration activities) were evaluated for each alternative based on field data, hydrologic models, previous analyses and professional experience. The effects of reasonably foreseeable activities were included. Results are presented as a narrative discussion supported by a table of "indicator" variables used in the analysis. The table of "Projected Watershed Response" for each watershed includes the indicators, their units of measure, and references. The tables are followed by a narrative discussion of projected direct, indirect, and cumulative effects in each watershed. A more detailed explanation of each indicator is provided in the "Watershed Hydrologic Response Estimates" discussion in the "Affected Environment" section and the project records.

The Forest Service used the indicators in the analysis to evaluate and compare the benefits of restoration and the effects of management. Proposed activities were designed (and would be implemented) so that the net result would either *maintain* or *improve* water quality. The Small Sales project is a salvage timber sale with minor planned watershed restoration. In all case, harvest activities were designed in such a way that no significant negative effects would occur and water quality will be maintained. The following is a brief discussion of each indicator.

Sediment Yield (%): Sediment yield, reported as the percent change above the estimated natural conditions, was estimated using the WATSED model (See Project Files, WATSED) for the year 2001. Proposed timber harvest units, temporary road construction, and site-preparation treatments are included in the analysis. WATSED was not used for evaluating the effects of restoration projects.

Peak Flow (%): The change in runoff estimated by WATSED 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 new road construction and decreases from watershed restoration activities.

Net Associated Risk (t/yr): The anticipated change in sediment risk in tons/year from inventoried roads. These values reflect increases from new road construction and decreases from watershed restoration activities. The inventory did not include all stream crossings within each analysis area, but focused on high-risk areas. The risk associated with uninventoried stream crossings was not included. However, the removal of uninventoried stream crossings would reduce the sediment risk beyond that reported.

Net Roads (mi): The net change in road mileage in each watershed. These values reflect increases from new road construction (permanent) and decreases from watershed restoration activities. Proposed temporary roads are not 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.

Methods for Cumulative Effects Analysis in the Small Sales Project

Cumulative Effects Analysis on National Forest land

The Small Sales project is a salvage sale covering a large area. Within this large area, widely scattered, relatively isolated patches of beetle-infected trees would be selectively harvested to salvage dead and dying trees along with a few areas of regeneration and improvement cuts. The loss of forest canopy would be very low and similar to that which would be lost to beetle mortality under the no action alternative. Approximately 0.75 miles of temporary road would be built and removed following harvest.

We used a two-fold approach to cumulative effects analysis for this project. The first approach was applied to those harvest areas proposed under the Small Sales EIS that were previously analyzed under the Douglas-fir Bark Beetle FEIS (USDA Forest Service, 1999). The second approach was applied to areas not covered under the Beetle FEIS.

Areas covered under the Douglas-fir Beetle FEIS: These areas include Beaver Creek, Thompson Creek, Fernan Creek, Fourth of July Creek, Cedar Creek, Wolf Lodge Creek, and Hayden Creek. In all of these areas, the actual harvest implemented on the ground was substantially less than planned

under the Douglas-fir Beetle FEIS. The amount of harvest proposed under the Small Sales EIS, combined with the actual harvest under both projects, was in all cases less than the amount of harvest analyzed under the Douglas-fir Beetle FEIS. As a result, the cumulative effects of harvest proposed under the Small Sales EIS would be smaller than the effects projected by the Beetle FEIS. The proposed activities under the Small Sales EIS fall within the scope of the original Douglas-fir Beetle analysis.

For the areas covered under the original Douglas-fir Bark Beetle FEIS, we relied solely on this original analysis to portray the cumulative effects of all activities. No further cumulative effects analysis was performed for the Small Sales EIS. For each area or watershed, the reader is referred to the cumulative effects section of the original Douglas-fir Bark Beetle analysis.

Areas not covered under the Douglas-fir Beetle FEIS: These areas include Trail Creek, Downey Creek, Shoshone Creek, Prichard Creek, Cougar Creek, Prado Creek, Blue Creek, Cataldo face, Canfield Face, and face drainages in the Lower Little North Fork. Within these areas, Beaver Creek, Downey Creek, and Trail Creek watersheds had the highest levels of proposed harvest per acre of watershed area. Beaver and Downey Creeks both had proposed temporary road construction. Trail Creek has no road construction, but included 9.5 acres of tractor logging on sensitive landtypes. Consequently, these three watersheds had the potential to incur the greatest impacts from management activities proposed under the Small Sales EIS.

We assumed that the three highest risk watersheds would reflect the areas with the highest level of effects. The analysis showed that the effects were very slight, even in these highest-risk watersheds. Therefore, the rest of the watersheds were not modeled in this document because the effects would be small to none. WATSED runs can be found in project files. Even though Beaver Creek was analyzed under the Douglas-fir Beetle FEIS, it was modeled for the reasons described in the preceding paragraph.

Cumulative Effects for Non-National Forest lands

Two categories of private land adjacent to Forest Service occur within the Small Sales project area. The first includes “landlocked” private inholdings (those surrounded by National Forest lands). The second is private land located downstream of National Forest land. Cumulative effects were considered for both of these situations.

Landlocked private land occurs in Fourth of July and Callis Creeks. Management activities occurring on these private lands could combine with activities from the Small Sales project to produce cumulative watershed effects. However, no management activity is anticipated on these private lands.

All other private land adjacent to the Small Sales project area is located downstream of National Forest land (e.g., lower portions of Prichard and Beaver Creeks). The Forest Service has no control over management on these lands, but it does ensure that the quality of the water leaving National Forest System 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 Small Sales project and was not performed.

Rain on Snow Analysis: No rain-on-snow model was run for the Small Sales project area. As discussed earlier, the project consists primarily of widely scattered, relatively isolated patches of beetle-infected trees with a few areas of regeneration and improvement cuts. 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 the Small Sales EIS because few openings would be created. The Beaver Creek watershed has the highest potential for increase in rain-on-snow magnitude. Under Alternatives 2 and 4, harvest of 257 acres would result in approximately 29 acres of Equivalent Clearcut Area (ECA). This amounts to 0.1% of the watershed. Crown openings (which are the main risk factor for rain-on-snow) would be negligible because the 29 acres of ECA is scattered throughout the 257 acres of harvest rather than grouped together, and much of the canopy has already been lost to beetle mortality.

The percent ECA associated with other areas of the Small Sales EIS are comparable to those modeled in WATSED or lower (Project Records, WATSED Reports). In addition, harvest of dead trees mimics the loss of forest canopy that would occur under the no-action alternative as a result of beetle mortality. No appreciable new openings would be created. The magnitude of change for rain-on-snow events, if any exists, would be insignificant under any of the action alternatives.

Hayden Lake Analysis Area

Overview

The Hayden Lake watershed is approximately 41,400 acres and is comprised of numerous first, second, and third order streams that drain into Hayden Lake. Hayden Lake is essentially a closed basin - it is not directly connected to a parent stream. It is however, a principle source of groundwater to the Rathdrum Aquifer. Hillslopes are generally steep (40 to 60 percent) and vegetated predominately with conifers. Management activities such as timber harvest and road building has occurred in most of the tributaries to varying degrees. Much of the lower watershed and lake shore include or are adjacent to private land. Activities that have occurred on this urban interface include timber harvest, road building, cattle grazing, agriculture, residential development, and water-based recreation.

The Hayden Lake watershed is considered to be functioning at risk, although it includes some tributaries either properly functioning or non-functioning. In general, watershed and aquatic integrity are still high, but at risk from continued disturbances. Functioning-at-risk watersheds are considered the highest priority for watershed restoration and improvement.

Beneficial uses within the Hayden Lake Watershed include Salmonid Spawning, Cold Water Biota, Water supply for both Drinking and Agricultural, and Recreation as listed in the 1992 Idaho Water Quality Status Report. Hayden Lake is listed as a 303d waterbody by the Environmental Protection Agency 1998 report for nutrients and sediment.

Approximately 13 miles of road restoration has recently been completed associated with the

Deersham and Yellow Stacel timber sales. Work included removal of 24 road channel crossings, stabilizing unstable road sections, erosion control and upgrading culvert sizes to reduce failure potential and provide fish passage. Stream stabilization and fisheries improvement work has also been completed in the North Fork of Hayden Creek.

Foreseeable activity within the Hayden Creek watershed includes the removal of dead and dying Douglas-Fir associated with the Douglas-fir Beetle Project. Reasonably foreseeable funded watershed improvement work includes the removal of 24 miles of road, 40 road channel crossings, and numerous culvert upgrades to meet 100-year flood events. Included in the 24 miles of road that will be removed is a reduction of 2.4 miles in encroaching roads throughout the Hayden Lake Watershed.

Streamflow Regime

The hydrology of the Hayden Lake Watershed and all its major tributaries has been altered by past timber harvest and road building, in several respects. No quantitative data exists, but monthly peak flows are probably elevated above natural conditions due to past timber harvest activities and road building. It can also be inferred that periods of spring peak flow are longer in duration (Troendle and King, 1983).

Approximately 45% of the Hayden Lake watershed is in an elevation band sensitive to rain-on-snow events, but the equivalent clearcut area (ECA) is only 3%, representing a small increase in risk from rain-on-snow events over natural conditions.

The effective gradient of some of the channels has been increased. Many headwater channels have had large woody debris (pool creators) removed during timber harvest, several of the smaller tributaries that have been straightened by road placement.

Stream Channel Stability

Roads which encroach into stream channels or flood-prone areas are common in Hayden Creek and several of it's tributaries. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Frequent road failures have caused excess sediment introduction, particularly during the flood of 1996 when a section of Road 625 and the channel crossing at Bradbury Gulch failed, introducing a substantial volume of roadfill into the North Fork of Hayden Creek. Of all the encroaching roads within the Hayden Lake Watershed, removal of the 625 would be the highest priority for removal due to the potential sediment production along the .8 miles that encroach directly on the North Fork of Hayden Creek.

Encroaching road density is estimated to be .03 miles/total miles of stream length, with a total of 13.8 miles of riparian road. Ten drainage structures were determined to be fish migration barriers along the 13.8 miles of riparian roads within the Hayden Lake Watershed.

Within the Hayden Lake Watershed, 8 percent of the linear riparian influenced area has been directly affected by past regeneration harvest. An estimated 5 miles of riparian road has reduced stream shading to the extent that local water temperatures may be affected. This represents a relatively low

amount of past riparian harvest within the watershed, representing minimal effects compared to encroaching roads and road channel crossing failures.

Water Quality

Approximately 288 miles of road and 186 road channel crossings exist in the Hayden Lake Watershed, with road densities of 5.67 miles/square mile of area. The stream crossing frequency throughout the watershed is approximately 1.62 stream crossings/mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the watershed, 19 percent of the watershed is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 21 percent of the miles of road on these same sensitive land types. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "removing" of channel debris. The majority of the road channel crossings at increased risk for failure are located on unmaintained or irregularly maintained roads. Failures of these road channel crossings and the continual bank erosion and road fill failures of the streamside roads are the primary sediment contributors and component of disturbance to the lower to mid elevation areas of the watershed.

Table III-25. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Hayden Lake Watershed.

Physical Characteristics	
HUC: 170103051203	
Drainage Area (square miles)	65
Sensitive Landtypes (percent of watershed)	19
Sensitive Snowpack (percent of watershed)	45
Qualifications	
Is all or part listed as Water Quality Limited?	Yes, Hayden Lake
Apparent Watershed Status	Functioning-at-Risk
Subwatersheds used for analysis	Lancaster Creek
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	17
Current Runoff Modification (percent of peak)	5
Equivalent Clearcut Area (percent of watershed)	3
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	14
Current Sediment Load Modification (percent)	148
Road Density (miles/mile2)	5.7
Sensitive Road Density (miles/mile2)	0.9
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	3.5
Riparian Road Density (miles/mile2)	0.1
Stream Crossings	
Number of Inventoried Crossings	67
Risk of Failure for Inventoried Crossings (tons/year)	100
Number of Estimated Crossings	42
Risk of Failure for Estimated Crossings (tons/year)	269
Stream Crossing Frequency (#/mile of stream)	1.6
Number of Fish Migration Barriers	10

Cumulative Effects for Action Alternatives

The cumulative effects analysis area in the Hayden Lake watershed extends from the headwaters in Hayden Creek to the boundary between National Forest and private ownership. Earlier analysis of this cumulative effects area was completed in 1999 in the Douglas-fir Beetle Project FEIS. The analysis for this Small Sales EIS was based on: 1) the planned activity in the Douglas-fir FEIS and ongoing activities at the time, 2) what was actually implemented under the Douglas-fir FEIS, and, 3) the planned activities under the Small Sales EIS.

Cumulative effects of 1637 acres of harvest were analyzed under the selected alternative of the Douglas-fir Beetle FEIS. Approximately 1087 acres (66%) were actually harvested (See Project Records, Douglas-fir Beetle Project, Comparison of Planned Versus Implemented Harvest and Road Activities, 3 pages). Under Alternatives 2 and 3 of the Small Sales EIS, 19 additional acres of timber harvest are proposed in the Lancaster Creek watershed. No harvest would occur under alternative 4. No roads would be built under any alternative. The cumulative 1,106 acres of harvest is approximately 67% of what was analyzed in the Douglas-fir Beetle Project FEIS. The risk of negative cumulative effects to beneficial uses is actually lower than what was analyzed for Alternative D of the Douglas-fir Beetle Project EIS. The positive effects of watershed improvement associated with the Douglas-fir Beetle FEIS are continuing. Cumulative effects of proposed management under the Small Sales EIS fall within the scope of the Douglas-fir Beetle FEIS and are discussed on pages III-150 to III-153 of the Douglas-fir Project FEIS.

Table III-26. Projected watershed response in the Hayden Lake Watershed, by alternative.

Each measure of change in the table is discussed above in the "Methodology" section.

WATERSHED NAME: Hayden Lake Watershed	HUC: 170103051203
TRIBUTARY: Hayden Creek	HUC: 170103051203

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	159	**	**	159
Peak flow (%)	5	**	**	5
Net stream crossings (#)	-23	-23	-23	-23
Net associated risk (tons/year)	-121	-121	-121	-121
Net roads (miles)	-16	-16	-16	-16
Net encroaching road (miles)	-0.8	-0.8	-0.8	-0.8

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative. Net risk reductions in sediment due to restoration under alternative 1 may not be measurable, but sediment reductions would contribute to the stability of the stream channel at the watershed scale.*

Direct and Indirect Effects at the Tributary and Localized Scales (Lancaster 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 within Lancaster Creek. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat. The sediment yield and peak flow estimates in the table under Alternative 1 represent the cumulative expected responses based on forest development activities over time throughout the watershed. The estimates assume standard BMPs and Soil and Water Conservation Practices. The estimates under alternative 1, from the Douglas-fir Beetle Project FEIS Alternative D, are not expected to change under any of the action

alternatives of the Small Sale EIS. This conclusion is based on the decreased amount of harvest and road construction under the Douglas-fir Beetle FEIS and the small amount of harvest and no road construction proposed with this EIS under Alternatives 2 and 3.

Under Alternatives 2 and 3, 0.2 acres of tractor logging on sensitive landtypes would occur. The direct effects of the proposed harvest adjacent to small first-order streams would include minimal delivery of sediment at localized sites, but no measurable indirect effects to streams with the implementation of riparian buffers and BMP's.

The direct and indirect effects of canopy removal at localized sites under all alternatives within Lancaster Creek 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. No measurable effects would occur in stream channel conditions.

Canfield Face Analysis Area

Overview

The Canfield Face is a series of two small first order streams that drain into private land to the west. Valley sideslopes are generally steep (40 to 60 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred on the private ownership to the west, mostly ice storm and beetle-kill clean up. No activity has occurred on National Forest System lands within these small drainages. Adjacent face drainage National Forest System lands in the past have also had salvage operations associated with ice storm damaged timber, but no significant harvest activities. This area was not designated in the Coeur d'Alene Geographic Assessment. Beneficial uses along the Canfield are not listed in the 1992 Idaho Water Quality Status Report. No watershed improvement work has occurred or is a foreseeable action in this area.

Streamflow Regime

The hydrologic regime within the two small face drainages has not been altered as a result of timber harvest from National Forest System lands. A small increase may be contributed to the less than half mile of road that traverses across these small tributaries, but would not be measurable. Monthly peak flows can be presumed to be elevated from activities on private land and mortality from ice storm and Douglas-fir beetle. Due to the maritime influence, this area is at high risk from rain-on-snow events.

Stream Channel Stability

Within these face drainages on National Forest System lands encroaching road sections exist only at the road channel crossings, which are high in the drainage and most likely above the emergence of perennial or intermittent streams.

As previously discussed, increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Within the Canfield Face, no riparian influenced area has been directly affected by past harvest.

Water Quality

Approximately .4 miles of road and 3 road channel crossings are estimated to exist within these face drainages on National Forest System lands. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. The risk of future sediment loading within these face drainages is low due to the location of the channel crossings on the hillslope which is likely above the emergence of perennial or intermittent streams.

Table III-27. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Canfield Face.

Physical Characteristics	
HUC: 1701030512120	
Drainage Area (square miles)	0.21
Sensitive Snowpack (percent of watershed)	100
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Not Classified in GA
Subwatersheds used for analysis	Unnamed Tributaries
Erosion and Sediment	
Road Density (miles/mile2)	1.9
Channel Conflicts	
Riparian Road Density (miles/mile2)	0
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	7.5
Number of Fish Migration Barriers	0

Cumulative Effects

All of the proposed activities would occur in two small face drainages along the Dalton Gardens face. These face drainages with proposed management drain directly into private land. The cumulative effects analysis area extends from the headwaters of these face drainages to the border between National Forest System lands and private. No short- or long-term effects to beneficial uses are expected at the watershed scale. No apparent changes in sediment yields is expected to occur because all yarding would be done by helicopter. Some short-term changes in timing, and increases in the magnitude and quantity of flow is expected under all alternatives at this scale, including the No-Action Alternative (please refer to the Methodology Section, “Methods for Cumulative Effects Analysis in the Small Sales Project,” page III-101). The increase in flow is primarily due to the mortality of trees caused by the Douglas-fir beetle. The risk of increasing the magnitude of rain-on-snow events above the No-Action Alternative would be low (please refer to the Methodology Section, “Rain-on-Snow Analysis,” page III-103). No measurable cumulative effects would occur over the No-Action Alternative.

Table III-28. Projected watershed response in the Canfield Face, by alternative.

Each measure of change in the table is discussed above in the "Methodology" section.

WATERSHED NAME: Canfield Face	HUC: 1701030512120
TRIBUTARY: Canfield Face	HUC: 1701030512120

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

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative.*

Direct and Indirect Effects at the Tributary and Localized Scales

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. No increase in sediment is expected over the No Action Alternative. Some short-term changes in timing, and increases in the magnitude and quantity of flow is expected under all alternatives at this scale, as at the watershed scale. This increase in flow is primarily due to the mortality of trees caused by the Douglas-fir beetle and is not expected to exceed increases in water yield over the No-Action Alternative. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat.

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. The small amount of additional mortality due to harvest of green trees from the improvement cuts and the small regeneration harvest unit, and those that are dead and dying would not likely result in a measurable increase in magnitude or quantity of flows for any of the alternatives. No measurable effects are anticipated in stream channel conditions.

The cumulative effects from management activities most likely would not be discernible at this scale for increases in peak flows or sediment over what would occur under the No-Action Alternative.

Fernan Creek Analysis Area

Overview

Fernan Creek Watershed is an 18.8 square mile sixth scale Huc watershed, with 13.3 square miles on National Forest System lands. Valley sideslopes are generally steep (50 to 70 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred on both National Forest System lands and on private ownership within the Fernan Creek Watershed. The Fernan Creek Watershed is considered not properly functioning in the Coeur d'Alene Geographic Assessment and is listed as a 303d 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

Beneficial uses within the Fernan Creek Watershed are Salmonid Spawning, Cold Water Biota, Water supply for both Drinking and Agricultural, and Recreation as listed in the 1992 Idaho Water Quality Status Report.

Watershed improvement work completed within the Fernan Creek Watershed includes the removal of 2 miles of road and the removal of 5 road channel crossings under the Jungleberry Timber Sale.

Foreseeable activity within the Fernan Creek watershed includes the removal of dead and dying Douglas-Fir associated with the Douglas-fir Beetle Project. Reasonably foreseeable funded watershed improvement work includes the removal of 17 miles of road, 34 road channel crossings, and numerous culvert upgrades to meet 100-year flood events. Included in the 17 miles of road that will be removed is the one and a half mile streamside road up Dry Gulch which encroachs .8 miles of the streams length.

Streamflow Regime

The hydrologic regime within the Fernan Creek watershed has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, the Fernan Creek Watershed is at moderate to high risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events.

The equivalent clearcut area in the Fernan Creek watershed is approximately 6 percent. This represents a slight increased risk from rain-on-snow events over natural conditions.

Stream Channel Stability

Encroachment by streamside roads is the dominant feature of the riparian areas within the Fernan Watershed. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. No streamside road failures have been documented to date with the majority of streamside road on private land or county jurisdiction. A total of .8 miles on National Forest Lands within the watershed is estimated to encroach directly on the stream channel. These sections of road can directly compromise stream hydraulics and reduces stream shading to the extent that local water temperatures may be affected. The majority of the encroaching road sections are planned for removal under the Douglas-Fir Bark Beetle Project.

As previously discussed, increased bedload supply and bed mobility can result from riparian harvest

and may result in increases in streambank erosion. Within the Fernan Lake Watershed, 15 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 69 miles of road and 61 road channel crossings exist in the Fernan Creek Watershed area, with road densities of 5.2-miles/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 which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the Fernan Creek watershed, 22 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 12 percent of the miles of road on these same land types. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-29. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Fernan Creek Watershed.

Physical Characteristics	
HUC: 170103031301	
Drainage Area (square miles)	13.3
Sensitive Landtypes (percent of watershed)	22
Sensitive Snowpack (percent of watershed)	58
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Not properly Functioning
Subwatersheds used for analysis	Entire Watershed
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	17
Current Runoff Modification (percent of peak)	9
Equivalent Clearcut Area (percent of watershed)	6
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	20
Current Sediment Load Modification (percent)	151
Road Density (miles/mile2)	5.2
Sensitive Road Density (miles/mile2)	1.2
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	0.8
Riparian Road Density (miles/mile2)	0.4
Stream Crossings	
Number of Inventoried Crossings	25
Risk of Failure for Inventoried Crossings (tons/year)	137
Number of Estimated Crossings	43
Risk of Failure for Estimated Crossings (tons/year)	79
Stream Crossing Frequency (#/mile of stream)	2.0
Number of Fish Migration Barriers	2

Cumulative Effects

The cumulative effects analysis area in the Fernan Lake watershed extends from the headwaters near Fernan Saddle to a point on Fernan Creek approximately 3 miles above Fernan Lake. The lower portions of Fernan Creek below Dry Gulch are under private ownership. Earlier analysis of this cumulative effects area was completed in 1999 in the Douglas-fir Beetle Project FEIS. The analysis for this Small Sales EIS was based on: 1) the planned activity in the Douglas-fir FEIS and ongoing activities at the time, 2) what was actually implemented under the Douglas-fir FEIS, and, 3) the planned activities under the Small Sales EIS.

Cumulative effects of 1429 acres of harvest were analyzed under the selected alternative of the Douglas-fir Beetle FEIS. Approximately 556 acres (39%) were actually harvested (See Project Records, Douglas-fir Beetle Project, Comparison of Planned Versus Implemented Harvest and Road Activities, 3 pages). Under Alternatives 2 and 3, of the Small Sales EIS, 67 and 34 additional acres respectively of timber harvest are proposed in the Fernan Creek watershed. No harvest would occur under alternative 4. No roads would be built under any alternative. The cumulative 623 acres of harvest in Alternative 2 is approximately 44% of what was analyzed in the Douglas-fir Beetle Project FEIS. The cumulative 590 acres of harvest in Alternative 3 is approximately 41% of what was analyzed in the Douglas-fir Beetle Project FEIS The risk of negative cumulative effects to beneficial uses is actually lower than what was analyzed for Alternative D of the Douglas-fir Project EIS. The positive effects of watershed improvement associated with the Douglas-fir Beetle FEIS are continuing. Cumulative effects of proposed management under the Small Sales EIS fall within the scope of the Douglas-fir Beetle FEIS and are discussed on pages III-153 to III-155 of the Douglas-fir Project FEIS.

Table III-30. Projected watershed response in the Fernan Lake Watershed, by alternative.

Each measure of change in the table is discussed above in the "Methodology" section.

WATERSHED NAME: Fernan Lake	HUC: 170103030201
TRIBUTARY: Fernan Creek	HUC: 170103030201

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	151	**	**	151
Peak flow (%)	9	**	**	9
Net stream crossings (#)	-34	-34	-34	-34
Net associated risk (tons/year)	-122	-122	-122	-122
Net roads (miles)	-13	-13	-13	-13
Net encroaching road (miles)	-.8	-.8	-.8	-.8

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative. . Net risk reductions in sediment due to restoration under alternative 1 may not be measurable, but sediment reductions would contribute to the stability of the stream channel at the watershed scale.*

Direct and Indirect Effects at the Tributary and Localized Scales

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. No increase in sediment would be expected at the tributary scale with no planned road construction or reconstruction. The implementation of Best Management Practices (BMPs) and adherence with the

Inland Native Fish Strategy would provide protection for riparian habitat. The estimates under alternative 1, from the Douglas-fir Beetle Project FEIS Alternative D, are not expected to change under any of the action alternatives of the Small Sale EIS. This conclusion is based on the decreased amount of harvest and road construction under the Douglas-fir Beetle FEIS and the small amount of harvest and no road construction with this EIS in alternatives 2 and 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. No measurable effects would occur in stream channel conditions.

Blue Creek Analysis Area

Overview

Blue Creek Watershed is a 10.2 square mile fourth-order watershed, with 6.5 square miles on National Forest System lands. The majority of the Blue Creek Watershed is in private ownership and has substantial development. Valley sideslopes are generally steep (50 to 60 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred on both National Forest System lands and on private ownership within the Blue Creek Watershed. The Blue Creek Watershed was not assessed for functioning condition in the Coeur d'Alene Geographic Assessment

Beneficial uses within the Blue Creek Watershed were not listed in the 1992 Idaho Water Quality Status Report.

Within the Blue Creek watershed, a total of 9 miles of road has had watershed improvement work completed. Work included removal of 22 road channel crossings, stabilizing unstable road sections, and applying erosion control under the Jungleberry Timber Sale.

Streamflow Regime

The hydrologic regime within the Blue Creek watershed has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, Blue Creek drainage is at low risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events.

Stream Channel Stability

Within the Blue Creek drainage on National Forest System lands encroaching road sections exist only at the road channel crossings, which the majority are high in the drainage and most likely above the emergence of perennial or intermittent streams. The majority of high-risk road channel crossings have been removed.

As previously discussed, increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Within the Blue Creek drainage, 13 percent riparian influenced area has been directly affected by past regeneration harvest. This represents a relatively low amount of past riparian harvest within the watershed.

Water Quality

Approximately 26 miles of road and 19 road channel crossings exist in the Blue Creek Watershed on National Forest System lands. Road densities of 4.0-miles/square mile of land. The stream-crossing frequency throughout the watershed is approximately 1.5 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the Blue Creek watershed, 22 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 23 percent of the miles of road on these same land types. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-31. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Blue Creek Watershed.

Physical Characteristics	
HUC: 17010303001500	
Drainage Area (square miles)	6.5
Sensitive Landtypes (percent of watershed)	22
Sensitive Snowpack (percent of watershed)	31
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Not Classified in GA
Subwatersheds used for analysis	Entire Watershed in Federal Ownership
Erosion and Sediment	
Road Density (miles/mile2)	4.0
Sensitive Road Density (miles/mile2)	0.9
Channel Conflicts	
Riparian Road Density (miles/mile2)	1.0
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	1.5
Number of Fish Migration Barriers	0

Cumulative Effects

The cumulative effects analysis area in the Blue Creek watershed extends from the headwaters to the National Forest and private ownership boundaries. No short- or long-term effects to beneficial uses are expected at the watershed scale. No changes in sediment yields are expected with all helicopter yarding and no road construction. No changes in peak flows are anticipated under any of the action alternatives over the no action alternative with the majority of the harvest removing dead and dying timber. There would be no measurable direct or indirect or cumulative effects on the timing,

magnitude or quantity of flow under any alternative at the watershed scale (please refer to the Methodology Section in this chapter, "Methods for Cumulative Effects Analysis in the Small Sales Project," page III-101). Local or watershed-scale changes in flood frequency would not be measurable or affect stream or channel structure at this scale. The risk of increasing the magnitude of rain-on-snow events above the no action alternative is low (please refer to the Methodology Section in this chapter, "Rain-on-Snow Analysis," page III-103). Alterations in hillslope processes would not affect values or beneficial uses at the watershed scale.

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

Table III-32. Projected watershed response in the Blue Creek Tributary of the Coeur d'Alene Lake Watershed, by alternative.

Each measure of change in the table is discussed above in the "Methodology" section.

WATERSHED NAME: Coeur d'Alene Lake Area	HUC: 17010303001500
TRIBUTARY: Blue Creek	HUC: 17010303001500

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

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative.*

Direct and Indirect Effects at the Tributary and Localized Scales

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. No increase in sediment is expected over the No Action Alternative. Some short-term changes in timing, and increases in the magnitude and quantity of flow is expected under all alternatives at this scale. This increase in flow is primarily due to the mortality of trees caused by the Douglas-fir beetle and is not expected to exceed increases in water yield over the No-Action Alternative. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat.

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. The small percentage of additional mortality due to harvest of green trees would not result in a measurable increase in magnitude or quantity of flows for any of the alternatives. No measurable effects would occur in stream channel conditions.

The cumulative effects from management activities most likely would not be discernible at this scale for increases in peak flows or sediment over what would occur under the No-Action Alternative

Thompson Creek Analysis Area

Overview

Thompson Creek Watershed is a 3.8 square mile third-order watershed, with 2.6 square miles of National Forest System lands. Valley sideslopes are generally steep (50 to 70 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred on both National Forest System lands and on private ownership within the Thompson Creek Watershed. The Thompson Creek drainage is considered Functioning-at-Risk in the Geographic Assessment.

Beneficial uses within the Thompson Creek Watershed are Cold Water Biota, Water supply Agricultural, and Recreation as listed in the 1992 Idaho Water Quality Status Report.

Watershed improvement work that has occurred to date include the removal of 2 miles of road and 10 road channel crossings accomplished under the Small Potatoes Timber Sale.

Foreseeable activity within the Thompson Creek watershed includes the removal of dead and dying Douglas-fir associated with the Douglas-fir Beetle Project. Reasonably foreseeable funded watershed improvement work includes the removal of 2 miles of road, 3 road channel crossings, and culvert upgrades to meet 100-year flood events

Streamflow Regime

The hydrologic regime within the Thompson Creek watershed has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, the Thompson Creek Watershed is at moderate risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events.The equivalent clearcut area in the Thompson Creek watershed is approximately 2 percent. This represents a slight increased risk from rain-on-snow events over natural conditions.

Stream Channel Stability

Encroachment by streamside roads is the dominant feature of the riparian areas within the lower reaches of the Thompson Creek Watershed, on private ownership. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. No documented streamside road failures have been documented to date with the majority of streamside road on private land or county jurisdiction.

As previously discussed, increased bedload supply and bed mobility can result from riparian harvest

and may result in increases in streambank erosion. Within the Thompson Creek Watershed, 5 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, representing minimal effects compared to encroaching roads and road channel crossing failures.

Water Quality

Approximately 11 miles of road and 26 road channel crossings exist in the Thompson Creek watershed area, with road densities of 4.1-miles/square mile of land on National Forest System lands. The stream-crossing frequency throughout the watershed is approximately 1.2 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the Thompson Creek watershed, 19 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 27 percent of the miles of road on these same land types. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-33. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Thompson Creek Watershed.

Physical Characteristics	
HUC: 170103031806	
Drainage Area (square miles)	2.6
Sensitive Landtypes (percent of watershed)	19
Sensitive Snowpack (percent of watershed)	49
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Functioning-at-Risk
Subwatersheds used for analysis	Headwaters to Private Land
Erosion and Sediment	
Road Density (miles/mile2)	4.2
Sensitive Road Density (miles/mile2)	1.2
Equivalent Clearcut Area (percent of watershed)	2
Channel Conflicts	
Riparian Road Density (miles/mile2)	1.3
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	1.2
Number of Fish Migration Barriers	0

Cumulative Effects

The cumulative effects analysis area in the Thompson Creek watershed extends from the headwaters to the boundary of National Forest and private ownership. . Earlier analysis of this cumulative effects area was completed in 1999 in the Douglas-fir Beetle Project FEIS. The analysis for this Small Sales EIS was based on: 1) the planned activity in the Douglas-fir FEIS and ongoing activities at the time, 2) what was actually implemented under the Douglas-fir FEIS, and, 3) the planned activities under the Small Sales EIS. Cumulative effects of 473 acres of harvest were analyzed under the selected alternative of the Douglas-fir Beetle FEIS. Approximately 167 acres (35%) were actually harvested (See Projects, Douglas-fir Beetle Project, Comparison of Planned

Versus Implemented Harvest and Road Activities, 3 pages). Under Alternatives 2 and 3 of the Small Sales EIS, 47 additional acres of timber harvest are proposed in the Thompson Creek watershed. No harvest would occur under alternative 4. No roads would be built under any alternative. The cumulative 214 acres of harvest is approximately 45% of what was analyzed in the Douglas-fir Beetle Project FEIS. The risk of negative cumulative effects to beneficial uses is actually lower than what was analyzed for Alternative D of the Douglas-fir Project EIS. The positive effects of watershed improvement associated with the Douglas-fir Beetle FEIS are continuing. Cumulative effects of proposed management under the Small Sales EIS fall within the scope of the Douglas-fir Beetle FEIS and are discussed on pages III-165 to III-167 of the Douglas-fir Project FEIS. The watsed results from Thompson Creek are located in the (Project Records, Douglas-fir Bark Beetle Project, Watsed Summaries, 8 pages).

Table III-34. Projected watershed response in the Thompson Creek Watershed, by alternative.

Each measure of change in the table is discussed above in the "Methodology" section.

WATERSHED NAME: Thompson Creek	HUC: 170103031806
TRIBUTARY: Thompson Creek	HUC: 170103031806

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	291	**	**	291
Peak flow (%)	7	**	**	7
Net stream crossings (#)	-3	-3	-3	-3
Net roads (miles)	-2	-2	-2	-2
Net encroaching road (miles)	0	0	0	0

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative. Net risk reductions in sediment due to restoration under alternative 1 may not be measurable, but sediment reductions would contribute to the stability of the stream channel at the watershed scale.*

Direct and Indirect Effects at the Tributary and Localized Scales

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. No increase in sediment would be expected at the tributary scale with no planned road construction or reconstruction. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat. The estimates under alternative 1, from the Douglas-fir Beetle Project FEIS Alternative D, are not expected to change under any of the action alternatives of the Small Sale EIS. This conclusion is based on the decreased amount of harvest and road construction under the Douglas-fir Beetle FEIS and the small amount of harvest and no road construction with this EIS in alternatives 2 and 3.

The direct and indirect effects of canopy removal at localized sites under all alternatives within Thompson Creek 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. No measurable increase in magnitude or quantity of flows is expected in Alternative 2 with the small amount of additional mortality due to the harvest of selected green trees. No measurable effects would occur in stream channel conditions.

Wolf Lodge Creek Analysis Area

Overview

Wolf Lodge Creek is a 38.5 square mile sixth-scale watershed. Valley sideslopes are generally steep (50 to 70 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred on both National Forest System lands and on private ownership within the Wolf Lodge Creek Watershed. The Wolf Lodge Creek Watershed is considered functioning at risk condition in the Geographic Assessment and has sections of stream that are listed as 303d 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. Beneficial uses within the Wolf Lodge Creek Watershed are Salmonid Spawning, Cold Water Biota, water supply for both Drinking and Agricultural, and Recreation as listed in the 1992 Idaho Water Quality Status Report.

Funded foreseeable activities include the removal of 12 miles of road and the removal of 48 road channel crossings within Marie and Stella Creeks associated with the Horizon Sun Timber Sale. Other foreseeable activity within the Wolf Lodge Creek watershed includes the removal of dead and dying Douglas-Fir associated with the Douglas-fir Beetle Project. Funded watershed improvement work associated with this project includes the removal of 12 miles of road, 15 road channel crossings, and numerous culvert upgrades to meet 100-year flood events

Streamflow Regime

The hydrologic regime within the Wolf Lodge Creek watershed has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, the Wolf Lodge Creek Watershed is at moderate to high risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events. The equivalent clearcut area in the Wolf Lodge Creek watershed is approximately 8 percent. This represents a slight increased risk from rain-on-snow events over natural conditions.

Stream Channel Stability

Encroachment by streamside roads is the dominant feature of the riparian areas within the Wolf Lodge Watershed. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. No documented streamside road failures have been documented to date with the majority of streamside road on private land or county jurisdiction. A total of .8 miles within the watershed is estimated to encroach directly on the stream channel. These sections of road can directly compromise stream hydraulics and 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 Wolf Lodge Creek Watershed, 11 percent of the linear riparian influenced area has been directly affected by past harvest. This represents a relatively low amount of past riparian harvest within the watershed, so the effects are minimal, compared to encroaching roads and crossing failures..

Water Quality

Approximately 181 miles of road and 118 road channel crossings exist in the Wolf Lodge Creek Watershed area, with road densities of 4.7-miles/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 which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the Wolf Lodge Creek watershed, 29 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 13 percent of the miles of road on these same land types. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-35. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Wolf Lodge Creek Watershed.

Physical Characteristics	
HUC: 1701030306	
Drainage Area (square miles)	38.5
Sensitive Landtypes (percent of watershed)	29
Sensitive Snowpack (percent of watershed)	66
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Functioning at Risk
Subwatersheds used for analysis	Rutherford Gulch
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	26
Current Runoff Modification (percent of peak)	4
Equivalent Clearcut Area (percent of watershed)	8
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	15
Current Sediment Load Modification (percent)	76
Road Density (miles/mile2)	4.7
Sensitive Road Density (miles/mile2)	0.7
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	0.8
Riparian Road Density (miles/mile2)	0.4
Stream Crossings	
Number of Inventoried Crossings	37
Risk of Failure for Inventoried Crossings (tons/year)	9
Number of Estimated Crossings	36
Risk of Failure for Estimated Crossings (tons/year)	87
Stream Crossing Frequency (#/mile of stream)	2.0
Number of Fish Migration Barriers	2

Cumulative Effects

The cumulative effects analysis area in the Wolf Lodge Creek watershed extends from the headwaters to its confluence with Cedar Creek. Earlier analysis of this cumulative effects area was completed in 1999 in the Douglas-fir Beetle Project FEIS. The analysis for this Small Sales EIS was based on: 1) the planned activity in the Douglas-fir FEIS and ongoing activities at the time, 2) what was actually implemented under the Douglas-fir FEIS, and, 3) the planned activities under the Small Sales EIS.

Cumulative effects of 1121 acres of harvest were analyzed under the selected alternative of the Douglas-fir Beetle FEIS. Approximately 970 acres (87%) were actually harvested (See Project Records, Douglas-fir Beetle Project, Comparison of Planned Versus Implemented Harvest and Road Activities, 3 pages). Under Alternatives 2 and 3 of the Small Sales EIS, 62 additional acres of timber harvest are proposed in the Wolf Lodge Creek watershed. No harvest would occur under alternative 4. No roads would be built under any alternative. The cumulative 1032 acres of harvest is approximately 92% of what was analyzed in the Douglas-fir Beetle Project FEIS. The risk of negative cumulative effects to beneficial uses is actually lower than what was analyzed for Alternative D of the Douglas-fir Project EIS. The positive effects of watershed improvement associated with the Douglas-fir Beetle FEIS are continuing. Cumulative effects of proposed management under the Small Sales EIS fall within the scope of the Douglas-fir Beetle FEIS and are discussed on pages III-155 to III-158 of the Douglas-fir Project FEIS. The watsed results for Wolf Lodge Creek above Marie are located in (See Project Records, Douglas-fir Bark Beetle Project, Watsed Summaries, 8 pages).

Proposed ecosystem burning associated with Alternative 2 would not be expected to have any short- or long-term effects to beneficial uses. The burns would be low intensity, conducted in the spring, and streams would be buffered as not to run fire through those draws in the vicinity. Cumulatively, there would be no measurable short- or long-term effects to stream condition, hillslope hydrology, or fisheries habitat. No adverse effects to beneficial uses are expected.

Table III-36. Projected watershed response in the Wolf Lodge Creek Watershed, by alternative.

Each measure of change in the table is discussed above in the "Methodology" section.

WATERSHED NAME: Wolf Lodge Creek Watershed	HUC: 1701030306
TRIBUTARY: Wolf Lodge Creek above Marie Creek	HUC: 1701030306

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	86	**	**	86
Peak flow (%)	6	**	**	6
Net stream crossings (#)	-39	-39	-39	-39
Net associated risk (tons/year)	-220	-220	-220	-220
Net roads (miles)	-16	-16	-16	-16
Net encroaching road (miles)	0	0	0	0

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative. Net risk reductions in sediment due to restoration under alternative 1 may not be measurable, but sediment reductions would contribute to the stability of the stream channel at the watershed scale.*

Direct and Indirect Effects at the Tributary and Localized Scales (Rutherford Gulch)

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. No increase in sediment would be expected at the tributary scale with no planned road construction or reconstruction. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat. The estimates under alternative 1, from the Douglas-fir Beetle Project FEIS Alternative D, are not expected to change under any of the action alternatives of the Small Sale EIS. This conclusion is based on the decreased amount of harvest and road construction under the Douglas-fir Beetle FEIS and the small amount of harvest and no road construction with this EIS in alternatives 2 and 3.

The direct and indirect effects of canopy removal at localized sites under all alternatives within Rutherford Creek 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. No measurable increase in magnitude or quantity of flows is expected in either Alternative 2 or 3 with the small amount of additional mortality due to the harvest of selected green trees for safety. No measurable effects would occur in stream channel conditions.

Under Alternative 2, ecosystem burning is proposed in Rutherford Gulch. The direct effects of this proposed burning adjacent to small first-order streams would include minimal delivery of fine sediment at localized sites. With established buffers and low intensity spring burning no measurable indirect effect to streams would be expected.

Cedar Creek Analysis Area

Overview

Cedar Creek Watershed is a 15.0 square mile sixth-scale watershed. Valley sideslopes are generally steep (45 to 60 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred within the Cedar Creek Watershed. The Cedar Creek Watershed is considered functioning at risk 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.

Beneficial uses within the Cedar Creek Watershed are Cold Water Biota, water supply Agricultural, and Recreation as listed in the 1992 Idaho Water Quality Status Report.

Within Cedar Creek, a total of 26 miles of road has had watershed improvement work completed. Work included removal of 77 road channel crossings, stabilizing unstable road sections, and applying erosion control. This work was completed under multiple Timber Sales.

Streamflow Regime

The hydrologic regime within the Cedar Creek watershed has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, the Cedar Creek is at high risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events. The equivalent clearcut area in the Cedar Creek watershed is approximately 10 percent. This represents a slight increased risk from rain-on-snow events over natural conditions.

Stream Channel Stability

Encroachment by streamside roads is a dominant feature of the riparian areas in Cedar Creek, a tributary to Coeur d'Alene Lake. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force, this in turn can cause extensive bed and bank erosion. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Frequent road failures have caused excess sediment introduction through the years. Interstate 90 is an encroaching road within the Cedar Creek Watershed that has in the past will continue to contribute to instream channel erosion. These sections of road directly compromise stream hydraulics and 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 Cedar Creek Watershed, 23 percent of the linear riparian influenced area has been directly affected by past harvest. This represents a relatively low to moderate amounts of past riparian harvest within the watershed, so the effects are minimal, compared to encroaching roads and crossings failures.

Water Quality

Approximately 62 miles of road and 116 road channel crossings exist in the Cedar Creek Watershed area, with road densities of 4.2-miles/square mile of land. The stream-crossing frequency throughout the watershed is approximately 1.9 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within Cedar Creek, 12 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 19 percent of the miles of road on these same land types. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-37. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Cedar Creek Watershed.

Physical Characteristics	
HUC: 170103030609	
Drainage Area (square miles)	15
Sensitive Landtypes (percent of watershed)	12
Sensitive Snowpack (percent of watershed)	65
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Function at Risk
Subwatersheds used for analysis	Entire Watershed
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	28
Current Runoff Modification (percent of peak)	6
Equivalent Clearcut Area (percent of watershed)	10
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	15
Current Sediment Load Modification (percent)	134
Road Density (miles/mile2)	4.2
Sensitive Road Density (miles/mile2)	0.8
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	0.02
Riparian Road Density (miles/mile2)	0.3
Stream Crossings	
Number of Inventoried Crossings	20
Risk of Failure for Inventoried Crossings (tons/year)	25
Number of Estimated Crossings	0
Risk of Failure for Estimated Crossings (tons/year)	0
Stream Crossing Frequency (#/mile of stream)	1.9
Number of Fish Migration Barriers	0

Cumulative Effects

The cumulative effects analysis area in the Cedar Creek watershed extends from the headwaters to the confluence with Wolf Lodge Creek. Earlier analysis of this cumulative effects area was completed in 1999 in the Douglas-fir Beetle Project FEIS. The analysis for this Small Sales EIS was based on: 1) the planned activity in the Douglas-fir FEIS and ongoing activities at the time, 2) what was actually implemented under the Douglas-fir FEIS, and, 3) the planned activities under the Small Sales EIS.

Cumulative effects of 322 acres of harvest were analyzed under the selected alternative of the Douglas-fir Beetle FEIS. Approximately 88 acres (27%) were actually harvested (See Project Records, Douglas-fir Beetle Project, Comparison of Planned Versus Implemented Harvest and Road Activities, 3 pages). Ten more acres of harvest are planned under the Nordic Beetle Sale. Under Alternatives 2 and 3 of the Small Sales EIS, 28 additional acres of timber harvest are proposed in the Cedar Creek watershed. Under Alternative 4 of the Small Sales EIS, 33 additional acres of timber harvest are proposed in the Cedar Creek watershed. No roads would be built under any alternative. Cumulatively, 126 acres of harvest would occur under Alternatives 2 and 3 (approximately 39% of what was analyzed in the Douglas-fir Beetle FEIS), and 131 acres of harvest would occur under Alternative 4 (approximately 41% of what was analyzed in the Douglas-fir Beetle FEIS. The risk of

negative cumulative effects to beneficial uses is actually lower than what was analyzed for Alternative D of the Douglas-fir Project EIS. The positive effects of watershed improvement associated with the Douglas-fir Beetle FEIS are continuing. Cumulative effects of proposed management under the Small Sales EIS fall within the scope of the Douglas-fir Beetle FEIS and are discussed on pages III-162 to III-163 of the Douglas-fir Project FEIS.

Table III-38. Projected watershed response in the Cedar Creek Watershed, by alternative.

Each measure of change in the table is discussed above in the "Methodology" section.

WATERSHED NAME: Cedar Creek	HUC: 170103030501
TRIBUTARY: Cedar Creek	HUC: 170103030501

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	134	**	**	**
Peak flow (%)	6	**	**	**
Net stream crossings (#)	0	0	0	0
Net associated risk (tons/year)	-8	-8	-8	-8
Net roads (miles)	0	0	0	0
Net encroaching road (miles)	0	0	0	0

** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative.

Direct and Indirect Effects at the Tributary and Localized Scales

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. No increase in sediment would be expected at the tributary scale with no planned road construction or reconstruction. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat. The estimates under alternative 1, from the Douglas-fir Beetle Project FEIS Alternative D, are not expected to change under any of the action alternatives of the Small Sale EIS. This conclusion is based on the decreased amount of harvest under the Douglas-fir Beetle FEIS and the small amount of harvest and no road construction with this EIS in all the action alternatives.

The direct and indirect effects of canopy removal at localized sites under all alternatives within Cedar Creek 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. No measurable increase in magnitude or quantity of flows is expected in either Alternative 2 or 4 with the small amount of additional mortality due to the harvest of selected green trees. No measurable effects would occur in stream channel conditions.

Fourth of July Creek Analysis Area

Overview

Fourth of July Creek Watershed is a 23.6 square mile sixth-scale watershed. Valley sideslopes are generally steep (45 to 60 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred within the Fourth of July Creek Watershed on both

Federal Lands and the private ownership which includes the lower 7 square miles of the watershed. The Fourth of July Creek Watershed is considered 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.

Beneficial uses within the Fourth of July Creek Watershed are Cold Water Biota, water supply Agricultural, and Recreation as listed in the 1992 Idaho Water Quality Status Report.

Within the Fourth of July Creek watershed, a total of 4 miles of road has had watershed improvement work completed. Work included removal of 9 road channel crossings, stabilizing unstable road sections, and applying erosion control. Funded foreseeable activities include the removal of 20 miles of road and the removal of 27 road channel crossings under the Crinkle Kut Timber Sale.

Streamflow Regime

The hydrologic regime within the Fourth of July Creek watershed has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, the Fourth of July Creek Watershed is at moderate to high risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events. The equivalent clearcut area in the Fourth of July Creek watershed is approximately 6 percent. This represents a slight increased risk from rain-on-snow events over natural conditions.

Stream Channel Stability

Encroachment by streamside roads is a dominant feature of the riparian areas in Fourth of July, a tributary to the South Fork of the Coeur d'Alene River. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force, this in turn can cause extensive bed and bank erosion. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Interstate 90 is an encroaching road in the Fourth of July Creek Watershed that has in the past will continue to contribute to instream channel erosion. These sections of road directly compromise stream hydraulics and 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 Fourth of July Creek watershed, 8 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 crossing failures.

Water Quality

Within Federal Ownership, approximately 99 miles of road and 87 road channel crossings exist in the Fourth of July Creek Watershed area, with road densities of 5.8-miles/square mile of land. The stream-crossing frequency throughout the watershed is approximately 2.1 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the Fourth of July Creek watershed, 26 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 24 percent of the miles of road on these same land types. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-39. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Fourth of July Watershed.

Physical Characteristics	
HUC: 1701030324	
Drainage Area (square miles)	23.6
Sensitive Landtypes (percent of watershed)	29
Sensitive Snowpack (percent of watershed)	61
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Not Properly Functioning
Subwatersheds used for analysis	Entire Watershed
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	N/A
Current Runoff Modification (percent of peak)	4
Equivalent Clearcut Area (percent of watershed)	6
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	18
Current Sediment Load Modification (percent)	138
Road Density (miles/mile2)	6.0
Sensitive Road Density (miles/mile2)	1.0
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	2.1
Riparian Road Density (miles/mile2)	0.5
Stream Crossings	
Number of Inventoried Crossings	17
Risk of Failure for Inventoried Crossings (tons/year)	78
Number of Estimated Crossings	17
Risk of Failure for Estimated Crossings (tons/year)	31
Stream Crossing Frequency (#/mile of stream)	1.5
Number of Fish Migration Barriers	0

Cumulative Effects

The cumulative effects analysis area in the Fourth of July Creek watershed extends from the headwaters to the boundary of National Forest and private ownership. Earlier analysis of this cumulative effects area was completed in 1999 in the Douglas-fir Beetle Project FEIS. The analysis

for this Small Sales EIS was based on: 1) the planned activity in the Douglas-fir FEIS and ongoing activities at the time, 2) what was actually implemented under the Douglas-fir FEIS, and, 3) the planned activities under the Small Sales EIS.

Cumulative effects of 613 acres of harvest were analyzed under the selected alternative of the Douglas-fir Beetle FEIS. Approximately 13 acres (2%) were actually harvested (See Project Records, Douglas-fir Beetle Project, Comparison of Planned Versus Implemented Harvest and Road Activities, 3 pages). Under all the action Alternatives of the Small Sales EIS, 67 additional acres of timber harvest are proposed in the Fourth of July Creek watershed. No roads would be built under any alternative. The cumulative 80 acres of harvest is approximately 13% of what was analyzed in the Douglas-fir Beetle Project FEIS. The risk of negative cumulative effects to beneficial uses is actually lower than what was analyzed for Alternative D of the Douglas-fir Project EIS. The positive effects of watershed improvement associated with the foreseeable activities are continuing. Cumulative effects of proposed management under the Small Sales EIS fall within the scope of the Douglas-fir Beetle FEIS and are discussed on pages III-163 to III-164 of the Douglas-fir Project FEIS.

Table III-40. Projected watershed response in the Fourth of July Creek Watershed, by alternative.

Each measure of change in the table is discussed above in the "Methodology" section.

WATERSHED NAME: Fourth of July Creek Watershed	HUC: 170103030401
TRIBUTARY: Fourth of July Creek	HUC: 170103030401

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	138	**	**	**
Peak flow (%)	4	**	**	**
Net stream crossings (#)	-33	-33	-33	-33
Net associated risk (tons/year)	-109	-109	-109	-109
Net roads (miles)	-20	-20	-20	-20
Net encroaching road (miles)	0	0	0	0

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative. Net risk reductions in sediment due to restoration under alternative 1 may not be measurable, but sediment reductions would contribute to the stability of the stream channel at the watershed scale.*

Direct and Indirect Effects at the Tributary and Localized Scales

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. No increase in sediment would be expected at the tributary scale with no planned road construction or reconstruction. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat. The estimates under alternative 1, from the Douglas-fir Beetle Project FEIS Alternative D, are not expected to change under any of the action alternatives of the Small Sale EIS. This conclusion is based on the decreased amount of harvest under the Douglas-fir Beetle FEIS and the small amount of harvest and no road construction with this EIS in all the action alternatives.

The direct and indirect effects of canopy removal at localized sites under all alternatives within Fourth of July Creek 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. No measurable increase in magnitude or quantity of flows is expected in either Alternatives 2 or 4 with the small amount of additional mortality due to the harvest of selected green trees. No measurable effects would occur in stream channel conditions.

Under all action alternatives, less than one acre of tractor logging would occur on sensitive landtypes. The direct effects of the proposed harvest adjacent to small first-order streams would include minimal delivery of sediment at localized sites, but no measurable indirect effects to streams with the implementation of riparian buffers and Best Management Practices.

Cataldo Face Analysis Area

Overview

The Cataldo Face Tributaries, an area of 9.7 square miles, consist of Hayden and Hardy Gulch's and the smaller first order streams that flow into them. Valley sideslopes are generally steep (40 to 60 percent) and vegetated predominately with conifers. Both of these tributaries drain into private land and eventually into the Mission Flats. Activities such as timber harvest and road building has occurred on both National Forest System lands and the private ownership to the south. This area is designated as properly functioning condition in the Coeur d'Alene Geographic Assessment.

Beneficial uses along the Cataldo Face are not listed in the 1992 Idaho Water Quality Status Report.

No watershed improvement work has occurred or is a foreseeable action in the Cataldo Face drainages.

Streamflow Regime

The hydrologic regime within the these tributaries of Cataldo have been altered as a result of timber harvest and road building, in the same respects as previously discussed, but to a much lesser degree. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, these tributaries are at low risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events.

Stream Channel Stability

Within these face drainages on National Forest System lands encroaching road sections exist only at the road channel crossings, which the majority are high in the drainage and most likely above the emergence of perennial or intermittent streams.

As previously discussed, increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Within the Cataldo Face, no riparian influenced area has been directly affected by past regeneration harvest

Water Quality

Approximately 32 miles of road and 9 road channel are estimated to exist within these face drainages on National Forest System lands. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within these face drainages, 23 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 19 percent of the miles of road on these same land types.

Table III-41. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Cataldo Face.

Physical Characteristics	
HUC: 170103031821	
Drainage Area (square miles)	9.7
Sensitive Landtypes (percent of watershed)	23
Sensitive Snowpack (percent of watershed)	23
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Properly Functioning Condition
Subwatersheds used for analysis	Hardy Gulch and Hayden Gulch
Erosion and Sediment	
Road Density (miles/mile2)	3.3
Sensitive Road Density (miles/mile2)	0.6
Channel Conflicts	
Riparian Road Density (miles/mile2)	0.2
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	Low
Number of Fish Migration Barriers	0

Cumulative Effects

The Cataldo Face cumulative effects analysis area is comprised of a series of contiguous face drainages to Mission Flats including Hardy Gulch and Hayden Gulch. The cumulative effects analysis area extends from the headwaters of the face drainages to the private ownership.

No short- or long-term cumulative effects to beneficial uses is likely to occur at the watershed scale. There would be no predicted increases in peak flows under any of the Action Alternatives over the No Action Alternative with the majority of the harvest beetle killed Douglas-fir, (See Methodology Section, Methods for Cumulative Effects Analysis in the Small Sales Project, pg-101). With no road construction and only .4 acres of tractor logging on sensitive landtypes, no increases in sediment are anticipated. Local or watershed-scale changes in flood frequency would not be measurable at this scale. The risk of increasing the magnitude of rain-on-snow events above the no action alternative is low, (See Methodology Section, Rain-on-Snow Analysis, pg-103). Alterations in hillslope processes would not affect values or beneficial uses.

Table III-42. Projected watershed response in the Cataldo Face Area, by alternative.

Each measure of change in the table is discussed above in the "Methodology" section.

WATERSHED NAME: Cataldo Face	HUC: 170103031821
TRIBUTARY: Hardy and Hayden Gulch's	HUC: 170103031821

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

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative.*

Direct and Indirect Effects at the Tributary and Localized Scales

The proposed management activities in the Cataldo Face will occur mainly in Hardy Gulch, Hayden Gulch and several small face drainages. These drainages are widely spaced and evenly distributed across the Cataldo Face. At the tributary scale, no direct or indirect effects to beneficial uses is likely occur from management activities under any of the alternatives. With only .4 acres of tractor logging on sensitive landtypes, the risk of potential sediment increases would be low in all of the action alternatives. BMP implementation and adherence to the Inland Native Fish Strategy would provide protection for the riparian areas. The cumulative effects from management activities would not be measurable at the tributary scale for increases in peak flows or sediment over what would occur under the No-Action Alternative.

Under all action alternatives, .4 acres of tractor logging would occur on sensitive landtypes. The direct effects of the proposed harvest adjacent to small first-order streams would include minimal delivery of sediment at localized sites, but no measurable indirect effects to streams with the implementation of riparian buffers and BMP's. The direct and indirect effects of canopy removal at localized sites under all alternatives may be that snow accumulations and melt rates are altered. Some change in timing, and increases in the magnitude and quantity of flow is expected under all alternatives at this scale. The increase in flow is primarily due to the mortality of trees caused by the Douglas-fir beetle. Additional mortality due to harvest of green trees is not expected to be a measurable increase in magnitude or quantity of flows. No measurable differences are expected to occur between any alternatives. No measurable effects are expected to stream channel conditions.

Prado Creek Analysis Area

Overview

Prado Creek watershed is a 4.8 square mile third-order watershed. Also included in the analysis area is several small face tributaries to the Coeur d'Alene River. Valley side slopes are generally steep (50 to 60 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred throughout the watershed and within the face tributaries on both National Forest System lands and on private ownership. The Prado Creek Watershed is considered not properly functioning condition in the Geographic Assessment, but is not listed as a 303d watershed by the Environmental Protection Agency.

Beneficial uses within the Prado Creek Watershed and along the smaller face tributaries are not listed in the 1992 Idaho Water Quality Status Report.

Within the Prado Creek watershed, a total of 6 miles of road has had watershed improvement work completed under the Prado Timber Sale. Work included removal of 24 road channel crossings, removing encroaching road section along Prado Creek, stabilizing unstable road sections, and applying erosion control.

Streamflow Regime

The hydrologic regime within the Prado Creek watershed and the face has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the smaller tributaries. Due to the maritime influence, the Prado Creek Watershed is at moderate risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events.

Stream Channel Stability

Encroachment by a streamside road was a dominant feature of the riparian area in Prado Creek prior to 1998. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Frequent road failures have caused excess sediment introduction through the years, including the February 1996 flood. The 255 road, a streamside road was removed in 1998, restoring the capacity of the stream at flood stages, reducing velocities and reducing instream bed and bank erosion.

As previously discussed, increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Within the Prado Creek Watershed no riparian influenced areas have been directly affected by past regeneration harvest.

Water Quality

Approximately 15 miles of road and 19 road channel crossings exist in the Prado Creek Watershed area, with road densities of 3.1-miles/square mile of land. The stream-crossing frequency throughout the watershed is approximately .2 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the Prado Creek watershed, 49 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 49 percent of the miles of road on these same land types. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-43. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Prado Creek Watershed and Face Tributaries.

Physical Characteristics	
HUC: 170103010002	
Drainage Area (square miles)	4.8
Sensitive Landtypes (percent of watershed)	49
Sensitive Snowpack (percent of watershed)	54
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Not Properly Functioning
Subwatersheds used for analysis	Entire Watershed and Cd'a River Face
Erosion and Sediment	
Road Density (miles/mile2)	3.1
Sensitive Road Density (miles/mile2)	1.0
Channel Conflicts	
Riparian Road Density (miles/mile2)	.6
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	.2
Number of Fish Migration Barriers	0

Cumulative Effects

The cumulative effects analysis area in Prado Creek Watershed and the Face Tributaries extends from the headwaters to the North Fork of the Coeur d'Alene River. Within the Prado Creek Watershed only one 1 acre of salvage is proposed. No short- or long-term effects to beneficial uses are expected at the watershed scale. No apparent changes in sediment yields or peak flows are anticipated under any of the alternatives, (See Methodology Section above, Methods for Cumulative Effects Analysis in the Small Sales Project). There would be no anticipated direct or indirect or cumulative effects on the timing, magnitude or quantity of flow under any alternative. Local or watershed-scale changes in flood frequency would not be measurable or affect either the stream or channel structure at this scale, (See Methodology Section above, Rain-on-Snow Analysis). Alterations in hillslope processes would not affect values or beneficial uses at the watershed scale

The small face drainages, tributaries to the Coeur d'Alene River, are predominantly above the emergence of perennial or intermittent streams. . No short- or long-term effects to beneficial uses are expected at the watershed scale. No apparent changes in sediment yields or peak flows are anticipated under any of the alternatives, (See Methodology Section, Methods for Cumulative Effects Analysis in the Small Sales Project, pg-101). There would be no anticipated direct or indirect or cumulative effects on the timing, magnitude or quantity of flow under any alternative. Local or watershed-scale changes in flood frequency would not be measurable or affect either the stream or channel structure at this scale, (See Methodology Section, Rain-on-Snow Analysis, pg-103). Alterations in hillslope processes would not affect values or beneficial uses at the watershed scale

Cumulatively, there would be no measurable short- or long-term effects to stream condition, hillslope hydrology, or fisheries habitat. With no road construction or reconstruction, no increases sediment can be expected. No adverse effects to beneficial uses are expected. Risk of future

sediment loading, primarily at the road channel crossings, has been reduced by watershed improvement activities that have occurred in both 1998 and 1999.

Table III-44. Projected watershed response in the Prado Creek Watershed, by alternative.

WATERSHED NAME: Prado Creek Watershed	HUC: 170103010002
TRIBUTARY: Prado Creek	HUC: 170103010002

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

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative.*

Direct and Indirect Effects at the Tributary and Localized Scales

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. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat.

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. Additional mortality due to harvest of green trees in the Coeur d'Alene River face tributaries would not result in a measurable increase in magnitude or quantity of flows for any of the alternatives. No measurable effects would occur in stream channel conditions.

The cumulative effects from management activities most likely would not be discernible at this scale for increases in peak flows or sediment over what would occur under the No-Action Alternative.

Cougar Creek Analysis Area

Overview

Cougar Creek Watershed is a 19.3 square mile fourth-order watershed, with the lower reach in private ownership. Valley sideslopes are generally steep (50 to 70 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred on both National Forest System lands and on private ownership within the Cougar Creek Watershed. Cougar Creek is considered functioning at risk 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

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

Within the Cougar Creek watershed, extensive watershed improvement was implemented in 1994 and 1995. A total of 135 miles of road has had watershed improvement work completed. Work included removal of 101 road channel crossings, removal of encroaching road sections, stabilizing unstable road sections, and applying erosion control. These improvements have drastically reduced the potential risk of sediment and has restored the natural channel characteristics in localized areas.

Streamflow Regime

The hydrologic regime within the Cougar Creek watershed has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, the Cougar Creek Watershed is at high risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events.

Stream Channel Stability

Encroachment by streamside roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Within the Cougar Creek Drainage, the majority of the encroaching sections of road have been removed except at the remaining road channel crossings and on the private ownership in the lower reaches.

As previously discussed, increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Within the Cougar Creek Watershed, 39 percent of the linear riparian influenced area has been directly affected by past regeneration harvest. This represents a relatively moderate amount of past riparian harvest within the watershed.

Water Quality

Approximately 36 miles of road and 28 road channel crossings exist in the Cougar Creek Watershed area on National Forest System lands, with road densities of 1.9-miles/square mile of land. The stream-crossing frequency throughout the watershed is approximately .6 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the Cougar Creek watershed, 25 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-45. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Cougar Creek Watershed.

Physical Characteristics	
HUC: 1701030106	
Drainage Area (square miles)	19.3
Sensitive Landtypes (percent of watershed)	25
Sensitive Snowpack (percent of watershed)	80
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Functioning at Risk
Subwatersheds used for analysis	Entire Watershed and Face Tributaries
Erosion and Sediment	
Road Density (miles/mile2)	1.9
Channel Conflicts	
Riparian Road Density (miles/mile2)	.07
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	.6
Number of Fish Migration Barriers	0

Cumulative Effects

The cumulative effects analysis area in Cougar Creek Watershed extends from the headwaters to the North Fork of the Coeur d'Alene River and includes several smaller face tributaries that also drain into the North Fork of the Coeur d'Alene River. Management activities that would occur within the Cougar Creek watershed and Studer Creek would be all salvage of dead and dying Douglas-Fir. Since only salvage of dead and dying timber would occur, no road construction or tractor logging on sensitive landtypes, it can be expected that there would be no short- or long-term effects to beneficial uses at the watershed scale. No apparent changes in sediment yields or peak flows are anticipated under any of the alternatives, (See Methodology Section, Methods for Cumulative Effects Analysis in the Small Sales Project, pg-101). There would be no direct or indirect or cumulative effects on the timing, magnitude or quantity of flow under any alternative. Local or watershed-scale changes in flood frequency would not be measurable or affect either the stream or channel structure at this scale, (See Methodology Section, Rain-on-Snow Analysis, pg-103. Alterations in hillslope processes would not affect values or beneficial uses at the watershed scale

One 6 acre regeneration unit falls along the face of the North Fork of the Coeur d'Alene River. The majority of the harvest within this unit is mortality due to the Douglas-Fir beetle. Scattered green trees will be removed in order to burn and plant, but the canopy removed is a small percentage of the existing live canopy. With the majority of the timber to be removed dead and dying it can be expected that there would be no short- or – long term effects to beneficial uses at the watershed or tributary scale. No apparent changes in sediment yields with no road construction or tractor yarding. There would be no anticipated direct or indirect or cumulative effects on the timing, magnitude or quantity of flow under any alternative. No changes to peak flows are anticipated over the no action alternative, (See Methodology Section, Methods for Cumulative Effects Analysis in the Small Sales Project, pg-101). Local or watershed-scale changes in flood frequency would not be measurable or affect either the stream or channel structure at this scale, (See Methodology Section, Rain-on-Snow Analysis, pg-103).

Cumulatively, there would be no measurable short- or long-term effects to stream condition, hillslope hydrology, or fisheries habitat. With no road construction or reconstruction, no increases sediment would be expected to occur. No adverse effects to beneficial uses are expected. Risk of future sediment loading, primarily at the road channel crossings and removal of encroaching road segments, has been drastically reduced throughout the Cougar Creek Watershed due to past watershed improvement activities. The pollutant of concern (sediment) that has caused Cougar Creek to be listed as a Water Quality Limited Stream would not be increased.

Table III-46. Projected watershed response in the Cougar Creek Watershed, by alternative.

WATERSHED NAME: Cougar Creek Watershed	HUC: 1701030106
TRIBUTARY: Cougar Creek	HUC: 1701030106

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

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative.*

Direct and Indirect Effects at the Tributary and Localized Scales

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. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat.

The direct and indirect effects of canopy removal at localized sites under all alternatives would include 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. Additional mortality due to harvest of green trees would most likely not result in a measurable increase in magnitude or quantity of flows for any of the alternatives. No measurable effects would occur in stream channel conditions.

The cumulative effects from management activities most likely would not be discernible at this scale for increases in peak flows or sediment over what would occur under the No-Action Alternative.

Lower Little North Fork of the Coeur d'Alene River Analysis Area

Overview

The face drainages in the lower Little North Fork of the Coeur d'Alene River included in this analysis include Gimlet Creek, Owl Creek, Williams Draw, Brown Gulch, Little Tepee Creek, Little Bumblebee Creek and several small first and second order streams. These third and fourth order streams combined with the first and second order streams total 24.9 square miles. Valley sideslopes are generally steep (50 to 60 percent) and vegetated predominately with conifers. Activities such as

timber harvest and road building has occurred throughout the majority of these face tributaries to varying degrees. The Lower Little North Fork is considered 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

Beneficial uses within the Little North Fork Watershed are Salmonid Spawning, Cold Water Biota, Water Supply Agricultural and Drinking, and Recreation as listed in the 1992 Idaho Water Quality Status Report.

Within the Lower Little North Fork, from Gimlet Creek down to the confluence with the North Fork of the Coeur d'Alene River, 37 miles of road have had watershed improvement work completed under multiple timber sales. This improvement work includes the removal of 79 road channel crossings, stabilizing unstable road sections, upgrading 12 undersized culverts, and applying erosion control. This work has removed some of the highest priority known and potential sediment sources throughout the Lower Little North Fork.

Streamflow Regime

The hydrologic regime within the Lower Little North Fork has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, the Lower Little North Fork is at moderate risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events.

Stream Channel Stability

Encroachment by streamside roads is the dominant feature of the riparian area in the Little North Fork. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Frequent road failures have caused excess sediment introduction through the years. Road 209, the main river road, encroaches in numerous locations, not just in the lower reaches, but along it's entire length into the headwaters. These sections of road directly compromise stream hydraulics and 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 Lower Little North Fork, 19 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 45 miles of road and 131 road channel crossings exist in the Lower Little North Fork, with road densities of 1.8-miles/square mile of land. The stream-crossing frequency throughout the watershed is approximately .7 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the Lower Little North Fork, 39 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 29 percent of the miles of road on these same land types. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-47. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Tributaries in the Lower Little North Fork Analysis Area.

Physical Characteristics	
HUC: 170103010312	
Drainage Area (square miles)	24.9
Sensitive Landtypes (percent of watershed)	39
Sensitive Snowpack (percent of watershed)	51
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Not Properly Functioning
Subwatersheds used for analysis	Little Tepee, Little Bumblebee, Owl, Gimlet, Williams, and Browns Creeks
Erosion and Sediment	
Road Density (miles/mile2)	1.8
Sensitive Road Density (miles/mile2)	.5
Channel Conflicts	
Riparian Road Density (miles/mile2)	.3
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	.7
Number of Fish Migration Barriers	0

Cumulative Effects

All of the proposed activities would occur in a contiguous area along the face of the Little North Fork of the Coeur d'Alene River. The face drainages with proposed management drain directly into the Little North Fork of the Coeur d'Alene River, which is listed as a Water Quality Limited Stream. The cumulative effects analysis area extends from the headwaters of these face drainages to their outlet into the North Fork of the Coeur d'Alene River. No measurable cumulative effects would occur at the scale of the main river. Effects from the mortality of trees would be distributed over several smaller tributaries, including Little Bumblebee Creek, Little Tepee Creek, Owl Creek , Gimlet Creek and several smaller face tributaries.

At the watershed scale, there most likely would be no measurable direct, indirect or cumulative effects on the timing, magnitude or quantity of flow anticipated under any of the alternatives with the majority of harvest removing dead and dying trees. With only .3 miles of road construction on or

near ridge lines and not on any sensitive landtypes, no increase in sediment can be expected over the No-Action Alternative with no adverse affects to any of the beneficial uses, (See Methodology Section, Methods for Cumulative Effects Analysis in the Small Sale Project, pg-101). Local or watershed-scale changes in flood frequency most likely would not be measurable or affect either the stream or channel structure, (See Methodology Section, Rain-on-Snow Analysis, pg-103). Alterations in hillslope processes would not affect values or beneficial uses. Sediment risk has be reduced as a result of past watershed restoration activities. Net risk reductions in sediment associated with past watershed restoration from culvert upgrades and a net decrease in road channel crossings may not be measurable at this scale. However, sediment reductions from restoration work would contribute to the stability of the stream channel at the watershed scale in various areas.

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 be substantially and permanently reduced with past watershed improvement activities. The pollutant of concern (sediment) that has caused the Little North Fork of the Coeur River to be listed as Water Quality Limited would not be increased under any of the alternatives including the No-Action Alternative.

Table III-48. Projected watershed response in the Lower Little North Fork of the Coeur d'Alene River by alternative.

WATERSHED NAME: Lower Little North Fork	HUC: 170103010312
TRIBUTARY: Lower Little North Fork	HUC: 170103010312

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	**	**	**	**
Peak flow (%)	**	**	**	**
Net stream crossings (#)	-25	-27	-27	-27
Net roads (miles)	-6	-7	-7	-7
Net encroaching road (miles)	0	0	0	0

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative.*

Direct and Indirect Effects at the Tributary and Localized Scales

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 within any of the face tributaries, (See Project Records, Watsed Reports, Gimlet Creek, Little Tepee Creek, Little Bumblebee Creek and Owl Creek). The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat

In all the Action Alternatives, 2 acres of tractor logging on sensitive landtypes would occur. The direct effects of the proposed harvest adjacent to small first-order streams would include minimal delivery of sediment at localized sites, but no measurable indirect effects to streams with the implementation of riparian buffers and BMP's. Under the action alternatives, 2 stream channel crossings would be restored and 1 mile of road would be decommissioned.

The direct and indirect effects of canopy removal at localized sites under all alternatives may be that

snow accumulations and melt rates are altered. Some change in timing, and increases in the magnitude and quantity of flow is expected under all alternatives at this scale. The increase in flow is primarily due to the mortality of trees caused by the Douglas-fir beetle. Additional mortality due to harvest of green trees is not expected to be a measurable increase in magnitude or quantity of flows. No measurable differences are expected to occur between any alternatives. No measurable effects are expected to stream channel conditions.

Beaver Creek Analysis Area

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 Beaver Creek Watershed is considered 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 road has 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.

Other foreseeable activity within the Beaver Creek watershed includes the removal of dead and dying Douglas-fir associated with the Douglas-fir Beetle Project. Watershed improvement work also associated with this project includes culvert upgrades to meet 100-year flood events. Other funded foreseeable watershed improvement associated with Kings Ridge and Unknown Pony Timber Sales includes; removal of 8 miles of road and 19 channel crossings, fish habitat improvement, fish cover structures, log step downs, riparian planting and erosion control on 4 miles of road.

Streamflow Regime

The hydrologic regime within Beaver Creek has been substantially altered as a result of timber harvest, road building, and mining in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities. Approximately 70% of the Beaver Creek watershed is sensitive to rain-on-snow events. Equivalent Clearcut Acres account for approximately 9% of the watershed, representing a slight increased risk from rain-on-snow events.

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 III-49. 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	Unknown Gulch, Potosi Gulch, White Creek
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	25
Current Runoff Modification (percent of peak)	4
Equivalent Clearcut Area (percent of watershed)	9
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	17
Current Sediment Load Modification (percent)	136
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	
Number of Inventoried Crossings	26
Risk of Failure for Inventoried Crossings (tons/year)	110
Number of Estimated Crossings	24
Risk of Failure for Estimated Crossings (tons/year)	42
Stream Crossing Frequency (#/mile of stream)	2.0
Number of Fish Migration Barriers	3

Cumulative Effects

The cumulative effects analysis area extends from the headwaters of Beaver Creek to its outlet into the North Fork of the Coeur d'Alene River. Earlier analysis of this cumulative effects area was completed in 1999 in the Douglas-fir Beetle Project FEIS. The analysis for this Small Sales EIS was based on: 1) the planned activity in the Douglas-fir FEIS and ongoing activities at the time, 2) what was actually implemented under the Douglas-fir FEIS, 3) the planned activities under the Small Sales EIS, 4) additional watsed modeling to use as a comparison for increases in peak flow and sediment.

Cumulative effects of 589 acres of harvest were analyzed under the selected alternative of the Douglas-fir Beetle FEIS. Approximately 243 acres (41%) were actually harvested (See Project Records, Douglas-fir Beetle Project,Comparison of Planned Versus Implemented Harvest and Road Activities, 3 pages). Under all the action Alternatives of the Small Sales EIS, 257 additional acres of timber harvest are proposed in the Beaver Creek watershed. Only .2 miles of temporary road construction would be built under the action alternatives. The cumulative 500 acres of harvest is approximately 85% of what was analyzed in the Douglas-fir Beetle Project FEIS. The risk of negative cumulative effects to beneficial uses is actually lower than what was analyzed for

Alternative D of the Douglas-fir Beetle Project EIS. Cumulative effects of proposed management under the Small Sales EIS fall within the scope of the Douglas-fir Beetle FEIS and are discussed on pages III-172 to III-174 of the Douglas-fir Beetle Project FEIS. The additional comparison runs of the wasted model for all alternatives show no increases in either peak flow or sediment for all the action alternatives.

Table III-50. Projected watershed response in the Beaver Creek Watershed, by alternative.

Each measure of change in the table is discussed above in the "Methodology" section.

WATERSHED NAME: Beaver Creek Watershed	HUC: 1701030130
TRIBUTARY: Beaver Creek	HUC: 1701030130

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	142	141	141	141
Peak flow (%)	5	5	5	5
Net stream crossings (#)	0	0	0	0
Net associated risk (tons/year)	0	0	0	0
Net roads (miles)	0	0	0	0
Net encroaching road (miles)	0	0	0	0

Direct and Indirect Effects at the Tributary and Localized Scales

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. No increase in sediment would be expected at the tributary scale with only .2 miles of planned road construction. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat. The estimates under alternative 1, from the Douglas-fir Beetle Project FEIS Alternative D, are not expected to change under any of the action alternatives of the Small Sale EIS. This conclusion is based on the decreased amount of harvest under the Douglas-fir Beetle FEIS, additional levels of harvest remaining below what was analyzed, and the small amount of road construction with this EIS in all the action alternatives.

The direct and indirect effects of canopy removal at localized sites under all alternatives within Beaver Creek 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. No measurable increase in magnitude or quantity of flows is expected in any of the action alternatives with the small amount of additional mortality due to the harvest of selected green trees. No measurable effects would occur in stream channel conditions.

Prichard Creek Analysis Area

Overview

Prichard Creek is a 97.7-square mile sixth-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. Activities such as timber harvest, extensive mining and road building

has occurred throughout the watershed on both National Forest System lands and on private ownership. The Prichard Creek Watershed is considered 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 Prichard Creek Watershed are Salmonid Spawning, Cold Water Biota, Water Supply Agricultural and Drinking, and Recreation as listed in the 1992 Idaho Water Quality Status Report.

Within the Prichard Creek watershed, a total of 22 miles of road has had watershed improvement work completed. Work included removal of 56 road channel crossings, stabilizing unstable road sections, removal of encroaching road segments and applying erosion control.

Funded forseeable watershed improvement work includes erosion control on 7 miles of road, instream log placement for fish habitat and armored stream crossings.

Streamflow Regime

The hydrologic regime within Prichard Creek has been substantially altered as a result of timber harvest, road building, and mining in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities. Approximately 52% of the Prichard Creek watershed is sensitive to rain-on-snow events

Stream Channel Stability

Encroachment by streamside roads is the 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. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Road failures have caused excess sediment introduction through the years. The major tributaries that are known to have encroaching sections are, Prichard Creek, Bear Gulch, West Fork of Eagle, Casper Creek and Alder Gulch. Removal of encroaching sections of road has occurred within Nocelley Creek, East Fork of Eagle Creek and Cottonwood Creeks.

As previously discussed, increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Within the Prichard Creek Watershed, 15 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, representing minimal effects compared to encroaching roads and road channel crossing failures.

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Water Quality

Approximately 409 miles of road and 290 road channel crossings exist in the Prichard Creek watersheds, with road densities of 4.2 miles per square mile of land. The stream-crossing frequency throughout the watershed is approximately 2.6 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. 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 III-51. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Prichard Creek Watershed.

Physical Characteristics	
HUC: 1701030127	
Drainage Area (square miles)	97.7
Sensitive Snowpack (percent of watershed)	52
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Not Properly Functioning
Subwatersheds used for analysis	WF Eagle and Prichard Creeks
Erosion and Sediment	
Road Density (miles/mile2)	4.2
Channel Conflicts	
Riparian Road Density (miles/mile2)	.4
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	2.6
Number of Fish Migration Barriers	0

Cumulative Effects

The cumulative effects analysis area in Prichard Creek Watershed extends from the headwaters to the North Fork of the Coeur d'Alene River. No short- or long-term effects to beneficial uses are expected at the watershed scale. With no road construction and the majority of the harvest dead and dying timber, no apparent changes in sediment yields or peak flows are anticipated under any of the alternatives, (See Methodology Section, Methods for Cumulative Effects Analysis in the Small Sale Project, pg-101). There would be no direct or indirect or cumulative effects on the timing, magnitude or quantity of flow under any alternative. Local or watershed-scale changes in flood frequency would not be measurable or affect either the stream or channel structure at this scale, (See Methodology Section, Rain-on-Snow Analysis, pg-103). Alterations in hillslope processes would not affect values or beneficial uses at the watershed scale. Sediment risk has be reduced as a result of past watershed restoration activities and will be further reduced with forseeable watershed activities. Net risk reductions in sediment associated with past watershed restoration from a net decrease in road channel crossings may not be measurable at this scale. However, sediment reductions from restoration work would contribute to the stability of the stream channel at the watershed scale in various areas.

Proposed ecosystem burning associated with Alternative 2 would not be expected to have any short- or long-term effects to beneficial uses. Cumulatively, there would be no measurable short- or long-term effects to stream condition, hillslope hydrology, or fisheries habitat. No adverse effects to beneficial uses are expected. Risk of future sediment loading, primarily at the road channel crossings, has been reduced through watershed improvement activities. The pollutant of concern (sediment) that has caused Prichard Creek to be listed as a Water Quality Limited Stream would not be increased under any of the alternatives, including the No-Action Alternative.

Table III-52. Projected watershed response in the Prichard Creek Watershed, by alternative.

WATERSHED NAME: Prichard Creek Watershed	HUC: 1701030127
TRIBUTARY: Prichard Creek	HUC: 1701030127

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	**	**	**	**
Peak flow (%)	**	**	**	**
Net stream crossings (#)	-5	-5	-5	-5
Net roads (miles)	-3.5	-3.5	-3.5	-3.5
Net encroaching road (miles)	0	0	0	0

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative.*

Direct and Indirect Effects at the Tributary and Localized Scales

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. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat.

Sediment reductions would be associated with the net reduction in stream channel crossings and road miles under Alternative 1. The direct effect of this work would be a short-term introduction of fine sediment at localized sites, which would not be expected to adversely affect channel conditions and fish habitat. Other direct effects include reductions in the contributing area and in the risk for channel crossing failure. A small reduction in the contributing area might trend the localized tributaries towards reduced peak flows. Removing culverts eliminates flow constriction, which reduces flow velocities at local sites.

Indirect effects of the watershed improvement work includes decreasing fine sediment and bedload sources, increasing flood-prone area, decreasing risks of catastrophic channel failures and increasing the stream's ability to dynamically adjust to flows and sediment. At this scale in the watershed, this would provide a gradual decline in sediment routing downstream which would provide improved conditions for beneficial uses.

Alternative 2 proposes ecosystem burning in the Prichard Face drainages. The direct effects of the burning that is adjacent to small first-order streams would include minimal deliver of fine sediment at localized sites; no measurable indirect effects to streams would be expected. No road construction, reconstruction, or tractor logging on sensitive landtypes would occur in the Prichard Creek drainage under any of the alternatives.

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. Additional mortality due to harvest of green trees would not result in a measurable increase in magnitude or quantity of flows for any of the alternatives. No measurable effects would occur in stream channel conditions.

The cumulative effects from management activities most likely would not be discernible at this scale for increases in peak flows or sediment over what would occur under the No-Action Alternative. Cumulative benefits at the tributary scale with the amount of watershed improvement planned would most likely not be discernible at this scale either.

Shoshone Creek Analysis Area

Overview

Shoshone Creek Watershed is a 69.3 square mile fifth-order watershed, and a tributary to the North Fork of the Coeur d'Alene River. Valley sideslopes are generally steep (50 to 60 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred throughout the Shoshone Creek Watershed. The Shoshone Creek Watershed is considered 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

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

Within the Shoshone Creek watershed, a total of 29 miles of road has had watershed improvement work completed. Work included removal of 51 road channel crossings, removal of encroaching road sections, stabilizing unstable road sections, and applying erosion control

Streamflow Regime

The hydrologic regime within the Shoshone Creek watershed has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, the Shoshone Creek Watershed is at moderate risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events.

Stream Channel Stability

Encroachment by streamside roads is the dominant feature of the riparian areas in Shoshone Creek, and several of the major tributaries. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and

culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Frequent road failures have caused excess sediment introduction through the years, including the February 1996 flood. Roads 412, 945, and 948 have sections that encroach directly on the stream, with numerous other roads that encroach mainly at the road channel crossings. These sections of road directly compromise stream hydraulics and 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 Shoshone Creek Watershed, 39 percent of the linear riparian influenced area has been directly affected by past regeneration harvest. This represents a relatively moderate to high amount of past riparian harvest within the watershed.

Water Quality

Approximately 479 miles of road and an estimated 538 road channel crossings exist in the Shoshone Creek Watershed area, with road densities of 6.9-miles/square mile of land. The stream-crossing frequency throughout the watershed is approximately 0.5 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the Shoshone Creek watershed, 22 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 22 percent of the miles of road on these same land types. In addition, sediment has been released from headwater areas through harvest of riparian-influenced areas and the "cleaning" of channel debris.

Table III-53. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Shoshone Creek Watershed.

Physical Characteristics	
HUC: 170103012400	
Drainage Area (square miles)	69.3
Sensitive Landtypes (percent of watershed)	22
Sensitive Snowpack (percent of watershed)	59
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Not Properly Functioning
Subwatersheds used for analysis	Entire Watershed
Erosion and Sediment	
Road Density (miles/mile2)	6.9
Sensitive Road Density (miles/mile2)	1.5
Channel Conflicts	
Riparian Road Density (miles/mile2)	.11
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	.5
Number of Fish Migration Barriers	0

Cumulative Effects

The cumulative effects analysis area in Shoshone Creek Watershed extends from the headwaters to the North Fork of the Coeur d'Alene River. No short- or long-term effects to beneficial uses are expected at the watershed scale. With no road construction and the majority of the harvest dead and dying timber, no apparent changes in sediment yields or peak flows are anticipated under any of the alternatives. There would be no direct or indirect or cumulative effects on the timing, magnitude or quantity of flow under any alternative. Local or watershed-scale changes in flood frequency would not be measurable or affect either the stream or channel structure at this scale. Alterations in hillslope processes would not affect values or beneficial uses at the watershed scale.

Cumulatively, there would be no measurable short- or long-term effects to stream condition, hillslope hydrology, or fisheries habitat. With no road construction or reconstruction to occur, no increases in sediment are expected. No adverse effects to beneficial uses are expected. Risk of future sediment loading, primarily at the road channel crossings, have been reduced by past watershed improvement activities. The pollutant of concern (sediment) that has caused Shoshone Creek to be listed as a Water Quality Limited Stream would not be increased.

Table III-54. Projected watershed response in the Shoshone Creek Watershed, by alternative.

WATERSHED NAME: Shoshone Creek Watershed	HUC: 170103012400
TRIBUTARY: Shoshone Creek	HUC170103012400

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

*** No measurable increases in sediment or peak flows are anticipated over the No Action Alternative.*

Direct and Indirect Effects at the Tributary and Localized Scales

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. With no road construction, tractor logging on sensitive landtypes, and the majority of the harvest removing dead and dying timber, no increases in peak flow or sediment are anticipated. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat.

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. Additional mortality due to harvest of green trees would not result in a measurable increase in magnitude or quantity of flows for any of the alternatives. No measurable effects would occur in stream channel conditions.

Downey Creek Analysis Area

Overview

Downey Creek Watershed is a 9.5 square mile fourth-order watershed, in a southwest-northwest trending drainage. Valley sideslopes are generally steep (30 to 60 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred throughout the entire watershed.. The Downey Creek Watershed is considered 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

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

Completed watershed improvement work consists of removal of 14 miles of road and 34 stream crossings, stabilizing road fills, and applying erosion control. This work was completed under the Yellow Dog Downey Timber Sale EA, using Presidents Initiative funding. Within the Downey Creek Watershed, foreseeable activities include the removal of 51 miles of road and the removal of 49 road channel crossings including the removal of 3.8 miles of encroaching road sections along lower Downey Creek.

Streamflow Regime

The hydrologic regime within the Downey Creek watershed has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, the Downey Creek Watershed is at high risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events. The equivalent clearcut area in the Downey Creek watershed is approximately 10%, representing a small increase in risk from rain-on-snow events over natural conditions.

Stream Channel Stability

Encroachment by streamside roads is the dominant feature of the riparian areas in Downey Creek. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Frequent road failures have caused excess sediment introduction through the years. Road 6524 is an encroaching road within the lower reaches of Downey Creek. These sections of road directly compromise stream hydraulics and 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 Downey Creek Watershed, 59 percent of the linear riparian influenced area has been directly affected by past regeneration harvest. This represents a relatively moderate to high amount of past riparian harvest within the watershed, compounding the effects of the encroaching roads and crossings failures..

Approximately 78 miles of road and 102 road channel crossings exist in the Downey Creek Watershed area, with road densities of 7.9-miles/square mile of land. The stream-crossing frequency throughout the watershed is approximately 1.9 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Within the Downey Creek watershed, 23 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 30 percent of the miles of road on these same land types. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-55. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Downey Creek Watershed.

Physical Characteristics	
HUC: 170103010030	
Drainage Area (square miles)	9.5
Sensitive Landtypes (percent of watershed)	23
Sensitive Snowpack (percent of watershed)	68
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Not Properly Functioning
Subwatersheds used for analysis	Entire Watershed
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	29
Current Runoff Modification (percent of peak)	10
Equivalent Clearcut Area (percent of watershed)	16
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	18
Current Sediment Load Modification (percent)	565
Road Density (miles/mile2)	8.2
Sensitive Road Density (miles/mile2)	2.5
Channel Conflicts	
Riparian Road Density (miles/mile2)	0.3
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	1.9
Number of Fish Migration Barriers	0

Cumulative Effects

The cumulative effects analysis area in Downey Creek Watershed extends from the headwaters to the North Fork of the Coeur d'Alene River. No short- or long-term effects to beneficial uses are expected at the watershed scale. No apparent changes in sediment yields or peak flows are anticipated under any of the alternatives, (See Project Records, Watsed Reports). There would be no

direct or indirect or cumulative effects on the timing, magnitude or quantity of flow under any alternative. Local or watershed-scale changes in flood frequency would not be measurable or affect either the stream or channel structure at this scale. Alterations in hillslope processes would not affect values or beneficial uses at the watershed scale. Net reductions in sediment from the removal of road channel crossings and road miles associated with Alternative 1 would not be measurable at this scale.

Cumulatively, there would be no measurable short- or long-term effects to stream condition, hillslope hydrology, or fisheries habitat. Short-term increases in fine sediment would occur in localized areas immediately following new road construction in the lower reach of Downey Creek. No sediment is expected to reach Downey Creek due to the location of temporary road. No adverse effects to beneficial uses are expected. Risk of future sediment loading, primarily at the road channel crossings, would be reduced with planned watershed improvement activities associated with Alternative 1. The pollutant of concern (sediment) that has caused Downey Creek to be listed as a Water Quality Limited Stream would not be increased. In fact, slight short- and long-term reduction of sediment would occur with implementation of activities associated with Alternative 1.

Table III-56. Projected watershed response in the Downey Creek Watershed, by alternative.

WATERSHED NAME: Downey Creek Watershed	HUC: 170103010030
TRIBUTARY: Downey Creek	HUC: 170103010030

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	125	125	125	125
Peak flow (%)	10	10	10	10
Net stream crossings (#)	-49	-49	-49	-49
Net roads (miles)	-51	-51	-51	-51
Net encroaching road (miles)	-3.8	-3.8	-3.8	-3.8

Direct and Indirect Effects at the Tributary and Localized Scales

At the tributary scale, no direct or indirect effects to beneficial uses are anticipated from harvest activities and temporary road construction under any of the action alternatives. The implementation of Best Management Practices (BMPs) and adherence with the Inland Native Fish Strategy would provide protection for riparian habitat and control the majority of the sediment associated with management activities. The sediment yield and peak flow estimates in the table represent the cumulative expected responses based on forest development activities over time throughout the watershed. The estimates assume standard BMPs and Soil and Water Conservation Practices.

No road construction or tractor logging on sensitive landtypes would occur in the Downey Creek drainage under any of the alternatives.

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 ice-storm damage. Additional mortality due to the incidental harvest of green trees would not result in a

measurable increase in magnitude or quantity of flows for any of the alternatives. No measurable effects would occur in stream channel conditions.

The cumulative effects from management activities most likely would not be discernible at this scale for increases in peak flows or sediment over what would occur under the No-Action Alternative. Cumulative benefits at the tributary scale with the amount of watershed improvement planned would most likely not be discernible at this scale either, however, net risk reductions in sediment due to the restoration would contribute to the stability of the stream channel.

Trail Creek Analysis Area

Overview

Callis Creek is a 5.8-square mile fourth-order tributary to Trail Creek, a 29.8-square mile fifth-order stream. Valley sideslopes are generally steep (50 to 70 percent) and vegetated predominately with conifers. Activities such as timber harvest and road building has occurred within the Trail Creek Watershed, but limited activities have occurred within Callis Creek. The Trail Creek Watershed is considered 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

Beneficial uses within the Trail Creek watershed include Cold Water Biota, Salmonid Spawning Water Supply Agricultural and Drinking, and Recreation as listed in the 1992 Idaho Water Quality Status Report.

Within the Trail Creek watershed, a total of 7 miles of road has had watershed improvement work completed. Work included removal of 26 road channel crossings, removing sections of encroaching road, stabilizing unstable road sections, and applying erosion control.

Streamflow Regime

The hydrologic regime within the Trail Creek watershed has been altered as a result of timber harvest and road building, in the same respects as previously discussed. Within Callis Creek, harvest and road building has been confined to the headwaters and has not negatively altered the streamflow characteristics as the Trail Creek Watershed as a whole. Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries. Due to the maritime influence, the Trail Creek watershed is at high risk from rain-on-snow events. Past management activities and natural vegetative modifications that cause openings in tree cover can cause increases during these events. The equivalent clearcut area in the Trail Creek watershed is approximately 7%, representing a small increase in risk from rain-on-snow events over natural conditions.

Stream Channel Stability

Encroachment by streamside roads is the dominant feature of the riparian areas in Trail Creek, with no encroaching road segments in Callis Creek and only a small section at the lower reach of Hamilton Creek. Encroaching roads constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and culvert failures along with channel pattern changes can result in undesirable long-term changes to the stream. Streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Frequent road failures have caused excess sediment introduction through the years, including the February 1996 flood. Road 534 in Potter Creek is an encroaching road. Sections of road directly compromise stream hydraulics and 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 Trail Creek Watershed, 27 percent of the linear riparian influenced area has been directly affected by past regeneration harvest. This represents a relatively low to moderate amount of past riparian harvest within the watershed, possibly adding the effects of the encroaching roads and crossings failures.

Water Quality

Approximately 160 miles of road and 202 road channel crossings exist in the Trail Creek Watershed area, with road densities of 5.4-miles/square mile of land. Within Callis Creek, Coon Gulch and Hamilton Creek a total of 38 miles of road exist and 2 road channel crossings. The stream-crossing frequency throughout the watershed is approximately 3.3 crossings per mile of stream. Each of the road channel crossings, particularly on roads which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Hamilton Creek at its confluence with Trail Creek is drained by a ditch causing some fish migration problems and should be replaced with a bottomless arch to provide fish access and channel stability. Within the Trail Creek watershed, 61 percent of the area is on sensitive landtypes with high landslide and sediment delivery potential, with approximately 44 percent of the miles of road on these same land types. Callis Creek, Hamilton and Coon gulch have 34 percent of the area on these same landtypes, and 28 percent of the roads. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris.

Table III-57. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Trail Creek Watershed.

Physical Characteristics	
HUC: 17010301151506	
Drainage Area (square miles)	29.8
Sensitive Landtypes (percent of watershed)	61
Sensitive Snowpack (percent of watershed)	90
Qualifications	
Is all or part listed as Water Quality Limited?	Yes
Apparent Watershed Status	Not Properly functioning
Subwatersheds used for analysis	Callis Creek, Coon Gulch, Hamilton Creek
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	20
Current Runoff Modification (percent of peak)	2
Equivalent Clearcut Area (percent of watershed)	7
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	20
Current Sediment Load Modification (percent)	227
Road Density (miles/mile2)	5.4
Sensitive Road Density (miles/mile2)	2.4
Channel Conflicts	
Riparian Road Density (miles/mile2)	0.14
Stream Crossings	
Stream Crossing Frequency (#/mile of stream)	3.3
Number of Fish Migration Barriers	0

Cumulative Effects

The cumulative effects analysis area in Trail Creek Watershed extends from the headwaters to Tepee Creek. No short- or long-term effects to beneficial uses are expected at the watershed scale. There is an indication that a short-term increase in sediment can be expected under all the action alternatives, with no apparent increases in peak flows under any of the alternatives. This modeled increase is an indicator that an increase in sediment is possible. However the modeled increase can be attributed to the tractor logging that would be controlled with the implementation of BMP's and adherence with the Inland Native Fish Strategy, providing protection for riparian habitat and control the majority of the sediment associated with these activities.

At the watershed scale, would be no measurable direct or indirect or cumulative effects on the timing, magnitude or quantity of flow under any alternative. Under all the Action Alternatives, the indicated increase in sediment from management activities represents a slight, short- term risk to beneficial uses, but is not expected to adversely affect any of those beneficial uses. Local or watershed-scale changes in flood frequency would not be measurable or affect either the stream or channel structure at this scale. Alterations in hillslope processes would not affect values or beneficial uses at the watershed scale.

Cumulatively, there would be no measurable short- or long-term effects to stream condition, hillslope hydrology, or fisheries habitat. No adverse effects to beneficial uses is expected. Risk of future sediment loading, primarily at the road channel crossings, would not be reduced with any of

the alternatives with no planned watershed improvement activities. The pollutant of concern (sediment) that has caused Trail Creek to be listed as a Water Quality Limited Stream would not be decreased or increased under any of the alternatives.

Table III-58. Projected watershed response in the Trail Creek Watershed, by alternative.

WATERSHED NAME: Trail Creek Watershed	HUC: 17010301151506
TRIBUTARY: Trail Creek Watershed	HUC: 17010301151506

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment yield (%)	227	229	229	229
Peak flow (%)	2	2	2	2
Net stream crossings (#)	0	0	0	0
Net roads (miles)	0	0	0	0
Net encroaching road (miles)	0	0	0	0

Direct and Indirect Effects at the Tributary and Localized Scales (Callis Creek, Hamilton Creek, and Coon Gulch).

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. The short-term increase in sediment associated with the action alternatives would not be measurable at the tributary scale. The implementation of BMP's and adherence to the Inland Native Fish Strategy would provide protection for riparian habitat and control the majority of the sediment associated with these activities. The sediment yield and peak flow estimates in the table represent the cumulative expected responses based on forest development activities over time throughout the watershed (please refer to the Project Files, WATSED, "Callis Creek" for the tributary-scale projected watershed response). The estimates assume implementation of standard BMP's and Soil and Water Conservation Practices.

Proposed management activities would result in limited, short term sediment inputs in localized areas within individual tributaries under all action alternatives. Limited sediment inputs would occur in areas of tractor skidding that are in close proximity to stream channels. Implementation of BMPs would reduce potential sediment loading at these localized sites. Potential increases in sediment associated with logging under the action alternatives would be minimal, and would not be expected to have an effect on channel conditions.

Under all action alternatives, 9.5 acres of tractor logging on sensitive landtypes would occur. The direct effects of the proposed harvest adjacent to small first-order streams would include minimal delivery of sediment at localized sites, but no measurable indirect effects to streams with the implementation of riparian buffers and BMP's.

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 ice-storm damage. Additional mortality due to harvest of green trees that are dying would not

result in a measurable increase in magnitude or quantity of flows for any of the alternatives. No measurable effects would occur in stream channel conditions.

The cumulative effects from management activities most likely would not be discernible at this scale for increases in peak flows or sediment over what would occur under the No-Action Alternative.

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, 3) the low level of temporary road construction, 4) the location of temporary roads in the watershed, and the 5) 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 restoration projects and through scheduling of timber harvest and road building activities. 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 specified in Chapter II.

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 the Alternatives would be consistent with the Clean Water Act and Water Quality Limited Listings.

FISHERIES

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 (36CFR219.19). Regulations further state that the effects on these species and the reason for their choice as management indicator species be documented (36CFR219.19(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 (40CFR1502.16). 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 Small Sales Project EIS 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.

Affected Environment

Introduction

The cumulative effects areas are made up of sixteen groups of watersheds: Little North Fork Coeur d'Alene River, Fourth of July, Wolf Lodge, Cedar, Cougar, Downey, Callis, Prichard/Eagle, Beaver, Shoshone, Rathdrum, Fernan, Hayden, Blue creek, Thompson Creek and Cataldo Face. Within these watersheds there are several subwatersheds in which analysis was conducted for fish, as displayed in the table below.

Table III-59. Sixth-scale code watersheds and the Hydrological Unit Code (HUC) associated with the watershed.

Stream Name	HUC #
Downey area	170103010030
Callis area	
Trail	17010301151500
Callis	17010301151506
Coon	17010301151500
Hamilton	17010301151500
Prichard/Eagle	
Prichard	1701030127
Eagle	170103012703
Nocelly	170103012706
Beaver area	
Beaver	1701030130
Trail	170103013012
Potosi	17010301301200
Placer	170103013012
Unknown	170103013021
Pony	170103013018
White	170103013054
Alder	170103013051
Lower Little NF CDA area	
Little NF CDA River	1701030103
Browns	170103010303
Owl	170103010309
Williams	170103010306
Little Bumblebee	170103010378
Little Tepee	170103010375
Gimlet	170103010312
Main NF CDA River	
Main NF CDA River	1701030100
Lightner	170103010006
Fernan Creek area	170103030303

Stream Name	HUC #
Wolf Lodge area	
Wolf Lodge	170103030603
Rutherford	17010303060312
Blue	17010303001500
Cedar area	1701030306
Fourth of July area	
Fourth of July	1701030324
Curran	170103032424
Mason	170103032421
Fern	17010303243000
Bentley	170103032433
Rantenan	17010303243015
Service	170103032427
Cougar area	
November	1701030106
Cougar	1701030106
Chain Lakes area	
Thompson	170103031806
Nettleton Gulch area	
Nettleton Gulch	170103050621
Hayden Lake area	
Hayden	170103051206
Lancaster	17010305120606
Shoshone area	
Shoshone	170103012400
Falls	170103011824
Haystack	17010301246300
Cataldo Face area	
Hayden	170103031824
Hardy	170103031821

** HUC code numbers may represent a single 6th+ code, although there are multiple HUCs within the watershed area*

Fish Presence

These cumulative effects areas (Table III-59) contain approximately 200 miles of fish-bearing streams. Fish species that inhabit streams in this area 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*), and possibly longnose dace (*Rhinichthys cataractae*) and 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 and between native bull trout and exotic brook trout may be present. The distribution of some of these fish within streams in the cumulative effects areas can be found in the table below.

The current condition and distribution of the fisheries resources within the areas analyzed within this EIS 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 Coeur d'Alene portion of this EIS can be found in Table III -60.

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 III-60. Summary of the distribution of selected fish species within selected streams in the project area.

Stream Name	HUC #	Access	WCT	BT	RT	BkT	MW	Scp
Downey area	170103010030	Y	Y	LN	LN	LN	LN	Y
Callis area								
Trail	17010301151500	Y	Y	LN	LN	N	N	Y
Callis	17010301151506	Y	Y	LN	LN	N	LN	Y
Coon	17010301151500	Y	Y	N	LN	N	LN	Y
Hamilton	17010301151500	Y	Y	N	LN	N	LN	Y
Prichard/Eagle area								
Prichard	1701030127	Y	Y	Y	LY	Y	Y	Y
Eagle	170103012703	Y	Y	Y	LY	Y	N	Y
Nocelly	170103012706	Y	Y	LN	LY	LN	N	Y
Beaver area								
Beaver	1701030130	Y	Y	H	LY	Y	LN	Y
Trail	170103013012	Y	LY	LN	LN	LY	LN	LY
Potosi	17010301301200	N	Y	LN	LN	LY	N	Y
Placer	170103013012	N	LY	LN	LN	LN	LN	LY
Unknown	170103013021	N	LY	LN	LN	LY	N	LY
Pony	170103013018	LY	Y	LN	LN	LY	N	Y
White	170103013054	Y	Y	LN	LN	LY	N	Y
Alder	170103013051	Y	Y	LN	LN	Y	N	Y
Lower Little NF CDA								
Little NF CDA River	1701030103	Y	Y	H	LY	Y	Y	Y
Browns	170103010303	Y	Y	LN	LN	LN	N	Y
Owl	170103010309	Y	Y	LN	LN	LY	N	Y
Williams	170103010306	Y	Y	LN	LN	LN	N	Y
Little Bumblebee	170103010378	Y	LY	N	LN	LN	N	Y
Little Tepee	170103010375	Y	Y	N	N	Y	N	Y
Gimlet	170103010312	Y	Y	N	Y	LY	N	Y
Main NF CDA River								
Main NF CDA River	1701030100	Y	Y	Y	Y	LY	Y	Y
Lightner	170103010006	Y	LY	LH	LN	LN	LN	LY
Fernan Creek area	170103030303	Y	LY	LH	LY	LY	LN	LY
Wolf Lodge area								
Wolf Lodge	170103030603	Y	Y	LH	N	Y	Y	Y
Rutherford	17010303060312	LN	Y	LH	N	LN	LN	LY
Blue	17010303001500	LN	LY	LH	N	LN	LN	LY
Cedar area	1701030306	Y	Y	LH	LN	LY	LN	LY
Fourth of July area								
Fourth of July	1701030324	N	LY	LH	LN	LY	LN	LY
Curran	170103032424	N	LY	LH	LN	LY	LN	LY
Mason	170103032421	N	LY	LH	LN	LY	LN	LY
Fern	17010303243000	N	LY	LH	LN	LY	LN	LY
Bentley	170103032433	N	LY	LH	LN	LY	LN	LY
Rantenan	17010303243015	N	Y	LH	LN	LY	LN	LY
Service	170103032427	N	LY	LH	LN	LY	LN	LY
Cougar area								
November	1701030106	Y	LY	LH	LN	LY	LN	Y
Cougar	1701030106	Y	Y	LH	Y	LY	LN	LY

Table III-60. Summary of the distribution of selected fish species within selected streams in the project area, continued.

Stream Name	HUC #	Access	WCT	BT	RT	BkT	MW	Scp
Chain Lakes area								
Thompson	170103031806	N	LY	LH	LN	Y	LN	LY
Nettleton Gulch area	170103050621	N	N	N	N	N	N	N
Hayden Lake area								
Hayden	170103051206	Y	Y	N	Y	Y	N	Y
Lancaster	17010305120606	Y	LY	N	LY	LY	LN	LY
Shoshone area								
Shoshone	170103012400	Y	Y	LH	LN	LN	LY	Y
Falls	170103011824	Y	Y	LH	LN	LN	LN	Y
Haystack	17010301246300	Y	Y	LH	LN	LN	LN	Y
Cataldo Face area								
Hayden	170103031824	N	LY	LH	LY	LY	N	LY
Hardy	170103031821	N	LY	LH	LY	LY	N	LY

Due to the large number of fish species within the cumulative effects areas, 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 EIS 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 also. 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 project 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 EIS because they are not known to occur in the Coeur d'Alene Watershed (Simpson and Wallace 1978).

Westslope cutthroat trout and bull trout are native to streams in the project area (Maclay 1940, Dunnigan 1997, Horton 1985, Lider and Techau 1994, Lukens et al 1976). Westslope cutthroat trout are known to be utilizing streams within the project area for migration, spawning, rearing, and over-wintering. Although bull trout were historically documented in the project area reproducing populations have not been recently documented. Individual fish, however, have been reported within the mainstem Coeur d' Alene River, Prichard creek and the Little North Fork Coeur d' Alene river. Nonetheless, westslope cutthroat trout and bull trout have been selected as appropriate Management Indicator Species for the fisheries analysis of the opportunities (capturing economic value) related to tree mortality caused by Douglas-fir beetle. Although both fish do not exist in all streams one of the two is found in most large streams. 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 watersheds in the project area. 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 adfluvial life history strategies of westslope cutthroat trout are likely present within watersheds in the project area (Maclay 1940, Dunnigan 1997, Horton 1985, Lider and Techau 1994, Lukens et al, 1976). 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 project 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).

Of the streams listed in Table III-60, the following streams are likely the most important to species persistence to westslope cutthroat within the analysis areas:

- *Coeur d' Alene River (Enaville to Tepee creek)*
- *Wolf Lodge Creek (excluding Cedar Creek)*
- *Prichard/Eagle*
- *Callis*
- *Cougar*
- *Hayden Creek*

The main Coeur d'Alene River system and specifically the reaches from Enaville to Tepee creek provide critical winter habitat for westslope cutthroat trout. The remaining larger, deep pools are critical for winter refugia areas for adult fish. Lewynsky (1986) found that fluvial fish concentrated in a few large runs and pools during winter. These areas seem to be critical for the maintenance of stocks of fluvial fish. Resident, fluvial and possible adfluvial fish utilize the Downey, Wolf Lodge, Prichard/Eagle, Challis and Cougar watersheds for spawning and rearing. They have a variety of

stream types (size , flows and complexity) that appear to provide fish with diverse habitats allowing for long term persistence within the watersheds. Downey creek (althought population are depressed with the watershed) is adjacent to Nodal habitat (CDA river) with some of the higher populations in the watershed. With these stocks in the river adjacent spawning and rearing areas are critical. Factors which could be limiting fish production relate to amount of roads within the watershed. Hillslope roads have been contributing excessive levels of sediment which may be affecting channel conditions and pool habitat. Valley bottom roads could also be affecting channel condition by increasing sediment loading (from road failures). Both could be negatively affecting channel/floodplain connectivity and affect the distribution and stability of large wood which influences instream cover and stream complexity. Both of these parameters can have dramatic effects on fish production.

Wolf Lodge Creek, and its tributaries, are very important to the persistence of adfluvial populations of cutthroat trout within the northern end of Lake Coeur d' Alene. These watersheds have a variety of stream types that appear to provide fish with diverse habitats allowing for long-term persistence within the watershed. Sediment loads from hillslope roads and the effects on channel morphology from timber harvest appear to be the greatest impact from national forest system lands. Development within the flood-prone area on private land also impacts the persistence of fish within the Wolf Lodge Creek basin.

The Hayden Creek watershed provides for the greatest number of miles of spawning and rearing streams for adfluvial populations in Hayden Lake. Again, the size of the watershed provides a variety of stream types that appear to provide fish with diverse habitats allowing for long-term persistence within the watershed. Sediment from failing roads and valley bottom roads appear to be a major factor that could be limiting fish production. These road systems and sediment loads are affecting channel conditions and pool habitat. Valley bottom roads may be affecting channel conditions by increasing sediment loading (from road failures), negatively affecting channel/floodplain connectivity and affecting the distribution and stability of large wood which influences instream cover and stream complexity. Migration barriers may also be negatively affecting fish production.

Bull Trout

Bull trout are also native to watersheds draining into Lake Coeur d' Alene and the North Fork of the Coeur d' Alene River within the project areas. Currently, only occasional migrants are found within the Coeur d'Alene Watershed. They have been noted in Prichard creek, the main Coeur d' Alene river up to the Downey creek analysis area and are known to occur within Lake Coeur d' Alene (J. Davis Idaho Department of Fish and Game, Personnel Communication). 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. The lower limits of many strong bull trout distributions mapped by Lee et al. (1997) correspond to a

mean annual air temperature of about 4 degrees Centigrade (ranging from 3 to 6 degrees Centigrade) and should equate to ground water temperatures of about 5 to 10 degrees Centigrade (Meisner 1990). Temperature can be strongly influenced by land management (Henjum et al. 1994).

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).This high risk of extinction is due to cumulative effects from past action within the Coeur d' Alene basin. These actions have increased the risks of extinction due to barriers to migration, competition and hybridization with introduced species such as brook trout, habitat degradation and over harvesting. 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 which is within the cumulative effects area for this project. However, seasonal bull trout migration up and down from the mouth of Prichard creek makes it likely that individuals periodically inhabit portions of the Coeur d' Alene drainage. Based on existing surveys within the Coeur d' Alene basin (Dunnigan 1997, Horton 1985, Lider and Techau 1994, Lukens et al 1976) no individuals are known to spawn within the basin.

Of the streams listed within Table III-60, the following streams are likely the most important to species persistence for bull trout within the analysis areas:

- *Coeur d' Alene River (Enaville to Tepee creek)*
- *Cougar Creek*
- *Prichard/Eagle*
- *Wolf Lodge Creek*
- *Falls creek*

The importance of the main Coeur d' Alene River and Wolf Lodge Creek are presented in the discussion on cutthroat trout. Prichard/Eagle may be important due to water temperatures. Bull trout have repeatedly been associated with the coldest stream reaches within basins. Temperature data collected during the summer of 1999 indicated that the upper reaches of Prichard and Eagle creek maintain water temperatures in the range of 7 to 12 degrees Centigrade during the summer months (Project files, Fisheries, page ??) Literature suggest that temperatures in excess of 15 degrees Centigrade are thought to limit bull trout distribution (Rieman and McIntyre, 1993). The data indicates that temperatures, although not within optimim ranges for rearing, were some of the lowest values found in the Basin in the last two years of monitoring (Project Files, Fisheries, pages *). Increases in water temperatures as affected by timber harvest and channel widening (excessive sediment levels due to roads) may be a factor affecting fish production within these basins.

Falls Creek has the last documented population of bull trout within the Shoshone Creek watershed. Recent surveys conducted by the Forest Service and the U.S. Fish and Wildlife Service found no bull trout within the stream reaches surveyed, although habitat in the lower A-type reaches have some higher quality pool habitat which appear to be capable of supporting the species.

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. They 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 effects 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.

General Effects of Land Management Activities

Newer roads and some historic roads within the planning area 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 during the winter of 1995-1996 delivered approximately 11,500 cubic yards of material in eighteen streams within the analysis area and considerably altered the condition and trend for fish habitat.

Recent (past five 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 five years), associated roads and watershed/fisheries restoration work 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 have 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, volcanos) 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 on Management Indicator fish species that is not addressed in the fisheries analysis is change 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 planning area is 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 (INFS 1995) the fisheries resource would be served by improving stream habitat conditions.

ENVIRONMENTAL CONSEQUENCES

Methodology

Direct and Indirect effects

Existing conditions were established for primary habitat components believed to be influencing the productive potential of the Management Indicator fish species within the planning areas. 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 effected by management actions. Habitat components of interest include stream temperature, dissolved oxygen, aquatic habitat diversity, cover complexity, and channel stability.

Stream temperature and Dissolved Oxygen 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 if they exists. Dissolved oxygen in high gradient streams, within a mountain valley setting are usually at or exceed saturation levels for dissolved oxygen . These saturation levels are dependent on water temperatures. By tracking the potential changes in stream temperature we can indirectly determine changes in dissolved oxygen.

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 Final EIS 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 area. 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, this EIS tracks 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 EIS 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 by accelerating erosion and sediment loadings, by altering channel morphology, and by changing the runoff characteristics of watersheds. 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 include 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 desired 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 effects of fish passage is the movement of fish to portions of streams not previously used but also culvert replacement activities may increase short-term sediment production. The indirect effects are a better genetic exchange between populations resulting in more sustainable populations over a larger area. 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 and 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 desired Pool Frequency and the Width/Depth Riparian Management Objectives.

Effects to Management Indicator Species Habitat Components

Some activities, in addition to the activities described in the EIS are common to all alternatives and are described under "Reasonably Foreseeable Activities" (Chapter II). All future decisions associated with those projects identified as Reasonably Foreseeable will need to complete consultation with the U.S. Fish and Wildlife Service prior to the decision. 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 these activities, and any action alternative under this analysis is considered to have additive effects when combined with the No-Action Alternative.

Direct and Indirect Effects at the Analysis Area Scale

Riparian Harvest: Loss of riparian habitat does not benefit the Management Indicator Species. No timber harvest units would occur within RHCA's. Alternatives 1, propose no stream crossing , the changes in riparian vegetation within Alternative 1 are due to forseeable action associated with the Douglas-fir Beetle EIS (USDA Forest Service, 1999). All action Alternatives would remove no additional riparian vegetation as there are no new stream crossings. 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 would 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 riparian harvest. The indirect effect would 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 would occur, none of the action alternatives would result

in a significant cumulative effect to Management Indicator Species within the sixteen cumulative watershed effect areas.

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 change in sediment risk in any of the watersheds under any alternative. The No-Action Alternative (Alternative 1) risk reduction in sediment delivery is associated with foreseeable actions under the Douglas-fir Beetle EIS and other projects. The small amount of road building with none in riparian areas, and no stream crossing in the action alternatives would not result in a significant cumulative effect to the Management Indicator Species within the watersheds. With the foreseeable removal of stream channel crossings under Alternative 1, and the removal of the two uninventoried stream crossing in the headwaters of Little Tepee creek, in the action alternatives there would be a short-term increase in sediment in selected watersheds.

Increased Fish Passage: Alternatives that remove barriers to fish passage would be a benefit to the Management Indicator species. The greater the value, the greater the benefit. The greatest amount of habitat is made available to fish with Alternative 1. The No-Action Alternative (Alternative 1) increase in fish passage is associated with foreseeable actions under the Douglas-fir Beetle EIS and other projects. Alternatives 2, 3 and 4 have no additional benefits to increase fish passage. 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. The proposed project would have no additional cumulative negative or positive effects to the Management Indicator Species within the sixteen cumulative watershed effect 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. Alternative one reflects the amount of removal of encroaching roads that is being implemented under the Douglas-fir Beetle EIS and other projects. Alternatives 2, 3, and 4 would not remove any additional encroaching roads, and would be the same as Alternative 1 in that respect. In the short term, there would be an increase in fine sediment and reduction in cover where the road prism is currently in contact with the stream. In some areas along encroaching roads vegetation has grown along the fill slope as the fill slope is removed this vegetation is removed causing a short term reduction is cover. The possibility of the introduction of fine sediment can also occur with the removal of section of road. This introduction could occur due to fill sloughing during removal. Reduction of this encroachment in the long term, would allow the stream courses to settle into a regime where the stream course would be able to interact with the flood plain. Large wood recruitment would improve over time as these areas regenerate to forest and provide fallen trees into the stream and riparian areas. Habitat complexity would increase and provide more pool and hiding/resting habitat for fish. There would be an immediate short term increase with the addition of wood during the removal of the road and long term increase with the recovery of the riparian area. Sediment would slowly go into storage behind these obstructions, and should result in less bedload movement through the system. The short-term increase in sediment delivery in combination with the long-term benefit associated with the removal of encroaching roads would not result in a significant cumulative effect to the Management Indicator Species within the 16 cumulative watershed effect areas. Given the amount of encroaching roads within the cumulative effects areas, the benefits of restoration activities would be minimal.

Cumulative Effects on Westslope Cutthroat Trout and Bull Trout Individuals and Populations

The following tables portray effects of the ongoing and proposed activities (including the reasonably foreseeable activities, described in Chapter II), and are designed to show the trend that would be attained with each of the alternatives, by watershed analysis area. These calls integrate the preceding evaluations of habitat components and the foreseeable actions described above. 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 individual 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 Objectives are trended away from at the subwatershed scale.

Table III-61. Effects to Management Indicator Species Under All Alternatives.

Watershed	Likely to result in a long term decline in populations	Likely to result in a long term risk in individuals	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 population	No WCT recently found within basin	No BT recently found within Basin	DIRECT AND INDIRECT EFFECTS (Positive Components	DIRECT AND INDIRECT EFFECTS (Negative Components)
Little NF CDA			X				X	No Change	No Change
Fourth July			X				X	No Change	No Change
Wolf Lodge				X			In CDA Lake	Decrease Long term sediment (-220%)	Increased short term sediment, increased riparian harvest in Cat 2 or 4 RHCA's
Cedar			X				In CDA Lake	No Change	No Change
Cougar			X				X	No Change	No Change
Downey					X		In CDA River	decreased Long term sediment risk((83 crossings removed), reduced road encroachment(3.8 miles),stream stabilization	Increased short term sediment
Callis			X				X	No Change	No Change
Prichard/ Eagle			X					No Change	No Change
Beaver			X				X	decreased Long term sediment risk(-123%)	No Change
Shoshone			X				X	No Change	No Change
Rathdrum			Non Fisheries			X	X	No Change	No Change
Fernan				X			X	decreased Long term sediment risk (-122%) reduced road encroachment	Increased short term sediment, increased riparian harvest in Cat 2 or 4 RHCA's

Table III-61. Effects to Management Indicator Species Under All Alternatives, continued.

Watershed	Likely to result in a long term decline in populations	Likely to result in a long term risk in individuals	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 population	No WCT recently found within basin	No BT recently found within Basin	DIRECT AND INDIRECT EFFECTS (Positive Components	DIRECT AND INDIRECT EFFECTS (Negative Components)
Hayden				X			X	Increased fish access decreased Long term sediment risk (-121%) reduced road encroachment	Increased short term sediment risk, increased riparian harvest in Cat 2 or 4 RHCA's
Blue Creek			X				X	No Change	No Change
Thompson			X				X	No Change	No Change
Cataldo			X				X	No Change	No Change

Alternative 1

From historical accounts, all the above listed basins except Rathdrum had abundant populations of cutthroat trout and all but two (Hayden Lake and Rathdrum, likely had no access) had populations of bull trout. Currently, only Cougar, Callis, Wolf Lodge and Hayden Lake tributaries have strong populations of cutthroat and none has a viable population of bull trout (Dunnigan 1997, Cross, 1992). The population trend of these cutthroat was in a rapid decline but now appears to be stabilizing. In basins with large amounts of private land ownership in the largest fish bearing portions of the watersheds (Beaver, Prichard, Blue creek, Thompson, Fernan Lake and Wolf Lodge), adfluvial cutthroat populations would likely be negatively affected as these private land owners continue to dike these stream channels, harvest timber, mine and construct roads associated with this activity.

The effect of the no action alternative would result in no change or slightly improved changes in the current condition or trend in the Management Indicator Species in 15 watersheds. A stable population of cutthroat would result, in basins where private land owners have limited influence, a declining population of adfluvial cutthroat in basins where private land owners alter stream channels, and a non-viable population of bull trout. The No-Action Alternative could increase the level of risk to these species with timber harvesting, but would slightly improve the condition through restoration in specific watersheds (Douglas-fir Beetle EIS, 1999, page II-19.).

Reasonably foreseeable activities that will occur would not have any negative incremental effect that would result in a cumulative effect to any of the watersheds. The effects to fish under Alternatives 2, 3, and 4 would be similar to Alternative 1.

Alternative 2

Alternative 2 would result in a slight change in risk to individuals and no change in population condition at the scale of a stream segment in all watersheds. 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 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 project area.

Alternative 3

Alternative 3 would result in a slight change in risk to individuals and no change in population condition at the scale of a stream segment in all watersheds 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 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 project area.

Alternative 4

Alternative 4 would result in slight change in risk to individuals and no change in population condition at the scale of a stream segment in all watersheds 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 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 project area.

Effects of Opportunities

Additional watershed restoration projects (such as road obliteration, removal or improvement of stream crossings and placement of instream structures to benefit fish habitat) have the opportunity to be funded with this project (see list of opportunities). These projects could result in the short term increase in sediment, but in the long term, would benefit the Management Indicator Species. All future projects must be designed to meet the Forest Plan as amended by the Inland Native Fish Strategy and be reviewed by the District Fisheries Biologist prior to implementation.

Treatment of noxious weeds would have no effect on the Management Indicator Species; treatments would follow standards that minimize risk to riparian vegetation and aquatic species (Noxious Weeds FEIS, 2000).

Consistency with the Forest Plan and Other Applicable Regulatory Direction

Consistency With the Forest Plan (as amended by the Inland Native Fish Strategy)

Inland Native Fish Strategy: All action alternatives would be consistent with the Forest Plan as amended by the 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 alternatives as described in Chapter II (Features Designed to Protect Aquatic Resources).

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 area. 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 (timber sale, obliterated, closed or used for slash disposal or reforestation). 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.

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."

This standard is no longer considered applicable. Since completion of the Forest Plan, the focus of fish habitat analysis has shifted away from fine sediments as a predictor of habitat quality and fish production. A profession consensus has been reached that fine sediment (particle size smaller than .6 millimeter) detrimental to fish egg survival (Chapman and McLeod 1987) was not the limiting factor for fish production in this system. While potential limiting factors for aquatic ecosystems may be numerous (Everest and Sedell 1984; Orth 1987), field analysis suggests that channel disequilibrium and a lack of large woody debris presently plays the most important role in population regulation by influencing over-wintering survival (Sedell et al 1988; McFadden 1979; Bjornn 1971). This shift has been supported by a cross-section of internal and external groups, including the Idaho Department of Fish and Game (personal communication with Ned Horner), Idaho Department of Lands, and Idaho Department of Environmental Quality.

The IPNF Forest Plan provides six management goals that apply to streams of this analysis area, (Page II-1, Items #8, 9, 11, 13, 18, 19). Among these goals are to "manage habitat to maintain populations of identified sensitive species of animals and plants" and to manage fisheries habitat to provide a carrying capacity that will allow an increase in the Forest's trout population". The Plan states that the objective in forest fisheries streams is "to maintain 80 percent of fry emergence success" and that sedimentation arising from land management activities will be managed to meet this objective (IPNF Forest Plan, II-7). Appendix I further details: "In the event that cumulative effects of the proposed and past activities on stream sedimentation are projected to result in greater than a 20 percent reduction in fry emergence, a more detailed fishery/watershed analysis will be undertaken….before the environmental analysis is approved…". 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). It was determined that it was not a good monitoring tool to report stream health. Item G-1 was combined with an expanded Item G-3, which includes a more comprehensive array of fisheries and hydrology parameters.

Fish Standard 2: Streams providing spawning and rearing 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. Please refer to the discussion under Fish Standard 1, above.

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 streams are within the project area. 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 (permanent) roads or create any new migration barriers. No migration barriers are known to exist on the proposed haul routes within 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. The Small Sales EIS 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. Generally the design was to reduce the effects of roads on stream channels within the project area. Changes in Large woody debris were not addressed in the short term.

Consistency With Legal Mandates

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.Depending on watershed conditions, the effects of the alternatives would range from no change in habitat or populations to l**ikely to result in a long term reduction in risk of past management actions to populations and habitat.** With the proposed 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. Depending on watershed conditions, the effects of the alternatives would range from no change in habitat or populations to l**ikely 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 by alternative and watershed, depending on which alternative is selected. A biological assessment was prepared for all endangered and threathened species (Project Files, "Biological Assessment and Evaluations"). A copy of the US Fish and Wildlife Service's letter of concurrence with these assessments is also provided in the Project Files ("Biological Assessment and Evaluations").

Recreational Fishing (Executive Order 12962, 1995): Information on the effects to fish species are discussed in the effects analysis and tables in the "Fisheries" section of Chapter III. The tables display the potential effects by alternative and watershed, depending on which alternative is selected. The analysis discusses both habitat and populations. As populations and habitat are affected, either negatively or positively, the recreational fishing should respond similarly. A discussion of access changes due to road restoration and how that could affect recreational fishing are also presented.

WILDLIFE

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)*
- *Migratory Bird Executive Order*
- *National Forest Management Act of 1976 (NFMA)*
- *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.

On January 10, 2001, President Clinton signed an Executive Order describing the Responsibility of Federal Agencies to Protect Migratory Birds, directing executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act (Project Files, Wildlife). 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 the 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 included an evaluation of the effects of the proposed activities on neotropical or migratory birds (Appendix A, "Issues Not Addressed in Detail"). As more information and direction related to this Executive Order becomes available, the analysis and documentation related to the Small Sales EIS project will be reviewed to determine whether a correction, supplement, or revision to the EIS is necessary, in compliance with Forest Service Handbook 1909.15 (Chapter 18).

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.

Methodology

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).

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 Coeur d'Alene drainage and the analysis 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 drainage and the analysis areas.

Some habitat and species may occur within the Coeur d'Alene River drainage but may not be applicable to any or all analysis 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 analysis area level.

No further discussion or analysis is necessary for those species or suitable habitat that are not found within the assessment area. Additional rationale is provided in Appendix A ("Issues Not Addressed in Detail) and the Project Files (Wildlife, Document WL-2) for those species dismissed from further discussion.

Some wildlife species or their habitat are found to be present in the assessment area, 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 in the Project Files (Wildlife, Document WL-2).

Effects Analysis

The analysis considered direct, indirect, and cumulative effects. Cumulative effects are defined as impacts to the environment which result from the incremental impact of an action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time. The relative scope of the cumulative effects analysis has both a temporal and a spatial component. Refer to Tables II-1 through II-15 in Chapter II for a list of foreseeable and ongoing projects.

Cumulative impacts considered and incorporated into this analysis include past harvest, roading, and mineral exploration. Past, present and future grazing, timber stand improvement (ie thinning), and recreation use were also considered. Alternative D of the Douglas-fir Beetle EIS was incorporated into this analysis, however on ground implementation of this project was actually less than assessed in Alternative D (Douglas-fir Beetle Final EIS Project Implementation Documentation, pages III-243 through III-326). The cumulative impacts of past and ongoing activities have changed age classes, reduced security, reduced snags and old growth, and increased the spread of noxious weeds. There has also been an increase in forage for big game as a result of past and present activities. Thinning practices are promoting a larger diameter tree for the future.

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. Except where specifically mentioned, it is assumed that private lands did not provide habitat. These lands were analyzed as not providing habitat in order to most conservatively analyze impacts of past, present and future activities on these lands. That assumption may not always be correct, however the Forest Service has no jurisdiction over the management of these lands and are not informed when management activities occur on adjacent private lands. This requires that a more conservative approach is necessary when analyzing cumulative effects on adjacent National Forest lands.

USDA Forest Service policy (Forest Service Manual 2670.32, page 5) 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 EIS and project file. The Sensitive Species and MIS Summary of Conclusion of Effects can be found in the Project Files (Wildlife, Document WL-2).

Indicators for Selected Species

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 (Project Files, Wildlife, "Query Data"). 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 by wildlife analysis area.

Table III-62. Management indicators for analyzed wildlife species.

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

Cumulative Effects Analysis Areas

For each species analyzed in this chapter, the cumulative effects area has been determined 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. They do not necessarily correlate with the analysis area boundaries. All cumulative effects wildlife Analysis Areas were designed to mimic the home range for a fisher, which has the largest home range of any species being analyzed. Maps depicting wildlife habitat by species are provided in the enclosed map packet and in the Project Files ("Wildlife"). For more information, refer also to the Project Files (Wildlife, Document WL-5).

There are seven analysis areas:

- *Hayden Analysis Area includes the Hayden watershed.*
- *Coeur d' Alene Lake North Analysis Area covers over 60,000 acres, and includes the Fernan, Wolf Lodge, South Fork Cedar Creek, Beauty Creek, Carlin Creek, and other Coeur d'Alene Lake watersheds.*
- *Chain Lakes Analysis Area includes the Chain Lakes watershed.*
- *Callis Analysis Area includes the Callis watershed.*
- *Shoshone Analysis Area includes the Shoshone and a portion of the Coeur d'Alene River Bumblebee watershed.*
- *Potosi Analysis Area includes the Beaver and Eagle watersheds.*
- *Scatterwall Analysis Area includes Fourth of July, Owl, Little Tepee, Prado, Cougar, Gimlet, Studer and Cataldo watersheds.*

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*

The analysis is done at different levels of intensity (for example, from course filter to medium filter to fine filter) as appropriate to address the issues and concerns. Some elements of wildlife habitat require detailed analysis to determine potential effects on wildlife species. Other elements may either not be impacted, 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, pages 1-19).

Affected Environment

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 prior to European settlement.

Low intensity, frequent fires maintained open understories in ponderosa pine and drier Douglas-fir habitats. Western white pine, whitebark 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.

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.

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 (refer to Figure III-2 in the Forest Vegetation section of this chapter). The Columbia Basin Assessment lists those species considered at risk that depend on or prefer natural structural conditions associated with old and mature forests (such as open-grown ponderosa pine). Some of these include the flammulated owl, boreal owl, Vaux's swift, and Lewis' woodpecker. Most species identified as "Sensitive" by the Forest Service are associated with later successional habitats, or habitats and cover types in short supply (such as cottonwood communities, large standing dead trees or large downed trees.)

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 may prefer gentle slopes more in these dry habitats.

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 (Bull. et al. 1997). 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 at least 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).

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 which 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 (Bull et al. 1997). Timber harvesting and fuelwood gathering are common activities in the forest. Forest management typically selectively harvests the dying, diseased and dead trees for timber harvest, so treated 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 the areas 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 (Menasco 1983).

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. Due to reductions in old growth, species associated with old growth and snags are probably less abundant than historically (Idaho Panhandle National Forests 1998). 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 for more background and general management recommendations regarding snag-dependent species.

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. Because of low levels of humans and low levels of use historically, all of the lands now in the National Forest were considered security for wildlife dependent upon it and animals moved freely across the landscape (Geographic Assessment, page 41).

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.

Cumulative Effects on 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 (Geographic Assessment, page 41). The gray wolf, bald eagle and peregrine falcon are Threatened and Endangered wildlife species which may occur within the Coeur d'Alene River drainage. The lynx was listed as threatened on March 24, 2000 (Federal Register Vol. 65, No. 58). These species 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 (Geographic Assessment, page 41).

Assessing Cumulative Effects

Past management of the project areas has included harvesting timber, constructing and maintaining roads and trails, road removal, and maintenance of recreational facilities. Currently, there are ongoing and foreseeable actions in and adjacent to the analysis areas (Chapter II, Tables II-1 through II-15). Douglas-fir beetle activity has occurred, as described in the Douglas-fir Beetle EIS (USDA Forest Service, 1999, page I-1). This has resulted in the removal of diseased trees across the landscape. The removal of these trees required that many previously closed and/or brushed in roads were reopened. Displacement of big game and other wildlife occurred in these activity areas. Post-sale activities associated with Douglas-fir beetle will be occurring simultaneously with Small Sales 2000 further reducing available displacement areas for wildlife.

Road management activities are also ongoing and reasonably foreseeable. Road closures have a beneficial effect upon wildlife by increasing security. Snag creation increases snag density and contributes to a better distribution. Burning promotes big-game forage and could have minor short-term negative effects on the prey base for carnivores.

Other ongoing activities incorporated into the effects analysis are grazing and precommerical thinning. The preferred alternative for the Coeur d'Alene River Grazing Allotments EA shows no impacts to threatened, endangered or most sensitive species. There are slight impacts to the Coeur d'Alene salamander, boreal toad, Northern leopard frog and harlequin duck resulting from grazing. To ensure protection of adequate big game forage, utilization surveys and standards would be implemented (Draft Coeur d'Alene River Grazing Allotments Environmental Assessment, USDA Forest Service, 2001, page 17). Precommercial thinning impacts hiding cover for big game for the short term. However, since cover is not limiting on the District, thinning was considered to have a negligible effect on big game. Since the analysis areas lie outside of delineated lynx analysis units, precommercial thinning is not a concern for lynx forage habitat (Project Files: Lynx Analysis Units Map).

The elk model is a tool which is used to assess security for many species including fisher. The elk model is a cumulative effects model which incorporates openings, roads and reductions in security. Past and present timber sale activity, mining and recreation uses are all incorporated into the model. Model outputs can then be used to project changes in security not only for big game but also for large ranging furbearers.

Models are also used to query habitats for fisher, goshawk and flammulated owl. These model runs query the district timber stand data base. These model runs evaluate cumulative losses of habitat, except roading. Since the data base has not been updated with Douglas-fir Beetle FEIS units that are planned but not harvested; Queries for species were run and outputs were then overlaid with planned Douglas-fir beetle harvest associated with Alternative D of the Douglas-fir Beetle FEIS (Project Files, Wildlife, "Cumulative Effects of the Douglas-fir Beetle Project, Document WL-59").

Reference and Existing Condition

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 areas. 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. Suitable habitat is considered a portion or subset of capable habitat in the model outputs.

Sensitive Species

Fisher. Fisher are medium-sized mammalian carnivores. 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 (Powell, 1982).

Fishers prefer habitats with high canopy closure (greater than 80 percent) and avoid areas with low (less than 50 percent) canopy closure (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.

Reference Condition: No accurate estimates or records exist for historic wildlife populations of fisher or American marten in the analysis areas. 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. 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.

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, whereas the increase in canopy cover brought about by fire suppression has expanded denning habitat quality.

Flammulated owl. Flammulated owls are seasonal migrants that occupy home ranges in the northern latitudes of Idaho 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 (Verner 1994).

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.

Reference Condition: Historically, the Coeur d'Alene basin provided more flammulated owl habitat, primarily on dry habitats at lower elevations (Geographic Assessment, page 37). No populations numbers exist for this species' historic condition; however, a geographic assessment of the Coeur d'Alene River basin (Geographic Assessment, page 37) 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. The lower elevation,

low gradient areas outside the Forest boundary have been subjected to human development. These factors have dramatically reduced the amounts of suitable habitat for this species.

Existing Condition: 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.

Northern goshawk. Goshawks 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 which influence nest site selection and food availability. Regeneration harvest would reduce nesting (and feeding) values to zero. Reductions in canopy cover (either from stand decline or treatment) would reduce the feeding value.

Reference Condition: Much of the historic conditions noted for flammulated owls apply to northern goshawks as well. Historic numbers of goshawks were likely higher than they are today, because many of the species they prey upon were likely more numerous. This is because their primary prey species were more plentiful than today (USDA Forest Service, Douglas-fir Beetle Project FEIS, 1999, page III-255).

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 this generally mesic 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, a product of aggressive fire supression.

Management Indicator Species

Elk. 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.

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.

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).

Environmental Consequences

Fisher

Effects Common to All Action Alternatives

The analysis areas used are based on the home range of the fisher, since this species has the largest home range of the species analyzed. In some cases, several proposed sale areas are combined and analyzed as one area in order replicate the home range of a fisher.

Analysis of the fisher reflects changes in habitat for the marten, since their habitat needs are similar. Existing open road densities on the Central Zone are moderate to high, contributing to relatively high vulnerability or low security for fisher (Access Management EA, page 53). The Access Management Plan displays that there are approximately 7 miles of road per square mile on the zone. Many of these roads are currently brushed in and not drivable. Over the long term the implementation of the Access Management Plan will reduce open road densities to 1.1 miles of road per square mile. Design features of this project would manage access to an extent that most temporary and barriered roads opened to implement the Decision would be closed to motorized use (except for administrative use) during the implementation phase of the project, including post-sale activities.

During sale activity, no brushed in roads would be opened to access timber. Any roads opened that are currently closed with earth barriers would require installation of a gate for the duration of the project. The exception to this would be when activities behind the closure would only last for a week or two. In that case the road would remain open but it would be required that the activity occur outside of center-fire rifle season. The earth barrier would be re-installed as soon as salvage operations were completed. Road 2301 is an example, and would not be closed until the salvage is completed in the area. This is because the period of activity on this road would be of very short duration (approximately 2 weeks). Salvage accessed by the 2301 road will have to be scheduled outside of rifle season to public road use is often at its peak. Some roads currently managed as open will be closed for wildlife security, post-sale. Under any of the action alternatives, a number of roads that are currently open would be closed within individual analysis areas in association with this project. This would include 6.8 miles in Scatterwall and 1.4 miles in the Shoshone area. In addition, 2.0 miles of road in the Shoshone area would have an improved closure by replacing the gate with a front-end obliteration. These road reductions would not occur under Alternative 1. Additional closures would occur under ongoing and foreseeable actions in most analysis areas.

Monitoring has determined that obliterated roads result in negligible effects to security, since the roads are harder to find and thus less likely to be traveled by humans (Ruggiero et al., 1994). Temporary road construction bisecting suitable fisher habitat would be closed (with gates or earth berms) during periods of non-use to reduce use by motor vehicles, including snowmobiles. Any temporary roads constructed through fisher suitable habitat will be concealed with a front end obliteration at the end of the sale. These measures would reduce potential risk of incidental trapping mortality and would avoid long-term disturbance in fisher habitat.

All action alternatives would affect wildlife security, but would differ in the amount of access that reduces security. For example, no new system road construction is proposed under any alternative.

All action alternatives propose construction of 0.8 miles of temporary roads of which 0.2 miles bisect suitable fisher habitat.

Cumulative Road Impacts

Historically timber harvest and mining resulted in increased road densities on the Coeur d'Alene River District. This resulted in some of the highest road densities on national forest land in the United States. There was a loss of wildlife security due to the road system. Fisher were most likely over trapped because of increased access. More recently the Coeur d'Alene River District has worked towards a reduction in road densities and restoration of habitats. Under all alternatives, open road densities in all analysis areas would be reduced from the existing condition within five years, in association with past and ongoing timber sales, including the Douglas-fir Beetle Project. In some cases road closures would be improved (an earth barrier would be replaced with a front-end obliteration). Obliteration of roads that are currently open (or that are closed but not brushed in) would improve wildlife security. These closures will improve security for fisher.

Under Alternatives 2, 3 and 4, there would be some improved closures on currently closed roads in all analysis areas related to the Douglas-fir Beetle project, which would decrease the risk of trapping for fisher. For example, in the high integrity area of the Coeur d'Alene Lake North analysis area (Project Files, Wildlife, "Wildlife Security Priorities"), approximately 30 miles of road that are currently closed by earth barrier would be obliterated as a result of Douglas-fir Beetle Project EIS. Within approximately 5 years, there would be a minor to moderate improvement in security for fisher. The Project Files ("Wildlife") also provide supporting information regarding roads with improved closure types.

The capable habitat varies in structure and age class. Capable fisher habitat is not currently providing habitat for fisher, however due to species composition and habitat types these habitats have potential to provide suitable fisher habitat at some point in the future. 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 but are very young and it may be over 100 years before they are providing habitat for the fisher. There would be less than 5% difference in canopy losses between Alternative 1 (no action) and salvage harvest in the action alternatives, resulting in no change in effects.

For more information about effects to fisher under all alternatives and in all analysis areas, please refer to the Project Files (Wildlife, "Fisher Methodology" Document WL-12 and "Percent Denning in Integrity Area" Document WL-13).

Effects to Fisher Habitat in Hayden Analysis Area

Streams and the area adjacent to old growth stands provide habitat within the analysis area. Due to displacement resulting from recreational disturbance, the more likely areas for potential use lie within the southern portion of the analysis area, within the High Integrity Area (Project Files, "Wildlife Security Priorities"). With the exception of the High Integrity Area, the Hayden area is does not provide optimal fisher habitat due to the high recreational disturbance, proximity to urban areas, and lack of mature and older forests. Currently the Hayden Analysis Area falls below the acres desired in fisher denning habitat, based upon management guidelines from "Fisher Biology and Management in the Western United States" (Heinemeyer and Jones. 1994) . There are a total of 1,409 acres in the

High Integrity Area. There are 512 acres of mature and older forest within the High Integrity Area; the optimal number of acres would be 634.

From this information the Douglas-fir Beetle EIS extrapolated that 45% of the high integrity area within the Hayden area should be in mature or older forest to provide optimal habitat for the fisher. Currently in the Hayden Analysis High Integrity Area only has 512 acres in mature or older forests. This is 36% of the total acres within the high integrity area. The current road density in the Hayden Lakes area is 1.3 miles of road per square mile of area.

Direct and Indirect Effects

Alternative 1: Beetle mortality in the Hayden area would reduce the canopy closure on some suitable and capable habitats. Additional mortality associated with the Douglas-fir bark beetle is not expected to continue at significant amounts over the long term. The majority of the beetle mortality is scattered and not concentrated in patches that would impact suitable or capable habitats. However, where mortality has occurred in more concentrated areas, canopies may be too sparse to provide suitable denning. However, there would be an increase in downed logs and snags which, in some cases, could improve denning habitat. Foreseeable activities would not include any new road construction in fisher habitat. Planned road closures associated with the Douglas-fir Beetle EIS project would reduce road densities.

Alternatives 2 and 3: Under Alternatives 2 and 3, no additional loss of canopies in fisher suitable habitat would occur beyond the effects identified in Alternative 1. The degree to which harvest would reduce canopy beyond that caused by beetle mortality would be minimal, with less than a 5% difference in canopies under Alternative 1 compared to Alternatives 2 and 3. However, the harvest of dead and dying trees would remove snags and future downed wood from the landscape.

Under Alternatives 2 and 3, 12 acres of proposed harvest are in allocated old growth. Since some harvest would occur in old growth, there would be a removal of large diameter snags and future downed wood from the site. This could have negative impacts fisher denning habitat over the long term. Harvest would occur in another 31 acres of old growth that is not optimal fisher habitat (and was therefore not identified by the model). This would result in a loss of snags and future downed wood not associated with optimal fisher habitat.

The change in fisher habitat within the high integrity area under Alternatives 2 and 3 would result from removal of dead wood component.

Under Alternatives 2 and 3, there would be no reconstruction or brushing of roads bisecting fisher habitat within the Hayden Analysis Area. There would be no new road construction under any Alternative. Approximately 0.7 miles of roadway would have an earth barrier removed to allow access to a helicopter landing. This roadway would have a gate that would be closed at the end of daily activities. This gate closure would reduce risk of incidental trapping during the use period..

Alternative 4: Alternative 4 does not propose activities within the Hayden Analysis Area, so effects would be the same as described for Alternative 1.

Cumulative Effects

Based on past reductions of suitable habitat and security (Project Files, Wildlife, "Wildlife Security Priorities"), the cumulative effects in the Hayden area are high. Implementation of either Alternative 2 or 3 would result in 15 acres of salvage in capable habitat, which would not increase canopy opening greater than that caused by the beetle infestation but snags and log component would be lost. Cumulative impacts as a result of past activities are high. The implementation of Alternatives 2 and 3 would have an additional moderate impact (Project Files, Wildlife, "Percent Denning in Integrity" Document WL-10). Alternative 4 does not propose any harvest within this analysis area. Because the Hayden Area already has high recreation disturbance due to its proximity to an urban area, additional impacts resulting from implementation of the action alternatives *may impact individuals* but would not trend the species toward listing.

Effects to Fisher Habitat in Coeur d'Alene Lake North Analysis Area

Streams and adjacent stands provide some habitat within the analysis area. The Coeur d'Alene Lake North wildlife analysis area includes: Canfield, Fernan, Blue Creek, East Rutherford, Cedar and Fourth of July Project Areas. Human development outside the Forest boundary has encroached upon historic fisher habitat (Refer to Discussion on Cumulative Effects on Populations). This has made habitat on the National Forest more important to the fisher. Currently there are 8,217 acres of suitable habitat and 24,340 acres of capable habitat. The Coeur d'Alene North area lies primarily within a High Integrity Area. The High Integrity areas have relatively lower road densities than many other areas of the district and are considered important habitats for large ranging furbearers (Geographical Assessment, pages 66-67) . Within the High Integrity Area there is a shortage of denning habitat. The High Integrity Area has 44% of the area in old or mature forest and provides denning habitat. The optimal amount is 45%. The current open road density in the Coeur d'Alene Lake North area is 1.3 miles of road per square mile of area.

Direct and Indirect Effects

Alternative 1: Beetle-caused mortality in the Coeur d'Alene Lake North area would reduce the canopy closure of some fisher habitats. Additional mortality associated with the Douglas-fir bark beetle is not expected to continue at the current level over the long term. The majority of the beetle mortality is scattered and not concentrated in patches that would impact fisher habitats. However, where mortality has occurred in concentrations, habitat may no longer be capable of providing suitable denning because of canopy loss. Mortality should increase the recruitment of snags and downed log, improving denning habitat in some cases. Ongoing and foreseeable actions will result in road construction in fisher habitat. Denning habitat within the High Integrity Area would continue to be slightly below optimal levels.

Alternatives 2, 3 and 4: Within the High Integrity Area, no fisher habitat would have canopies reduced beyond beetle-related mortality. Outside the High Integrity Area, under these three alternatives, some fisher capable habitat would have canopies reduced beyond what the beetles infestation would do as a result of harvest. Although at the current time these stands are not providing habitat for the fisher because of beetle mortality and related canopy reductions, harvest would result in a longer time frame before these stands become suitable habitat for the fisher. Under these alternatives, no new roads would bisect fisher suitable habitat, and no fisher habitat would be affected by opening closed roads.

Ecosystem burning that would occur under **Alternative 2** would not impact fisher. Although habitat exists in the proposed burning area, it is likely that the beetle-caused tree mortality will drop the canopy closure beyond what is normally used by fisher (50% canopy closure). Therefore, the minor additional loss of canopy as a result of the ecosystem burning would not impact the species and could benefit habitat for prey species.

Alternatives 2 and 3 propose harvest of 186 acres of beetle mortality that fall in stands designated as old growth. These stands of old growth are not located within delineated fisher habitat; however, harvest in these old growth stands would reduce large diameter snags and future downed logs. The loss of this deadwood component on site could reduce the quality of denning habitat.

Under Alternative 4, no harvest would occur in old growth or roadless area. Stands proposed for salvage under this alternative would not have any additional impact beyond the beetle-related mortality. Beetle killed trees within the unharvested old growth and roadless areas would provide large diameter snags and downed wood enhancing denning habitat.

Cumulative Effects

Past activities have reduced suitable fisher habitat because of loss of old and mature forest and reductions in security resulting in high cumulative effects. The loss of security from the proposed project is slight and short term. The Horizon Moon timber sale is a reasonably foreseeable action that will occur under all alternatives, and includes construction of a new road that would bisect fisher habitat. This sale would also reduce snags and downed logs. The Small Sales project combined with ongoing and foreseeable sales results in additional cumulative impacts to security. However, within 5 years, there would be a slight increase in security with closures under the Douglas-fir Beetle project. Overall, cumulative effects would still be considered high because of past activities.

All alternatives (including Alternative 1) would reduce denning habitat due to canopy reduction resulting from the beetle activity (Project Files, Wildlife, Documents WL-10 and WL-12). Alternative 1 would have an impact upon canopy closure in fisher habitat and could impact individuals. The action alternatives would have a minor impact to canopies in fisher habitat beyond alternative 1, and would have short-term disturbances and only a minor disturbance effect beyond that caused by the beetle (Project Files, Wildlife, Document WL-12). Reductions in snags and downed logs would be moderate to high under alternative 2 and 3. Despite loss of snags and downed wood, the areas harvested would still provide habitat for the fisher, although it would be of lower quality. There would be approximately 30 miles of road obliterated or closed with earth barriers under the Douglas-fir Beetle EIS Project, which would improve security for fisher (USDA Forest Service, Douglas-fir Beetle EIS, page III-280). All closed roads opened for this project would be closed back to the existing condition or better after completion of the project (Project Files, Wildlife, Document WL-13F). Since there would be no loss of fisher habitat, under any alternative there could be an *impact to individuals*, but none of the alternatives would likely trend the species toward federal listing or cause a loss of viability to the species or population.

Effects to Fisher Habitat in Chain Lakes Analysis Area

Fisher have been sighted from 1978 to 1982 in the vicinity of Black Lake in the Chain Lakes Analysis Area. The Chain Lakes wildlife analysis area includes the Thompson Project Area. The sightings did not occur on National Forest lands. Based on past sightings and habitat, the Chain Lakes Analysis Area is one of the more likely places in the Coeur d' Alene Mountains for fisher to occur. Habitat queries showed there are 8,792 acres of capable habitat, of which 2,798 acres are identified as suitable fisher habitat on National Forest System lands in this Analysis Area. The Chain Lakes Analysis Area currently exceeds the recommended amount of denning habitat. Since there is no High Integrity area within the Chain Lake Analysis area, 30% of the Analysis area needs to provide denning habitat. The current road density in the Chain Lakes area is 1.6 miles of road per square mile of area.

Direct and Indirect Effects

Alternatives 1 and 4: There would be no activity, other than on-going, in the Chain Lakes area under Alternatives 1 and 4. Beetle mortality in the Chain Lakes area would reduce the canopies in some fisher habitat. Additional high mortality associated with the Douglas-fir bark beetle is not expected to continue for the long term. The majority of the beetle mortality is scattered and not concentrated in patches that would impact fisher habitat. However, where mortality has occurred in concentrated areas, patches of habitat may no longer provide suitable denning. Since there is currently an abundance of fisher denning habitat, the effects of the beetle would not make the Chain Lakes Analysis Area unusable by the fisher. Foreseeable, previously planned projects would result in closure of approximately 19 miles of road.

Alternative 2: An additional 40 acres of suitable fisher habitat would be reduced in value for the fisher beyond the effects of beetle mortality. Beetle mortality has reduced these acres to 53% canopy closure. With the proposed improvement harvest, canopy closure would be further reduced 5-10%, resulting in a combined canopy closure of 46 to 49%. 47 acres of old growth (40 acres lie in fisher habitat) would be harvested under this alternative. The harvest in old growth would result in a loss of snags and downed wood that would reduce the quality of fisher denning habitat. No new or temporary roads would be constructed in this alternative. Because of the abundance of fisher habitat in the Chain Lake Analysis Area, this alternative would have minor effects to fisher. However, alternative 2 would be the most impactive to the fisher of the action alternatives due to harvest in old growth and additional canopy reduction.

Alternative 3: This salvage-only alternative would have no additional effect on canopies over those that would occur under the No-Action Alternative. Effects to old growth are similar to those in Alternative 2. No new or temporary roads would be constructed in this alternative.

Cumulative Effects

Cumulatively, there have been reductions in denning habitat and security as a result of past activities. However, the Chain Lakes Analysis Area still retains sufficient denning habitat to meet criteria stated in Heinemeyer and Jones, 1994 (Project Files, Wildlife, Documents WL-8, WL-10, and WL-12). Cumulative effects would be considered moderate. There are minor effects to fisher habitat under alternatives 1 and 4 from beetle mortality. Alternatives 1 and 4 may impact individuals as a result of reductions in canopy closure due to beetle-caused mortality. Alternatives 2 and 3 would result in a

loss of recruitment large downed wood and snag within fisher habitat, which would reduce suitability of denning habitat over the long term. Since the Chain Lakes area has an abundance of fisher denning habitat (Project Files, Wildlife, Document WL-10), the reduction in the dead wood component would reduce habitat and *may impact individuals* but would not trend the species toward listing.

Effects to Fisher Habitat in Scatterwall Analysis Area

Streams and adjacent stands provide some habitat within the analysis area. This larger wildlife analysis area include the following proposed project areas: 4th of July, Owl, Little Tepee, Prado, Cougar, Gimlet, Studer and Cataldo. This area includes part of a Secondary Conservation Area for furbearers, where low road densities, are important. Road densities for the Analysis Area is 1.9 miles per square mile of area. The part of the Analysis Area within the Secondary Conservation Area and those areas outside the Secondary Conservation Area meet the requirement for suitable habitats in low and moderate integrity areas. Currently there are 5,736 acres of suitable habitat and 16,425 acres of capable habitat. 32% of the Scatterwall Analysis area provides fisher denning habitat. This exceeds the Heinemeyer and Jones (1994) recommendation of 30%. Within the High Integrity Area, an area of low road densities important for large ranging furbearers, 40% of the habitat is suitable for denning.

Direct and Indirect Effects

Alternative 1: Beetle mortality in the Scatterwall area would reduce the canopy closure on some fisher habitats. Additional high mortality associated with the Douglas-fir bark beetle is not expected to continue over the long term. The majority of the beetle mortality is scattered and not concentrated in patches that would impact fisher habitats. However, where mortality has occurred in more concentrated areas, habitat may no longer be capable of providing suitable denning. Since there is currently an abundance of fisher denning habitat in the Scatterwall analysis area, the effects of the beetle should not make the Scatterwall Analysis Area unusable by the fisher.

Effects Common to Alternatives 2, 3 and 4

There would be some loss of future downed logs and snags due to harvest of beetle killed trees. This would reduce the dead wood structure required for fisher denning habitat. The effect may be negligible since there is an abundance of fisher habitat within the Scatterwall Analysis area. No new system roads and 0.17 miles of temporary roads would be built under these alternatives. There would be 20.5 miles of closed roads opened under all action alternatives, with 27.3 miles being closed after activities are finished. There would be no harvest in old growth stands.

Alternatives 2 and 4: An additional 12 acres of fisher habitat would have forest canopies reduced beyond the effects of beetle mortality. Beetle mortality has reduced these acres to 54% canopy closure. With the proposed improvement harvest units, canopy closure would be further reduced by 5-10%, resulting in a combined canopy closure of 47-50%. These alternatives would have slightly more impact on suitable habitat than either Alternatives 1 or 3, due to canopy reduction and disturbance.

Alternative 3: This salvage-only alternative would have no additional effects to canopies in fisher habitat beyond the effects of Alternative 1. Less than two-tenths of a mile of temporary road

construction would occur under Alternative 3. There would be 20.5 miles of currently closed roads opened under this alternative, with 27.3 miles being closed after activities are finished.

Cumulative Effects

Past activities have reduced security and denning habitat, resulting in high cumulative effects. Alternative 1 would impact 12 acres of suitable habitat; all but 3 acres have been reduced well below the 50% canopy closure recommended for sustaining suitable habitat. Individuals may be impacted under Alternatives 2, 3 and 4 from proposed harvest activities reducing canopy closure beyond what the beetles have done (except 3) and disturbance resulting from the opening of closed roads and logging activities. Denning habitat would remain in abundance under all alternatives. Cumulative effects resulting from past activities are high. However, the additional short term effects resulting from this project are considered to be moderate. This is primarily due to opening 20.5 miles of roads which would result in increased disturbance. Approximately half of the road opening is using roads that are currently gated. Risk of incidental trapping would be minimized by requiring gates to be closed at the end of daily activities and by the restricted public access proposed under the Access Management Travel Plan. Because denning habitat would remain abundant (Project Files, Wildlife, Documents WL-10 and WL-12), the action alternatives *may impact individuals* but would not trend the species toward listing.

Effects to Fisher in Callis Analysis Area

Callis, Stewart and Potter Creek and the other streams in this analysis area may provide fisher habitat and travel corridors. The Callis wildlife analysis area is larger than the proposed Callis project area in order to better analyze the habitat within the home range of a fisher. The area falls within a Low Integrity Area for furbearers. This analysis area consists of 1,943 acres of suitable habitat and 7,703 acres of capable habitat for fisher in the Callis Analysis area. Currently there is not enough suitable denning habitat within this analysis area. Currently only 25% of the Callis area provides denning habitat, this falls below the recommended 30%. Open road densities in the Callis area are 1.8 miles of road per square mile.

Direct and Indirect Effects

<u>Alternative 1:</u> Beetle-caused mortality and ice damage in the Callis area have reduced the canopy closures in some fisher habitat. Downed logs resulting from ice damaged trees may have improved denning habitat in some locations. The majority of the beetle mortality is scattered and not concentrated in patches that would impact suitable or capable habitats. However, where mortality has occurred in more concentrated areas, habitat may no longer provide suitable denning. Since there is currently a scarcity of fisher denning habitat, the natural loss of canopies in the Callis Analysis Area may have had negative impacts on the fisher.

<u>Alternatives 2, 3 and 4:</u> Each of the three action alternatives propose salvage of 133 acres along existing open roads in forested areas that could provide denning habitat for fisher within 20-50 years. The reduction in forest canopies with these alternatives is very similar to Alternative 1. However, there would be a loss of snags and downed logs under Alternatives 2, 3 and 4, as a result of salvage logging. This loss of dead wood component would have negative effects upon fisher denning habitat, in a area that currently falls below the optimal amount of denning habitat.

Cumulative Effects

Cumulative effects resulting from past actions are high. 133 acres of mature fisher habitat would have salvage harvest. This would result in an increase in the time required for this habitat to provide denning habitat There would be no change in forest canopies beyond those effects of the beetle infestation (Project Files, Wildlife, Document WL-12). Because the area currently falls below the recommended amount of denning habitat (Project Files, Wildlife, Documents WL-8 and WL-10), the salvage of 133 acres of mature fisher habitat and resulting loss of snags and downed wood, Alternatives 2, 3 and 4 would have moderate additional cumulative impacts. Since the proposed harvest would occur along existing open roads (Project Files, Wildlife, Document WL-13F) that are corridors of disturbance (such as fuelwood harvest), the action alternatives may impact individuals but would not trend the species toward listing.

Effects to Fisher Habitat in Shoshone Analysis Area

The Coeur d'Alene River, Shoshone Creek and other streams in this analysis area may provide fisher habitat and travel corridors. The Shoshone wildlife analysis area includes Shoshone and Downey project areas. The Shoshone analysis area contains 2,556 acres of suitable habitat and an additional 9,972 acres of capable habitat for fisher. The area is short denning habitat as described by Heinemeyer and Jones (1994). The current road density in the Shoshone area is 2.0 miles of road per square mile of area.

Direct and Indirect Effects

Alternative 1: Beetle-caused mortality in the Shoshone area would reduce the canopy closure on some suitable and capable habitats. The majority of the beetle mortality is scattered and not concentrated in patches that would impact fisher habitats. However, where mortality has occurred in more concentrated areas, canopy loss may no longer provide necessary shade for suitable denning. Sixteen acres of fisher denning habitat has had canopies reduced as a result of the beetle infestation.

Alternatives 2 and 4: Both alternatives propose harvest of 16 acres of fisher habitat, requiring the opening of approximately 9.2 miles of roads, while harvesting another 4 acres of fisher habitat along existing open roads. Approximately half of the acres harvested in these alternatives would further reduce canopies beyond what the beetle infestation has done. There would be 0.2 miles of temporary road constructed in fisher habitat. After the project is complete, approximately 4.3 miles of road would be closed with a front-end obliteration. This mileage figure includes a side road off of the 1569B road as well. Two other roads would be closed with earth barriers and gates. Currently open road densities are 2 miles of road per square mile resulting in a high impact to fisher security and risk of potential trapping. Road densities would be reduced to 1.8 miles of road per square mile after completion of the project and post harvest activities. These alternatives may have impact to individual fisher as a result of short term loss of security.

Alternative 3: This salvage-only alternative would have no additional effects to canopies in fisher habitat beyond effects described in Alternative 1. However, in the 20 acres of fisher habitat where salvage harvest is to occur there would be a reduction in standing and downed dead wood component. This loss of the dead wood component would reduce the quality of denning habitat. Opening 9.2 miles of roads would decrease security and may increase the risk of incidental trapping in the short

term. This alternative may impact individuals from short term loss of security resulting from high road densities.

Cumulative Effects

Cumulative effects due to past activies are high. Past harvest activities have reduced fisher denning habitat below the recommended level (Project Files, Wildlife, Documents WL-8 and WL-10). While only 20 acres of fisher habitat are being impacted under the three action alternatives, 16 of these acres are within the Low Integrity area (security habitat for large ranging furbearers) (Project Files, Wildlife, "Wildlife Security Priorities"). Currently this Low Integrity Area is 8% below the required amount of denning habitat to provide optimal conditions for the fisher. There would also be a loss of snags and downed logs, which are important components of denning habitat. Opening 9.2 miles of closed roads and building 0.2 miles of temporary roads could displace fisher and potentially further increase the risk of trapping in an area would that already has high open-road densities (Project Files, Wildlife, Document WL-13F). This risk would be lessened with requirement of gate closures at the end of daily activities and by the restricted public access proposed under the Access Management Travel Plan. After the project, road densities would be reduced (Project Files, Wildlife, Document WL-13F), which would increase security in the long term. Additional cumulative effects resulting from this project are considered to be moderate within this area. The moderate rating is a result of harvest within an Integrity area and disturbance from opening of 9.2 miles of currently closed roads. The area is already low in fisher habitat (Project Files, Wildlife, Document WL-8), and is probably insufficient to support a population of fisher. Because fisher are unlikely to occur here except on a transitory basis, the implementation of any of the alternatives *may impact individuals*, but would not trend the species toward listing.

Effects to Fisher Habitat in Potosi Analysis Area (includes Beaver, Prichard & White Project Areas)

Beaver, Prichard, Eagle Creek and other streams in this analysis area may provide fisher habitat and travel corridors. The Potosi analysis area contains 2,653 acres of suitable habitat and an additional 9,638 acres of capable habitat for fisher. Currently there is not enough denning habitat within the Analysis Area to meet the requirements specified in Heinemeyer and Jones (1994). Road densities are moderate at 1.2 miles of road per square mile of land. The Potosi analysis area contains a portion of a High Integrity Area. High Integrity Areas are large, low-road density blocks of forest considered important to the survival of large ranging furbearers.

Direct and Indirect Effects

<u>Alternative 1:</u> Beetle-caused mortality in the Potosi area would reduce the canopy closure in some fisher habitat. The majority of the beetle mortality is scattered and not concentrated in patches that would impact suitable or capable habitats. However, where mortality has occurred in more concentrated areas, habitat may no longer provide suitable denning because of canopy loss. Since there is currently a scarcity of fisher denning habitat within the Primary Conservation Area, the effects of the beetle and resulting canopy loss may make the Potosi Analysis Area less desirable for the fisher. Sixteen acres of suitable habitat have had canopies reduced as a result of the beetle infestation.

Alternatives 2 ,3 and 4: Each of the three alternatives propose harvest of 43 acres of fisher habitat, requiring opening 26 miles of roads and building 0.2 miles of temporary roads. After the project is completed, all roads would be closed back to existing condition. Current open road densities are 1.2 miles of road per square mile resulting in a moderate impact to fisher security with regard to disturbance and potential increased risk of trapping. Road densities will return to 1.2 miles of road per square mile after completion of the project and post sale activities. Harvest activities will have little effect on canopies within fisher habitat beyond impacts of the beetle as described in Alternative 1. Harvest within fisher habitat would remove snags and potential downed logs which would decrease the quality of denning habitat. Opening 26 miles of roads would raise the open road density to 1.6 during the length of the sale. Most of these roads are currently gated. Gates would be required to be closed at the end of daily activities to minimize public usage. This road density is still considered moderate-high, security for the fisher would be reduced during the life of the project. This alternative *may impact* individuals from loss of downed wood and snags, reduced security and increased risk of trapping associated with opening closed roads. However, after roads are closed after completion of project activities, security would increase and habitat would still be useable by the fisher.

Ecosystem burning proposed under Alternative 2 would not impact fisher habitat, since no fisher habitat exists within the proposed burn areas. The burning could potentially have long term beneficial impacts on the prey base of the fisher.

Cumulative Effects

Overall past activities have resulted in high cumulative effects. Past harvest activities have reduced suitable fisher habitat below the recommended level (Project Files, Wildlife, Documents WL-8 and WL-10). Approximately 43 acres of fisher habitat would have harvest activities under all action alternatives. The Low Integrity Area is currently 8% under the required amount for fisher denning habitat (Project Files, Wildlife, Document WL-8). Opening 26 miles of closed roads and building 0.2 miles of temporary roads would potentially increase trapping pressure in an area would that already has moderate open road densities (Project Files, Wildlife, Document WL-13F). This *may impact individuals* in association with open road densities, increased disturbance and increased risk of trapping in the short term. This risk would be reduced with the requirement of gate closures at the end of daily activties and by the restricted public access proposed under the Access Management Travel Plan. Loss of downed wood component in fisher habitat would be a long term effect. Road densities would be returned to pre-project levels after the sale activities are completed. The additional cumulative effects resulting from this project would be moderate.

Flammulated Owl

The following sections analyze the effects of the alternatives on flammulated owls and their habitat. Please refer also to the project files (Wildlife, Documents WL-18 and WL-19) for supporting information.

Effects Common to All Action Alternatives

Historically, the project areas provided more flammulated owl habitat, primarily on dry habitats at lower elevations (Geographic Assessment, page 37). Flammulated owl habitat in the Lower Clark Fork drainage, which includes the Coeur d'Alene Basin, has been reduced by 95% (Wisdom, in

press).

Much of the habitat loss is due to urban and agricultural development at low elevations outside the forest boundary on private lands. Suitable habitats are forested areas that currently provide for the needs of the flammulated owl. Under all action alternatives, no harvest would occur within suitable habitat. However, there is proposed harvest in habitats that could meet the needs of the flammulated owl within the next 20-50 years (capable habitat). The analysis will focus on the stands that could provide habitat in the future or "capable" stands.

A minimal canopy closure of at 40% appears to be an important component of flammulated owl nesting habitat (project files: canopy closure supporting document). Based on site-specific information (project files WL-18), the units proposed for regeneration harvest within capable flammulated owl habitat are stands that would not maintain sufficient canopy closure to meet the needs of the flammulated owl because of Douglas-fir beetle mortality. There was no significant difference between canopy closure resulting from beetle activity and harvest (Project Files, Wildlife, Document WL-18). Therefore, the effects to canopy closure under all alternatives, including the No-Action Alternative, would be similar. However, the number and availability of snags is greater under Alternative 1 than under any of the action alternatives. These harvest alternatives also pose a risk of losing an undetected nest tree.

Under all harvest alternatives, proposed salvage harvests would not likely alter the ability of the stands to provide suitable flammulated owl nesting habitat in the long term since 2-6 large snags per acre (depending on the habitat type) would be maintained for nesting habitat. In addition, as these stands mature, snags would be created over time. A direct impact of logging could be the loss of flammulated owl nests, although these older "capable" stands are generally not structurally optimal for nesting (they are either too dense or not old enough).

Thinning of larch stands would occur under Alternatives 2 and 4. Stands predominantly composed of larch where thinning is recommended, do not provide habitat for flammulated owls (project files: Flammulated Owl Occurrence Table, Verner 1994).

Summary

Under all alternatives, including Alternative 1, there would be no change to stands that currently provide habitat for the flammulated owl ("suitable" habitat). Stands currently too dense could trend towards suitable flammulated owl habitat due to reductions in canopy resulting from beetles mortality (Project Files, Wildlife, "Canopy Closure Supporting Data" Document WL-18). Under all alternatives in all analysis areas, except in the Shoshone Analysis Area, there would be some loss of canopy which could delay the length of time until stands provide optimal nesting habitat. Old growth stands are the most likely to provide habitat for flammulated owls (Project Files, Wildlife, "Canopy Closure Supporting Data" Document WL-18). Under the action alternatives, there would be a low risk of losing an occasional nest tree to harvest. Due to harvest of optimal flammulated owl habitat in old growth and the lack of flammulated owl habitat in the ecosystem (IPNF, 1998, pages 36-37), Alternatives 2 and 3 would impact individuals or habitat in the Hayden and Chain Lakes analysis areas and could trend the species toward listing. Within the Shoshone analysis area, there would be no impact to the flammulated owl under any alternative because no harvest would occur within flammulated owl habitat in that area. In the other analysis areas, there would be some reduction in habitat but none would occur in optimal old growth habitat. As a result, all alternatives

may impact individual flammulated owls in the remaining analysis areas, but would not trend the species toward listing or loss of viability.

Alternative 1 would result in an increased number of large snags for use by flammulated owls for nesting or roosting. Large snags are considered an important, and sometimes limiting, habitat requirement. If canopies are not reduced below 40%, the increase in these large snags would increase habitat quality for the flammulated owl. According to (Howie and Ritcey 1987:251) flammulated owl's have been observed using stands with canopy closures as low as 35%. The mortality of large trees also indicates a loss of future snags as trees are no longer available for increased diameter growth.

Beetle-related tree mortality in some cases may benefit stands, allowing trees to grow larger because of reduced competition. The benefit may be off-set by an increased risk of a stand-replacing fire (see Fire analysis). A stand-replacing fire has the potential to greatly reduce owl habitat.

Under **Alternatives 2 and 3**, retention of six snags per acre in old growth and two to five snags per acre in non-old growth dry habitat types would ensure sufficient snags for the flammulated owl. It is assumed that as the stands mature and mortality increases, the number of snags per acre would also increase over time.

The following table displays the number of acres of capable flammulated owl habitat that would have stand canopies altered by the beetle infestation and proposed harvest activities. These acres would maintain the ability to eventually provide habitat for the flammulated owl, although the reduction in canopy may increase the amount of time needed for the habitat to meet the species needs.

Table III-63. Acres of capable flammulated owl habitat that would have canopies altered by beetles and proposed activities.

Analysis Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Hayden	15	15	15	15
Coeur d'Alene Lake North	67	67	67	67
Chain Lakes	48	48	48	48
Callis	14	14	14	14
Shoshone	0	0	0	0
Scatterwall	39	39	39	39
Potosi	18	18	18	18

Effects to Flammulated Owl Habitat in Hayden Analysis Area

Currently, there are 3,627 acres of capable flammulated owl habitat in the Hayden analysis area, of which approximately 24 acres are identified as suitable habitat. At least half of this capable habitat has had some type of harvest.

Direct and Indirect Effects

Alternative 1: Refer to effects common to all altermatives.

Alternatives 2 and 3 : The salvage harvest would have similar impacts as Alternative 1 except for reduced snag densities in the action alternatives.. None of the proposed salvage harvest would reduce canopy closure below 40%. 8 acres of flammulated owl habitat that have been identified as old growth would be harvested under these alternatives. This large diameter old growth and associated snags would be considered optimal habitat for flammulated owls. Another 7 acres of flammulated owl habitat that is not classified as old growth would also be salvaged. Since flammulated owl habitat is in short supply in the Coeur d'Alene basin, harvest of optimal habitat *could trend the species towards listing.*

Alternative 4: No harvest would occur in Hayden under this alternative. Effects are the same as Alternative 1.

Cumulative Effects

Based on past reductions of flammulated owl habitat from harvest activities, urban development and fire exclusion cumulative effects are high. Alternatives 1 and 4 may result in minor improvements of the flammulated owl habitat by opening the canopy to meet the requirements of the flammulated owl. There would be no additional cumulative effects in alternatives 1 and 4 as a result of this project. Under Alternatives 2 and 3, the loss of flammulated owl habitat in old growth combined with past high cumulative effects could trend the species towards listing.

Effects to Flammulated Owl Habitat in Coeur d'Alene Lake North Analysis Area

Currently, there are approximately 12,120 acres of capable flammulated owl habitat, of which 339 acres are identified as suitable habitat. Some capable habitat could provide habitat for the flammulated owl in the future as tree diameters and snags increase. Due to past harvest, the cumulative effects analysis shows that the amount of remaining habitat is of utmost importance for maintaining flammulated owls. There has also been an additional loss of snags along open roads due to fuelwood harvest. Based on monitoring, the snag levels in the Alder Creek drainage are considerably low due to past harvest.

Direct and Indirect Effects

Alternative 1: Refer to effects common to all altermatives. Under Alternative 1, trees would die within the stands of flammulated owl habitat. Because of current canopies and predictions for mortality within these stands, 67 acres of capable habitat would require a longer period of time before providing habitat for the flammulated owl. Suitable stands would continue to provide habitat for the flammulated owl despite some beetle-related tree mortality.

Alternatives 2 and 3: There would be no harvest of flammulated owl stands classified as old growth under these alternatives within the Coeur d'Alene analysis area. There are 67 acres of potential ("capable") flammulated owl harvested with these alternatives. Salvage harvest on these 67 acres mimics beetle mortality in relation to canopy closure however, there is a loss of snags for future nesting. A slight risk of losing a nest to harvest exists.

The majority of the ecosystem burning proposed under Alternative 2 would not negatively impact capable flammulated owl habitat, since canopy closure would remain at or above 40 percent. However, flammulated owls could be affected in one stand within the proposed burning (stand #3700508), because canopy closures would drop slightly more than is normally used by flammulated owls. Fire could expand flammulated owl habitat since fire exclusion is on of the past negativie impacts on the species.

Alternative 4: Effects are the same as Alternative 3 except only 11 acres of potential ("capable") flammulated owl habitat are harvested. This difference is a result of the roadless area being excluded from harvest under alternative 4.

Cumulative Effects

Due to past harvest and exclusion of fire, there has been a severe decline in flammulated owl habitat (approximately 95%); cumulative effects are high. Harvest in Alternatives 2, 3, and 4 in flammulated owl habitat would not alter canopies beyond the effects displayed in Alternative 1. There is an increased risk of a loss of a nest in Alternatives 2, 3, and 4. There would also be a reduction in snags and structure under these harvest alternatives. Although there are only slight additional cumulative effects from this project, based on past and foreseeable projects, cumulative effects would remain high. Ongoing activities (Fernan Heli Bug) will harvest 8 acres in suitable habitat.

Effects to Flammulated Owl Habitat in Chain Lakes Analysis Area

There are currently 3,560 acres of capable flammulated owl habitat in the analysis area, of which 171 acres are identified as suitable flammulated owl habitat. Most of these suitable habitats are found in the Lake Creek and Cottonwood Creek drainages.

A flammulated owl was present in the Chain Lakes Analysis Area during 1999 field surveys. There are no proposed harvest units within one mile of the sighting location. If active flammulated owl nest sites are found, the Forest Service may cancel timber harvest and road construction activities within 200 feet of the nest site.

Direct and Indirect Effects

Alternatives 1 and 4: Beetle mortality in the Chain Lakes area would reduce the canopy closure on some suitable and capable habitats. Based on current canopies and predictions for mortality within these stands, 8 acres of capable habitat may require more time before it would provide suitable habitat for the flammulated owl. There is no harvest in the area under either alternative. Increased snag densities would occur as a result of the Douglas-fir beetle mortality.

Alternatives 2 and 3: With the implementation of Alternatives 2 and 3, 48 acres of harvest would occur within flammulated owl habitat that is also classified as old growth. This old growth flammulated owl habitat is considered optimal habitat for the species. A loss of large diameter snags and potential nesting habitat would result from the harvest. Alternative 2 would include 8 acres of regeneration harvest in old growth flammulated owl habitat. Regeneration harvest would remove most forest structure to provide future nesting habitat. Planting of ponderosa pine would

provide additional suitable habitat over the long term (150 years). Only salvage harvest would occur with the implementation of Alternative 3. Effects would be slightly reduced from Alternative2.

Cumulative Effects

Past activities have severely reduced flammulated owl habitat. Cumulative effects are high due to a reduction in flammulated habitat from past harvest, exclusion of fire and from development on private lands. Because of the harvest of old growth flammulated owl habitat in a basin that is all ready underrepresented in flammulated owl habitat, *Alternatives 2 and 3 could trend the flammulated owl towards listing*. Additional cumulative impacts from loss of snag habitat, old growth nesting habitat and potential risk of loss of nest are moderate.

Effects to Flammulated Owl Habitat in Scatterwall Analysis Area

There are 3,529 acres of capable habitat of which 86 acres are identified as suitable. Due to past harvest, the cumulative effects analysis shows that the amount of remaining habitat is of utmost importance for maintaining flammulated owls. There has also been a loss of snags along open roads.

Direct and Indirect Effects

Alternative 1: Under Alternative 1, trees would die within the stands of suitable and capable habitat because of Douglas-fir beetle mortality. Canopy loss predictions for stands of currently suitable flammulated owl habitat show that habitat will still be provided for the flammulated owl within these stands despite mortality. Some mature stands not currently providing habitat for the owl ("capable" habitat) could actually move towards more suitability because canopies would thin out. Opening these stands resulting from beetle mortality would actually better meet the needs of the flammulated owl. Large snags resulting from Douglas-fir beetle would remain in place providing nesting and foraging habitat for the owl.

Alternatives 2 and 4: These alternatives would implement 25 acres of salvage harvest within potential ("capable") flammulated owl habitat. In most stands, canopies loss would mimic the same loss that occurred with the beetle mortality. There would be an additional harvest of 10 acres of improvement harvest and 4 acres of thinning within flammulated owl habitat. In these stands (14 acres) canopies would be reduced beyond the effects of the beetle mortality. Neither of the alternatives would harvest old growth within the Scatterwall Analysis Area. In both alternatives there would be a loss of snags and a reduction in nesting habitat.

Alternative 3: This alternative would salvage beetle killed Douglas-fir within 39 acres of potential ("capable") flammulated owl habitat. Canopy loss would mimic the effects resulting from beetle mortality. There would be no harvest of old growth within the Scatterwall Analysis Area. There would be a loss of snags and a reduction in nesting habitat.

Cumulative Effects

Past activities have severely reduced flammulated owl habitat. Cumulative effects are high due to a reduction in flammulated habitat from past harvest, exclusion of fire and from development on private lands. The majority of the harvest under the action alternatives results in canopy reductions similar to Alternative 1 (no action). There would be a loss of snags and a potential for a direct loss

of a nest during harvest activities. Due to snag loss and potential nest loss the additional cumulative impacts of Alternatives 2, 3 and 4 is moderate. No optimal habitat (old growth or suitable habitat) would be harvest under the 3 action alternatives. The implementation of any of the 3 alternatives *may impact individuals* but would not trend the species towards listing.

Effects to Flammulated Owl Habitat in Callis Analysis Area

The Callis area does not provide optimal habitat for the flammulated owl. The predominately moist habitat types in the area are not preferred by the owl. Currently there are no acres of suitable habitat within the analysis area. There is a total of 1,161 acres of capable habitat that could provide habitat for the flammulated owl at some point in the future.

Direct and Indirect Effects

All alternatives affect 14 acres of potential ("capable") habitat. Currently these stands provide only 21% canopy closure due to beetle mortality and ice storm damage. The resulting salvage harvest associated with all action alternatives would have no effect on canopy closure beyond the effects of beetle mortality. Alternative 1 (no action) would result in an increase of snags and potential nesting habitat. Alternative 2, 3 and 4 would remove some of these snags and potential nest trees.

Cumulative Effects

Due to inherent lack of suitable habitat flammulated owl habitat past activities have had a moderate cumulative effect on the flammulated owl. Alternatives 2, 3 and 4 would have low additional cumulative effects on flammulated owl habitat, primarily because the area provides little habitat for the flammulated owl. The implementation of any of the 3 action alternatives *may impact individuals* but would not trend the species towards listing.

Effects to Flammulated Owl Habitat in Shoshone Analysis Area

The Shoshone analysis area provides approximately 1,196 acres of potential ("capable") habitat which could provide suitable habitat sometime in the future.

<u>Direct and Indirect Effects:</u> There is no habitat for the flammulated owl harvested under any of the alternatives in the Shoshone area. Under all alternatives, including Alternative 1, there would be no change in flammulated owl habitat.

<u>Cumulative Effects:</u> The Shoshone inherently lacks habitat for the flammulated owl therefore the cumulative effects of past activities on flammulated owl are moderate . Therefore, additional cumulative effects to the flammulated owl as a result of implementing any of the alternatives is low. There is an extremely slight chance that harvest activities outside of flammulated owl habitat could result in the loss of a nest tree. However, it is unlikely that flammulated owls nest in habitats other than those identified through the modeling process. Due to a slight risk of loss of a nest tree, the implementation of any of the alternatives *may impact individuals* but would not trend the species towards listing.

Effects to Flammulated Owl Habitat in Potosi Analysis Area

The Potosi analysis area provides no suitable habitat and 1,196 acres of capable habitat which could provide suitable habitat sometime in the future.

Direct and Indirect Effects

Alternative 1: Beetle mortality in the Potosi area would reduce the canopy in some potential ("capable") flammulated owl habitat. The majority of the beetle mortality is scattered and not concentrated in patches that would impact flammulated owl habitat. The only suitable habitat in this area has not been affected by beetle mortality. Currently there is a shortage of suitable habitat within the Potosi Analysis Area. Canopy reduction in older capable habitat may actually provide suitable habitat sooner. There would be no loss of snags or potential nesting trees with this alternative.

Alternatives 2 and 4: There would be 18 acres (12 acres of salvage, 6 acres of improvement harvest) of potential flammulated owl habitat harvested under these alternatives. Effects to canopy are similar to those outlined in Alternative 1. In six acres of improvement harvest canopies would be reduced beyond the effects that would occur under Alternative 1. The resulting canopy closure after improvement harvest is estimated to be 38%. Since this is only slightly below the threshold of 40% canopy closure required by the owl, these 6 acres of improvement harvest may provide habitat for flammulated owls within 5 to 10 years. Snags would be lost with the implementation of either of these alternatives. The snag loss would result in a reduction of nesting habitat and a risk of a direct loss of a nest tree.

Ecosystem burning proposed under Alternative 2 would not impact flammulated owl habitat, since no flammulated owl habitat exists within the proposed burn areas.

Alternative 3: The effects of this alternative are very similar to Alternatives 2 and 4 however, only salvage harvest would occur under this alternative. No canopies would be reduced below 40%. As in the other action alternatives, snag loss would occur resulting in a reduction of nesting habitat and a risk of a direct loss of a nest tree.

Cumulative Effects

Past harvest has resulted in a decline in suitable flammulated owl habitat. Habitats for the flammulated owl are inherently low in the Potosi Analysis area. Cummulative effects from past activities are moderate for the flammulated owl. Alternatives 2 and 4 reduce canopy closure on six acres of flammulated owl habitat beyond the effects of the Douglas-fir beetle. All three action alternatives remove snags and have a potential risk of loss of a nest tree. The additional cumulative effects resulting from the implementation of any of the 3 action alternatives is low. Due to a slight risk of loss of a nest tree, the implementation of any of the alternatives *may impact individuals* but would not trend the species towards listing.

Northern Goshawk

The following section analyzes the effects of the alternatives on northern goshawks and their habitat using the indicators documented earlier in this chapter. Table III-64 displays the acres of capable and suitable goshawk habitat affected by the proposed treatments for each alternative.

For analysis purposes on the Coeur d'Alene River Ranger District, because of the low level of existing suitable habitat in some Analysis Areas, goshawk assessment areas were delineated within each Analysis Area (refer to Project Files map WL-17). These assessment areas approximate hypothetical territories (USDA Forest Service, 1990). The areas were delineated based on subcompartment boundaries, potential ("capable") goshawk habitat, typical territory sizes in the northern Rockies (5,000 to 6,000 acres), and amount of National Forest System land within the subcompartments. Stands and acres impacted were compared to existing goshawk nesting habitat (including stand size and distribution) to determine the effects on goshawk habitat at the scale of approximate home ranges. Refer to the text for details on individual analysis areas. The following analysis area will be tiered to Douglas-fir Beetle Project EIS: Hayden, Coeur d'Alene Lake North and Chain Lakes. This analysis will discuss those effects which add to the cummulative effects of these areas.

Effects Common to All Analysis Areas

In general, activities such as fire suppression, selective harvest and the subsequent dominance of Douglas-fir and grand fir have likely increased goshawk habitat by creating dense canopies (Idaho Panhandle National Forests, 1998, page 36). Under Alternative 1, canopy loss would occur as a result of mortality associated with the Douglas-fir beetle. Analysis found that this reduction in canopy closure from the beetle activity would result in some stands no longer providing goshawk nesting habitat (Project Files, Wildlife, Documents WL-14(page 6) and WL-16(page 2)).

In most cases units proposed for salvage harvest under all action alternatives would not impact canopy closure beyond the effects from the bark beetle. Live canopy closure would vary little from the No-Action Alternative. Predictions for stands that are proposed for regeneration harvest show that mortality from the bark beetle would reduce canopies below acceptable levels for goshawk (Project Files, Wildlife, Document WL-16 (page 2)).

Under Alternatives 2, 3 and 4 there would be a loss of snags and downed wood. These are important features in relation to prey availability for the goshawk (Refer to Project Files: Goshawk Snag Relationship, USDA 1993). Design features for snags and downed woody material would ensure some prey availabilty in salvage and improvement harvest units (please refer to Chapter II, "Features Designed to Protect Wildlife Habitat"). However, prey would be reduced in those stands where natural mortality has occurred and snags and down wood are allowed to remain at high levels. Stands that would be impacted by management activity are included in the calculations displayed in the table.

Table III-64. Reduction in acres of northern goshawk habitat, by alternative.

Analysis Area	Existing	Alt. 1	Alts. 2	Alt. 3	Alt. 4
Hayden (25,644 acres)					
Capable Habitat	6,160	8	8	8	8
Suitable Habitat	1,112	0	0	0	0
Chain Lakes (18,805 acres)					
Capable Habitat	6,083	0	0	0	0
Suitable Habitat	1,846	8	47	8	8
CdA Lake North (45,554 acres)					
Capable Habitat	18,624	0	0	0	0
Suitable Habitat	6,625	66	66	66	66
Callis (21,298 acres)					
Capable Habitat	4,185	22	22	22	22
Suitable Habitat	956	0	0	0	0
Shoshone (22,902 acres)					
Capable Habitat	6,945	4	4	4	4
Suitable Habitat	1,388	0	0	0	0
Scatterwall (37,489 acres)					
Capable Habitat	10,063	40	40	40	40
Suitable Habitat	3,114	21	21	21	21
Potosi (40,70 acres)					
Capable Habitat	5,404	17	17	17	17
Suitable Habitat	1,072	0	0	0	0
Totals					
Capable Habitat	57,464	91	91	91	91
Suitable Habitat	17,061	95	134	95	95

Under any alternative (including the No-Action Alternative), changes in capable goshawk habitat indicate that the habitat will take a longer period of time before it meets conditions to be considered suitable habitat.

Cumulative Impacts of Reasonably Foreseeable Actions

Under all alternatives, reasonably foreseeable actions would occur which would impact suitable goshawk habitat (please refer to the tables in Chapter II). In the Coeur d'Alene North analysis area, timber harvest under the Horizon Moon and West Rutherford Heli Bug timber sales would affect 741 acres of suitable goshawk habitat. In the Chain Lakes analysis area, the Hogback Beetle, Killarney Beetle, Ward Ridge Heli Bug and Blue Swan Beetle Heli timber sales will affect 131 acres of suitable goshawk habitat. In the Scatterwall analysis area, the reasonably-foreseeable Teratoid Tepee project would affect an estimated 4 acres of suitable goshawk habitat. These timber sales would reduce canopy cloure, remove snags and potential downed wood. Nesting and foraging habitat would be reduced. There is also a potential risk for a nest tree to be lost. Other foreseeable projects would not vegetatively impact suitable goshawk habitat. Foreseeable actions are also scheduled which would close, restrict, or otherwise reduce potential disturbance to nesting goshawks. These impacts are discussed for each appropriate analysis area. Because all analysis areas would still retain sufficient habitat for goshawks (Project Files, Wildlife, Documents WL-16 and WL-17), implementation of any of the alternatives *may impact individuals but would not trend the species toward listing.*

Effects to Goshawk Habitat in Hayden Analysis Area

The Hayden Analysis Area consists of approximately 6,160 acres of potential ("capable") goshawk habitat, of which 1,112 currently is classified as suitable habitat. In 1993, three immature goshawks were sighted within the Analysis Area.

For analysis purposes the Hayden Analysis Area was delineated into six goshawk assessment areas. Five of these assessment areas currently contain sufficient suitable habitat to support goshawks. Suitable nesting habitat in assessment areas with sufficient habitat varies from 177 acres to 273 acres. The area which does not contain sufficient habitat contains approximately 77 acres of suitable habitat in four blocks, all less than 25 acres in size.

Direct and Indirect Effects

Alternatives 1 and 4: Beetle mortality in the Hayden area would reduce the canopy closure in some goshawk habitats. The majority of the beetle mortality is scattered and not concentrated in patches that would impact suitable or capable habitats. Despite the loss of canopy, the recruitment of snags and down wood as a result of beetle mortality would enhance prey availability for the goshawk. Prey availability is anticipated to increase dramatically for the short-term. There is a total of 8 acres of potential ("capable") habitat within allocated old growth impacted by the beetle infestation. Adequate nesting habitat to support a breeding pair of goshawks would still be available.

Alternative 2 and 3: Alternatives 2 and 3 each propose 15 acres of salvage within potential ("capable") goshawk habitat. 8 acres of harvest fall within old growth that provides optimal habitat for the goshawk. Another 35 acres of old growth that is not considered goshawk nesting habitat would be selectively harvested. This old growth provides foraging habitat even though it does not meet the criteria for nesting habitat. Canopy closure in harvested stands would not be reduced beyond the effects of the beetle. Snags and downed wood providing habitat for a prey base would be removed on the 15 harvested acres. In harvested areas prey base is anticipated to decline. Sufficient habitat to support a pair of breeding goshawks within the territory would continue to be provided after harvest.

Cumulative Effects

Past activities have not substantially reduced goshawk habitat. In fact, some influences such as fire suppression and dominance of Douglas-fir have probably increased habitat for the goshawk. Past cumulative effects are moderate (Project Files, Wildlife, Document WL-17). The effects on goshawk habitat under all action alternatives when added to the bark beetle-related tree mortality and existing and foreseeable effects would be considered low (Project Files, Wildlife, Document WL-16); and the capability of the area to support goshawks at existing levels would not be reduced.

Effects to Goshawk Habitat in Coeur d'Alene Lake North Analysis Area

The Coeur d'Alene Lake North Analysis Area consists of approximately 18,624 acres of potential ("capable") goshawk habitat, of which 6,625 currently is classified as suitable habitat. Much of the suitable habitat occurs in relatively large blocks. The analysis area was delineated into 11 goshawk assessment areas. An analysis of goshawk habitat on National Forest System administered lands indicates that ten of these assessment areas currently contain sufficient habitat to support goshawks.

The area which does not contain sufficient habitat is comprised primarily of non-National Forest System administered lands on which information regarding goshawk habitat is not available; there are only 49 acres of goshawk habitat on National Forest System lands in this assessment area. The range of suitable habitat in assessment areas with sufficient habitat varies from 116 acres (in 3 blocks) to 1,364 acres.

Direct and Indirect Effects

Alternative 1: Beetle-caused mortality in the Coeur d'Alene Lake North analysis area would reduce the canopy closure in some goshawk habitats. The majority of the beetle mortality is scattered and not concentrated in patches that would impact goshawk habitats.

Alternative 1 would result in canopy reduction on 66 acres of goshawk suitable habitat in two assessment areas, this resulting canopy loss would have little impact on these areas to provide suitable nesting habitat required to support a breeding pair of goshawks. Snags and down logs recruited as a result of Douglas-fir beetle activity would improve habitat for prey. Prey availability is expected to increase in these areas.

Due to foreseeable actions approximately 6.4 miles of existing open road would be closed and there would be a reduction in open road density from the existing 1.4 to 1.3 miles per square mile of area. An additional 3.5 miles of road would receive improved closures (e.g. earth barriers or obliteration). Road reductions would reduce potential disturbance around nest sites and reduce the loss of snags to roadside firewood harvest.

Alternatives 2 and 3: Effects of both alternatives on canopies would be similar to Alternative 1; beetle-caused mortality has reduced canopies on 66 acres of goshawk habitat. There is additional salvage harvest in 186 acres of old growth. These stands of old growth do not meet the criteria for goshawk nesting habitat and have not been identified as such when querying the model. However, these stands provide a large diameter live tree and snag component. The old growth stands are important for prey species of the goshawk. Harvest in both the 66 acres of goshawk habitat and 186 acres of old growth would reduce snag and downed wood. Reducing the prey availability for the goshawk and potentially reducing productivity.

Ecosystem burning that would occur under Alternative 2 would not impact goshawks. Although habitat exists in the proposed burning area, it is likely that the beetle-caused tree mortality will drop the canopy closure beyond what is normally used by goshawk (50% canopy closure). Therefore, the minor additional loss of canopy closure as a result of the ecosystem burning would not impact the species. Habitat for some prey species could be enhanced as a result of ecosystem burning.

Alternative 4: There is no harvest proposed in old growth stands. Only 8 acres of goshawk habitat would be selectively harvested under this alternative. Snag habitat remaining for prey species would be similar to Alternative 1.

Cumulative Effects

The effects of the no action alternative combined with the effects from past management activity results in a moderate reduction in habitat for this species. Additional cumulative impacts resulting from this project are high under Alternatives 2 and 3 (Project Files, Wildlife, Document WL-16).

However, based on the availability of nesting habitat, the Coeur d'Alene North analysis area contains sufficient habitat to support 9 pairs of nesting goshawks (Project Files, Wildlife, Document WL-17). The loss of the capability of one assessment area to support nesting goshawks would not affect the capability of the area to support goshawks at recommended levels.

Effects to Goshawk Habitat in Chain Lakes Analysis Area

The Chain Lakes Analysis Area consists of approximately 6,083 acres of capable goshawk habitat, of which 1,846 currently is classified as suitable habitat. Much of the suitable habitat occurs in relatively large blocks. The analysis area was delineated into 4 goshawk assessment areas; all assessment areas contain sufficient suitable nesting habitat to support a breeding pair of goshawks. The range of suitable habitat in assessment areas varies from approximately 174 acres to 612 acres.

There is one active goshawk nest site just west of the Analysis Area. Its territory most likely includes a portion of the Chain Lakes Analysis Area. There was a goshawk nest identified in 1992 within the analysis area, but the current status is unknown. Most of the suitable habitat is located in the Lake Creek drainage.

Direct and Indirect Effects

Alternatives 1 and 4: Beetle-caused mortality in the Chain Lakes area would reduce the canopy closure on some suitable and capable habitats. Due to reasonably foreseeable activities, approximately 19.1 miles of existing open road would be closed and there would be a reduction in open road density from 2.3 to 1.6 miles per square mile of area.

Alternative 2: This alternative would harvest a total of 48 acres of goshawk habitat. Another 150 acres of old growth which was not queried by the model as goshawk habitat would also be harvested. Harvest in old growth would not alter nesting habitat but would negatively impact foraging habitat. Helicopter activity associated with the proposed timber harvest could cause the goshawk nesting just west of the analysis area to abandon the nest. To avoid this impact, harvest would occur in the analysis area between September 1 and March 1. There are no units proposed within the 600-acre post-fledgling area or nest area.

In all of the harvest areas, canopies would be reduced more than would result from beetle mortality. Loss of snags and recruitment of down wood would occur, reducing both nesting habitat and prey availability. Based on these changes, harvest activities *may impact individuals*, but would not effect the ability of the area to continue to support nesting goshawks.

Alternative 3: This alternative would treat the same acres as under Alternative 2 (including 150 acres in old growth), but would use only the salvage harvest method. Canopy reduction would be less than in Alternative 2, which should maintain more habitats for the goshawk. Helicopter activity associated with the proposed timber harvest could cause the goshawk nesting just west of the analysis area to abandon the nest. To avoid this impact, harvest would occur in the analysis area between September 1 and March 1. There are no units proposed within the 600-acre post-fledgling area or nest area. There would be loss of snags and recruitment of downed wood as described in Alternative 2. Habitat for prey species would be reduced. Based on these changes, harvest activities *may impact individuals*, but would not effect the ability of the area to continue to support nesting goshawks.

Cumulative Effects

The effects from past management activity results in a moderate reduction in habitat proportionate to the amount of suitable habitat remaining. The additional effects on goshawk habitat from harvest related to bark beetle-related tree mortality when added to existing and foreseeable effects is high (Project Files, Wildlife, Documents WL-16 and WL-17). The Chain Lakes area would still support goshawks at existing levels.

Effects to Goshawk Habitat in Scatterwall Analysis Area

The Scatterwall Analysis Area consists of approximately 10,063 acres of capable goshawk habitat, of which 3,114 currently is classified as suitable habitat (Project Files, Wildlife, Document WL-17). The analysis area was delineated into 8 goshawk assessment areas. All but one contain sufficient suitable nesting habitat to support a breeding pair of goshawks. The range of suitable habitat in assessment areas varies from approximately 74 acres to 838 acres.

The Scatterwall Analysis Area provides the dense canopies required by the Northern goshawk. Historically, the presence of large trees provided habitat for the goshawk and they most likely used the area. There have been no reported sightings of goshawks in the area.

Direct and Indirect Effects

Alternative 1: Beetle mortality in the Scatterwall area would reduce the canopy closure on some suitable and capable habitats. Alternative 1 would not effect suitable habitat infested with Douglas-fir bark beetle. Canopy cover would remain sufficient to provide habitat for the goshawk; and there would be no effect to suitable goshawk nesting habitat. Foraging habitat would be maintained at current levels.

Alternatives 2 and 4: Each of these alternatives would reduce 9 acres of suitable habitat below the optimal 50% canopy closure. A total of 61 acres of goshawk habitat would be harvested. The harvest in this goshawk habitat would result in a reduction in snags and downed wood recruitment. The reduction in snags could reduce prey availability for the goshawk. Despite reductions in habitat there would continue to be sufficient habitat within the Scatterwall Analysis area to provide nesting habitat for 8 pairs of goshawks.

Alternative 3: Alternative 3 is salvage only. Effects to canopy are similar to Alternative 1. There would be a loss of snags and down wood within the 61 acres of goshawk habitat that are harvested under this alternative. Prey availability is anticipated to decline. As under the other alternatives, there would continue to be sufficient habitat within the analaysis area to provide nesting habitat for 8 pairs of goshawks.

Cumulative Effects

Due to past activities, past cumulative effects are considered moderate. Additional cumulative impacts resulting from this project are low; and the capability of the area to support goshawks at existing levels would not be affected (Project Files, Wildlife, Documents WL-16 and WL-17). Due

to the risk of disturbance or loss of a nest during harvest activities, implementation of the action alternatives *may impact individuals* but would not reduce the areas ability to support goshawks.

Effects to Goshawk Habitat in Callis Analysis Area

The Callis Analysis Area contains 4,185 acres of capable goshawk habitat, of which 956 currently is classified as suitable habitat. The analysis area was delineated into 4 goshawk assessment areas (Project Files, Wildlife, Document WL-17); two of which contain sufficient suitable nesting habitat to support a breeding pair of goshawks, while the other two do not. The range of suitable habitat in assessment areas varies from approximately 24 acres to 487 acres.

Direct and Indirect Effects

Alternative 1: Beetle mortality in the Callis area would reduce the canopy closure on some goshawk habitats (22 acres). This beetle mortality will also increase snag and downed wood recruitment which could enhance the prey base for the goshawk. No habitat delineated as suitable goshawk has been impacted from Douglas-fir beetle infestation.

Alternative 2, 3 and 4: All action alternatives would have harvest on 22 acres of goshawk habitat. Canopy loss for all three alternatives is the same as described in Alternative 1. Implementation of any of these 3 alternatives would result in a loss of snags and recruitment of downed wood. This loss of dead wood component would reduce prey availability for the goshawk.

Cumulative Effects

Due to past activities, past cumulative effects are considered moderate. There would be a reduction in prey availability under the action alternatives (Project Files, Wildlife, Documents WL-21 and WL-24). However, sufficient habitat would still be provided to maintain the capability of the area to support goshawks at existing levels (Project Files, Wildlife, Document WL-16).

Effects to Goshawk Habitat in Shoshone Analysis Area

The Shoshone Analysis Area consists of approximately 6,945 acres of capable goshawk habitat, of which 1,388 currently is classified as suitable habitat. For analysis purposes the Shoshone Analysis Area was delineated into five goshawk assessment areas (Project Files, Wildlife, Document WL-17); four of these assessment areas currently contain sufficient suitable habitat to support goshawks. The range of suitable habitat in assessment areas varies from 85 acres to 600 acres.

In 1999, there was a goshawk pair and fledgling sighted in the Shoshone Analysis Area. No nest has been located. There are no units within one mile of where the sighting occurred. Goshawk surveys will occur in the analysis area prior to implementing harvest activities. Based on the mitigation measures identified related to goshawks, the determination of effects would not change.

Direct and Indirect Effects

Alternative 1: There would be no suitable habitat that would be affected by beetle mortality that would reduce these stands from providing nesting habitat.

Alternatives 2, 3 and 4: No goshawk habitat would be altered under any of the action alternatives.

Cumulative Effects

Due to past activities, cumulative effects are considered moderate. There is no additional effect from any alternative (Project Files, Wildlife, Document WL-16); and the capability of the area to support goshawks at existing levels would not be affected.

Effects to Goshawk Habitat in Potosi Analysis Area

The Potosi Analysis Area consists of approximately 5,404 acres of capable goshawk habitat, of which 1,072 currently is classified as suitable habitat. For analysis purposes the Potosi Analysis Area was delineated into 8 goshawk assessment areas, 4 of these assessment areas currently contain sufficient suitable habitat to support goshawks (Project Files, Wildlife, Document WL-17). The range of suitable habitat in assessment areas with sufficient habitat varies from 108 acres to 250 acres.

Direct and Indirect Effects

Alternative 1: No goshawk habitat would be altered by beetle activity.

Alternatives 2, 3 and 4: No harvest would occur in goshawk habitat under any of the action alternatives. There would be no effect to suitable goshawk nesting habitat in any alternative. Ecosystem burning proposed under Alternative 2 would not impact goshawk habitat, since no goshawk habitat exists within the proposed burn areas.

Cumulative Effects

Due to past activities, cumulative effects are considered high. There is no additional effect from any alternative (Project Files, Wildlife, Document WL-16); and the capability of the area to support goshawks at existing levels would not be affected.

Management Indicator Species

Elk

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 which 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 (Project Files, Wildlife, “Elk Model Criteria”). Although the elk habitat model does not address elk mortality during hunting season, restrictions would be applied to purchasers during hunting season, as identified in Chapter II ("Features Common to All Alternatives"). For information on open road densities, please refer to the "Fisher" discussions earlier

in this chapter.

Elk Habitat Units are made up of several compartments and encompass large areas. For example, Elk Habitat Unit 6 encompasses 13,848 acres and comprises 6 compartments. The existing elk habitat potential for each Elk Habitat Unit within the analysis areas was determined using the most activity depicted during sale activity from Douglas-fir beetle EIS (Douglas-fir Beetle Final EIS, pages 310-322).

The existing condition for EHUs, not included in the previous EIS, was calculated. Elk Habitat Unit 6(Fernan) had the most proposed activities related to the beetle; elk habitat potential in this EHU was analyzed to determine the effects of the Douglas-fir beetle activity and effects after completion of sale activities (Small Sales 2000, post-sale) based on the activities proposed under Alternative 2. The model was also run for EHU 5 (Wallace). Alternative 2 was used for the analysis because it proposes the most activities of all alternatives. Effects to elk habitat potential under other action alternatives were analyzed based on the amount, location, and timing of proposed activities in relation to the elk habitat potential changes occuring in Elk Habitat Unit 6. The effects are described in terms of anticipated change in elk habitat potential, as described below.

The degree of change to elk habitat potential in each analysis area is based on professional judgement. This judgement is based on outcomes of the full analysis of Elk Habitat Unit 6, and knowledge of how the model works (Project Files, Wildlife, "Justification for Elk Analysis"). The following terms and definitions are used to describe percentage change in the model.

Minor	*Effects would cause a 0 to 2% change in the elk habitat potential (either positive or negative) when compared to the existing condition.*
Moderate	*Effects would cause a 3 to 4% change in the elk habitat potential (either positive or negative) when compared to the existing condition.*
High	*Effects would cause a 5% or greater change in the elk habitat potential (either positive or negative) when compared to the existing condition, or would remain below the Forest Plan goal over the long term.*

The following table displays the existing elk habitat potential and anticipated elk habitat potential (post sale) under the action alternatives, in comparison to the Forest Plan goal. The assumption was made that all activities of the Douglas-fir Beetle project were not yet completed. In addition, road closures that will occur under Alternative 1 as a result of other foreseeable projects were not included so that Alternative 1 and the existing condition are displayed as the same. An explanation of how these figures were derived is provided in the Project Files (Wildlife, Document WL-32A).

Table III-65. Elk habitat potential, by alternative.

Analysis Area	EHU	Forest Plan Goal	Existing/ Alt. 1	Alt. 2 During Activities	Alt. 2 Post-Sale Activities	Alt. 3 During Activities	Alt. 3 Post-Sale Activities	Alt. 4 During Activities	Alt. 4 Post-Sale Activities
Hayden;Coeur d' Alene North	9 (Fernan)	38	42	41	42	41	42	42	42
Hayden	10 (Fernan)	44	43	42	43	42	43	43	43
Coeur d' Alene North	7 (Fernan)	42	42	42	42	42	42	42	42
Coeur d' Alene South/ Chain Lakes	8 (Fernan)	41	56	55	56	55	56	56	56
Callis	3 (Fernan)	72	69	69	69	69	69	69	69
Scatterwall	6 (Wallace)	28	39	38	39	38	39	38	39
Scatterwall	5 (Fernan)	38	59	58	59	58	59	58	59
Scatterwall	6 (Fernan)	51	44	43	46	43	46	43	46
Shoshone	7 (Wallace)	33	48	47	49	47	49	47	49
Potosi	5 (Wallace)	55	48	47	48	47	48	47	48
Potosi	3 (Wallace)	65	56	55	56	55	56	55	56
Shoshone	2 (Wallace)	42	47	47	47	47	47	47	47

Direct, Indirect, And Cumulative Effects During Sale Activities

Alternative 1

Under Alternative 1, there may be some loss of thermal cover due to the Douglas-fir beetle outbreak, and some areas where the 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. Cumulatively, there would be no change from the existing elk habitat potential.

Effects Common To All Action Alternatives

The effects of a loss of security during sale activity would result in a minor loss to elk habitat potential in analysis areas where roads that are currently closed with earth barriers would be gated during timber sale activities. Closing the gates at the end of each day would reduce the likelihood of long-term security loss. In EHU 6 (Scatterwall), the 0.2 miles of temporary road is not within areas providing security. In addition, purchaser restrictions during big-game hunting season would also decrease effects to elk security (Chapter II, Features Common to All Alternatives). The most activity would occur in EHU 6, and would decrease elk habitat potential by 1%. Because EHU 6, which had the largest amount of activity, changed the elk habitat potential by only 1%, it is predicted that other areas with similar amounts of change in road closure types and security losses would cumulatively experience decreases in the elk habitat potential from the existing condition.

Effects Common To Alternatives 2 And 3

Cumulatively, during sale activity there would be a minor loss of security and/or less than optimal road closures within Fernan EHU's 9, 10, 8, 6, 5 and Wallace EHU's 7, 5 and 3. Although the changes in the elk habitat potential would be minor over the short term, EHU 10 would remain below the Forest Plan goal longer and to a greater degree than under Alternatives 1 or 4. There would be no change in security or increased roading effects in Fernan EHU's 7 and 3 or in Wallace EHU 2, because all activity would occur along open roads.

Effects Common To Alternatives 2 And 4

Under Alternatives 2 and 4, regeneration harvests would occur. There would be a minor reduction in the amount of hiding cover and an increase in forage beyond the effects of the beetle. Analysis did not reveal a measurable change in the cover:forage ratios or loss of thermal cover due to either beetle activity or regeneration harvest.

Alternative 4

Alternative 4 would be the least impactive action alternative for elk because more secure areas would exist, there would be fewer treatment areas, and fewer earth barriers would be removed from currently closed roads. There would be no additional loss of security in EHUs 9, 10 and 8 beyond the existing condition. Under Alternative 4, there would be no additional loss of security in EHU 10, which is already below the Forest Plan goal. Fernan EHU's 6 and 5 and Wallace EHU's 5 and 3 would have a decrease in security during sale activities and remain below the Forest Plan goal.

Direct, Indirect, And Cumulative Effects Post Sale

Alternative 1

Under Alternative 1, there would be fewer EHU's with increased security over the long term. Open road densities would not be as greatly reduced as under the action alternatives. For example, Fernan EHU 6, which is below the Forest Plan goal, would remain below the goal. There would be no additional road closures in Wallace EHU 7.

Alternatives 2, 3, and 4

Temporary roads would be a minor long-term decrease in elk habitat over the long term, although the effects would be so slight as to not be measureable. Less than one mile of temporary road is proposed throughout all EHU's. After sale activities are completed, the road would remain on the landscape, but would be closed to standard-sized vehicles by means of earth barriers or gates. The benefits would outweigh the effects of the temporary roads in most cases. As a result of the features to protect wildlife habitat (Chapter II, Features Common to All Action Alternatives), security and elk habitat potential would increase in Fernan EHU's 7, 6, and 5 and Wallace EHU 7. There would be a substantial increase in EHU 6, which is currently below the Forest Plan goal. The effect of the proposed temporary road in Wallace EHU 5 is not enough to change the elk model predictions, but would not result in a positive trend in an EHU that is currently below the Forest Plan Goal.

Cumulatively, the elk habitat potential is expected to return to the existing condition or increase in all EHU's. EHU 6 (Fernan) would have high improvements. Elk habitat potential is expected to increase to 50 over the next 5 year period (Project Files, Wildlife, Document WL 33-35). EHU 5 (Wallace) is expected to increase to 53 over the next 5 year period (Project Files, Wildlife, Documents WL 36 through WL-38). The basis for these increases is based on road closures under this project, the Douglas-fir Beetle Project and other ongoing and foreseeable projects identified in Chapter II.

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 was calculated with a model that incorporates "Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho" as specified on page II-27 (Item 1c) of the Forest Plan.

Alternatives 1 and 4 would be consistent with Forest Plan management direction, goals, objectives, standards and guidelines for the management and protection of wildlife and species. Alternatives 2 and 3 would not be consistent with management goals for Sensitive species (Forest Plan, Chapter II, page II-28, Item 9) in the Hayden and Chain Lakes Analysis Areas because of threats to the flammulated owl.

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 EIS). As more information and direction related to this Executive Order becomes available, the analysis and documentaion related to the Small Sales FEIS 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).

SCENERY

Regulatory Framework

The Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin and the Geographic Assessment:

- *Delinate ecosystems as important to humans as places of unique character and value*
- *Define landscapes in the Coeur d'Alene basin*

Scenery management direction is provided by the Forest Plan and is described in terms of Visual Quality Objectives. The objectives are based on the area seen from sensitive travel corridors and on other features that result in a high visual sensitivity level. The visual management system was revised in 1995, and is now known as the Scenery Management System. The revised guidelines are provided in "Landscape Aesthetics: A Handbook for Scenery Management," (USDA Forest Service, 1995

Methodology

Timber harvest, road construction and fuels treatments can affect the appearance of a forested landscape due to contrasts created between natural appearing landforms and vegetation, and those modified by management activities. These changes are often expressed in artistic terms of form, color, line and texture. Contrasts are created by human induced changes in vegetative cover and soil disturbances.

The ability to control how management impacts will appear when viewed with an artist's critical eye depends on the silvicultural system employed, logging techniques, terrain orientation to viewers, and logging slash disposal methods and completeness.

The appearance of the analysis areas today is quite different from what one may have seen in the early 1900s, before much of the dramatic human influence on terrain including logging, cultural activities, settlement development and forest fire control began in earnest. Pre-1900s photographs and written descriptions, as well as dendrological study, paint a picture of a forested landscape somewhat different from the existing condition. Instead of today's' uniform, thick blanket of trees, the nineteenth century landscape was far more diverse. There were much larger numbers of western white pine, ponderosa pine and western larch. The overall appearance was of more open stands of timber, larger trees in both height and diameter, and more diversity in color and texture. Uncontrolled fire created a patchwork of openings in the timber, far more than one observes today.

One objective of scenery management for the long term would be to reintroduce a more representative mix of the long-lived trees and timber stands more "natural" to the region. Accomplishment of this goal presents unacceptable social effects. For instance, most people who live here now would not accept a policy of letting wildfires run their natural course with no attempt to suppress them. Nor will people accept widespread clearcut logging to artificially open the land where, as with fire aftermath, trees could be planted and tended so that eventually, in a hundred years or so, things would more resemble prehistoric conditions.

The goal, therefore, of scenery management will be to maintain, generally, the views people now

enjoy from the key points of high visual sensitivity previously identified in the existing condition portion of this document. Where there is an opportunity, planting would introduce a tree component that would help to diversify color and texture in the stand. Small openings created on timbered slopes would be in scale with existing naturally created openings and be irregularly shaped. The employed systems are evaluated as to their effects to visual quality as viewed from key viewpoints. Effects of burning are similarly evaluated.

The methodology in evaluating the effects of the various management proposals for the areas involves the following premises:

1. *Determine the value of the scenic landscape to people. This "landscape visual sensitivity" has been mapped and is contained in the Idaho Panhandle National Forest Plan (Forest Plan, Appendix D, pages D-1 through D-3 and D-7 through D-9). Visual sensitivity is a combination of established key viewpoints and the scenic attractiveness of the viewed area. It must be noted that it is not possible to evaluate the scenic condition of the area landscapes from every possible viewpoint of concern to people. Selected key viewpoints are representative of views enjoyed by most residents and visitors to these places.*

2. *Determine the scenic character of the landscape. This is expressed as "scenic integrity levels". These levels are rated as Very High, with a goal of preservation of the scene; High, with a goal to retain that quality; Moderate, the goal is to partially retain the view: Low, views can be modified to an extent; and Very low, the condition of the landscape is, and can continue to be highly modified by human manipulation of the land and vegetation, and vegetation.*

3. *Determine the ability of the landscape to absorb human alterations without loss of landscape character and without reduction of scenic character.*

4. *Determine how much of the landscape is visible from key viewpoints as well as what portions of the landscape are hidden (views blocked by terrain).*

5. *Utilize computer aided graphics to determine how timber harvest might affect the appearance of the landscape in the most sensitive viewed areas.*

6. *Determine a desirable future condition for scenery in the Areas.*

The existing scenic condition of privately owned or other public agency lands is considered in the overall visual effects of applied management on National Forest System lands.

Fire, and smoke from fire; helicopters and logging equipment are considered a short-term and temporary impact on scenic integrity and are not considered in the effects analysis.

Existing Conditions and Environmental Consequences

Hayden Lake

This area is common from a scenic point of view. There is general mixed conifer stands and brush and some evidence of past timber harvest. It is not seen from main travel routes, recreation facilities or residences.

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. Alternative 1 would not change the scenic conditions here except that large numbers of dead trees might be noticed. Alternatives 2 and 3 feature salvage logging treatments that generally not be very noticeable on the landscape.

Canfield

This area is fully visible to residential areas where there is great concern over the appearance of forested hills that often are viewed directly from peoples' homes. This area has been assigned the highest visual sensitivity. The assigned VQO here is high limiting management activity that result in the partial retention of the scenic character of the hillside.

Alternative 1 would have little effect on the present scenic condition of the area, which has recently been visually affected to some extent by the death of many Douglas-fir trees to the recent beetle infestation.

Under Alternative 2, the proposed improvement harvests designed to favor large Ponderosa will have little visual impact other than creating a slightly more open effect in the tree cover on the hillside. Long term the visual effects could be quite positive in that it would favor the growth of large visually pleasing Ponderosa Pine trees. Alternative 3 would involve all salvage logging in this area, which would comply with VQO.

Fernan

This is a small section of a long ridge that borders Fernan Creek. Visually it is not significant other than it can be observed by visitors to the gun ranges and by travelers on one of the principal access roads into the Coeur d'Alene basin. For those reasons the scenic condition here is considered of moderate to high concern to people.

Alternative 1 would have no effect other than that occurring naturally. Alternative 2 proposes a combination of salvage and regeneration harvest. While the salvage operation would meet VQO, Unit 12 (the regeneration cut) would not. This unit is proposed to be almost nine acres in size and is shaped like a diamond. It forms a middle ground view as observed from the Fernan road and as designed would not be sufficiently absorbed into the surrounding landscape. Alternative 3 as entirely salvage would conform to the scenic conditions of the area and meet VQO.

Blue Creek

The area is encased in the folds of terrain that form a western tributary of Blue Creek. This area is typical of the Coeur d'Alene River Basin in that it is a complex of nondistinctive ridges with a full to broken cover of conifer trees and brush species. The area of the project can be observed from some homes in the Blue Creek drainage.

Alternative 1 would have no effect beyond natural occurring vegetative changes. Alternative 2 proposes improvement treatments that would be similar in effect to those described for the Fernan area. There are also two regeneration harvests which, although creating openings, should blend or be absorbed into the landscape well. These units would undoubtedly be observable from some upper Blue Creek residences but would conform well to a landscape that has been considerably altered by agricultural activities for the past half century. Land clearing to create hay fields and animal grazing lands are accepted as a normal characteristic of rural landscapes. This is a common scenic condition of this area. Alternative 3 would meet VQO but could be less desirable than Alternative 2 over the long term.

Thompson Creek

The Thompson Creek analysis area is within a VQO location of low to moderate concern. The terrain is characterized by general forest mix with an unusually high amount of natural opening in the forest cover.

Alternative 1 would have no effect. Alternative 2, which proposes mostly improvement harvest, would meet VQO. Unit 23 is a proposed regeneration harvest, but would conform to the local landscape fairly well due to the naturally-occurring opening nearby and because it is not readily observable from places of high concern. Alternative 3 would comply with VQO.

East Rutherford

The scenery of this area is quite common for the Coeur d'Alene River Basin. Heavy forest cover with evidence of past harvest activity is the dominate feature of the area. Alternative 1 would have no effect on the existing scenic condition. Alternatives 2 and 3 (with proposed salvage harvests) would comply with VQO and would be barely noticed by visitors to the area.

Cedar

This area has scenic character common to the Coeur d'Alene River Basin. Visual concern is considered low, as the mix of harvest units cannot be observed from key visual points. All alternatives would meet prescribed VQO.

Fourth of July

This area is adjacent to Cedar analysis area and has the same visual prescription. All Alternatives would meet VQO.

Cataldo Face

This area forms the landscape framed by Wall Peak, Hardy Gulch and Ratenan Creek. Some units would be partially observable from Interstate 90 and to a limited degree from rural residences in the bottomlands around the afore-mentioned drainages. It is characterized by typical forest cover and features numerous natural openings in forest cover and culturally created openings for farming and grazing. This area is considered to be of high to moderate in importance in scenic condition.

Alternative 1 would have no effect. Alternatives 2, 3, and 4 would meet VQO as prescribed. Although some of these units would be seen from viewpoints of importance, there is a high degree of capacity in the terrain to absorb the effects created by regeneration units in this area. The critical viewpoints (such as the Interstate Highway or the Cataldo Mission Historic State Park) are from 3.5 to 5 miles' distance from the harvest sites. At that distance these units are background views and would blend into the terrain in a naturally-appearing manner.

Downey

The area occupies a high ridge slope above the North Fork of the Coeur d'Alene River in terrain typical of this highly scenic river canyon. Visual sensitivity in the River corridor is high; units that could be seen from the River road and Forest Highway 9 would need to conform well to the visual character of this special place.

In the Downey analysis area, all alternatives would easily conform to the high scenic standards set for the Coeur d'Alene River Canyon.

Prado

The visual prescription for the segment of the Prado area visible from the North and Little North Fork of the Coeur d'Alene River is high. Prado Units 2 through 6 would be partially observable from portions of the viewpoints of high concern.

Alternative 1 would have no effect. Alternatives 2, 3 and 4 would meet the VQO standard requiring in the River corridors that the scenic characteristics that make this area a highly valued recreation destination for people be at least partially retained. Alternatives 2, 3 and 4 would meet the scenic objectives for the area. The small size improvement and salvage-logging units would not detract from the scenic condition of the River corridors.

Studer

The salvage units of the Studer area lie far up in a small tributary stream to the North Fork. The broken nature of the forested landscape and terrain interrupt views from key visual points. The units are also proposed as salvage harvests. All alternatives would meet VQO.

Cougar

Cougar Creek is a major tributary of the North Fork Coeur d'Alene River, featuring terrain and vegetation common to the River canyon.

Alternative 1 would have no effect. All action alternatives would meet VQO due to terrain screening and/or harvest selection, with the exception of Unit 4, which would not meet the VQO of partial retention assigned to the land it occupies. This 5.6-acre shelterwood-regeneration unit would standout significantly when viewed from the Forest Highway and several recreation residential properties along the River. The location could accommodate a salvage or light improvement harvest.

Gimlet, Owl, Little Tepee

These areas are related in that they occupy high terrain north and south of the lower third of the Little North Fork of the Coeur d' Alene River. Not much of the upper slopes of tributary drainages can be observed from the scenically-valuable River corridor.

Alternative 1 would have no effects to scenery in these areas. Units proposed under Alternatives 2, 3,and 4 would be out of sight of the River and its recreation developments. The units are within areas where visually-modified vegetation treatments are permissible, andmost of the units are salvage harvests, which have very minimal effects to scenery.

Callis

The Callis area is adjacent to a large roadless landscape that is managed for primitive recreation. The Callis units are actually outside the roadless area but occupy a site largely unmodified in appearance.

Alternative 1 would have no effect on existing conditions beyond those already occurring. There are many trees dying in the area, which is not particularly attractive from a scenery point of view. Alternatives 2, 3, and 4 all propose salvage of dead timber along Road 436. This is not a road with high visually sensitivity, so moderate timber management that modifies the scenery is permitted. An advantage for visual quality is that all of the proposed harvest units are within the foreground views from the road. In a case such as this, salvage harvest usually has a long-term beneficial effect on the landscape by removing dead timber and creating a more open effect for views from the road into the surrounding forest.

Prichard

The Prichard areas' three subdivisions occupy a diverse landscape that includes Prichard Creek, which was treated rough by placer mining in the early twentieth century. The Creek is paralleled by the Murray-Thompson scenic road, which connects the Clark Fork River in Montana with the Coeur d'Alene River drainage. One area subdivision is located on the slopes immediately above the West Fork of Eagle Creek and the access road to the heavily visited Settlers Grove Botanical Area.

Alternate 1 would have no immediate change on scenery in the area. Alternative 2 proposes a mix of salvage and tree improvement harvests that would meet the high VQO sensitivity assigned the scenic road. Salvage units on the West Fork Eagle road would meet the standard as well. Only Units 23 and 24 under Alternative 2 pose some problem as regeneration harvests. The proposed units are fairly small in size but would be clearly visible from the scenic highway and would probably not meet VQO unless modified to some degree of partial cut harvest.

Alternative 3 proposes salvage harvests, and would meet the visual quality standard. Alternative 4 is similar to Alternative 2 and would meet VQO with a salvage harvest treatment applied to Units 23 and 24.

Potosi and White

These areas lie astride Beaver Creek, the bottomlands of which are mostly in private ownership. The residents in Beaver Creek live in a rural environment that has been modified visually to allow agricultural pursuits to be maintained. The slopes above the rural valley are heavily forested and in places past timber harvest activity is evident. The road running parallel to Beaver Creek is a primary access to the Coeur d'Alene River recreation sites. Visual sensitivity is considered moderately high for views from the road and residential sites along the valley.

Alternative 1 would have little effect to scenery in the valley. Alternatives 2, 3 and 4 propose small salvage harvest units within the foreground visual range of road and homes. These would easily meet the VQO for the area and would barely be noticed after post-logging activity is completed. The remainder of the units under these alternatives would be positioned out of sight of the points of greatest visual sensitivity in areas of modified forest lands, and would therefore meet VQO.

Shoshone

These two subdivisions are located low in the valley and within a few miles of the mouth of Shoshone Creek. The road up Shoshone Creek is fairly heavily traveled by the recreating public. Timber harvest is readily evident in this narrow canyon as is a large power transmission line. Regardless, the scenery is visually pleasing, with a large size creek and rocky tree-covered slopes near at hand. The VQO prescription allows natural appearing but visually modified scenery.

Alternative 1 would have no effect. Alternatives 2, 3 and 4 would easily meet VQO as only three small salvage units are proposed within sight of the road and the undeveloped and developed camp sites along Shoshone Creek.

Cumulative Effects

The scenery and recreation resources consider cumulative effects at the Coeur d'Alene River Ranger District scale. The National Forest provides a wide range of scenic views and recreational opportunities scattered across the district. The National Forest also provides for a wide range of uses. The ongoing and reasonably foreseeable projects and activities identified in Chapter II (Tables II-1 through II-15) fall within that wide range and natural variation. The Small Sales EIS and other ongoing and foreseeable projects are designed to meet Forest Plan visual quality objectives for the overall landscape. Short-term disturbances to recreational usage in any given area may occur, but dispersal to other parts of the forest where activities are not occurring is always available.

Alternative 1: Natural systems are dynamic and changing. Changes are usually subtle and occur over log periods of time. Occasionally changes are catastrophic reaping large-scale transformation of the scenic condition of the landscape. Selection of this alternative does remove the threat of relatively small short-term changes in the visual character of the landscape but does not insure no change.

Action alternatives: Collectively the logging systems applied to the majority of the units in the proposals have negligible over all effect on the scenic character of the Coeur d'Alene basin. The visually acceptable regeneration units to an extent mimic naturally occurring openings in tree cover which totally in character with this ecosystem.

Consistency With Forest Policy and Legal Mandates

Alternative 1 would be consistent with the visual quality objectives. All action alternatives would meet the assigned Visual Quality Objectives, with the following exceptions:

- Under Alternative 2: Unit 4 in the Cougar Creek drainage, Unit 12 in the Fernan Creek drainage, and Units 23 and 24 in the Prichard Creek drainage

- Under Alternative 4: Unit 4 in the Cougar Creek drainage

These units include regeneration harvests; the units could meet the Visual Quality Objectives if modified to use a salvage or light improvement harvest prescription.

ROADLESS AREA

Regulatory Framework

Forest Plan

The Forest Plan directs that roadless areas be managed based on the direction and goals established for the respective management area within which they are located (Forest Plan, Chapter II, page II-4). The Forest Plan allocated lands in the Skitwish Ridge Roadless Area to Management Areas 1 (lands designated for timber production) and 4 (lands designated for timber production within big-game winter range). (Please refer to the Project Files, Roadless).

Interim Road Rule

On January 28, 1998, in an Advance Notice of Proposed Rulemaking (63 FR 4350), the Forest Service announced its intent to revise regulations concerning management of the national forest transportation system. Simultaneously, the Forest Service published a proposed interim rule (63 FR 4351) to temporarily suspend permanent and temporary road construction and reconstruction in certain unroaded areas of National Forest System lands. The purpose of the interim rule was to take a "timeout" for 18 months while the Forest Service developed a revised road management policy and analytical tools to provide a more ecological approach to existing and future road needs. The final interim rule, issued on February 12, 1999 (64 FR 7289) continued the temporary suspension until development of a revised Forest System road system policy.

After considering public input and identifying actions to help find an appropriate balance between safe and efficient access for all forest road users and protection of healthy ecosystems, the Forest Service proposed specific revisions to the road system rules at 36 CFR part 212 and to Forest Service administrative directives governing transportation analysis and management. 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 officer consideration about possible road construction, reconstruction, and decommissioning needs and opportunities.

This analysis tool was not available to us at the time the Small Sales proposal was being developed and analyzed. Consequently, the transportation analysis was conducted based on existing information and guidelines provided in the Forest Plan. The management of each road was determined based on the logging systems plan under each alternative. For additional information, please refer to the "Transportation Planning" discussion under "Issues Not Addressed in Detail in This EIS," in this chapter, and the Project Files (Transportation).

Access management is an ongoing District program. A new District Travel Plan has recently been developed for the Coeur d'Alene River Ranger District, and changes in access will be implemented over a period of several years through both administrative changes to transportation management and through specific documentation in a written decision under NEPA. All alternatiaves were designed to be consistent with the new Travel Plan. For additional information, please refer to the discussions of "Reasonably Foreseeable Activities" in Chapter II, "Transportation Planning" under "Issues Not Addressed in Detail in This EIS" in Appendix A, and in the Project Files (Transportation).

Roadless Area Conservation Rule

On October 13, 1999, President Clinton directed the Forest Service to develop a proposal for managing some 50 million acres of roadless areas in the National Forests. The Roadless Area Conservation Rule was published in the Federal Register on January 5, 2001, and will be effective May 12, 2001. Essentially, the Final Rule prohibits new road construction and reconstruction and prohibits the cutting, sale and removal of timber in inventoried roadless areas on National Forest System lands (with specific exceptions).

Affected Environment

The East Rutherford analysis area is located within a small portion of Skitwish Ridge Inventoried Roadless Area #01135. At the time it was inventoried in the 1979 RARE II process and in 1983 for the Forest Plan, the Skitwish Ridge Roadless Area was 6,330 acres in size (Forest Plan, page IV-6). The Forest Plan allocated all lands within the Skitwish Ridge Roadless Area to management direction that allows road construction and other development. Specifically, the area includes Forest Plan Management Areas 1 (lands designated for timber production) and 4 (lands designated for timber production within big-game winter range.

Under the Horizon Forest Resource Area project (USDA Forest Service, 1991), timber harvest and road construction occurred in the northwest third of the roadless area. In addition, a fuelbreak was created on the ridge between Rutherford Gulch and Marie Creek. These activities resulted in development (road construction and timber harvest) of about 1890 acres in the roadless area. Today,

about 4,440 acres of the Skitwish Area remain in an unroaded condition. The enclosed "East Rutherford and Cedar Creek Analysis Areas" displays the portion of the Skitwish Ridge Roadless Area that remains unroaded. A map of the Roadless Area prior to the activities of the Horizon project is provided in the Project Files.

The roadless area is approximately a 25-minute drive from the Coeur d'Alene area, most of it on a paved road system (USDA Forest Service, 1991, Horizon Forest Resource Area Final EIS, pages III-2 and III-3). Human influence is predominant in the Skitwish and Burton drainages of the roadless area as a result of recent timber harvest and road construction. While the area is small, it is possible for visitors to gain a sense of wildness, especially in the stream bottoms, where the forest and ridges provide a muffling effect on the sights and sounds of development.

In the portion of the roadless area identified as the East Rutherford analysis area, there have been approximately 65 acres of past timber harvest (12% of the analysis area). Under the Douglas-fir Beetle EIS, another 98 acres (18% of the analysis area) is scheduled for harvest; this harvest is outside of the roadless area boundary (but within one mile). The unroaded area in the Rutherford Gulch basin is separated from the remainder of the Marie Creek basin by a major ridgeline. It is located in the headwaters of Rutherford Gulch, less than two air miles from the Interstate 90 corridor, and adjacent to roaded private property on the south and west sides. Approximately 72% of the East Rutherford analysis area is showing signs of beetle mortality. For more information on resource conditions in the area, please refer to the other resource discussions in Chapter III (for example, Forest Vegetation, Watershed, Fisheries, and Wildlife).

Environmental Consequences

Alternatives 1 and 4

Neither Alternative 1 nor 4 propose activities in the Skitwish Ridge Roadless Area. There would be no effect on the status of the roadless area under these two alternatives, other than that from ongoing activities.

Alternatives 2 and 3

The three units proposed in the East Rutherford analysis area under Alternatives 2 and 3 are located primarily within the boundary of Skitwish Ridge Roadless Area. All of Units 1 and 3 are within the boundary, with approximately two-thirds of Unit 2 within the boundary. Timber harvest and associated fuels treatment would occur in approximately 1.4 percent of the Skitwish Ridge Roadless Area boundary as inventoried in 1983. In addition, to these activities, approximately 225 acres of ecosystem burning would occur to further reduce fuels, improve winter forage for big game, and to re-introduce fire as an integral part of the ecosystem. Please refer to the enclosed map titled "East Rutherford and Cedar Creek Analysis Areas," which displays the Skitwish Ridge Roadless Area in comparison to the proposed harvest units.

No new road construction or temporary road construction would occurVegetative conditions that warrant timber harvest and fuels treatment in the East Rutherford Gulch area are described in the Forest Vegetation section of Chapter III.

Table III-66. East Rutherford analysis area units located at least partially within Skitwish Ridge Roadless Area #01135 (Alternatives 2 and 3).

Unit	Est. acres in inventoried roadless	Prescription	Yarding System	Fuels Treatment
1	29	Salvage	Helicopter	Lop and scatter
2	*20	Salvage	Helicopter	Jackpot
3	3	Salvage	Cable	Lop and scatter
Total	52	--	--	--

** There are approximately 30 total acres in the unit; about two-thirds of the unit is located within the roadless area.*

Wilderness attributes: The Skitwish Roadless Area was evaluated for wilderness in the Forest Plan (Appendix C, Forest Plan FEIS); the area was not recommended for wilderness, but was allocated to multiple-use management. The area where Unit 1 is proposed is identified as Management Area 1 (lands designated for timber production); Units 2 and 3 would be located in an area identified as Management Area 4 (lands designated for timber production within big-game winter range). None of the units extend further than one-quarter mile into the roadless area. The salvage harvest would result in a short-term change to the vegetative characteristics, including stand densities and species composition, of the 52 acres along the edge of the roadless area. Over time, these vegetative changes would not be noticeable to the average viewer.

Natural integrity and Apparent naturalness: The areas to be treated are on the perimeter of the inventoried roadless area and adjacent to private lands. None of the units extend further than one-quarter mile into the roadless area. Based on the harvest unit prescriptions (all would be salvage harvest, with helicopter yarding on all but 3 acres), size and location of units, the natural appearance of the area would be generally retained. There would be a short-term change to the density of vegetation within the proposed harvest units as a result of the salvage harvest. The natural integrity of the area would be affected in the short term by the sights and sounds of the timber harvest activities. Evidence of tree cutting would be longer lasting, but effects would not be considered irreversible.

Opportunities for solitude and remote recreation: Based on the harvest unit prescriptions, size and location, there should be no long-term effects to the opportunities for solitude and remote recreation. There will be short-term, direct effects during sale activities in and adjacent to the roadless area, associated with the sight and sounds of timber harvest and fuels treatment; these would be overshadowed by the ongoing traffic and noise on Interstate 90. People visiting the area may be limited in their access during project implementation. Following completion of the activities, opportunities for solitude and remote recreation within the existing roadless area would return to the current levels.

Special features, places and values: There are no unique characteristics (such as proximity to historical or cultural resources, parklands, wetland, etc.) within or adjacent to the areas in which timber harvest would occur. There are no foreseeable adverse effects to any special feature, places or values.

Manageability and boundaries: Currently, the remaining unroaded portion of the roadless area does not meet the 5000-acre size criterion for wilderness designation. However, the questions of whether the area is suitable for wilderness is an issue to be addressed during revision of the IPNF Forest Plan. The proposed activities will not change the size or boundaries of the current unroaded portions of the Skitwish Ridge Roadless Area. Based on the location of the salvage units (at the perimeter of the

roadless area), the established uses in this area, and the changes that have already occurred to the forested character as a result of past management activities, beetle infestation and storm-related damage, the salvage activities would not significantly affect the characteristics of this inventoried roadless area.

Effects of the salvage on the quality of the human environment are not highly uncertain and do not involve unique or unknown risks. Implementation of the proposed activities would not establish a precedent for future actions with significant effects, and does not represent a decision in principle about any future considerations.

Consistency With Forest Policy and Legal Mandates

Forest Plan

The Forest Plan directs that roadless areas be managed based on the direction and goals established for the respective management area within which they are located (Forest Plan, Chapter II, page II-4). Under Alternatives 2 and 3, three units are proposed within the Skitwish Roadless Area. The area where Unit 1 is proposed is identified as Management Area 1 (lands designated for timber production); Units 2 and 3 would be located in an area identified as Management Area 4 (lands designated for timber production within big-game winter range). (Please refer to the Project Files, Roadless, Document **). Activities proposed in these units (timber harvest and fuels reduction) are consistent with the standards, goals and objectives of the Forest Plan.

Interim Road Rule

On January 28, 1998, in an Advance Notice of Proposed Rulemaking (63 FR 4350), the Forest Service announced its intent to revise regulations concerning management of the national forest transportation system. Simultaneously, the Forest Service published a proposed interim rule (63 FR 4351) to temporarily suspend permanent and temporary road construction and reconstruction in certain unroaded areas of National Forest System lands. The purpose of the interim rule was to take a “timeout” for 18 months while the Forest Service developed a revised road management policy and analytical tools to provide a more ecological approach to existing and future road needs. The final interim rule, issued on February 12, 1999 (64 FR 7289) continued the temporary suspension until development of a revised Forest System road system policy.

All alternatives within the proposed project are in compliance with the interim rule. There is no new road construction or road reconstruction scheduled within the 6330-acre inventoried Skitwish Roadless Area.

Roadless Area Conservation Rule

On October 13, 1999, President Clinton directed the Forest Service to develop a proposal for managing some 50 million acres of roadless areas in the National Forests. The Roadless Area Conservation Rule was published in the Federal Register on January 5, 2001, and will be effective May 12, 2001. Essentially, the Final Rule prohibits new road construction and reconstruction and prohibits the cutting, sale and removal of timber in inventoried roadless areas on National Forest System lands (with specific exceptions).

Alternatives 1 and 4 would be consistent with this rule, because neither proposes any activities within the roadless area. Alternatives 2 and 3 both propose timber harvest within the roadless area, so neither would appear to be consistent with this rule. As stated above, there are specific exceptions to the Roadless Area Conservation Rule; if either Alternative 2 or 3 were selected for implementation, there would need to be additional analysis to determine whether the proposed harvest activities meet the criteria to be exempted from the rule.

COMPLIANCE WITH THE ENVIRONMENTAL JUSTICE ACT

In February 1994, President Clinton signed an Executive Order on environmental justice, requiring federal agencies to conduct activities related to human health and the environment in a manner that does not discriminate or have the effect of discriminating against low-income and minority populations. Although low-income and minority populations live in the vicinity, activities under the Iron Honey 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.

ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

Fuels and Fire Behavior

Under the No Action alternative, the prolonged buildup of fuel may lead to fires more catastrophic and destructive to the site than typically occurred in the native forest. The combination of more fine fuels such as grasses and shrubs regenerating in openings, new understory trees serving as ladder fuels, and continuing accumulation of heavy fuels from down logs and snags all contribute to changes in fuels and towards more severe fire behavior, which in turn threaten future fire control and place neighboring forest ecosystems at risk. The fuel conditions that enable a fast moving wildfire of higher than normal intensity could persist for several decades. One negative impact from the No Action Alternative is the increasing levels of snags created and the danger to firefighters. Further discussion of these effects and risk are outlined in the Chapter III effects discussion.

SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Fuels and Fire Behavior

Timber harvest under the Action Alternatives can significantly affect both short and long-term fuel loading. Timber harvest moves unavailable aerial fuels (tops, stems, limbs, needles) into available surface fuels. Thus the risk of a crown fire may be reduced while the risk of surface fires can be increased by moving fuel to the ground. An increased fire hazard and risk of ignition from ground activities such as recreation camping, vehicles, recreational hiking, and machinery used in timber harvest may result. Proposed treatments (such as lopping and scattering, yarding tops, piling and burning, and jackpot or underburning in the created fuels) can reduce some ignition risk and improve our ability to control fire.

Air Quality

The potential for air quality degradation and reduced visibility increases with Alternative 1, No Action. Existing and increased tree mortality increases the intensity of wildfire. A wildfire under normal summer conditions could prove difficult to control. Consumption of increased fuel loads and understory biomass would increase the amount of smoke emissions. These emissions may remain in the local and surrounding airsheds for a period of a few days to several weeks depending on the fire's size and intensity. Under the action alternatives, the Forest Service would voluntarily cease burning activities to avoid violations of State standards. Burning of fuels under prescription would occur primarily in early spring when demand for airspace has been historically low. Activities such as agricultural field burning, other forest residue burning on private lands, residential wood stove use, motor vehicle exhaust, and dust input from the Palouse and Columbia basin are competing uses of the monitored airspace.

IRREVERSIBLE AND IRRETRIEVABLE EFFECTS

Fuels and Fire Behavior

Without fuels treatment on sites and restoration of seral species, the chances increase that in appropriate weather, when wildland fires do occur, their intensities and severity would most likely be higher than historic fires. These large and hot fires could result in soil damage through loss of stored nutrients, loss of organics, and reduction of infiltration; with an accompanying loss in potential soil productivity.

United States
Department of
Agriculture

Forest Service

Northern Region

April 2001

Coeur d'Alene River Ranger District Small Sales Project

Final Environmental Impact Statement [Revised]

Appendices

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LIST OF REFERENCES

The list of references is organized by the following categories:

I. Fisheries
II. Fire, Fuels and Air Quality
III. Finances
IV. Forest Vegetation
V. Noxious Weeds
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VII. TES Plants
VIII. Watershed
IX. Wildlife

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ACRONYMS/GLOSSARY

Acronyms

ATV	All-terrain vehicle
BA	Basal Area
BACT	Best Available Control Technology
BEHAVE	Fire Behavior Model
BF	Board foot*
BMP	Best Management Practices*
CCF	Cunit (hundred cubic feet)*
CDA	Coeur d'Alene
CFR	Code of Federal Regulations*
CNF	Colville National Forest
cfsm	Cubic feet per second per square mile (referring to water flow)
COR	Contractor's Officer Representative
dbh	Diameter at breast height
DEIS	Draft Environmental Impact Statement
DEQ	Department of Environmental Quality
DF	Douglas-fir
EAWS	Environmental Assessment at the Watershed Scale
ECA	Equivalent Clearcut Acres
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAR	Functioning at risk (referring to watersheds)
FEIS	Final Environmental Impact Statement
FFE	Fire and Fuels Extension
FOFEM	First Order Fire Effects Model
FPA	Forest Practices Act
FSH	Forest Service Handbook
FSM	Forest Service Manual
FVS	Forest Vegetation Simulator
GA	Geographic Assessment
GAO	Government Accounting Office
ICBEMP	Interior Columbia Basin Ecosystem Management Project
IDL	Idaho Department of Lands
IDT	Interdisciplinary Team*
IFPA	Idaho Forest Practices Act
IFTNP	Intermountain Forest Tree Nutrition Cooperative
INFS	Inland Native Fish Strategy
IPNF	Idaho Panhandle National Forests
KV	Knutson-Vandenburg Act of 1924
LP	Lodgepole pine
MA	Management Area*
MBF	Thousand Board Foot
MMBF	Million Board Foot
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act*
NFMA	National Forest Management Act
NFS	National Forest System
NPFC	Not properly functioning condition (referring to watersheds)
PFC	Properly functioning condition (referring to watersheds)
PM	Particulate Matter
PP	Ponderosa pine
PWC	Public works contract
Q2	level of instantaneous discharge expected to occur on average of every 2 years (referring to watershed conditions)
Q50	level of instantaneous discharge expected to occur on average of every 50 years (referring to watershed conditions)
R1	Region 1--the Northern Region of the Forest Service
R6	Region 6--the Pacific Northwest Region of the Forest Service
RD	Ranger Distrcit
RHCA	Riparian Habitat Conservation Area*
RMO	Riparian Management Objective
ROD	Record of Decision
RPA	(Forest and Rangeland) Renewable Resources Planning Act
SAF	Subalpine fir
SAM	Sale area map
SCA	Stream Channel Alteration (Act)
SMU	Streamside Management Unit
SMZ	Streamside management Zone*
SPCC	Spill Prevention Control and Countermeasure
SPS	Special project specifications
SWCP	Soil and Water Conservation Practices
TES	Threatened, Endangered and Sensitive
TMDL	Total Maximum Daily Load
TML	Timber Marginal Lands
TSA	Timber Sale Administrator
TSC	Timber Sale Contract
TSI	Timber Stand Inventory
TSP	Total Suspended Particulate
WBP	White-bark pine
WDNR	Washington State Department of Natural Resources
WH	Western hemlock
WL	Western larch
WP	White pine
WQLS	Water Quality Limited Stream
WRC	Western redcedar
WSDFW	Washington State Department of Fish and Wildlife
WSDOE	Washington State Department of Ecology

** These terms are defined in the Glossary below.*

Glossary

A

Activity Fuels. The residue left on the ground after human-caused disturbances.

Aesthetics. Generally, the study, science, or philosophy dealing with beauty and with judgments concerning beauty. In scenery management, it describes landscapes that give visual and sensory pleasure.

Affected Environment. The natural, physical, and human-related environment that exists at the time of the analysis.

Age Class (Scenery/Visual definition). An age grouping of trees according to an interval of years, usually 20 years. A single age class would have trees that are within 20 years of the same age, such as 1 - 20 years or 21 - 40 years.

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.

Allocated old growth. Stands of timber identified for the long-term management as old-growth forest.

Alluvial. Materials transported and deposited by water.

Area Transportation Plan. A plan that identifies the transportation facilities needed to manage the lands and resources for a given area.

Armoring. Protective coverings or structures used to displace the erosive force of water. Rip-rapping is a type of armoring.

Aspect. The direction a slope faces. For example, a hillside facing east has an eastern aspect.

B

Background (Visual Distance Zone). That part of a scene, landscape, etc., which is furthest from the viewer; The distant part of a landscape. The IPNF defines background as the landscape area located from three miles to infinity from the observer. The Newport Ranger District defines background as the landscape area located from 4 miles to infinity from the viewer.

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

Baseline Data. Data representative of a particular base period or concurrent control sample. Normally representative of the undisturbed, undeveloped state.

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.

Biomass. Total weight or quantity of organic material on a given area over a defined period.

Biophysical Settings. The Newport Ranger District defines biophysical settings as areas with similar vegetation characteristics, fire frequencies, moisture regimes and geological and topographical characteristics. The Newport Analysis Area has five biophysical settings: BS #3 - Douglas-fir/grand fir with tall shrubs; BS #5 - Douglas-fir/grand fir with huckleberry; BS #7 - subalpine fir with forbs and shrubs; BS #11 - western redcedar/western hemlock with forbs and shrubs; and BS #12 - western redcedar/western hemlock on moist bottomlands.

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. In terms of scenery or visuals, it refers to the part of any stand of trees represented by the tree crowns, usually the uppermost layer of foliage, but it can be used to describe lower layers in a multi-storied forest.

Canopy Closure. The amount of ground surface shaded by tree canopies, as seen from above. Used to describe how open or dense a stand of trees is, often expressed in percent.

Capable Habitat. Wildlife habitat that has the fixed attributes that enable it to produce the habitat requirements for a given species currently or in the future. These fixed attributes are usually soils (or parent material, or landtype), slope, aspect, elevation, and habitat type. 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. See also Suitable Habitat.

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

Characteristic. When used in terms of scenery or visuals, this refers to the qualities that constitute a character, that characterize a landscape; a distinguishing trait, feature, or quality; uniqueness; or attribute.

Clearcut Harvest. A stand in which essentially all of the trees have been removed in one operation. Depending on management objectives, a clearcut may or may not have reserve trees left to attain goals other than regeneration.

Climax Vegetation. The culminating stage in plant succession for a given habitat, that develops and perpetuates itself in the absence of disturbance, natural or otherwise (in temperate ecosystems this rarely occupies large portions of the natural landscape because of the frequency of natural disturbances).

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

Color. The property of reflecting light of a particular wavelength that enables the eye to differentiate otherwise indistinguishable objects. A hue (red, green, blue, yellow, and so on), as contrasted with a value (black, white, or gray).

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

Contract Provisions. Controls constraints, and/or general direction included in Contracts offered by the Forest Service.

Contrast. A term used in regard to scenery or visuals, referring to the diversity or distinction of adjacent parts, or the effect of striking differences in form, line, color, or texture of a landscape.

Contour map feature. A term used in regard to scenery or visuals, referring to a line drawn on a map that connects points of the same elevation.

Corridor. A term used in regard to scenery or visuals, referring to a clearing made by a skyline logging system.

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, 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.

Created Opening. A term used in regard to scenery or visuals, referring to an opening in the forest cover created by the application of even-aged silvicultural practices.

Cross Drain/Ditch. A man made ditch or channel constructed to intercept surface water runoff and divert it before the runoff concentrates to erosive volumes and velocities.

Crowning. Forming a convex road surface which allows runoff to drain from the running surface to both sides of the road prism.

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

Cultural Landscape. A term used in regard to scenery or visuals, referring to human-altered landscapes, especially those slowly evolving landscapes with scenic vegetation patterns or scenic structures. Addition of these elements creates a visually pleasing complement to the natural character of a landscape.

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.

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

D

Decommissioning. Refers to road obliteration. Partial obliteration includes removal and recontouring of all stream crossings and, as needed, recontouring of unstable fill slopes, cutslope stabilization, ripping the road tread, installation of no-maintenance cross ditches, and revegetation. Full obliteration includes removal of all stream crossings and full recontouring of the entire road prism, introduction of woody debris, and revegetation as needed.

Degraded Watershed. A basin which has suffered environmental damage, resulting in accelerated soil or vegetative loss or chemical contamination to the quantifiable detriment of other resources.

Designated Streams. A stream or portion of a stream identified as warranting special consideration in management decisions and project activities. See also Stream or Streamcourse.

Desired Future Condition. The combination of desirable attributes to be attained in the future through management of the national forest. For scenery management, desired future condition is comprised of interrelated components, including desired travelways, desired use areas, desired landscape character and desired scenic condition.

Desired Landscape Character. A term used in regard to scenery or visuals, referring to the appearance of the landscape to be retained or created over time, recognizing that a landscape is a dynamic and constantly changing community of plants and animals. Combination of landscape design attributes and opportunities, as well as biological opportunities and constraints.

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. Includes such activities as hunting, hiking, viewing scenery and cross-country skiing.

Distance Zones. Landscape areas denoted by specified distances from the observer. Used as a frame of reference in which to discuss landscape attributes or the scenic effect of human activities in a landscape (Immediate Foreground, Foreground, Middleground, and Background).

Distinctive. Refers to extraordinary and special landscapes. These landscapes are attractive, and they stand out from common landscapes.

Disturbance. An event, either natural or human induced, that causes a change in the existing condition of an ecological system.

Dominance Elements. In scenery management, the dominance elements are form, line, color, and texture. They are the attributes that make up the landscape character.

Dominant Human Alterations. In scenery management, dominant human alterations override the natural character of the landscape and are very noticeable.

Down or Downed Wood. A tree or part of a tree that is dead or dying and is laying on the ground.

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 associated environment.

Ecosystem/Wildlife Burning. This is the application of prescribed fire to fire-dependent ecosystems in order to meet multi-resource objectives (for example, to improve forage habitat for wildlife).

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. The line where an object or area begins or ends. Edge serves to define borders, limits or boundaries. In this analysis, edge often refers to 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 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 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.

Evident. That which is noticeable, apparent, conspicuous, or obvious.

Existing Scenic Integrity. Current state of the landscape, considering previous human alterations; existing visual condition.

Expected Image. A term used in regard to scenery or visuals, referring to a mental picture of what a person expects to see in a national forest.

F

Feature. A visually distinct or outstanding part, quality, or characteristic of a landscape.

Floodplain. The lowland and relatively flat areas during adjoining inland waters that are covered by its waters during flooding.

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 shrubs (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. The IPNF defines foreground as the landscape area located from one-quarter to one-half mile from the observer. The Newport Ranger District defines foreground as the landscape area located from the observer to one-half mile away.

Forest Cover Type. A category of forest usually defined by its dominant vegetation, based on percentage cover of trees (see Timber Type).

Form. Structure, mass, or shape of a landscape or of an object. Landscape form is often defined by edges or outlines of landforms, rockforms, vegetation patterns, or waterforms, or the enclosed spaces created by these attributes.

Frame of Reference. An area or framework against which various parts can be judged or measured.

Fry. Recently hatched fish.

Fuelbreak. A strategically-located strip or block of land where the fuel is modified to reduce fire intensity potential. Fuelbreaks are designed to interrupt the continuity of heavy, hazardous fuel so fires burning to them can be readily controlled. They are pre-attack installations that provide safer, easier, and faster control efforts for fighting fire. Generally, this treatment provides holding area and accessibility for fire-suppression forces and reduces potential fire damage to adjacent resources.

Fuels. Combustible materials present in the forest which contribute to the intensity of a fire.

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

G

Group Selection. A method of regenerating uneven-aged stands in which trees are removed and new age classes are established, in small groups.

H

Habitat Type. (Vegetation). 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.

Hazardous Substance. Materials which by their nature are toxic or dangerous to handle or dispose of, such as radioactive materials, petroleum products, pesticides, chemicals and biological wastes.

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.

High Integrity Area. Those areas within the drainage which are functioning the best in terms of providing security, late successional forests, current carnivore sightings, and key habitats. See also Secondary Integrity Area.

High Scenic Integrity Level. A scenic integrity level meaning human activities are not visually evident. In high scenic integrity areas, activities may only repeat attributes of form, line, color, and texture found in the existing landscape character.

Historical Variation. A term used in regard to scenery or visuals, referring to the range of the spatial, structural, compositional, and temporal characteristics of ecosystem elements during a period specified to represent "natural" conditions.

Human Impact or Influence. A term used in regard to scenery or visuals, referring to a disturbance or change in ecosystem composition, structure, or function caused by humans.

I

Immediate Foreground (Visual Distance Zone). That part of the foreground which is extremely critical for visual detail. The IPNF defines immediate foreground as the landscape area located usually within 400 feet of the observer. The Newport Ranger District defines immediate foreground as the landscape area within the first few hundred feet of the observer, usually within 300 feet of the observer. Distance zones are normally used in project-level planning rather than broad-scale planning.

Improvement Cutting. The removal of less desirable trees of any species in a stand of poles or larger trees, primarily to improve composition and quality.

In-Service. Pertains to activities, actions or personnel within the USDA Forest Service.

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.

Inland Native Fish Strategy (INFS). 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.

Intactness. A term used in regard to scenery or visuals, referring to something untouched or unaltered, especially by anything that harms or diminishes its character.

Interdisciplinary Approach. Use 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.

Interdisciplinary Team (IDT). A group of two or more individuals, with different training or skills, assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. The members of the team proceed to solution with frequent interaction, so that each discipline may provide insights to any stage of the problem and disciplines may combine to provide new solutions. This is different form a multidisciplinary team, where each specialist is assigned a portion of the problem and their partial solutions are linked together at the end to provide the final solution. The forming of the team, the data collection and analysis, team discussions, interactive evaluation, and joint resolution of the problem in the Interdisciplinary 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.

J

Jackpot Burning. A modified method of broadcast burning used primarily to burn concentrations of fuels where the fuelbed is not continuous.

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.

Landform. One of the attributes or features that make up the Earth's surface, such as a plain, mountain, or valley.

Landscape. An area composed of interacting ecosystems that are repeated because of geology, land form, soils, climate, biota, and human influences throughout the area. Landscapes are generally of a size, shape, and pattern which is determined by interacting ecosystems.

Landscape Character. Particular attributes, qualities, and traits of a landscape that make it identifiable or unique.

Landscape Character Goal. A management prescription designed to maintain or modify the existing landscape character to a desired future state. (See Desired Landscape Character.)

Landscape Setting. The context and environment in which a landscape is set; a landscape backdrop.

Landscape Visibility. Accessibility of the landscape to viewers, referring to one's ability to see and perceive landscapes.

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.

Lethal fires. Fires that kill 90% or more of the dominant tree canopy. These are often called "stand-replacing" fires. They are commonly crown fires, burning with high severity. In general, lethal fires have long return intervals (140 to 250 years or more apart), but affect large areas when they occur. Local examples of these types of fires would be the Sundance and Trapper Peak Fires of 1967 that burned over 80,000 acres in a relatively short time period during late summer drought conditions. Refer to mixed severity fires and nonlethal fires.

Line. An intersection of two planes; a point that has been extended; a silhouette of form. In terms of landscapes, features such as ridges, skylines, structures, changes in vegetation, or individual trees and branches may be perceived as line.

Line Officer. Management personnel within the Forest Service Organization consisting of: Secretary of Agriculture, Chief of Forest Service, Regional Foresters, Forest Supervisors, and District Rangers. Refers to the line of authority and responsibility.

Log Landing. An area where logs are skidded or yarded prior to loading and transportation to a mill.

Lop and Scatter. Branches are cut from felled trees to a predetermined height then scattered to reduce fuel concentrations. The objective is to re-arrange the fuel so as to eliminate concentrations and break up vertical and horizontal continuity. Generally, this treatment hastens natural decomposition and improves esthetic qualities of the treated area.

Low Scenic Integrity. A scenic integrity level meaning human activities must remain visually subordinate to the attributes of the existing landscape character. Activities may repeat form, line, color, or texture common to these landscape characters, but changes in quality of size, number, intensity, direction, pattern, and so on, must remain visually subordinate to these landscape characters.

M

Maintenance. See Road Maintenance.

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, trends toward a Desired Future Condition over time.

Management Activity. An activity humans impose on a landscape for the purpose of managing natural resources.

Mature Timber. Trees or an even-aged stand that is capable of reproduction, has attained most of its potential height growth, or has reached merchantability standards. In the context of wildlife, mature forests are those with the characteristics needed to provide habitat for species such as pine marten and pileated woodpecker (generally when the stand is around age 100).

Metapopulation. Clustered, non-contiguous populations that interact at times through geneflow and dispersal.

Middleground. (Visual Distance Zone). The IPNF defines middleground as that part of a scene or landscape which hits between the foreground and background zones. The Newport Ranger District defines middleground as the zone between the foreground and the background in a landscape, usually located from one-half mile to four miles from the observer.

Mitigate. To offset or lessen real or potential impacts of effects through the application of additional controls or actions. Counter measures are employed to reduce or eliminate undesirable or unwanted results.

Mixed Conifer. See Timber Types.

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

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.

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 Disturbance. Periodic impact or natural events such as fire, severe drought, insect or disease attack or wind.

Natural Landscape Character. Landscape character that originated from natural disturbances such as wildfires, glaciation, succession of plants from pioneer to climax species, or indirect activities of humans, such as inadvertent plant succession through fire prevention.

Natural-Appearing Landscape Character. Landscape character that has resulted from human activities, yet appear natural, such as historic conversion of native forests into farmlands, pastures, and hedgerows that have reverted back to forests through reforestation activities or natural regeneration.

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 of 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.

Nonlethal fires. Fires that kill 10% or less of the dominant tree canopy. A much larger percentage of small understory trees, shrubs and forbs may be burned back to the ground line. These are commonly low-severity surface and understory fires, often with short-return intervals (a few decades). Refer to mixed severity and lethal fires.

Nonpoint Source (NPS) Pollution. Diffuse sources of water pollution that originate from many indefinable sources and normally include agricultural and urban runoff, run-off from construction activities, etc. In practical terms, nonpoint sources do not discharge at a specific, single location (such as a single pipe). Nonpoint source pollutants are generally carried over or through the soil and ground cover via stormflow processes. Unlike point sources of pollution (such as industrial and municipal effluent discharge pipes), nonpoint sources are diffuse and can come from any land area. It must be kept in mind that this definition is necessarily general: legal and regulatory decisions have sometimes resulted in certain sources being assigned to either the point or nonpoint source categories because of consideration other than their manner of discharge (for example, irrigation return flows are designated as "nonpoint sources" by law, even though the discharge is through a discrete conveyance).

Normal Operating Season. A portions of a year when normal timber harvesting operations are expected to take place uninterrupted by adverse weather conditions.

Noxious Weeds. Rapidly spreading plants which can cause a variety of major ecological impacts to both agriculture and wild lands.

O

Obliteration. See Road Obliteration.

Observer Position. Specific geographic position in the landscape where the viewer is located. Also known as viewer platform.

Old-growth Forest. Old-growth forests are considered ecosystems that are distinguished by old trees and related structural attributes. They encompass the later stages of stand development that typically differ from earlier stages in characteristics such as tree age, tree size, number of large trees per acre and basal area. Attributes such as decadence, dead trees, the number of canopy layers and canopy gaps are also important, but are more difficult to describe because of high variability. (See also Recruitment Old Growth.)

Older Capable Habitat. Stands that are nearing the age at which they would provide "suitable" wildlife habitat. Canopy closures in older capable habitat may not currently meet the needs of flammulated owls.

Open Park-Like Stand. A single stratum of large trees is present. Large trees are common. Young trees are absent or few in the understory. Park-like conditions may exist. (Applies to Newport Ranger District Only)

Open Road Density. A measure of the roads accessible to motorized use which affects wildlife, expressed as miles of road per square mile of area.

Outputs. The goods and services produced from and offered on National Forest lands.

Outsloping. Shaping a road to cause drainage to flow toward the outside shoulder (generally the fill slope), as opposed to insloping which encourages drainage to flow to the inside shoulder (generally the cut slope). Emphasis is on avoiding concentrated water flow.

Overstory. The portion of trees in a forest which forms the uppermost layer of foliage.

P

Park-like Structure. Stands with large scattered trees and open growing conditions, usually maintained by ground fires.

Partial Retention. A visual quality objective which, in general, means man's activities may be evident but must remain subordinate to the characteristic landscape.

Pattern. An arrangement of parts, elements, or details that suggests a design or somewhat orderly distribution

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's 25 percent fund payments.

Perennial Streams. Streams that flow continuously throughout the year.

Permittee. Individual or entity that has received a grazing or Special Use Permit from the Forest Service.

Pesticide. A general term applied to a variety of chemical materials including insecticides, herbicides, fungicides and rodenticides.

Pile Burning. Employing top-attached yarding methods, woody debris is removed from a site to a roadside landing or hand-piled on site, where the woody debris can be burned safely and inexpensively. Pile burning is conducted in late fall.

Point Source. Originating from a discrete identifiable source or conveyance.

Population. Spatially-discreet groups of individuals that can freely interbreed.

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. Any fire ignited by management actions to meet specific objectives. Prescribed fire can rejuvenate forage for livestock and wildlife or prepare sites for natural regeneration of trees.

Prescription. Management practices selected and scheduled for application on a designated area to attain specific land and resource management 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.

Purchaser. The entity which is awarded a USDA Forest Service contract after bidding, usually with competition. As used in timber, the entity which has purchased timber as identified in a timber sale contract.

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.

Range of Variability. The spectrum of conditions possible in ecosystem composition, structure, and function considering both temporal and spatial factors.

Reconstruction. See Road Reconstruction.

Recruitment Old Growth. Stands that do not yet have the characteristics of old growth (as defined under "Old Growth Forests," above), but are being managed to develop those characteristics over time.

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.

Regeneration. The renewal of a forest, whether by natural or artificial means. This term may also refer to the young trees themselves.

Regeneration Harvest (or Harvesting and Reforesting). For the purposes and intent of this EIS only, the definition of regeneration harvest areas will be as follows: These areas include forest stands in which the Douglas-fir beetle has led to or contributed to high mortality in the stand. In addition to beetles, other disturbance agents which have caused high mortality in the forest stand may include wind, snow, ice, and/or root disease. Generally these are stands of at least five acres in size where greater than 50% of the stand of trees are dead and dying or are expected to die during the beetle outbreak (for the Newport Ranger District, these are stands where less than 40 square feet of live basal area remain). Harvesting involves removing most of the dead trees and some green trees for the purpose of providing growing space for planted seedlings to become established. Both live and dead trees would be retained in an irregular spacing to provide wildlife habitat, maintain visual quality, provide some shelter for seedling establishment, provide a seed source

for natural regeneration, and provide woody debris for long-term site productivity. Generally there would be less than 30% of the trees remaining on these areas and the general view would be openings with scattered leave trees and clumps or patches of leave trees. Most of these retained trees would remain on site for a considerable time after seedlings have established. The size of the open areas created by the beetles and other disturbance agents described above would range from approximately 5 acres to 400 acres, following the pattern of openings created by the beetles. After harvest, logging slash and other debris would be treated, where necessary, to reduce the fire hazard and, on the IPNF, to prepare these sites for reforestation. Prescribed fire or mechanical methods would be used for these treatments. Most of the areas would be planted with western larch, ponderosa pine, and or white pine. The silvicultural prescriptions may include regeneration systems, such as shelterwood with reserves, seed trees with reserves, and group selection.

Residual Stand. Trees remaining standing after some disturbance event, such as fire or logging.

Resilience. The ability of an ecosystem to maintain diversity, integrity, and ecological processes following a disturbance.

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.

Revegetation. The replacement of vegetative cover which has been harvested or lost due to natural occurrences. Accomplished either through planting or nursery stock or seeding, or through natural processes.

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.

Riparian Habitat Conservation Areas (RHCAs). Portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems.

Rip Rapping. The use of a large rock, boulders, concrete chunks or similar non-erosive, heavy objects as an armoring device.

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. Maintenance includes needed brushing, blading, and shaping of the road tread, cleaning ditch lines and culvert inlets, drivable waterbars or rolling dips and revegetation.

Road Maintenance Plan. A document schedule and program for upkeep of roads to provide a level of service for the user and protection of resources. There are five levels of maintenance; Level I being the least intense and Level V being the most intensive.

Road Obliteration. There are varying degrees of road obliteration. **Level 1 Obliteration** includes removal and recontour of all stream crossings and, as needed, recontour of unstable fill slopes, cutslope stabilization, ripping the road tread, installation of no-maintenance cross ditches, and revegetation. Obliteration also includes some kind of road closure method such as with a guard rail barrier, gate, an earthen berm, or a short section of full recontour, called "front end" obliteration. Front End Obliteration includes recontouring of the first site distance, or about 250 feet of the road, to stop motorized traffic from entering onto the road. Culverts that pose a high risk of failure because of lack of maintenance would be removed and recontoured concurrently with the closure of the road. **Level 2 Obliteration** includes removal of all stream crossings and full recontour of the entire road prism, introduction of woody debris, and revegetation as needed.

Road Reconstruction. There are varying degrees of road reconstruction. **Light Road Reconstruction** includes, as needed, installation of rolling dips, installation of relief culverts, rolling the road grade for increased drainage, armoring of culvert catch basins and outlets, and adding gravel surfacing. **Heavy Road**

Reconstruction includes, as needed, changing the road design, replacing existing stream crossings, cut and fill slope stabilization using gabions or other means, subgrade reinforcements, road prism realignment, and removal of encroaching road fills.

Road Stabilization. Stabilization includes the use of vegetation and geotextiles to control or reduce surface erosion.

Rocking. The application of aggregate to a roadbed to provide strength and a more stable erosion resistant surface.

S

Sale Area Map. A map of suitable scale and detail to be legible which part of a timber sale contract. The map identifies sale area boundaries and contract requirements specific to the sale.

Salvage Harvest. The removal of dead trees or trees damaged or dying because of injurious agents other than competition, for the purpose of recovering economic value that would otherwise be lost.

Sanitation Harvest. Removal of dead, damaged or susceptible trees to prevent the spread of pests or pathogens.

Scale. The degree of resolution at which ecological processes, structures, and changes across space and time are observed and measured.

Scenery. General appearance of a place, general appearance of a landscape, or features of a landscape.

Scenery Management. The art and science of arranging, planning, and designing landscape attributes relative to the appearance of places and expanses in outdoor settings.

Scenic. Of or relating to landscape scenery; pertaining to natural or natural appearing scenery; constituting or affording pleasant views of natural landscape attributes or positive cultural elements.

Scenic Attractiveness. The scenic importance of a landscape based on human perceptions of the intrinsic beauty of land form, rockform, waterform, and vegetation pattern. Reflects varying visual perception attributes of variety, unity, vividness, intactness, coherence, mystery, uniqueness, harmony, balance, and pattern. It is classified as a), distinctive; b) typical or common; or c) undistinguished.

Scenic Class. A system of classification describing the importance or value of a particular landscape or portions of that landscape.

Scenic Integrity. State of naturalness or, conversely, the state of disturbance created by human activities or alteration. Integrity is stated in degrees of deviation from the existing landscape character in a national forest. "**Very High**" (unaltered) refers to landscapes where the valued landscape character is intact with only minute, if any, deviations. The existing landscape character and sense of place is at the highest possible level. "**High**" (appears unaltered) refers to landscapes where the valued landscape character appears intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident. "**Moderate**" (slightly altered) refers to landscapes where the valued landscape character "appears slightly altered". Noticeable deviations must remain visually subordinate to the landscape character being viewed. "**Low**" (moderately altered) refers to landscapes where the valued landscape character "appears moderately altered". Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. "**Very Low**" (heavily altered) refers to landscapes where the valued landscape character "appears heavily altered". Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside the landscape being viewed. "**Unacceptably Low**" (extremely altered) refers to landscapes where the valued landscape character being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern or scale from the landscape character.

Scenic Quality. The essential attributes of landscape that when viewed by people, elicit psychological and physiological benefits to individuals and therefore, to society in general.

Scenic Resource. Attributes, characteristics, and features of landscapes that provide varying responses from, and varying degrees of benefits to humans.

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.

Secondary Integrity Area. Those areas which contain slightly higher amounts of mature or old forest when compared to other areas in the drainage, yet are highly fragmented and typically have high total road and open road and/or motorized trail densities.

Security. The inherent protection that provides minimal human disturbance and minimal threat of mortality for species that either avoid human disturbance or are directly threatened by trapping, hunting, and/or other forms of mortality.

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 Harvest. The cutting of all trees except for a small number of widely-dispersed trees retained for seed production and to produce a new age class in a fully-exposed microenvironment. Some or all of the shelter trees may be retained after regeneration has become established to attain goals other than regeneration.

Seed Trees With Reserves. Harvest where some or all of the shelter trees are retained after regeneration has become established to attain goals other than regeneration.

Seedlings and Saplings. Non-commercial size young trees, generally occurring in plantations.

Seen Area. The total landscape area observed based upon land-form screening. Seen areas may be divided into zones of immediate foreground, foreground, middleground, and background. Some landscapes are seldom seen by the public.

Selective Harvest. For the purposes and intent of this EIS only, the definition of Selective Harvest will be as follows: Most selective harvest would occur in forest stands where less than 50% of the stand is dead or dying or is expected to die from the beetle outbreak and other disturbance agents. Due to special management concerns such as public safety, maintaining visual quality, or to meet specific wildlife habitat requirements, some selective harvest would be done in areas where more than 50% of the stand is dead or dying. For the Newport Ranger District, selective harvest would be used in all stands where greater than 40 square feet of live basal area remain. On most areas, selective harvest would remove only dead trees, but in some areas, where there is the opportunity to maintain or enhance the growth of the desired western larch or ponderosa pine or move the stand towards desired structural stages, green trees would be removed in addition to the dead Douglas-fir. The green trees to be removed would generally be the smaller trees which would be "thinned out." Most stands that are described as selective harvest would not be open enough to allow for successful establishment of desired tree species. The number of trees remaining in these areas would vary, but stands would generally not look much different than before harvest except for fewer dead trees. Following harvest, fuel hazards may be reduced by use of fire or mechanical methods where these are appropriate. The silvicultural prescriptions may include treatments such as salvage, thinning, and improvement cutting.

Sense of Place. A concept that focuses on the subjective and often shared experience or attachment to the landscape emotionally or symbolically. It refers to the perception people have for a physical area with which they interact, whether for a few minutes or a lifetime, that gives that area special meaning to them, to their community, or to their culture.

Sensitivity Level. Measure of people's concerns for the scenic quality of the National Forest. Sensitivity levels are determined for land areas viewed by people who are: traveling through the forest on developed roads and trails; using areas such as campgrounds and visitor centers; or recreating at lakes, streams and other water bodies. There are three sensitivity levels for identifying the different levels of concern a visitor/user has for the visual scenic quality they experience. They are classified as: Level I - Highest Sensitivity, Level II - Average/Moderate Sensitivity, and Level III - Lowest Sensitivity.

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 temporal and intermediate stage in the process of succession.

Shade Intolerant. Tree species which grow best in direct sunlight.

Shade Tolerant. Tree species which can tolerate a shaded environment.

Shape. Contour, spatial form, or configuration of a figure. Shape is similar to form, but shape is usually considered to be two-dimensional.

Shelterwood Harvest. The cutting of most trees in an area, leaving those needed to produce sufficient shade to produce a new age class in a moderated microenvironment.

Shelterwood with Reserves. Harvest unit where some or all of the shelter trees in a shelterwood harvest unit are retained after regeneration has become established to attain goals other than regeneration.

Significant Disturbance. Disturbance of surface resources, including soil, water and vegetation, which has the potential to degrade water quality to a level requiring corrective action.

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.

Site Specific. Pertains to a discernible, definable area of point on the ground where a project or activity would (or is proposed) to occur.

Slash. The residue left on the ground after natural or human-caused disturbance.

Snag. A standing dead tree, usually greater than five feet tall and six inches in diameter at breast height. Snags are important as habitat for a variety of wildlife species.

Soil and Water Conservation Practice (SWCP). The set of practices which, when applied during implementation of a project, ensures that soil productivity is maintained, soil loss and water quality impacts are minimized, and water related beneficial uses are protected. These practices can take several forms. Some are defined by state regulation or Memoranda of Understanding between the Forest Service and the States and thus are recognized as Best Management Practices (BMPs). Others are defined by the Forest Service interdisciplinary teams or described in Forest Service Handbooks for application Forest-wide. Both kinds of SWCP are included in the Forest Plan as Forest-wide standards or are referenced in the plans. A third kind of SWCP is identified by the interdisciplinary team for application to specific management areas; these are included as Management Area Standards in the appropriate management areas in the Forest Plan. A fourth kind, project level SWCPs, are based on site specific evaluations and represent the most effective and practical means of accomplishing the soil and water resource goals of the specific area involved in the project. These project level conservation practices can either supplement or replace the Forest Plan for specific projects. This handbook would aid in the development of the fourth kind of SWCP.

Soil Productivity. The capacity of the soil to produce a specific crop such as fiber and forage, under defined levels of management. It is generally dependent on available soil moisture and nutrients and length of growing season.

Space. A limited extension in one, two or three dimensions or a volume. Expanse of a landscape, such as the floor, walls, and ceiling of an "outdoor room."

Special Use Permit. A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest land for some special purpose.

Specified Road. A forest development transportation system road that is identified in and to be constructed or reconstructed under a Forest Service contract.

Stand. A contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality to be a distinguishable unit.

Stand Composition. The proportion of each tree species in a stand expressed as a percentage of either the total number, basal area, or volume of all tree species in the stand.

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.

Stand Structure. The horizontal and vertical distribution of components of a forest stand, including the height, diameter, crown layers, and stems of trees, shrubs, herbaceous understory, snags, and down woody debris.

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.

Streamside Management Zone (SMZ). A designated zone that consists of the steam and an adjacent area of varying width where management practices that might affect water quality, fish, or other aquatic resources are modified. The SMZ is not a zone of exclusion, but a zone of closely managed activity. It is a zone which acts as an effective filter and absorptive sone for sediment, maintains shade, projects aquatic and terrestrial riparian habitats, protects channel and streambanks, and promotes floodplain stability. The SMZ may be wider than the riparian area.

Structural Stages. The Newport Ranger District defines structural stages as classifications used to characterize the vegetation structure of the stand. The classifications are described by criteria such as number of canopy layers, presence or absence of large trees, relative amounts of different tree sizes, snags and down woody material. There are several structural stages. Stages 1, 2 and 3 are considered "early" stages, and include stand initiation through stem exclusion. Stages 4 and 5 are considered "middle" and include understory re-initiation and multi-stratum without at least eight "large" trees (at least 21-inches DBH). Stage 6 is multi-stratum with large trees; and Stage 7 is single storied with large trees. Structural Stages 6 and 7 are considered "late and old structure" (LOS) in this analysis.

Structure. How the parts of ecosystems are arranged, both horizontally and vertically. Structure might reveal a pattern, or mosaic, or total randomness of vegetation.

Subordinate. A term used in regard to scenery or visuals, referring to landscape features that are inferior to, or placed below, another in size, importance, brightness and so on. Features that are secondary in visual impact or importance.

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 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.

Suitable Habitat. Wildlife habitat that currently has both the fixed and variable stand attributes that enable it to produce the habitat requirements for a given species. Fixed attributes of a stand do not change over time, and may include elevation, aspect, landtype, slope, and habitat type. Variable attributes change over time and may include seral stage, cover type, stand density, tree size, stand age, or stand condition. See also Capable Habitat.

Sustainability. The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

Sustainable. The yield of a natural resource that can be produced continually at a given intensity of management is said to be sustainable.

T

Texture. Visual interplay of light and shadow created by variations in the surface of an object. Grain or nap of a landscape or a repetitive pattern of tiny forms. Visual texture can range from smooth to coarse.

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. A cultural treatment to reduce the density of trees in a stand, primarily to improve growth and enhance forest health, or to recover potential mortality.

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 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.

Tractor. Any logging system which uses ground-based machines.

Trampling. Fuel is treated by crushing it. Trampling is utilized in areas where fuels are relatively light and the area is limited by slope (usually areas that are harvested with a machine). The objective is to mix fuel with soil to hasten decomposition and provide for nutrient cycling.

Typical or Common Landscape. A term used in regard to scenery or visuals, referring to prevalent, usual, or widespread landscapes within a landscape province. It also refers to landscapes with ordinary and routine scenic attractiveness.

Travel Corridor. The habitat pathway that allows an animal to move from one place to another.

U

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

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.

Unique. Unequalled, very rare, or uncommon.

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. The IPNF defines unsuitable forest land as 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 precludes *scheduled* 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

Variety. An intermixture, diversity, or succession of different things, forms, or qualities in the landscape.

Variety Class. A term from the Visual Management System. See "Scenic Attractiveness."

Very High Scenic Integrity Level. A scenic integrity level that generally provides for ecological change only.

Very Low Scenic Integrity Level. A scenic integrity level meaning human activities of vegetative and landform alterations may dominate the original, natural landscape character but should appear as natural occurrences when viewed at background distances.

Viable Population. Populations able to survive fluctuations in demographic, genetic, and environmental conditions and maintain its vigor and potential for evolutionary adaptation over a long period of time (Soule, 1987).

Viewshed. Sub-units of the landscape where the visitor's view is contained by topography similar to a watershed.

Visual. A mental image attained by sight.

Visual Absorption Capability. A classification system used to denote relative ability of a landscape to accept human alterations without loss of character of scenic quality.

Visual Quality Objective (VQO). The IPNF defines Visual Quality Objective as a system of indicating the potential expectations of the visual resource by considering the frequency an area is viewed and the type of landscape. The Newport Ranger District defines Visual Quality Objective as a desired level of scenic quality and diversity of natural features based on physical and sociological characteristics of an area, referring to the degree of acceptable alterations of the characteristic landscape. Under the Newport definition, all VQO's except "Preservation" imply that there will be management activities: "**Preservation**": In general, human activities are not detectable to the visitor; usually provides for ecological change only. "**Retention**:" Human activities are not evident to the casual Forest visitor. "**Partial Retention**": Human activities may be evident, but must remain subordinate to the characteristic landscape. "**Modification**": Human activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground. "**Maximum Modification**": Human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background. "**Rehabilitation**": A short-term management alternative used to return existing visual impacts that are undesirable or do not meet adopted VQO's to a desired visual quality. "**Enhancement**": A short-term management alternative which is done with the express purpose of increasing positive visual variety where little variety now exists.

Visual Resource. The IPNF defines visual resource as the composite of landforms, water features, vegetative patterns and cultural features which create the visual environment. The Newport Ranger District defines visual resource as the composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

W

Watershed. Entire area that contributes water to a drainage system or stream.

Wetlands. Those areas that are inundated by surface or groundwater with a frequency sufficient, under normal circumstances, to support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated solid conditions for growth and reproduction. Wetlands included marshes, bogs, sloughs, potholes, wet meadows, river overflows, mud flats, seeps and springs.

Windrowing. To pile slash or debris is a row along the contour of the slope.

Wildland Fire. Any non-structure fire, other than prescribed fire, that occurs in the wildland. This term encompasses fires previously called both wildfires and prescribed natural fires.

Wildlife Burning. See Ecosystem/Wildlife Burning.

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

INTRODUCTION

This appendix provides an overview of public involvement activities, how public comments were analyzed and used in the issue identification and alternative development process. Distribution and review of the EIS is addressed, providing responses to specific comments and displaying copies of all comments received during review of the Draft EIS. A list of those to whom the Final EIS will be distributed is also provided.

SCOPING AND ISSUE IDENTIFICATION

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:

- *"Quarterly Schedule of Proposed Actions" for the IPNFs (January 2000 issue)*
- *Notice of Intent to prepare an environmental impact statement (January 5, 2000)*
- *legal ad in the newspaper of record (Spokesman-Review) dated January 11, 2000*
- *letter to the public dated February 7, 2000*

Scoping activities also included a field trip to the area and newspaper articles (Project Files, Public Involvement). During scoping, letters were received from John Neirinckx II (adjacent landowner), Susan Weller (National Audubon Society), John Rider and Olivia Oare (adjacent landowners), Diane Riley (Idaho Department of Environmental Quality, Boise), Jeff Juel (Ecology Center), and Mike Mihelich (Kootenai Environmental Alliance). Copies of their letters were provided in the Draft EIS (Appendix A) and are part of the Project Files (Public Involvement – Scoping). In addition to the letters, we received telephone calls from other landowners who identified similar concerns and had questions regarding possible management of national forest stands adjacent to their property. Documentation of these conversations is also provided in the Project Files (Public Involvement - Scoping).

Issues Addressed in Detail in This EIS

There are several issues considered as factors in the decision to be made. Some are those that 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. These include:

- *Improvement of vegetative resources (including old-growth)*
- *Fire/fuels*
- *Economic values (finances)*
- *Watershed*
- *Fisheries*
- *Wildlife*
- *Scenery*
- *Roadless Area*

Issues Not Discussed in Detail in This EIS

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 EIS, 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 include:

- *Threatened, Endangered and Sensitive plants*
- *Specific Threatened, Endangered and Sensitive wildlife species (gray wolf, bald eagle, lynx, black-backed woodpecker, boreal toad, common loon, Coeur d'Alene salamander, harlequin duck, Northern leopard frog, Townsend's big-eared bat, white-headed woodpecker, and wolverine)*
- *Other wildlife species and habitat (American marten, pileated woodpecker, boreal owl, forest land birds and snags and down woody habitat)*
- *Noxious weeds*
- *Air quality*
- *Soils*
- *Recreation*
- *Heritage resources*
- *Grazing allotments*
- *Public safety*

For each of these, a brief overview of the issue and the reason for not providing further documentation in the EIS is provided below.

Threatened, Endangered and Sensitive Plants

There would be no effect to either of the two Threatened plant species under any alternative. There would be no effect to the proposed Threatened plant species. There are no Endangered plants identified for the Idaho Panhandle National Forests. White some Sensitive plant individuals may be impacted implementation of projects on National Forest System lands, cumulatively these effects constitute insignificant impacts to Sensitive plant populations or suitable habitat. Please refer to Appendix C and the Project Files (TES Plants) for supporting information.

Specific Threatened, Endangered and Sensitive Wildlife Species

Gray wolf: Individual wolf sightings have occurred in the Hayden, Shoshone, Potosi and Chain Lakes wildlife analysis areas (none within the last four years). None of these sightings were of wolf packs. The likelihood of affecting wolves by activities proposed under the Small Sales project is low since there are no known packs and no known sightings within the majority of the analysis areas. Less than 1% of the winter range available within the analysis areas is proposed for harvest. An analysis of cover:forage ratios found no detectable changes from the existing condition either from the Douglas-fir beetle canopy mortality or harvest activity. It is unlikely that the prey population is limiting for the gray wolf 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. This project may have a minor increase in disturbance short term (one to three years) above the existing levels and affect wolves by temporarily displacing big game. In the long term, under all alternatives, reduced open road densities and/or improved closures would slightly to moderately decrease the risk of human caused mortality and increase habitat for big game. The maintenance of an adequate prey base and reduction in open road densities would continue to provide habitat for wolves. Therefore, this project may affect but would not likely adversely affect gray wolves or their habitat.

Bald eagle: None of the proposed harvest units or helicopter flight paths would affect potential bald eagle habitat. The nearest unit and helispot is more than one mile from any suitable nesting site and is further made unsuitable due to topographic features. The nearest service landing is over one mile away, with flights being flown away from Hayden Lake. No flights would be made closer than one mile. 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. None of the harvest units are located within any of the Lynx Analysis Units. Eight units (51 acres) associated with the Shoshone Analysis Area lie within Lynx Travel Corridors. Upon further review from aerial photography and based on the type and location of past harvest activities, these additional units would not reduce lynx travel habitat between LAU's. Therefore, this project would have no effect on lynx populations.

Black-backed woodpecker: 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 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 and white-headed woodpecker discussions). For these reasons, the project would contain design criteria and mitigation measures to adequately protect and maintain appropriate habitat for black-backed woodpeckers.

Analyses found that an estimated 63,000 acres may provide additional snags that would not be harvested in association with this project. Maintenance of these snags would avoid long-term impacts to the black-backed woodpecker. Please refer to the map under "Snag and dead down woody habitat," which displays snag distribution across the analysis areas. There may be impacts to individual black-backed woodpeckers because harvest activities may reduce some of the habitat available for potential population increases that 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 occured.

Boreal toad: Boreal toads require shallow water in ponds, lakes or slow-moving streams for breeding sites. This species does not require much aquatic or emergent vegetation in its breeding habitat. After the brief spring breeding season, adult toads leave aquatic habitats and travel to a variety of upland habitats. Radiotelemetry research on boreal toads in southern Idaho found that toads can travel up to 2 kilometers (about 1 mile) from their natal ponds; it also showed that toads avoided crossing openings (Bartelt, 1994). Boreal toads in Colorado have been documented traveling up to 2.5 miles away (Loeffler, 1998).

Boreal toads hibernate in the winter in habitats with a high humidity and above-freezing temperatures. Areas that provide shelter for hibernating toads include rodent burrows, beaver dams and slash piles. It is important that toads be able to move among their seasonal habitats. According to Nussbaum et al., optimal habitat probably has moderate to dense undergrowth in more humid regions. The biggest potential barrier to their movements is roads. Steep roadcuts can be a barrier to toads moving between seasonal habitats. Juvenile toads are vulnerable to being killed by motorized vehicles when they are dispersing from their natal ponds.

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. Road removal or improvement would benefit toads by eliminating a potential sediment and mortality source near the wetlands. It was determined that there were adequate design criteria to protect boreal toads and their habitat.

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, 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. Approximately 0.8 miles of temporary roads would be built with no stream crossings, and the existing roads to be used are high on the slope, minimizing sedimentation into streams. Two stream crossings would be pulled within the Little Tepee Analysis Area, however these crossings are dry part of the year, providing no habitat for Coeur d'Alene Salamanders. 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: Harlequin ducks were sighted on the Coeur d'Alene River and the North Fork of the Coeur d'Alene in 1991. No harlequin ducks were found on the Coeur d'Alene River District during two years of surveys. Most recently a pair of harlequin ducks were spotted in Fern Creek during the summer of 1999. In 1982, harlequin ducks were seen in Tepee Creek. In 1987, there was a pair seen on the east end of the district, northeast of Cathedral Peak in the Coeur d'Alene River. The Idaho Conservation Data Base Center has no record of harlequin sightings in the Little North Fork.

A 1989 study of harlequin duck habitat in North Idaho concluded that one missing element in the Coeur d'Alene Mountains may be boulders and log jams providing mid-stream loafing sites (Groves and Wallen 1988). More recent studies have indicated that stone fly populations may be more important than stream structure in indicating suitability for the harlequin. In this case, sedimentation would have a direct impact upon a streams suitability for the harlequin. District field personnel have noted that stone fly populations appear to be low in the Little North Fork.

There would be no activities under any of the alternatives that would affect harlequin duck habitat or cause a change in streamflow. Water quality is expected to be maintained under all action alternatives (please refer to the "Watershed" section for a detailed discussion on water yield). Harvest and watershed restoration activities (i.e. culvert removal) may increase sediment in localized areas, but no measurable effect would be expected. Road-related activities associated with the proposal would reduce existing risks to water quality. For these reasons, the risk factors to harlequin ducks have been avoided through design features. Therefore, no further analysis or discussion is warranted.

Northern leopard frog: This species occupies marshes, wet meadows, riparian areas and moist, open woods. Leopard frogs apparently require moderately high ground cover for concealment (Nussbaum et al., 1983, p. 128). Because this species attaches its eggs to aquatic vegetation, it prefers ponds or lakes shores which have fairly dense aquatic and emergent vegetation during the spring egg-laying season. This species probably hibernates in ponds and lakes.

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. Road removal or improvement would benefit frogs by eliminating a potential sediment and mortality source near the wetland. It was determined that there were adequate design criteria to protect northern leopard frogs and their habitat. Therefore, no further analysis or discussion is needed.

Townsend's big-eared bat: These sensitive mammals are found in a variety of habitats, from arid juniper/pine forests to high-elevation mixed conifer forests. Big-eared bats winter in large groups in caves or old mines. They are thought to be very sensitive to human disturbance (USDA Forest Service, 1989) During 1997 surveys on the Sandpoint Ranger District, a maternity site for big-eared bats was found in a mine, indicating that these bats are present on the Idaho Panhandle National Forest.

The known mine sites in the Hayden, Potosi, Coeur d'Alene Lake North and Chain Lakes analysis areas would be analyzed for survey needs. If Townsend's big-eared bats are found in these mines, the Habitat Conservation Assessment and Conservation Strategy for Townsend's big-eared bats would be applied (Idaho State Conservation Effort 1995). This would protect the bats from disturbance and maintain surrounding forest vegetation which regulates the temperature regime in the roost which makes it suitable for Townsend's big-eared bats. For these reasons, it is unlikely the project would have measurable impacts on the Townsend's big-eared bat. Therefore, no further discussion and analysis is necessary.

White-headed woodpecker: Because of habitat similarities with flammulated owl, the white-headed woodpecker would be treated as a guild with flammulated owl in this document. Please refer to the discussions addressing flammulated owl in Chapter III, Wildlife.

Wolverine: Based on their wide-ranging nature and existing habitat components (i.e. lack of 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 Small Sales project.

Risk of disturbance during the sensitive denning period is not a factor in this 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. Preliminary analysis revealed that the minor changes in open road densities would not measurably affect wolverine. Therefore, no additional analysis is necessary.

Other Wildlife Species and Habitat

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 III (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. 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," earlier in the Wildlife section of this chapter). The minimum number of snags left in any unit with a canopy closure greater than 50% would be adequate to maintain a distribution of snags across the landscape. For these reasons, it is unlikely the project would have measurable impacts on pileated woodpeckers. Therefore, no further discussion or analysis is necessary.

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, this project would not impact boreal owls. No further analysis and discussion is necessary for this species.

Forest land birds: On the Coeur d'Alene River Ranger District, agricultural lands are adjacent to the Coeur d'Alene Lake North and Hayden wildlife analysis areas. These habitat types can be inhabited 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).

To analyze the impact of this project on cowbird parasitism, agricultural lands and grazing allotments were mapped along with proposed units. These areas are considered to be potential feeding areas for cowbirds. 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, were not mapped. The presence of livestock in these areas was considered to be of such a short-term nature that suitable cowbird feeding areas were not created. Proposed harvest units within 7 kilometers of agricultural pasture lands and grazing allotments were considered to be threatened by cowbird parasitism. All harvest units within the Hayden and Coeur d'Alene Lake North analysis areas could potentially be parasitized by cowbirds, resulting in a reduction of neotropical migrant birds. If trees in the proposed harvest units are allowed to die naturally, similar openings and opportunities for cowbird nest parasitism would be created. It is unknown to what extent neotropical populations would be affected under either scenario. To reduce effects to ground-nesting birds, timing restrictions would be implemented during burning activities to maintain potential next sites in similar habitat (please refer to the discussion of Features Common to All Alternatives in this chapter).

Because a detailed analysis has been conducted for other species 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 epidemic has, is and will continue to kill live trees, thereby creating snags and areas of high snag densities. The scope of the bark beetle infestation is discussed elsewhere in this document. In all action alternatives some snags created by bark beetles would be harvested and lost as habitat for cavity dependent species. However, the potential effects 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. 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 which has been shown to support viable populations of species which use snags and logs (Features Common to All Action Alternatives, Chapter II). Snags and snag replacements would be retained in all treatment units at levels recommended by scientific literature based on recent studies. Snag retention objectives 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 ponderosa pine and mixed conifer forests that contained about four snags per acre (Bull et al. 1997).

The project would meet Forest Plan goals and objectives for cavity habitat, and Forest Plan standards would be met or exceeded in all alternatives.

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).

Air Quality

Because use of prescribed fire would be based on smoke management guidelines, current air quality standards would not be exceeded under any alternative. Over the long term, prescribed fire may reduce total particulates by reducing the risk of large wildfires that cannot be managed for emissions. Supporting information is provided in the Project Files (Air Quality).

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 (using the WATSED model)*
- *accomplish transportation planning (location, design and management of the road system)*
- *analyze potential depletion of key nutrients*

To minimize erosion and ensure compliance with State water quality standards, all temporary road construction and timber harvest associated with the Small Sales project would be completed using Best Management Practices. For additional information, please refer to "Features Common to All Action Alternatives – Features Designed to Protect Aquatic Resources" in this Chapter. Maps related to soil conditions are provided in the Project Files (Soils).

Recreation

No developed recreation sites would be directly affected under any alternative. The proposed activities would have only transitory effects on recreation access and opportunities. There would be sounds of helicopters and logging trucks passing recreation sites, and some recreation visitors could be temporarily displaced to other parts of the District or adjacent National Forest System lands. Please refer to Appendix E for supporting information.

Heritage Resources

Known sites containing important cultural resources will be assessed for their historical value and be protected as appropriate. Any future discovery of cultural resource sites would be inventoried, and protected if found to be of cultural significence. Decisions to avoid, protect, or mitigate inpacts to these sites is in accordance with the National Historic Preservation Act of 1966.

Grazing Allotments

Ongoing grazing allotment projects are identified in Table II-5. 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 the allotments. An environmental assessment concerning management of the allotments has been initiated and is expected to be completed in mid-2000.

The Coeur d'Alene River Grazing Allotments Environmental Assessment is currently in progress, and will address management of the Iron-Mokins-North Fork cattle allotment. The environmental assessment is expected to be completed early in 2001. Under the preferred alternative, no additional riparian exclosure fencing needs were identified at this time, though some may be called for in the future pending future surveys for Threatened, Endangered and Sensitive plant species by the District's botanist. Also, no change in stocking levels nor grazing seasons was called for under the preferred alternative; however, utilization standards, in riparian areas especially, would be established by Riparian Management Objectives under the Inland Native Fish Strategy.

Transportation Planning

The transportation planning for this EIS 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 analysis areas encompass a total of approximately 45,000 acres of National Forest System land. Within these analysis areas are approximately 328 miles of road (this includes both system and nonsystem roads). Approximately 102 miles of these roads would be used to yard and haul timber.

Roads used to haul and yard timber would be placed on a Level Two or Three maintenance schedule during the life of the sale. The roads which are gated, and would be used for timber yarding and haul only, would be maintained for low speed travel and for use by high clearance vehicles (Maintenance Level 2). Those which would also be used by the public would be maintained for travel in a standard passenger car (Maintenance Level 3). These roads would be maintained for low speed and would be single lane with turnouts and spot surfacing.

There would be approximately 0.8 miles of temporary road needed. Temporary roads would be built, utilized, and closed in the same season under timber sale contract provision CT6.4, except for those roads needed for post-sale activities (i.e. tree planting, slash treatment). All new construction of temporary roads would install drainage structures, if needed, which meet standards and guidelines of the Inland Native Fish Strategy.

The management of each road was determined by using the logging systems plan for each alternative. The transportation plan located in the project file displays the harvest methods and the roads used to harvest each unit. The management of each road during and after the sale can be found in the Road Management Plan by alternative (Project Files, Transportation).

Public Safety

Proposed activities would be accomplished utilizing safety standards based on the Forest Service's Health and Safety Code Handbook (FSH 6709.11). Should the selected alternative include road construction and/or reconstruction, the standards and objectives for these activities emphasize safety (please refer to the Transportation Plan in the Project Files). Any timber sale contract would contain safety provisions C6.33 – Safety and C6.332 – Safety (Timber Hauling). These provisions require development and implementation of a traffic control plan and other safety requirements.

Social Values

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 these values at risk. When these conditions exist adjacent to private ownership, then not only have the risks increased on the National Forest, but have increased on private ownership as well. Areas near private ownership often carry increased scenic landscape values as they are much more visible to urban population centers or travel corridors into the forest than areas in the backcountry. High fuel loads as a result of timber mortality increase the risk of a major change to the scenic character of the area as well as risk of loss of private property, and potentially even loss of lives.

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 portion of the trees being considered for removal under this project were killed by bark beetles in 1998, a smaller but significant portion were killed in 1999. Based on reports from timber sale purchasers, sale administration, and local mills, timber being removed under the Douglas-fir Beetle Project is running 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 or higher defect percentages. It is important this timber be removed as quickly as possible to provide for the greatest opportunity for long-term 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. 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. This is not to say that all fire activity is bad and must be suppressed. But it is preferred to allow this to occur in areas where fewer social values are at risk or in areas where our management decisions have less effect on lands owned by private individuals. It is also preferred to make use of the benefits of fire

under more controlled conditions than what occurs during a wildfire. Large trees and stands of old-growth character have social value to many. Stands of old-growth character with high fuel loadings and significant amounts of dead trees have intrinsic value. However, these same characteristics pose risks when found in urban interface areas where many other values and private ownership are also part of the management decision equation.

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. 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 and for funding opportunities to enhance recreational usage.

There are social values associated with each of the resources and issues analyzed in this EIS.

ALTERNATIVE DEVELOPMENT AND MODIFICATION

Alternatives Considered in Detail

The project team used the 6-step process outlined in the "Federal Guide to Watershed Analysis - Environmental Analysis at the Watershed Scale" (USDA Forest Service, August 1995) to focus on proposed activity areas, describe current conditions, and identify possible treatment alternatives. Documentation related to the process is provided in the project files ("Alternative Development"). In addition to the No-Action Alternative, three action alternatives were developed. These alternatives are discussed in detail in Chapter II.

Alternatives Considered But Eliminated

Six alternative concepts were developed by the project interdisciplinary team and considered during early scoping and project development, but dismissed from further study as explained briefly below.

Salvage all of the beetle-killed and infested timber

This alternative was dismissed as not economically feasible or desirable from a resource standpoint. Field reconnaissance identified areas of timber mortality concentrations that were thought to be economically feasible to remove given the full range of yarding system options including helicopter. Very small or isolated patches of timber mortality were often dismissed during reconnaissance as not being economically feasible. Harvest of mortality within riparian areas was dismissed during reconnaissance because the trees carry more value as potential recruitment for stream channel stability.

During reconnaissance, areas where historic regeneration harvest created overall low snag habitat were not considered for salvage harvest. Venus Creek is an example of this situation. Concentrations of timber mortality in stands being managed for old growth habitat were not considered for entry unless they were adjacent to private ownership. There are many patches of old growth habitat with concentrations of beetle mortality scattered across the district. This dead component in old growth habitat is recognized for its value in overall old growth quality. Only when this occurred adjacent to private ownership, with stronger concerns for fire hazard levels, was entry proposed.

Use conventional harvest equipment only

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 pattern of the beetle mortality in many areas, the concern of unacceptable impacts to watershed, wildlife, and fisheries of significant roading, and the time frames needed to design and engineer road systems and costs to build long road segments to access small harvest units, this option was not considered feasible. Temporary roads needed to gain access to conventional units and for fuels treatment were designed to be short, high on the slope, and have miminal impact under all action alternatives. The project as a whole was designed to access concentrations of beetle-killed timber from existing transportation systems with minimal investment, rather than trying to access all of the mortality areas. The use

of helicopter actually expands what can be reached in an economical and low impact fashion, although helicopter yarding costs more than ground-based systems.

No new roads

There is no permanent road construction proposed under this project. Each action alternative contains six scattered locations for temporary road construction. These six temporary roads result in a total of 0.8 miles of construction. These roads would be short and are located high on the slope associated with ridgelines with no drainage crossings. They are temporary in nature and would be closed to public access after use. Four of the six segments are off of road systems that already have some form of closure device restricting access. Since they are all of such minimal impact to other resources and would not be part of the forest road system increasing maintenance needs the construction of these temporary spurs does not warrant analysis of a separate alternative. None of these temporary spurs are located in roadless or old growth areas.

Re-install culverts in the Little Tepee Creek drainage to facilitate timber removal

Many of the roads in the Little Tepee area have been obliterated or had culverts pulled and stream channel crossings restored. This restoration was completed several years ago after the Tebreak and Breakwater timber sales in this area. Consideration was given to reopening Road 209A. This would have allowed for the location of a helicopter landing approximately one-quarter mile south of Little Tepee Unit 1 and would allow for a downhill short flight from the largest cluster of units in that area. This would be the most logical way to access this area for timber salvage. However, use of Road 209A would have required six culvert reinstallations. These installations would have occurred low on the slope in side watersheds that flow directly into the Little North Fork of the Coeur d'Alene River, which is identified as a Water Quality Limited Stream under Section 303(d) of the Clean Water Act. This option was eliminated from further consideration based on anticipated effects to the Little North Fork of the Coeur d'Alene River.

Another option that was considered was to reopen the southern half of Road 1521 that is in the County Creek drainage. This option would have required uphill flights but of a reasonably short distance. This option was eliminated from further consideration because it would have required the re-installation of six drainage crossings within face drainages of the Little North Fork. This route also had deep fills at the crossing locations which would have required significant amounts of dirt to be moved.

A third option was considered that would access the same landing area by coming in from the north end of Road 1521. This would have forced a longer haul but would have re-established 5 drainage crossings up high in the Little Tepee drainage where effects would be less likely to reach the Little North Fork. This option was eliminated from further consideration because watershed concerns would have likely forced the removal of these crossings from this road; the costs of installing and subsequently removing the 5 crossings for the small amount of timber amount of timber in this area is not economically sound.

Replace nutrients through fertilization

One of the fuels reduction methods in harvest operations is to leave tops attached to the top log and remove with the logging operation. Reducing nutrients by yarding tops of trees is a concern in areas of potassium-poor soils associated with Prichard and St. Regis soil types. The primary concern in the urban interface areas is fuels reduction and treatment. These urban interface areas are also locations where maintaining and promoting ponderosa pine habitat is desirable. Alternatives 2 and 4 look at "daylighting" existing large ponderosa pine throughout the treatment areas. This involves harvest of understory trees that are growing up into the crowns of the ponderosa pine and intermediate trees that are crowding the crowns of these large ponderosa pine. This is especially true in the dryer urban interface areas where more of this habitat exists. Consideration was given to flying the green tops that were created as a result of the daylighting effort so as not to increase fuel loads above existing conditions. Since much of the urban interface county is in Prichard and St. Regis soil types this presented a conflict between fuels reduction and nutrient displacement. Consideration was given to flying the green tops and replacing the lost nutrients with a fertilization treatment. This option was dropped due to poor road access and expense. Most of this urban interface area is scheduled for helicopter yarding and with limited road access it would make it difficult to pack in 50 pound bags of fertilizer to accomplish the recommended 600 pounds per acre treatment need. The cost of fertilizer and the manual labor to spread that amount of fertilizer were felt to be high.

Some thought was given to aerial application of fertilizer using a helicopter but again the costs would be high and it would be difficult to get the fertilizer to exact areas where the nutrients were reduced. It might be hard enough to locate the small, scattered units from the air after salvage much less where the daylighting had occurred. There was also a concern with drift with aerial application. The proposed action modified the fuel treatments throughout the treatment areas to account for Prichard and St. Regis soil types. In areas where the existing fuel loads where felt to be low, lop and scattering of slash on site was used. In higher fuel concentration areas the lop and scattering treatment was followed by a jackpot burn treatment. Within the urban interface, where fuels reduction is the prime consideration, most areas were scheduled for lop and scatter followed by a jackpot burn or hand piling treatment. This additional expense was felt to be similar to a fertilization treatment but also carried the additional benefit of being able to treat existing down fuels in these areas, much of which occurred as a result of ice-storm damage.

Watershed Restoration Only

In many of the areas proposed for treatment under this project, watershed restoration activities have been recently completed, are ongoing, or are scheduled to occur. For example:

- *Road 323 into the Little Tepee Creek drainage has recently had the culverts upgraded.*
- *Road 2352 into the Cougar Creek area has recently had culverts upgraded.*
- *Roads 620 and 933 (haul routes) out of the White area have had culverts upgraded to meet standards and guidelines of the Inland Native Fish Strategy*
- *Road 3100 in the Potosi area was constructed several years ago and the stream crossings meet Inland Native Fish Strategy standards.*
- *Stream crossings on Road 1519 in the Shoshone area meet Inland Native Fish Strategy standards. There are ongoing projects to upgrade culverts on Road 1586 in the White area and Road 3010G road in the Owl area.*
- *Aquatics restoration work is scheduled under the completed Alder Kid, Capitol Hill, and Unknown Pony timber sales, all within the Beaver Creek watershed.*
- *Aquatics restoration work is scheduled in the Downey Creek drainage under the Yellowdog Downey timber sale.*

The purpose and need for this Small Sales project is to recover the economic value of dead and damaged timber, fuels reduction in areas of timber mortality especially adjacent to private ownership, and to promote long-term vegetative objectives in areas of timber mortality. The Salvage of this timber may provide the funding to finance some additional watershed restoration opportunities that have been identified during project development. To propose a watershed only alternative that did not consider timber salvage would not meet the purpose and need for this project and was therefore dismissed from further consideration.

Distribution and Review of the EIS

Copies of the Draft EIS were initially mailed to 41 individuals, organizations, and agencies, with additional copies provided upon request. Another 36 copies were distributed to federal agencies as required. A Notice of Availability of the Draft EIS was published in the Federal Register on April 7, 2000. On April 14, 2000, a notice in the Federal Register corrected the due date for public comments from May 15 to May 22, 2000. A total of 15 letters provided comments based on review of the Draft EIS. Some letters were received after the close of the comment period; all comments received on the Draft EIS by June 12, 2000 were considered and are addressed in this appendix.

The Draft EIS was released for public review in April 2000. Although no new issues were identified by the public, they provided comments that helped to further define the analysis of effects and proposed activities. Concerns identified by the public are identified later in this Appendix, with the Forest Service response. Copies of comment letters are enclosed with this EIS.

A Final EIS and Record of Decision to implement Alternative 4 (with modifications) was issued in July 2000. Two letters were received from the public following publication of the Small Sales Supplemental (Final) EIS. Diane Riley, Idaho Department of Environmental Quality, provided a letter emphasizing her concerns with air quality and documentation of burn plans (Project Files, Public Review Draft EIS, Document DCOM-11). Richard Parkin, US

Environmental Protection Agency, provided a letter documenting their review of the Final EIS and Record of Decision. He recommended that one NEPA process be used to determine the treatment for the six old-growth parcels not addressed by the decision. He also stated that the final EIS adequately responded to their comments on the Draft EIS (Project Files, Public Review Draft EIS, Document DCOM-15).

The decision to implement Alternative 4 was appealed (Project Files, Appeal Process). Upon review, the Appeal Deciding Officer reversed the decision, citing inadequate documentation of the cumulative effects analysis. In January 2001, the District Ranger announced that a revised Final EIS would be prepared and a new decision issued.

For the convenience of our interested public and in an effort to reduce costs, the Small Sales Final EIS and Record of Decision will also be made available to the public on the Idaho Panhandle National Forests' internet web page -

www.fs.fed.us/ipnf/eco/manage/nepa/

Copies will be distributed to the following agencies, organizations and individuals who have indicated an interest in the project. If a comment letter was received from that person, their name is followed by an identification number that corresponds to the number assigned to their letter when it was received.

Agencies

U.S. Environmental Protection Agency - Richard Parkin (Comment Letter #15)
USDI Fish and Wildlife Service, Boise and Spokane Offices
Idaho Department of Environmental Quality – Diane Riley (Comment Letter #11)
Idaho Department of Environmental Quality – Jack Skille
Idaho Fish and Game – Greg Tourtlotte (Comment Letter #07)

Organizations

Daugherty Logging Crew and Family (Comment Letter #13)
Ecology Center & Alliance for the Wild Rockies – Jeff Juel (Comment Letter #05)
Idaho Forest Owners Association – Amy Gillett (Comment Letter #08)
Idaho Rivers United & Idaho Conservation League – Sara Denniston (Comment Letter #10)
Kootenai Environmental Alliance – Mike Mihelich (Comment Letter #06)
National Audubon Society – Susan Weller (Comment Letter #12)

Individuals

Charles and Sarah Gates (Comment Letter #09)
Ron Giddings (Comment Letter #02)
Walter W. Morris (Comment Letter #01)
John Neirinckx II (Comment Letter #04)
Dave Reynolds (Comment Letter #03)

A letter was also received from USDI Office of Environmental Policy and Compliance (Comment Letter #14), stating that they did not have any comments to offer on the Draft EIS.

Following our notice of intent to prepare a revised Final EIS, two letters were received from the public. Mike Mihelich, Kootenai Environmental Alliance, provided comments; they have been attached to and addressed with his earlier comments in this appendix (Comment Letter #06). The U.S. Fish and Wildlife Service provided a letter stating they had no comment on the Small Sales EIS.

Although no new issues were identified by the public, they provided comments that helped to further define the analysis of effects and proposed treatments. The team has considered concerns identified by the public and incorporated their

ideas whenever possible. The following briefly identifies the issues of concern and how each was incorporated into or addressed by the alternatives or analyses. The key concerns have been paraphrased in order to get to the key concerns in the letters. Their letters are displayed in their entirety at the end of this appendix.

Public Comments During Scoping of the Revised Final EIS

One letter was received (from Mike Mihelich, Kootenai Environmental Alliance) following our notice of intent to prepare a revised Final EIS. His comments were appended to the comments he submitted based on review of the Draft EIS (Comment Letter #06).

Key Concerns identified by Walter W. Morris (Comment Letter #01)

1. Mr. Morris indicated support for harvesting "in any areas that are needed to prevent the spread of the Douglas Fir Bark Beetle." He indicated surprise that the timber was referred to as old growth, as it was his impression that most of the red fir timber is not a long-lived tree.

We cannot control the outbreak of Douglas-fir beetles due to the magnitude of the epidemic; the best methods for dealing with such insect outbreaks are preventive rather than suppressive. In local areas, removing currently infested trees from the forest (for example, under the Douglas-fir Beetle Project, 1999) would remove some beetles and could lessen the spread of the infestation locally. This would be a benefit, but would likely not stop the outbreak. The Small Sales EIS project would allow us to recover the economic value of the dead and damaged timber, reduce fuels in areas of timber mortality, and to promote long-term vegetative objectives in areas of timber mortality (Chapter I, page I-1).

Most of the Douglas-fir in the old-growth stands proposed for entry under Alternatives 2 and 3 are 90 to 100 years old; the desired age for old growth is 150 years or older.

Key Concerns identified by Ron Giddings (Comment Letter #02)

2 (a). Mr. Giddings states he is not opposed to responsible logging, but questions the need or wisdom for such a project, since studies show dead and dying trees can be important to forest health.

We agree that dead and dying trees are an important component of the forest ecosystem. In areas where the level of dead and dying trees is such that it poses an increased risk of stand-replacing wildfire, especially to resources and homes on adjacent property, we must carefully weigh the benefits and consequences in determining whether this is an acceptable risk. Stands of old growth with high fuel loadings and significant amounts of dead trees have intrinsic value. However, these same conditions pose unacceptable risks when found in urban interface areas where risks to other values and private property are of concern (Issues Not Discussed in Detail, "Social Values," in this appendix).

There are many areas of the Coeur d'Alene River Ranger District where bark beetles, ice storms, windstorms, and root disease have caused dead and downed trees. The 1999 aerial detection flight indicated there are approximately 63,100 acres of trees infested by bark beetles on the Coeur d'Alene River Ranger District (Forest Vegetation, page III-10). Timber harvest and fuels reduction are proposed in only a small percentage of these areas. It is estimated that approximately 7,250 acres of National Forest System lands within the analysis areas of the Small Sales EIS project have incurred some level of mortality due to the current bark beetle epidemic; under the proposed action harvest activities would occur on slightly more than 1,400 (20 percent) of these acres (Forest Vegetation, page III-11).

2 (b). Mr. Giddings is also concerned with the problems encountered with controlled burns in the past.

The Coeur d'Alene River Ranger District has a strong record of success in relation to controlled burns. All burning complies with federal, state and local regulations. In each case, a "burn plan" is developed that identifies specifically where the burn will occur, under what weather conditions, what methods of burning will be used, and the desired effect of the burn. The burn plan also includes a contingency plan that identifies what resources are available and how the burn will be managed should it exceed the identified boundaries of the prescribed burn area.

Over the past decade, controlled burning has occurred on an estimated average of approximately 1,200 acres each year on the Coeur d'Alene River Ranger District. Of these, less than 5 percent have "slopped over," which occurs when the

fire burns beyond the identified boundary of the prescribed burn. These slop-overs have each burned less than 10 acres (typically less than one-half acre), are controlled by the crew conducting the burn, and are attended until there is 100 percent "mop up" (the fire is out). In the last decade, there have been only two instances on the Coeur d'Alene River Ranger District where the controlled burn actually "escaped" to become a wildfire.

There are risks associated with controlled burning, but it is a valuable tool for reducing fuel loads in an area. Without the use of controlled burning, the risks of a catastrophic fire during the summer months would be greatly increased.

2 (c). Mr. Giddings states that, although very sparse thinning by use of helicopters might be acceptable, true old growth forests are a treasure to be enjoyed by all and should be left alone. The exception might be Canfield Mountain, where he does favor cleanup of the dead and debris if it truly presents a severe fire danger.

There are very few "true" old growth stands on the western half of the Coeur d'Alene River Ranger District. Most of the old growth stands proposed for treatment are a step down from true old growth, but are managed for those attributes that will trend the stands to old growth condition in the future. The only allocated old growth stands proposed for treatment under the Small Sales project are in areas adjacent to private ownership with an increased risk of stand-replacing fire due to increased fuel levels. There are numerous old growth stands across the district that have been affected by bark beetles and other natural events, but which are not proposed for treatment because they are not adjacent to private lands. Under the Small Sales project, additional stands will be identified for old growth management, to replace those old growth stands being treated with comparable timber that is more likely to meet the characteristics of true old growth in the future.

Under the Proposed Action (Alternative 2), approximately 34 acres are identified for harvest in the Canfield area due to the increased risk of catastrophic fire and adjacency to private lands. Of this, 31 acres are within allocated old growth (there are 84 total acres of allocated old growth currently within the Canfield analysis area) (Forest Vegetation, page III-13). We realize that harvest of dead and dying timber within these stands would likely have a short-term detrimental impact on the old growth character of the stand. However, as dead trees fall to the ground, fuel loading will increase dramatically. Natural regeneration will provide a fuel ladder into the crowns of residual trees, creating an increased potential for a stand-replacing fire. Removal of the dead trees would substantially reduce this potential on these dry sites.

2 (d). Mr. Giddings opposes any further logging or road building on the North Fork, due to concerns with silt and sediment entering the river.

Sediment impacts to the North Fork of the Coeur d'Alene River are the result of a variety of factors, many of which are management related (Coeur d'Alene River Basin Geographic Assessment). Splash dams, flumes and log drives down the North Fork earlier in the century scoured the channel and resulted in tremendous amounts of bed and bank erosion. Removal of riparian vegetation increased sediment inputs from channel widening and bank erosion. Additional sediment has been introduced to streams from road/stream crossing failures throughout the basin, which may have been further exacerbated by water yield increases from timber harvest.

Under the Small Sales project, a total of eight-tenths of one mile of road would be constructed (short segments in six different locations) under any action alternative. These segments would be located high on the slopes, away from drainage areas. Due to their location, there would be no mechanism for transporting silt or sediment into the aquatic system.

2 (e). Mr. Giddings states that deficit logging sales should be outlawed. "If total costs to the taxpayer outweigh the total profits and benefits, the sales should not be awarded – period!"

"…the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not when there are important qualitative considerations," (40 CFR 1502.23). Land management decisions are not made based solely on economics, although recovery of the economic value of dead and damaged timber is one of the goals of this project. The financial analysis for this project focuses on predicting the actual costs that would occur from this project and predicting what timber values would be worth at the time of the sale. The activities proposed under each alternative and each funding source is described in the "Finances" section of the EIS (pages III-83 through III-92). Each action alternative, as a whole, shows a positive net value and would therefore not be below cost. When viewed as individual sales, all of the action alternatives have one or more below-cost sales. There are opportunities to combine multiple sales to improve the financial condition at the time of the sale package preparation.

The proposed timber harvest and fuels treatment are tools that can provide long-term benefits to forest health that cannot be measured in terms of dollars. The proposed activities would reduce fuels to lower fire hazard, respond to concerns from adjacent landowners, and would promote long-term vegetative restoration in areas of timber mortality.

Concerns identified by Dave Reynolds (Comment Letter #03)

3. Mr. Reynolds heartily approves of the proposed activities. "All diseased or beetle-killed trees should be harvested as soon as possible. America's resources are too valuable to let go to waste.

Any of the three action alternatives would recover the economic value of dead and dying timber. The proposed action (Alternative 2) would provide the most effective combination of vegetative restoration and fuels treatment.

Concerns identified by John E. Neirinckx II (Comment Letter #04)

4. As an adjacent landowner, Mr. Neirinckx is considerably concerned about the amount of dead and dying timber on the adjacent national forest land because of the extreme fire hazard it poses to his forested property. He supports the proposed action (Alternative 2) because he believes it will provide the old growth forest the necessary management to maintain its beauty for future generations, while ensuring the safety of those residing in the area.

Any of the three action alternatives would reduce the risk of stand-replacing wildfires (only Alternatives 2 and 3 would reduce the risk in the vicinity of Mr. Neirinckx's property). Alternative 2 would provide the greatest reduction through a combination of timber harvest, fuels treatment, and ecosystem burning.

Concerns identified by Jeff Juel, Ecology Center/Alliance for the Wild Rockies (Comment Letter #05)

5 (a). One of Mr. Juel's concerns is that the analysis of cumulative effects is inadequate, specifically citing effects of ongoing and foreseeable actions and off-road vehicles, as well as effects to wildlife and spread of noxious weeds.

The EIS considered direct, indirect, and cumulative effects that could occur as a result of the proposed, ongoing, and reasonably foreseeable activities. Proposed activities are described in detail in Chapter II of the EIS (pages II-23 through II-33). Ongoing activities and reasonably foreseeable activities associated with specific projects are identified in Chapter II (Tables II-1 through II-15). Routine ongoing activities, such as recreation use, fuelwood gathering and other activities are considered as part of the existing condition for each resource. Direct, indirect and cumulative effects are disclosed for each of the resource issues discussed in Chapter III of the EIS.

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. 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). For more information, please refer to the "Issues Not Discussed in Detail" in this appendix with additional information in the Project Files (Noxious Weeds).

5 (b). Mr. Juel questions the need for the proposal, calling it "an extremely overblown reaction to an infestation of a native insect species – one that has been periodically infesting the forest without ill-effects for centuries." He contends the Small Sales and Douglas-fir Beetle projects are "the culmination of decades of overcutting and excessive road building on this Forest, to this point that the only justification for more logging is to perpetuate a "forest health" and wildfire scare so an increasingly skeptical public can be temporarily confused into submission."

The purpose and need is described on page I-1 of the EIS, and is based upon changes in resource conditions observed first hand by Forest resource specialists and documented in a number of science-based assessments, including:

- *Douglas-fir Beetle EIS/ROD (USDA Forest Service, 1999)*
- *Geographic Assessment (Toward an Ecosystem Approach: An assessment of the Coeur d'Alene River Basin, February 1998)*
- *Interior Columbia Basin Ecosystem Management Project (an assessment of ecosystem components in the Interior Columbia Basin and portions of the Klamath and Great Basins, 1997)*
- *Northern Idaho Forest Ecosystems: Historic Conditions and Current Trends in Forest Succession, Fire, Timber Harvest and Landscape Pattern (Zack, 1995).*

5 (c). Mr. Juel asserts that the main objective of this proposal is to keep large, capital-intensive timber operations in business by designing a timber sale that would require extensive use of helicopters. "Nowhere did the Forest Plan's EIS disclose such effects on the local economy, and this DEIS continues the pattern by including an extremely narrow economic analysis."

A financial analysis was completed and is disclosed in the EIS (pages III-83 through III-92). An effort was made to generate conventional sales (those not requiring helicopter yarding) where feasible, to allow for bidding opportunities for small operators (Finances, page III-84). Helicopter yarding was proposed to reduce the need for new road construction and have less impact on area resources. Helicopter yarding would be used on 46 percent of the harvested acres under Alternatives 2 and 3, and on 28 percent of the harvested acres under Alternative 4. The analysis meets the requirements provided in Forest Service Handbook 2409.18, section 32.

5 (d). Mr. Juel contends that there is no legal mandate for the FS to sell logs off national forest land. "The DEIS is wrong to not include an alternative that would "promote long-term vegetative objectives" and "reduce fire risk" without a commercial timber sale like the DFB FEIS did."

There is a very clear legal mandate related to the sale of timber from national forest system lands. The Federal Code of Regulations (36 CFR 221.3) directs that management plans for national forest timber resources will:

(1) Be designed to aid in providing a continuous supply of national forest timber for the use and necessities of the citizens of the United States.
(2) Be based on the principle of sustained yield, with due consideration to the condition of the area and the timber stands covered by the stands.
(3) Provide, so far as feasible, an even flow of national forest timber in order to facilitate the stabilization of communities and opportunities for employment.
(4) Provide for coordination of timber production and harvesting with other uses of national forest land in accordance with the principles of multiple use management.
(5) Establish the allowable cutting rate which is the maximum amount of timber which may be cut from the national forest lands within the unit by years or other periods.

The Douglas-fir Beetle EIS did consider an alternative (Alternative G) that proposed fuels treatment without commercial timber harvest. The alternative fell short of what overall restoration opportunities could be achieved by the combination of timber harvest, prescribed fire and planting of desired species on a large scale (Douglas-fir Beetle Project Record of Decision, page 24). Small Sales EIS did not consider such an alternative because one of the key objectives of this project is to allow recovery of the economic value of dead and damaged timber (Chapter I, page I-1). In addition to the No-Action Alternative and three action alternatives that were considered in detail (Chapter II, pages II-23 through II-33), six other alternatives were considered that were eliminated from further study ("Alternatives Not Addressed in Detail" in

this appendix). These ten alternatives represent a reasonable range of alternatives given the purpose and need specific to this proposal.

5 (e). Mr. Juel requests that a definition be provided for "cost effective resource protection."

This term was used in relation to the Fire/Fuels analysis (page III-67), in identifying one of the objectives of fuels management under the Small Sales project: "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." Cost effective resource protection refers to the ability to contain a fire within the first burning period with local initial attack forces to avoid incurring costs associated with a large-scale project fire.

5 (f). Mr. Juel requests that the harvest prescriptions be tightened up in the EIS. "…the loose definitions of the cutting prescriptions and the loopholes provided elsewhere in the DEIS show that just about every tree in the proposed cutting units could be cut down and removed from the forest (p. 89-90). Yet the discussions of impacts are based on the assumption that only salvage and light thinning would occur in the non-"regeneration" units."

The description of the proposed action (Alternative 2) on pages II-24 and 25 as well as Alternatives 3 and 4 (pages II-25 and II-26) are not intended as site-specific definitions of harvest prescriptions. They are intended to provide the reader with a visual image of the activities that would occur and the general appearance of the stands following harvest activities. Marking guides that identify more specific features of the Selected Alternative would be completed prior to implementation, to ensure that the harvest activities and resource protection features of the alternative are consistent with those identified and intended by the EIS and Record of Decision.

5 (g). Mr. Juel is concerned that the project area boundaries are not clearly defined. "In several places the DEIS refers to a "project area" yet nowhere does it define it. There is no acreage figure given, nor is there a "project area" delineated on any of the DEIS's accompanying maps." He states there is no apparent logic for many of the analysis area boundaries, other than they enclose proposed cutting units. "They do not use watershed boundaries or other Logical Resource Unit boundaries."

The effects analysis areas are displayed on the maps provided with the EIS. Cumulative effects analysis areas were based on the appropriate geographic scale or common features applicable to each resource. For example, the watershed resources analysis assessed effects on at least two scales: the local site or tributaries where activities occur, and the cumulative effect watershed, which is usually at the 6th code (HUC) level (page III-97). In the wildlife effects analysis, the effects to elk were measured for each elk habitat unit (pages III-216 and III-217), which are much larger than the analysis areas used for Forest Vegetation. Analysis areas for other wildlife species are displayed on the analysis area vicinity map that was enclosed with the EIS. The first resource addressed in Chapter III, Forest Vegetation, provides the acres for each analysis area, and the portion of the area that is managed under the National Forest System.

5 (h). Mr. Juel expresses concern that harvesting on unsuitable areas is in contradiction to the Forest Plan.

The Forest Plan identified Management Area 9 lands as those areas of non-forest lands, lands not capable of producing industrial products, lands physically unsuited for timber production, and lands capable of timber production but isolated by the above type lands or nonpublic ownership (Forest Plan, page III-39). The goals for these lands are to maintain and protect existing improvements and resource productive potential, and meet visual quality objectives (Forest Plan, page III-39). No scheduled harvest will occur in Management Area 9 lands (Forest Plan, page III-40). Salvage harvest and removal of firewood and miscellaneous products may occur from existing access in these areas. Salvage harvest is defined by the Forest Plan as "The cutting of trees that are dead, dying or deteriorating…before they lose their commercial value as sawtimber," (Forest Plan, page VI-31).

Under the Small Sales EIS, harvest is proposed on lands identified as Management Area 9 in the Canfield Face, Cataldo Face, and Lower Little North Fork analysis areas (pages III-44, III-47, III-48, III-51, III-52, III-54, and III-55). The land identified as Management Area 9 in the Canfield Face analysis area (around Hayden Lake) is physically suitable for timber production and forest regeneration, but was given this designation in order to protect the visual resources near the lake. The proposed harvest in the Canfield Face area would occur on sites suitable for timber production (EIS, page III-44). The Management Area 9 land within the Cataldo Face analysis area does contain large areas unsuitable

for timber harvest. Harvest under the proposed action would occur on smaller sites suitable for timber production within the larger areas (EIS, page III-48). Most of the Management Area 9 land within the Lower Little North Fork analysis area is unsuitable for timber production and forest regeneration. About 12 acres of salvage would occur within Management Area 9, but these stands would not be managed for long-term timber production (EIS, page III-48).

5 (i). Mr. Juel contends that the "Likely to adversely affect" lynx determination in the "Biological Assessment of the Effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada Lynx" makes Section 7 formal consultation mandatory, before actions such as the Small Sales project are approved. He further states "the IPNF must amend its Forest Plan before allowing the project activities in lynx habitat, because implementation of the present Plan is a factor that has led to the necessity for listing lynx under the ESA [Endangered Species Act]."

Mr. Juel asserts that the basis upon which the conclusion that the areas to be logged are not lynx habitat is not given. He feels the concept of Lynx Analysis Units vastly oversimplify lynx habitat relationships, which results in the DEIS not presenting a sufficient analysis for lynx. He also contends that a database query is not adequate for delineation of lynx habitat components.

Based on conferencing with the U.S. Fish and Wildlife Service, this project is following recommendations found in the Canada Lynx Conservation Assessment and Strategy (USDA Forest Service, 2000). The strategy identified lynx analysis units (LAU's) to be managed for lynx. None of the proposed harvest units are within any of the lynx analysis units (Issues Not Discussed in Detail, page A-3). A map is provided in the Project Files ("Wildlife") displaying the location of the proposed harvest units in relation to the identified lynx analysis units and travel corridors; this map is available for review upon request. Approximately 51 acres of proposed harvest lie within lynx travel corridors. Upon further review of aerial photography and based on the type and location of past harvest activities, these additional units would not reduce lynx travel habitat and this project would have no effect on lynx populations. The effects analysis and determination of effects in the biological assessment specific to this project has been reviewed by the U.S. Fish and Wildlife Service; their letter concurrence with our findings is provided in the Project Files.

5 (j). Mr. Juel points out what he feels are deficiencies in the analyses (and methodologies used) for each of the Sensitive wildlife species. One of his concerns is that the DEIS is inconsistent with the Interior Columbia Basin Ecosystem Management Project "forest carnivore" report in terms of the home range for fishers.

The analysis for wildlife considered direct, indirect and cumulative effects. The level of analysis for each wildlife species depends upon a number of variables, commensurate with the importance of the impact, the risk associated with the project, the species involved, and the level of knowledge at hand (Chapter III, page III-181). The criteria for deciding to analyze individual wildlife species in detail are explained in the "Species Relevancy Screen" discussion in the EIS(pages III-181 and III-182). Some habitat and species may occur within the Coeur d'Alene River drainage but may not be applicable to any or all analysis areas. No further discussion or analysis is necessary for those species or suitable habitat that are not found within the assessment area. Additional rationale is provided in the Project File ("Wildlife") for those species dismissed from further consideration.

The ICBEMP Scientific Assessment provides information about current conditions and trends. The information can be used by land managers to develop management goals and priorities. It also provides the context for decisions specific to smaller areas (An Assessment of Ecosystem Components in the Interior Columbia Basin and Portions of the Klamath and Great Basins, Volume I, June 1997, page 11). The information provided under the ICBEMP project regarding fisher home ranges is specific to Idaho. The information used for the Small Sales EIS used an average home range size not specific to Idaho. The use of a smaller home range in the Small Sales EIS analysis of effects to fisher represents a "worst-case" scenario. The ICBEMP home range figure could be used, but would dilute the effects due to the larger area involved.

Effects to goshawk were analyzed in detail, as disclosed in Chapter III (pages III-208 through III-216). Black-backed woodpeckers, boreal toads, harlequin ducks, Townsend's big-eared bats, white-headed woodpeckers, and wolverines were briefly discussed under "Issues Not Discussed in Detail" in this appendix, with additional supporting information in the Project Files ("Wildlife"), which are available for review upon request (Chapter I, page I-3).

5 (k). Mr. Juel is also concerned that the IPNF has failed to monitor population trends of old growth management indicator species as required by the Forest Plan. He contends that the EIS must disclose the District's methodology for maintaining viable populations of old growth species (pine marten, pileated woodpecker, and northern goshawk), "since it lacks population monitoring information, is unable to meet forest wide and OGMU Forest Plan old growth standards."

The methodology for the wildlife analysis is described in Chapter III (pages III-181 through III-184). Effects to habitat for pileated woodpecker are summarized under "Issues Not Discussed in Detail" (page A-5), with additional information provided in the Project Files ("Wildlife"). Since marten are in the same guild as fisher, any changes to fisher habitat will reflect changes to marten habitat. Effects to fisher habitat are disclosed on pages III-191 through III-201. Effects to habitat for northern goshawk are disclosed on pages III-208 through III-216.

The Ninth Circuit Court (which encompasses Idaho) has held that quantitative population data is not required by 36 CFR 219.19 (Inland Empire Public Lands Council v. U.S. Forest Service, 88 F.3d 754, 9th Cir. 1996), and clearly sanctioned the use of habitat analysis for those Management Indicator Species for which population data could not be obtained.

5 (l). Mr. Juel is concerned that the DEIS does not disclose whether the IPNF is meeting Forest Plan old growth standards. He points out that the Douglas-fir Beetle EIS "implied that old growth would be lost due to the effects of the beetle, yet this DEIS does not project a loss in acres of old growth." He requests that this inconsistency be addressed in the EIS.

"The Forest Plan (page II-29) set a standard of maintaining at least 10 percent of the forested portions of the IPNF as old growth. Old Growth Units (OGU) were established on the Forest with the objective of maintaining at least five percent of each OGU as old growth (and 5 percent as replacement stands) where old growth was available. Not all OGUs have five percent available old growth, and some have more," (Forest Vegetation, page III-32). Old growth is discussed for each analysis area under "Forest Vegetation" in Chapter III, with additional information provided in the Errata for the Small Sales EIS.

5 (m). Mr. Juel contends the Small Sales DEIS cannot be tiered to another project-specific EIS (specifically, the Douglas-fir Beetle EIS). "A full analysis of direct, indirect, and cumulative effects must be disclosed in the SS EIS."

"Tiering" refers to the coverage of general matters in broader environmental impact statements with subsequent narrower statements or environmental analyses, incorporating by reference the general discussions and concentrating on the issues specific to the statement being prepared. Agencies are encouraged to tier their environmental impact statements to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review (Forest Service Handbook 1909.15, Chapter 20, Section 22.31). One example of when tiering is appropriate is from an environmental impact statement on a specific action at an early stage to a supplement or a subsequent statement or analysis (Council on Environmental Quality, 40 CFR 1508.28). Based on that information, it is appropriate for the Small Sales EIS to tier to information already presented in the Douglas-fir Beetle EIS.

5 (n). Mr. Juel asserts that the DEIS fails to disclose the degree to which research has shown that logging activities will increase fire risk. "The DEIS also fails to disclose that the project will do little or nothing to protect buildings and private property from wildfire risk."

The "Fire/Fuels" analysis does discuss increased fire fuels associated with logging activities, and measures that can be taken to reduce the fire risk associated with timber harvest (page III-77). The areas proposed for harvest under the Small Sales EIS have increased fire risks associated with timber damage and mortality as a result of ice storms, wind events, diseases, and insect infestations (page I-1). Slash resulting from the proposed logging operations would be reduced through the proposed fuel treatment activities identified in the EIS (Chapter II, Table II-16).

5 (o). Mr. Juel requests that the Forest Service review Tiedemann et al. (2000) in order to improve the analyses of the proposed prescribed fire.

The disclosure of effects related to Fire/Fuels identifies the information resources used in the analysis (full citations are provided in the List of References); these did not include Tiedemann et al, 2000. The methodology used for the Fire/Fuels analysis is described on pages III-73 and 74 of the EIS, and is based on the best information available at the time the analysis was completed. The fuels specialist has reviewed the reference, and found that for the most part it does not apply to the Small Sales project, since the concerns identified are based on different circumstances than would occur with the proposed fuels treatment under the action alternatives. For example, the interval before fuels treatment would re-occur in this area would be much longer than described in the reference.

5 (p). Mr. Juel states that until there is a decision made on the Roadless Area policy, actions that will alter the roadless characteristics (such as the proposed logging) must not take place. "The DEIS has no maps of roadless areas, to allow the public to see if the boundaries of inventoried roadless areas are correct."

A portion of one of the analysis areas (East Rutherford) is located within the Skitwish Ridge Roadless Area. The description of activities proposed within the roadless area (pages II-24 and II-25) refers the reader to an analysis area map enclosed in the map package provided with the EIS, displaying the Skitwish Ridge Roadless Area. The proposed activities are covered by and comply with the existing programmatic environmental impact statement for the Forest Plan. A decision to select any of the alternatives considered under the Small Sales EIS would not limit the alternatives or prejudice the decision for the Roadless Area Conservation Policy.

5 (q). Mr. Juel is concerned that "the SS DEIS identifies several "opportunities" for watershed restoration but selection of action alternatives would not include commitments for actually doing the restoration. The DEIS does not disclose the impacts of the ongoing or potential watershed degradation which would occur if the work is not done."

The purpose and need for the Small Sales project does not include watershed restoration (Chapter I, page I-1). The watershed restoration opportunities identified on pages II-20 through II-22 are not mandatory for project implementation, nor guaranteed to be implemented, but may be accomplished if funding becomes available. The salvage of timber under this proposal may provide the funding to finance some of this watershed restoration.

5 (r). Mr. Juel is also concerned that the DEIS does not disclose sufficient information related to watershed resources, including which of the road segments in the affected watersheds are not currently meeting BMP standards, and contends that the DEIS relies upon unvalidated modeling for its watershed cumulative effects analysis. "Although the FS claims the models are to be used only for comparison between alternatives, it is clear the Forest Service exceeds those bounds and uses the results as if they are really quantitative estimates of predicted impacts."

The effects to watershed resources and fisheries were analyzed in detail and disclosed in the EIS (Chapter III). Methodology is discussed on pages III-94 through 96 and III-169 through III-173. The analysis included the effects of roads on stream channels, disclosing for each watershed the existing and anticipated miles of encroaching roads on stream channels (Tables III-25 through III-58). To minimize erosion and ensure compliance with State water quality standards, all road construction and timber harvest associated with the Small Sales project would be completed using Best Management Practices (BMPs). The Forest Service Handbook (Soil and Water Conservation, 2509.22) outlines Best Management Practices that meet the intent of the water quality protection elements of the Idaho Forest Practices Act (page II-28).

The effects analysis is based on more than simply modeling. The estimated responses are combined with other sources of information and analyses to determine the findings of probable effects (page F-1). Models are designed to address and integrate a vast and complex number of conditions, and organize the evaluation according to rule sets established by the author. In the case of WATSED, the rule sets were based on research, and on data and analysis collected locally. The models, however, also include simplifying assumptions, and do not include all possible controlling factors. Therefore, the use of models is to provide one set of information to the technical user who must integrate knowledge of the model and its limitations with other models, data, analyses, experience and judgment to make the appropriate determination of findings and conclusions (page F-1). For more information, please refer to the Project Files, Watershed, WATSED).

5 (s). Mr. Juel challenges the premise that most forested stands in general have a higher stocking level than occurred naturally and are dominated by Douglas-fir, due to the suppression of fire. The DEIS "provides no information on the number of Douglas-fir trees on any acre of land to support this supposition. It does not disclose any quantitative information based upon field measurements of present conditions." He further contends that "the DEIS merely parrots the conclusions of the ICBEMP process, and like that process isn't based upon information gathered in this specific area."

The information used in the description of existing Forest Vegetation conditions came from a variety of sources (EIS, pages III-10 and III-11). The extent and location of current bark beetle infestations on the Coeur d'Alene River Ranger District were based on aerial insect detection flights conducted in late summer of 1998-99 and on field surveys of sites with active beetle populations (1998-99). Information on habitat types, forest cover types, forest structural stage and past harvest activity are based on the Timber Stand Management Record System (TSMRS) database, stand exam information, historical records and aerial photo interpretation. Site-specific field reconnaissance notes for each proposed harvest unit are part of the Project Files ("Alternative Development").

5 (t). Mr. Juel also requests that the Ecology Center's January 25, 2000 letter to the Forest Supervisor be incorporated as comments on this DEIS. "Please place a copy of that letter in the Project File as responsive to your request for comments on the DEIS. The contents of the letter are based upon many years of experience in the public involvement process on the Coeur d'Alene River Ranger District, the IPNF and the national forests of the region as a whole. We also incorporate the Kootenai Environmental Alliance's comments on the Small Sales DEIS within our comments on the Small Sales DEIS."

In the past two years, Mr. Juel has made similar requests to incorporate letters he had written to Forest Supervisor David Wright regarding his desires for management of the National Forest. The Forest Supervisor has consistently responded that such an approach to public comment is insufficient, and does not meet the requirements for commenting on Forest Service proposals, which requires "specific facts or comments along with supporting reasons that the person believes the Responsible Official should consider in reaching a decision" (36 CFR 215.6(b)). Most recently, Mr. Juel was advised that many of the concerns he raised in his January 25, 2000 letter are more appropriately addressed at the Forest Plan scale or at even a more broad scale (letter to Jeff Juel from Forest Supervisor David Wright dated February 11, 2000). Mr. Juel was asked to respond as specifically as possible to project level proposals. Comments from the Kootenai Environmental Alliance (Mike Mihelich) are already included in this appendix.

5 (u). Mr. Juel identifies inaccuracies that he feels should be corrected. "The DEIS has a heading <u>Effects Common to All Alternatives</u> on page 80, and then again in the same Forest Vegetation section on page III-106. This is extremely confusing." He also found Figures III-5 and III-6 illegible.

The subtitle "Effects Common to All Alternatives" on page 80 pertained to the "Direct, Indirect and Cumulative Effects at the <u>Analysis Area</u> Scale (as indicated by the title directly above the subtitle). The same subtitle on page 106 pertained to the "Cumulative Effects at the <u>Small Sales EIS Project Area</u> Scale," and indicated by the title on page 103.

Figures III-5 and III-6 (part of the fuels analysis) could be difficult to discern if they were independent of the effects discussion. The discussions in that portion of the "Fire/Fuels" section provide conclusions drawn from the graphs: "As depicted, 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…" (page III-77); "As displayed in the figure below, salvage logging would increase potential flame lengths over the short term…" (page III-79).

5 (v). Jeff Juel identifies concerns related to other timber sales that are outside the scope of this project decision. "The DEIS discloses that the FS still plans to sell Horizon Moon and other timber sales in the vicinity of the SS project. However, the NEPA documents prepared for those sales are now out-of-date due to the conditions that have changed since their decision documents were signed…Simply put, selling Horizon Moon and the rest of those sales would violate NEPA. They must be re-analyzed in an updated NEPA public involvement process."

Re-examination of the Horizon Moon and other timber sales is outside the scope of this analysis and decision. Timber sales are assessed prior to implementation to ensure they comply with appropriate laws, regulations and policies. If new information or changed circumstances come to the attention of the responsible official after a decision has been made and prior to completion of the approved program or project, the responsible official must review the information

carefully to determine its importance. After an interdisciplinary review and consideration of new informtion within the context of the overall program or project, the responsible official determines whether a correction, supplement or revision to an environmental document is necessary, in compliance with the guidance provided by Forest Service Handbook 1909.15, Chapter 10, Section 18.1.

5 (w). Mr. Juel also describes concerns related to monitoring of ORV and snowmobile use in the Forest. "Without consistent and meaningful monitoring of this item, it is impossible for the IPNF to be able to understand the cumulative effects of ORV impacts to resources such as wildlife populations, soil productivity, and water quality."

Effects of off-road vehicles on resources, uses and public safety is a Forest Plan monitoring item (Forest Plan, page IV-11) with annual disclosure in the Forest Plan Monitoring and Evaluation Report. There are no proposed changes to ORV or snowmobile use under the Small Sales EIS. Project activities would have only transitory effects on recreation access and opportunities (page E-6). All alternatives would meet standards and guidelines of the Forest Plan, and would be consistent with the recommendations and findings of the Interior Columbia Basin Ecosystem Management Project and Geographic Assessment (page E-6).

Concerns identified by Mike Mihelich, Kootenai Environmental Alliance (Comment Letter #06)

Comments 6(a) through 6(j) were received from Mr. Mihelich based on review of the Draft EIS. Comments 6(k) through 6(n) were received from him following our notice of intent to prepare a revised Final EIS.

6 (a). Mr. Mihelich is concerned that the DEIS did not address the issue of whether there are in fact "at least 18,000 acres of true old growth on the former Fernan District." "There is also the question as to whether certain areas that have trees that are classified as old growth, do in fact contain trees that meet the current definition of old growth." He asserts that the Final EIS needs to indicate whether the current TSMRS data indicates there are at least 57,446 acres of actual old growth on the Coeur d'Alene River Ranger District. He also requests that the Final EIS supply data from the TSMRS that will indicate if Alternatives 2 or 3 would log any stands of trees that contain old-growth characteristics in any of the analysis areas, and the total number of acres that have been logged between calendar years 1991 and 1999, from both districts, where the logging has removed trees with a basal area greater than 14 inches.

The TSMRS database currently identifies 60,068 acres of stands managed for old growth habitat on the Coeur d'Alene River Ranger District; an estimated 20,100 acres of this is on the western half of the District (the former Fernan Ranger District). It is not the intent of the Small Sales EIS to revisit old growth allocation across the Coeur d'Alene River Ranger District; effects to old growth stands are analyzed where there is timber harvest proposed within specific allocated old growth stands. Old growth is discussed in the Forest Vegetation section of Chapter III, and Appendix D (Old Growth).

6 (b). Mr. Mihelich is concerned with the WATBAL and WATSED models. "If there is a specific page number(s) in the current WATSED manual that clearly indicates a high degree of scientific accuracy for stream routing with a high level of recognition of stream dynamics, the Final EIS needs to supply the page number(s)." Also, the DEIS "does not indicate the year when either the WATBAL model or WATSED model was first used for the timber sales that took place in and adjacent to each of the cumulative effects analysis areas." Mr. Mihelich feels the year in which either one of the models was first used is a critical component of NEPA's requirement at 1500.1(b) regarding accurate scientific analysis, high quality information, and expert agency comments. He also states that the Final EIS must indicate the minimum number of acres in a watershed that can be modeled by the WATBAL and WATSED models.

Mr. Mihelich asks that the Final EIS clarify which model was used to estimate peak flow. "The Final EIS needs to clarify which model was used to estimate peak flow. Page 143, under Hydrological Regime, implies that the WATBAL model was used to estimate peak flows. Page 151 under Peak Flow states, "The WATSED model also was used for this analysis to estimate the effects…" If both models were used to estimate peak flow, the Final EIS must state the reasons why both models were used."

The methodology used in the analysis of effects to watershed resources is discussed in Chapter III (pages III-93 through III-96 and III-101 through III-104), and in Appendix F. WATBAL is a component of the WATSED model. However, the effects analysis is based on more than simply modeling. The estimated responses are combined with other sources of information and analyses to determine the findings of probable effects (page F-1). Models are designed to address and integrate a vast and complex number of conditions, and organize the evaluation according to rule sets established by the author. In the case of WATSED, the rule sets were based on research, and on data and analysis collected locally. The models, however, also include simplifying assumptions, and do not include all possible controlling factors. Therefore, the use of models is to provide one set of information to the technical user who must integrate knowledge of the model and its limitations with other models, data, analyses, experience and judgment to make the appropriate determination of findings and conclusions (page F-1).

6 (c). Mr. Mihelich contends there are a number of issues not adequately addressed or analyzed in the Draft EIS, including bedload movement, stream temperature (in regard to Westslope cutthroat trout and bull trout), and dissolved oxygen concentrations (IDAPA 16.01.02, Section 250, pages 101-103).

Bedload movement was not addressed because it is not expected to change under any of the alternatives analyzed under the Small Sales EIS. Tree mortality caused by beetle damage would result in canopy loss that would be constant under all alternatives, and would be insignificant at the sixth-code watershed scale. There would be no effect to streamside canopy as a result of proposed activities under any action alternative due to the use of buffers as directed by the Inland Native Fish Strategy standards and guidelines for Riparian Habitat Conservation Areas (page III-171). With no anticipated change in canopy, there would be no change in stream temperature. Dissolved oxygen is directly related to stream temperature change; with no anticipated change in stream temperature, there would be no change to dissolved oxygen levels.

6 (d). Mr. Mihelich contends that the Final EIS must indicate if there is Forest Service monitoring data with accompanying written evaluations of the monitoring that has been performed for each of 28 timber sales he identifies. He adds that the Final EIS needs to indicate if there have been additional timber sales since 1987 in each of the analysis areas that have monitoring data and written evaluations of the effects to fisheries habitat from these timber sales.

Analysis area acres reflect the logical boundaries based on vegetation and terrain features, and are large enough to encompass the proposed harvest units. The analysis area boundaries do not follow old sale area boundaries, so comparison to past sales is irrelevant. Information specific to monitoring on the Coeur d'Alene River Ranger District can be obtained upon request. Monitoring results are reported annually, and a summary of the major findings from Forest Plan monitoring is made available to the public. Stream surveys are conducted at both the project and forest level (USDA Forest Service, Forest Plan Monitoring and Evaluation Report, 1998, page 79). Surveys are conducted to provide baseline information for monitoring trends of habitat composition, quality, and complexity. Some of these surveys are conducted only once, while others have been surveyed multiple years at the same location. Repeated monitoring through time will show whether fisheries habitat quality is stable, improving, or declining. Over 400 streams have been surveyed on the IPNF since 1988.

6 (e). Mr. Mihelich states, "The degraded fisheries and degraded water quality in the streams classified as NPF and FAR is a violation of the CWA and the Forest Plan."

The "properly functioning," "functioning at risk," and "not properly functioning" designations were assigned through the Geographic Assessment for the Coeur d'Alene River Basin (page III-95). In Chapter III of the EIS, these designations are identified in the discussion of existing conditions for each watershed, with the apparent watershed status estimated based on known conditions in the watershed, its sensitivity and resilience, and the disturbance history in the drainage (page III-101). The descriptions of streamflow regime, stream channel stability, and water quality in each watershed identify concerns specific to that watershed, regardless of the Geographic Assessment designation.

The analysis of effects to watershed resources and fisheries considered the effects of the proposed activities based on use of the Inland Native Fish Strategy standards and guidelines as well as Best Management Practices ("Features Designed to Protect Aquatic Resources, pages II-27 and II-28). The anticipated level of effects would be acceptable under any alternative; therefore, no additional mitigation measures were identified as necessary to implement the Small Sales EIS proposal.

6 (f). Mr. Mihelich asserts, "There is no discussion in Chapters II or III of the DEIS that explain why road construction that damaged watersheds and fisheries in the analysis areas occurred when there has been Forest Service road construction research that dates back to at least 1957." He questions, "Have there been any negative effects to the watersheds and fisheries in each of the analysis areas from road construction and reconstruction that took place after 1976? If there have been, have these effects from the new road construction and reconstruction that took place after 1976, when NFMA became law, damaged one or more watersheds and fisheries? If there are, these effects are not mentioned or described specifically in the DEIS." Mr. Mihelich also requests specific information related to road construction; for example, the number of miles of new road construction and reconstruction that took place from specific timber sales.

Effects of past activities, including road construction and reconstruction, have been considered in the analyses of effects to watershed resources and fisheries under the Small Sales proposal, as described in Chapter II (pages II-9 through II-20).

6 (g). Mr. Mihelich points out that "there is no information on page 28 that indicates whether the system roads planned to be used are now receiving regular road maintenance, including regular culvert inspections." He further states that page 28 "does not indicate if the non system roads planned to be used are completely brushed in, and if there are any plugged culverts on the nonsystem roads." He asserts that a lack of detailed information in the DEIS concerning road maintenance issues does not meet NEPA requirements for an explanation of missing or unavailable information.

Maintenance levels on roads associated with activities under the Small Sales EIS are described under "Transportation Planning" on page A-8 in this Appendix. Additional information is provided in the Project Files ("Transportation"). None of the roads currently closed but planned for use under the Small Sales project are completely brushed in. Road 1521UD is the only non-system road proposed for use; it is currently open. The timber sales would ensure that maintenance would occur on the roads used in association with the project.

6 (h). Mr. Mihelich disagrees with the information provided in the Draft EIS related to past harvests, specifically the number of clearcut acres. He is also concerned that the DEIS does not address the issue of locating new logging units adjacent to logging units from previous timber sales. Mr. Mihelich contends the analysis area boundaries have been "arbitrarily drawn up and do not accurately account for the past logging that is within a true cumulative effects analysis area."

The information provided in the EIS is correct. The discrepancies noted by Mr. Mihelich are likely the result of the methodology used in calculating acres by harvest method. In the EIS, acres of clearcut, seed tree and shelterwood harvests are tracked separately in the TSMRS database (as reflected in the tables related to Forest Vegetation in Chapters II and III), while it appears that Mr. Mihelich may be tracking all regeneration harvests as clearcut harvests. Analysis area acres reflect the logical boundaries based on vegetation and terrain features, and are large enough to encompass the proposed harvest units. The analysis area boundaries do not follow old sale area boundaries, so comparison to past sales is irrelevant. The watershed and wildlife analyses used larger scale areas for their effects analyses.

6 (i). Mr. Mihelich points out that no data is supplied in the DEIS from Forest Research publications that state how many acres in a 701,000-acre Forest are required in order to be classified as an epidemic. He contends there is no discussion "in the DEIS of the fact that the Forest Service has known for over 40 years of the relationship and interactions between the Douglas-fir beetle and Douglas-fir (DF) trees." He cites several publications. He asserts that, "in spite of the knowledge gained over 40 years ago by Forest Service entomologists, the Forest Service continued to plant DF trees across thousands of acres of the Coeur d'Alene National Forest. The Purpose and Need…does not provide expert agency comment as why this happened and the Vegetation section of Chapter III also does not provide expert agency comment why the planting of DF continued through 1998."

Whether the Douglas-fir beetle outbreak qualified as an epidemic is irrelevant to the scope of this proposal. The Small Sales EIS does not attempt to predict expansion of the beetle population or call for emergency actions to expedite the process. The intent of this proposal is to recover the economic value of dead and damaged timber, reduce fuels in areas of timber mortality (especially adjacent to private ownership), and to promote long-term vegetative objectives in areas of timber mortality (Chapter I, page I-1).

Douglas-fir has been planted because it is a valuable structural timber commodity. With improved seed collection abilities and increased awareness of the need to re-introduce pine and larch back into the ecosystem, reforestation efforts have shifted to include more pine and larch. All species of trees are vulnerable to attacks and mortality from certain insects and diseases. The fact that Douglas-fir is susceptible to bark beetles does not preclude the species from being managed as a valuable timber commodity.

6 (j). Mr. Mihelich states that a watershed restoration alternative should have been selected as the proposed action. "The DEIS completely ignored the watershed restoration programs associated with the Clean Water Action Plan and the federal funds that have been allocated for the highest priority watersheds in need of restoration."

An alternative was considered that would accomplish watershed restoration only, but was dismissed from further consideration (page A-11 in this Appendix). The purpose and need for the Small Sales project is to recover the economic value of dead and damaged timber, reduce fuels in areas of timber mortality (especially adjacent to private ownership), and to promote long-term vegetative objectives in areas of timber mortality (Chapter I, page I-1). Since the purpose and need did not include objectives related to watershed restoration, it would be inappropriate to select a watershed restoration alternative as the proposed action.

Watershed restoration opportunities are identified on pages II-20 through II-22; these are not mandatory for project implementation, nor guaranteed to be implemented, but may be accomplished if funding becomes available. The salvage of timber under this proposal may provide the funding to finance some of this watershed restoration. Aquatic restoration is occurring or reasonably foreseeable under other forest management projects across the district, as identified in Chapter II (Tables II-1 through II-15).

6 (k). Mr. Mihelich requests that the revised FEIS should supply analysis with data regarding historical peak flows and flow volumes in each of the watersheds where logging is being proposed. If these watersheds were gauged, then that historical data should be provided to contrast historical versus current flow volumes. If these watersheds were not gauged, the FEIS should describe the methods that were use to estimate historical flow volumes. Mr. Mihelich also requests that the FEIS displays if Hayden Lake, Fernan Lake, Wolf Lodge Creek, Cedar, Thompson, 4th of July, Cougar, Prado, Beaver, Downey, and Trail Creeks do or do not have a staff gauge or a full-time water level recorder.

The effects of past management were analyzed in the Coeur d'Alene Geographic Assessment (1998) and presented in the Small Sales EIS. Cumulative impacts on peak flows and sediment yields from past management and foreseeable actions are also being estimated using the indicators discussed in the Methods section of the EIS. Flow regime was estimated using the R1/R4 WATSED model. The model was run for a 50-year period beginning in 1980 and ending in 2031. It provides a useful basis for comparing alternatives and foreseeable actions to the existing condition. A summary will be provided in the FEIS and all detailed runs will be provided in the project files. The model will be run on watersheds which have the greatest risk of impact from management activities.

The IPNF has maintains eight long-term water quality-monitoring stations that are used as the basis for calibrating and validating watershed response models, such as WATSED. Two of these sites are located in the Central Zone on Halsey and Big Elk Creeks. These two sites were used to validate WATSED for peak flow and flow duration (See Forest Plan Monitoring and Evaluation Report 1999, page 31). WATSED results appear to be reasonably correlated over the period of record.

Other guages were installed in the IPNF at various times and locations, but have been discontinued. Data from these sites are limited and do not provide sufficient data to determine the specific effects of harvest activities. Inclusion of the historical flow data and guage history in the EIS is not germane to the analysis and is well beyond the requirements of NEPA.

6 (l). Mr. Mihelich states that KEA has obtained information that significant volumes of water have been moving in the following watersheds. Data for the Prichard Creek watershed shows that between the years of 1974 and 1979, the maximum steam flow recorded was 193 cfs, or 86,642.19 gallons per minute, and for Shoshone Creek between the years of 1979 and 1997, the maximum steam flow was 1,904 cfs, or 854,572.32 gallons per minute. He concludes that historical flow data for these watersheds would indicate whether cfs flows have changed over the last 40 years and that if there was no cumulative effects of past logging in relation to increases in flow volumes then the flow volumes would show no change.

This EIS does not infer that past activities over the last 40 years have had no effect on the watershed. The Coeur d'Alene River Geographical Assessment and the Small Sales EIS discuss the effects of past management on the watersheds. The available data are not sufficient to specifically identify flow changes from harvest activity in Shoshone and Prichard Creeks. The records are not of sufficient duration, nor do allow comparison between harvest and unharvested conditions. The maximum recorded flow cited by Mr. Mihelich does not provide any insight into to the condition of the watershed nor the effects of past management.

6 (m). Mr. Mihelich requests that the revised FEIS needs to indicate how previous logging in these watershed have not affected cfs flow volumes or peak flow volumes after logging took place in the watershed. As an example, Mr. Mihelich requests that the revised FEIS should include data for the number of acres that have been clearcut in the Lower Little North Fork over the past 40 years.

Past management effects are summarized in the EIS for each watershed under Existing Condition. This EIS does not imply that previous logging did not have any effect on existing watershed conditions. As stated by Mr. Mihelich in this letter, on page 190 of Chapter III of the DEIS, "Both monthly peak flows and the risk of rain-on-snow generated peak flows are presumed to be elevated from past management activities within the majority of the tributaries." That is a given. The cumulative effects analysis requires us to demonstrate whether the proposed treatments–along with past, present and reasonably foreseeable activities -- will improve, degrade, or have no effect on watershed condition.

6 (n). Mr. Mihelich questions whether the 26 cfsm figure for the Wolf Lodge drainage is correct or whether it should be 26 cfs for the drainage. He also questions whether these figures would include the effects of the completed Horizon Sun timber sale.

The Q2 26 cfsm figure as stated in the DEIS is the correct estimate. Q2 is the size of the peak flow that occurs on the average once every 2 years. Cfs refers to cubic feet per second of water flow. Cfsm refers to cubic feet per second per square mile of watershed. Cfsm allows a general comparison of between large and small watersheds. A comparison of cfs would have no meaning since a large watershed would naturally have a higher discharge. The cfsm figure does not include the effects of the Horizon Sun timber sale as well as effects from alternative D of the Douglas-fir Beetle because the CDA Geographic Assessment (from which the Q2 was taken) was completed in 1998 before the completion of the Horizon Sun timber sale.

Concerns identified by Greg Tourtlotte, Idaho Fish and Game (Comment Letter #07)

7 (a). Mr. Tourtlotte has serious reservations concerning the impact of the proposal on old-growth resources, and questions the need for harvest in old growth stands, given the scarcity of old growth in the Coeur d'Alene River Ranger District. He states the Idaho Fish and Game does not believe there is a strong enough rationale to justify deviating from the intent of the Forest Plan and further reduce the old growth component. He recommends that timber harvest activities target younger stands.

There are very few "true" old growth stands on the western half of the Coeur d'Alene River Ranger District. Most of the old growth stands proposed for treatment are a step down from true old growth, but are managed for those attributes that will trend the stands to old growth condition in the future. The only allocated old growth stands proposed for treatment under the Small Sales project are in areas adjacent to private ownership with an increased risk of stand-replacing fire due to increased fuel levels. There are numerous old growth stands across the district that have been affected by bark beetles and other natural events, but which are not proposed for treatment because they are not adjacent to private lands. Under the Small Sales project, additional stands will be identified for old growth management, to replace those old growth stands being treated with comparable timber that is more likely to meet the characteristics of true old growth.

7 (b). Mr. Tourtlotte points out that some data, such as equivalent clearcut acreages (ECA's), are missing for some of the watersheds. He states they are perplexed by the designation of some watersheds (such as Wolf Lodge Creek) in a "functioning at risk" category, when stream condition, channelization, intermittency, and collapsed fish populations indicate they are not functioning properly at all.

ECA's are part of the WATSED modeling. The WATSED model is an analysis tool that spatially and temporally organizes some typical watershed response relationships as a result of forest practices (EIS, page 143). The estimated responses are used in conjunction with other sources of information and analyses to determine probable effects of the proposed activities. ECA's were just one of the considerations in describing the existing hydrologic regime in each watershed (Chapter III, Watershed Resources), and were not calculated for all watersheds. Modeling was done for those watersheds with the most proposed activities, to allow for a comparative analysis of other watersheds.

The "properly functioning," "functioning at risk," and "not properly functioning" designations were assigned through the Geographic Assessment for the Coeur d'Alene River Basin (page III-95). In Chapter III of the EIS, these designations are identified in the discussion of existing conditions for each watershed, with the apparent watershed status estimated based on known conditions in the watershed, its sensitivity and resilience, and the disturbance history in the drainage (Tables III-25 through III-58). The descriptions of streamflow regime, stream channel stability, and water quality in each watershed identify concerns specific to that watershed, regardless of the Geographic Assessment designation.

7 (c). Mr. Tourtlotte states that many watersheds are at risk from increased peak flows. The analysis indicates that most of the trees to be harvested would be losing canopy anyway, due to mortality, but the Draft EIS does not provide a clear analysis of the differential risk to first and second order streams from timber harvest as opposed to tree mortality. He recommends that the Final EIS assess ECA's across headwater watersheds, and the condition of those watersheds.

Direct and indirect effects were considered at the tributary scale; cumulative effects were analyzed at the 6th code level. The difference in changes in canopy cover between the No-Action and Action Alternatives was immeasurable. In conjunction with the maintenance of no-entry instream buffers (in compliance with Inland Native Fish Strategy standards and guidelines) this is expected to result in no change to headwater watershed conditions under any of the alternatives (page III-171).

As stated earlier, ECA's are part of the WATSED modeling. The WATSED model is an analysis tool that spatially and temporally organizes some typical watershed response relationships as a result of forest practices (Appendix F). The estimated responses are used in conjunction with other sources of information and analyses to determine probable effects of the proposed activities. ECA's were just one of the considerations in describing the existing hydrologic regime in each watershed (Chapter III, Watershed Resources), and were not calculated for all watersheds.

7 (d). Mr. Tourtlotte is concerned that none of the proposed small sales appear to include watershed restoration activities, and the District is apparently relying on the restoration projects proposed under the Douglas-fir Beetle EIS. He recommends that the District look to use receipts from proposed small sales to accomplish restoration work.

The purpose and need for the Small Sales project is to recover the economic value of dead and damaged timber, reduce fuels in areas of timber mortality, and to promote long-term vegetative objectives in areas of timber mortality (Chapter I, page I-1). Watershed restoration opportunities are identified on pages II-20 through II-22; these are not mandatory for project implementation, nor guaranteed to be implemented, but may be accomplished if funding becomes available. The salvage of timber under this proposal may provide the funding to finance some of this watershed restoration. However, the timber to be salvaged under the Small Sales EIS is widely scattered over many areas of the district. The volume per acre is generally low and much of the wood to be removed is defective to a degree, with the risk of even further deterioration prior to actually removing the wood. With the emphasis on fire hazard reduction and associated costs, it is not likely that there would be much money generated to fund other activities such as watershed restoration (page II-20). The Coeur d'Alene River Ranger District has and will continue to evaluate proposals that focus on watershed restoration.

Concerns identified by Amy Gillette, Idaho Forest Owners Association (Comment Letter #08)

8 (a). The Idaho Forest Owners Association supports the proposed action (Alternative 2), and urges immediate implementation since many of the lands where project activities would occur are adjacent to private, non-industrial forestlands. Ms. Gillett cites the concerns of landowners that the threat of severe wildfire on the adjacent Forest Service lands will result in disaster this summer when the hot, dry weather begins. Furthermore, insects and disease have been spreading from Forest Service lands to adjacent private lands, causing unexpected mortality to the private lands. Ms. Gillett points out that it is the responsibility of the Forest Service to not only manage the forests in a healthy manner, but also to minimize the risks of wildfire and unhealthy forests to neighboring landowners.

Any of the three action alternatives would recover the economic value of dead and dying timber. The proposed action (Alternative 2) would provide the most effective combination of vegetative restoration and fuels treatment.

8 (b). Ms. Gillett is doubtful that true old growth exists on any of the Forest Service lands mentioned in the EIS. She states that trees 100-150 years old do not qualify as old growth by their definition, and that what few trees do remain in this age group are typically Douglas-fir and grand fir which will soon succumb to diseases (such as root rot), further reducing the number of trees in this category. She suggests harvesting the trees before they die, lose their value, and increase the risk of catastrophic wildfire.

There are very few "true" old growth stands on the western half of the Coeur d'Alene River Ranger District. Most of the old growth stands proposed for treatment are a step down from true old growth, but are managed for those attributes that will trend the stands to old growth condition in the future. The only allocated old growth stands proposed for treatment under the Small Sales project are in areas adjacent to private ownership with an increased risk of stand-replacing fire due to increased fuel levels. The Small Sales proposal would only reduce the dead and damaged timber component in these areas; the green timber component will be maintained as long as possible, even though at risk of losses to disease (such as root disease).

8 (c). Ms. Gillett supports the proposed prescribed burning, but urges extreme caution in determining when to burn and what methods to use, so that prescribed fires do not spread onto adjacent, private lands.

As stated earlier, the Coeur d'Alene River Ranger District has a strong record of success in relation to controlled burns. There are risks associated with controlled burning, but it is a valuable tool for reducing fuel loads in an area. Extra caution will be used when burning next to private ownership.

Concerns identified by Charles and Sarah Gates (Comment Letter #09)

9. Mrs. Gates is against the harvest associated with the Small Sales proposal (especially in old growth or roadless areas) based on her observations of logging that is occurring on Canfield Mountain. She is concerned "that people who are making decisions for the Forest Service have not seen the results of logging on Canfield Mountain."

The recent harvest areas on Canfield Mountain have been reviewed by a number of Forest Service representatives, including the Timber Sale Administrator, District team leader for the Douglas-fir Beetle EIS, Small Sales project team leader, and District Ranger.

Anticipated visual effectsas a result of proposed activities in the Canfield area are discussed on page 295 of the EIS. The area is fully visible to residential areas where there is great concern over the appearance of forested hills that often are viewed directly from people's homes. The proposed improvement harvests under the proposed action (Alternative 2) are designed to favor large ponderosa pine, and would have little visual effects other than creating a slightly more open effect in the tree cover on the hillside. Alternative 3 wouldu se salvage harvest methods only, which are generally not very noticeable on the landscape. Alternative 4 does not propose harvest in the Canfield area.

A letter was sent to Mrs. Gates, responding to her concerns with the recent logging on Canfield Mountain (Project Files, Public Involvement).

Concerns identified by Sara Denniston, Idaho Rivers United and Idaho Conservation League (Comment Letter #10)

10 (a). Ms. Denniston indicated that her organizations object to the proposed action (Alternative 2). She is concerned that the DEIS does not consider an adequate range of alternatives, asserting, "There is little difference between the action alternatives."

There are specific differences between the action alternatives. Alternative 2 is the proposed action, identifying ecosystem burning activities, timber harvest (using a combination of harvest methods), and fuels treatment, with activities occurring in both allocated old growth and inventoried roadless areas (pages II-23 and II-24). Alternative 3 differs in that the only harvest method used would be the salvage method, and there would be no ecosystem burning (pages II-24 and II-25). Alternative 4 is substantially different that Alternatives 2 and 3 in that there would be no activities in either allocated old growth or inventoried roadless areas (pages II-25 and II-26). In addition to the No-Action Alternative and three action alternatives that were considered in detail, six other alternatives were considered that were eliminated from further study (pages A-9 through A-11 in this appendix). These ten alternatives represent a reasonable range of alternatives given the purpose and need specific to this proposal.

10 (b). Ms. Denniston recommends that the Forest Service craft an alternative which does not include any clearcuts or logging in old growth stands, because the activities are unnecessary and unduly harmful to fish, wildlife, forest health, and stream health. She believes the Forest Service failed to adequately explain why logging is necessary in old growth stands.

The only allocated old growth stands proposed for treatment under the proposed action (Alternative 2) are in areas adjacent to private ownership with an increased risk of stand-replacing fire due to increased fuel levels. Under Alternative 3, harvest would occur in those allocated old growth stands but would use only salvage harvest methods, not regeneration harvest methods. Under Alternative 4, there would be no harvest treatment in any allocated old growth.

There are numerous old growth stands across the district that have been affected by bark beetles and other natural events, but which are not proposed for treatment because they are not adjacent to private lands. Under the Small Sales project, additional stands will be identified for old growth management, to replace those old growth stands being treated with comparable timber that is more likely to meet the characteristics of true old growth.

10 (c). Ms. Denniston also recommended that the selected alternative not include any logging in roadless areas, regardless of whether any road building is necessary. "Roadless areas provide our healthiest forests, cleanest water, and best fish and wildlife habitat." In addition, she point out that it is "inappropriate for the Forest Service to commit to any activities that might be prohibited under the President's Roadless Initiative until a final roadless rule has been implemented. The Roadless Initiative DEIS includes alternatives that would limit or ban logging in roadless areas. Therefore, the Panhandle National Forests proposal to log in roadless areas could very well be in violation of that rule."

A portion of one of the analysis areas (East Rutherford) is located within the Skitwish Ridge Roadless Area. The description of activities proposed within the roadless area (pages II-24 and II-25) refers the reader to an analysis area map enclosed in the map package provided with the EIS which displays the Skitwish Ridge Roadless Area. The proposed activities are covered by and comply with the existing programmatic environmental impact statement for the Forest Plan. The Final Rule will be effective May 12, 2001. Alternatives 1 and 4 would be consistent with this rule, because neither proposes any activities within the roadless area. Alternatives 2 and 3 both propose timber harvest within the roadless area, so neither would appear to be consistent with this rule. However, there are specific exceptions to the Rule; if either Alternative 2 or 3 were selected for implementation, there would need to be additional analysis to determine whether the proposed harvest activities meet the criteria to be exempted from the rule (pages III-232 and III-233).

10 (d). Ms. Denniston maintains that the selected alternative must include sufficient riparian buffer zones for logging and road building activities that do occur. "It is not enough to rely on the INFISH buffers, which are merely a minimum standard. In order to sufficiently protect water quality, fish habitat, and riparian areas, no logging or road building should occur within ¼ mile of any stream."

In development of the action alternatives, standards and guidelines of the Inland Native Fish Strategy were used specifically to protect water and aquatic biota during implementation of the activities under the Small Sales EIS project (pages II-27 and II-28). 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 (pages II-4 and II-5). 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.

The analysis of effects to watershed resources and fisheries considered the effects of the proposed activities based on use of the Inland Native Fish Strategy standards and guidelines as well as Best Management Practices (pages II-27 and II-28). The anticipated level of effects would be acceptable under any alternative; therefore no additional mitigation measures were identified as necessary to implement the Small Sales EIS proposal.

10 (e). Ms. Denniston was also concerned that the maps were difficult to read, due to the use of low-resolution black and white maps.

Color maps are occasionally warranted when maps need to display a great deal of detail. However, the maps associated with the Small Sales EIS were relatively simple, and did not warrant the expense of the color maps. Larger scale maps are available upon request from the Coeur d'Alene River Ranger District.

Concerns identified by Diane Riley, Idaho Department of Environmental Quality (Comment Letter #11)

11. Ms. Riley's comments focused upon air quality. She pointed out that "without the project file, it is difficult to evaluate whether air quality was adequately addressed…There should be a summary of the air quality analysis from the project file included in the DEIS." She states that the DEIS should disclose such information as: maximum number of acres to be burned in a day; PM10 and PM2.5 emission estimates; smoke sensitive areas; emission reduction techniques; public notification process; mitigation actions during smoke intrusion episodes; alternatives to burning considered and used; and coordination with other burn activity. "It would be useful to see an analysis of the emission reductions gained from harvest followed by burn treatment as compared to a burn only treatment."

The issue of air quality is not addressed in detail in this environmental impact statement, but was used to develop features of the alternatives (page A-6). Because use of prescribed fire would be based on smoke management guidelines, current air quality standards would not be exceeded under any alternative. A statement is provided in the EIS that supporting information is provided in the Project Files (page A-6) and that all Project Files are available for review by the public by contacting the Project Team Lead or NEPA Coordinator (Chapter I, page I-3). A copy of the Project Files related to air quality have been sent to Diane Riley.

Concerns identified by Susan Weller, National Audubon Society (Comment Letter #12)

12. Susan Weller's comments focused on the proposed treatment in allocated old growth areas. "Most of the old growth on the Coeur d'Alene Ranger District is fragmented, isolated, or both. Further disturbance by entry for salvage logging puts more stress on old growth-dependent species struggling in substandard habitat."

She indicates that Coeur d'Alene Audubon is not against using logging as a management tool, but they are opposed to entering old growth forests for any reason (but particularly in the Thompson Creek area). Based on specific site conditions, she acknowledges that the allocated old growth in the Canfield area would benefit from timber and prescription fire management, "but that only provides the tree component." She suggests a noxious

weed eradication program followed by an aggressive public awareness campaign might help improve both the spotted knapweed and the "off-roading" problems.

Coeur d'Alene Audubon supports the identification of additional old growth as replacement for those areas entered under the Small Sales EIS project. Ms. Weller proposes trading the old growth at Canfield and Blue Creek for old growth at Stella and Fortier Creeks, which "actually exhibits some characteristics of old growth."

We agree that the old growth in the areas proposed for harvest and fuels treatment is not of the highest quality. There are very few "true" old growth stands on the western half of the Coeur d'Alene River Ranger District. Most of the old growth stands proposed for treatment are a step down from true old growth, but are managed for those attributes that will trend the stands to old growth condition in the future. The only allocated old growth stands proposed for treatment under the Small Sales project are in areas adjacent to private ownership with an increased risk of stand-replacing fire due to increased fuel levels. The primary intent of entering these stands is not the recovery of the economic value of the timber, but to reduce fuels in areas adjacent to private ownership (pages A-8 and A-9).

There are numerous old growth stands across the district that have been affected by bark beetles and other natural events, but which are not proposed for treatment because they are not adjacent to private lands. Under the Small Sales project, additional stands will be identified for old growth management, to replace those old growth stands being treated with comparable timber that is more likely to meet the characteristics of true old growth into the future. The recommendations made by Coeur d'Alene Audubon Society will be considered in determining management of these stands.

Concerns identified by Daugherty Logging Crew and Family (Comment Letter #13)

13. The Daugherty Logging Crew and Family support the proposed activities under Alternative 2 based on their observations of the timber damaged by the Douglas-fir bark beetles and other events. They feel the trees should be harvested both for the economic value of the timber and to protect the communities and resources from increased fire risk.

Any of the three action alternatives would recover the economic value of dead and dying timber. The proposed action (Alternative 2) would provide the most effective combination of vegetative restoration and fuels treatment.

Concerns identified by Richard B. Parkin, United States Environmental Protection Agency (Comment Letter #15)

15 (a). The EPA expressed concerns about the salvage of dead or dying trees in old growth stands and the likely detrimental effect on the quality of old growth characteristics. As stated, the EPA can appreciate the concerns of neighboring landowners regarding the heightened risk of wildfires if these stands are not treated. However, they feel that the DEIS does not clearly characterize the fire risk to the nearby landowners and the salvage standards that will be used in these areas.

Additional information has been incorporated into Appendix D, Old Growth to provide more site-specific data in relation to fire risk and salvage standards in these areas (as described in the Errata package).

15 (b). The EPA commented that under the Douglas-fir Beetle EIS, they had expressed concern if additional beetle-kill salvaging efforts would follow that large-scale project, especially in light of projects already planned for the areas. The EPA questioned why the Small Sales EIS was not identified as a Foreseeable Activity under the Douglas-fir Beetle EIS and if there will be more small sales to come. Coupled with that concern was if the salvage of dead and dying timber did in fact reduce the amount of green timber scheduled to be harvested.

There is only a limited period of time in which the beetle-killed timber will be merchantable after infestation. Due to these limits, the Small Sales EIS is expected to be our last attempt to salvage anything that died during the 1998 season. As the beetle population declines, and fewer fresh hit areas are discovered, the scope of the beetle salvage will decline as well.

The Small Sales EIS was not identified under the Douglas-fir Beetle EIS (DFB EIS) because it was not conceived at that time. The DFB EIS predicted expansion of the population and assessed the additional mortality, but generally only adjacent to the existing mortality areas. The Small Sales EIS was developed after the DFB EIS was completed and some adjacent landowners came to realize that areas of concern to them were not part of the original salvage effort. Later, aerial and field reconnaissance indicated that there were significant areas of mortality outside of the DFB EIS analysis areas. Will there be more small sales? It is the intent of the Forest Service to salvage to recover value and foster forest health through vegetative treatment. There will likely be small salvage sales proposed as areas in need of treatment are discovered.

The IPNF has produced 70-80 million board feet of timber per year over the last several years. That figure did not increase during the beetle salvage effort. How that has affected projects proposed across the Idaho Panhandle is beyond the scope of this project. On the Coeur d'Alene River Ranger District, large-scale salvage efforts have been ongoing since the ice storm. Landscape-level projects such as Iron Honey and Steamboat have been delayed due to these salvage efforts, delaying the harvest of green timber. Most are or will come back on line because of the aquatics and terrestrial restoration needs for the areas. Consideration of potential activities in the Tenderfoot Horse areas will likely not be initiated since restoration work in that area will be accomplished under the Douglas-fir Beetle EIS.

APPENDIX B
SPECIFIC UNIT INFORMATION

INTRODUCTION

The following tables provide specific harvest unit information under each alternative (estimated acres have been rounded to the nearest whole number). No timber harvest is proposed under Alternative 1; therefore there is no information provided here regarding that alternative. Please refer to Chapter II for complete alternative descriptions.

Table B-1. Specific unit information, Alternative 2.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Blue Creek	13	26	Improvement harvest	Helicopter	Jackpot
Blue Creek	14	33	Improvement harvest	Helicopter	Jackpot
Blue Creek	20	4	Regeneration	Helicopter	Jackpot
Blue Creek	21	9	Regeneration	Helicopter	Jackpot
Blue Creek	22	7	Improvement harvest	Helicopter	Jackpot
Callis	1	64	Salvage	Skyline	Jackpot
Callis	2	4	Salvage	Tractor	Grapple pile
Callis	3	57	Salvage	Tractor	Top attach
Callis	4	3	Salvage	Tractor	Grapple pile
Callis	5	5	Salvage	Tractor	Grapple pile
Callis	6	22	Salvage	Skyline	Top attach
Callis	7	29	Salvage	Skyline	Jackpot
Callis	8	13	Salvage	Skyline	Jackpot
Callis	9	29	Salvage	Skyline	Jackpot
Callis	10	21	Salvage	Skyline	Jackpot
Callis	11	4	Salvage	Skyline	Jackpot
Callis	12	16	Salvage	Tractor	Grapple pile
Callis	13	14	Salvage	Skyline	Jackpot
Callis	14	8	Salvage	Tractor	Grapple pile
Callis	15	8	Salvage	Skyline	Jackpot
Callis	16	3	Salvage	Skyline	Top attach
Callis	17	13	Salvage	Skyline	Jackpot
Canfield	6	12	Improvement harvest	Helicopter	Jackpot
Canfield	7	3	Improvement harvest	Helicopter	Jackpot
Canfield	8	4	Improvement harvest	Helicopter	Hand pile
Canfield	9	7	Improvement harvest	Helicopter	Jackpot
Canfield	10	4	Improvement harvest	Helicopter	Jackpot
Canfield	19	4	Salvage	Helicopter	Hand pile
Cataldo	27	3	Salvage	Helicopter	Lop & scatter
Cataldo	28	2	Improvement harvest	Helicopter	Lop & scatter
Cataldo	29	<1	Salvage	Tractor	Lop & scatter
Cataldo	30	1	Improvement harvest	Cable	Lop & scatter
Cataldo	31	2	Improvement harvest	Helicopter	Jackpot
Cataldo	32	1	Salvage	Helicopter	Lop & scatter
Cataldo	33	2	Improvement harvest	Helicopter	Jackpot
Cataldo	34	<1	Salvage	Skyline	Lop & scatter
Cataldo	35	3	Salvage	Helicopter	Lop & scatter

Table B-1. Specific unit information, Alternative 2 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Cataldo	36	6	Regeneration	Helicopter	Underburn
Cataldo	37	2	Salvage	Cable	Lop & scatter
Cataldo	38	12	Regeneration	Skyline	Underburn
Cataldo	39	<1	Salvage	Tractor	Jackpot
Cataldo	40	1	Salvage	Tractor	Jackpot
Cataldo	41	1	Salvage	Cable	Jackpot
Cataldo	42	7	Regeneration	Skyline	Underburn
Cataldo	43	1	Salvage	Helicopter	Lop & scatter
Cedar	1	5	Regeneration	Helicopter	Underburn
Cedar	2	4	Improvement harvest	Helicopter	Lop & scatter
Cedar	3	2	Improvement harvest	Helicopter	Lop & scatter
Cedar	4	3	Salvage	Helicopter	Jackpot
Cedar	5	2	Salvage	Helicopter	Jackpot
Cedar	6	3	Improvement harvest	Helicopter	Jackpot
Cedar	7	1	Salvage	Helicopter	Lop & scatter
Cedar	8	3	Salvage	Helicopter	Lop & scatter
Cedar	9	1	Improvement harvest	Helicopter	Lop & scatter
Cedar	10	5	Salvage	Helicopter	Lop & scatter
Cougar	2	6	Salvage	Helicopter	Lop & scatter
Cougar	3	10	Salvage	Helicopter	Lop & scatter
Cougar	4	6	Regeneration	Cable	Underburn
Cougar	7	11	Salvage	Tractor	Top attach
Cougar	8	1	Salvage	Tractor	Top attach
Cougar	9	3	Salvage	Cable	Top attach
Downey	1	15	Salvage	Skyline	Top attach
Downey	2	1	Salvage	Helicopter	Lop & scatter
East Rutherford	1	29	Salvage	Helicopter	Lop & scatter
East Rutherford	2	30	Salvage	Helicopter	Jackpot
East Rutherford	3	3	Salvage	Cable	Lop & scatter
Fernan	11	25	Salvage	Helicopter	Lop & scatter
Fernan	12	9	Regeneration	Helicopter	Jackpot
Fourth of July	1	2	Salvage	Skyline	Lop & scatter
Fourth of July	2	1	Salvage	Cable	Lop & scatter
Fourth of July	3	4	Improvement harvest	Tractor	Jackpot
Fourth of July	4	1	Improvement harvest	Helicopter	Lop & scatter
Fourth of July	5	2	Improvement harvest	Skyline	Lop & scatter
Fourth of July	6	1	Improvement harvest	Skyline	Lop & scatter
Fourth of July	7	2	Salvage	Helicopter	Lop & scatter
Fourth of July	8	1	Salvage	Helicopter	Lop & scatter
Fourth of July	9	<1	Salvage	Helicopter	Lop & scatter
Fourth of July	10	2	Salvage	Helicopter	Lop & scatter
Fourth of July	11	3	Improvement harvest	Helicopter	Lop & scatter
Fourth of July	12	2	Improvement harvest	Helicopter	Lop & scatter
Fourth of July	13	10	Salvage	Helicopter	Lop & scatter
Fourth of July	14	4	Regeneration	Helicopter	Underburn
Fourth of July	15	1	Salvage	Tractor	Lop & scatter
Fourth of July	16	2	Salvage	Tractor	Lop & scatter
Fourth of July	17	<1	Salvage	Helicopter	Lop & scatter
Fourth of July	18	1	Salvage	Tractor	Lop & scatter
Fourth of July	19	3	Salvage	Tractor	Lop & scatter
Fourth of July	20	1	Salvage	Cable	Lop & scatter

Table B-1. Specific unit information, Alternative 2 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Fourth of July	22	3	Salvage	Tractor	Lop & scatter
Fourth of July	23	1	Salvage	Cable	Lop & scatter
Fourth of July	24	1	Salvage	Cable	Lop & scatter
Fourth of July	25	2	Regeneration	Skyline	Underburn
Fourth of July	26	3	Regeneration	Skyline	Underburn
Fourth of July	44	1	Salvage	Tractor	Lop & scatter
Fourth of July	45	2	Salvage	Helicopter	Hand pile
Fourth of July	46	2	Salvage	Helicopter	Lop & scatter
Fourth of July	47	5	Salvage	Horse	Hand pile
Fourth of July	48	1	Salvage	Cable	Top attach
Fourth of July	49	1	Salvage	Cable	Top attach
Fourth of July	50	3	Improvement harvest	Skyline	Lop & scatter
Gimlet	1	2	Salvage	Helicopter	Lop & scatter
Gimlet	2	1	Salvage	Tractor	Lop & scatter
Gimlet	3	2	Salvage	Skyline	Lop & scatter
Gimlet	4	2	Salvage	Helicopter	Lop & scatter
Gimlet	5	2	Salvage	Helicopter	Lop & scatter
Gimlet	6	3	Salvage	Helicopter	Lop & scatter
Gimlet	7	4	Improvement harvest	Helicopter	Lop & scatter
Gimlet	8	1	Salvage	Helicopter	Lop & scatter
Gimlet	9	2	Salvage	Helicopter	Lop & scatter
Gimlet	10	2	Salvage	Helicopter	Lop & scatter
Gimlet	11	3	Salvage	Helicopter	Lop & scatter
Gimlet	12	6	Salvage	Helicopter	Lop & scatter
Gimlet	13	3	Salvage	Cable	Lop & scatter
Gimlet	14	1	Salvage	Tractor	Lop & scatter
Gimlet	15	2	Salvage	Tractor	Lop & scatter
Gimlet	16	2	Salvage	Helicopter	Lop & scatter
Gimlet	17	3	Salvage	Helicopter	Lop & scatter
Gimlet	18	1	Salvage	Helicopter	Lop & scatter
Gimlet	19	5	Salvage	Skyline	Lop & scatter
Gimlet	20	2	Salvage	Helicopter	Lop & scatter
Gimlet	21	1	Salvage	Skyline	Lop & scatter
Hayden	1	6	Salvage	Tractor	Top attach
Hayden	2	3	Salvage	Helicopter	Hand pile
Hayden	3	3	Salvage	Helicopter	Lop & scatter
Hayden	4	5	Salvage	Helicopter	Lop & scatter
Hayden	5	2	Salvage	Helicopter	Lop & scatter
Little Tepee	1	5	Salvage	Helicopter	Jackpot
Little Tepee	2	9	Salvage	Helicopter	Lop & scatter
Little Tepee	3	11	Salvage	Helicopter	Jackpot
Little Tepee	4	7	Salvage	Helicopter	Lop & scatter
Little Tepee	5	3	Salvage	Helicopter	Jackpot
Little Tepee	6	5	Salvage	Helicopter	Jackpot
Little Tepee	7	4	Improvement harvest	Helicopter	Top attach
Little Tepee	8	4	Improvement harvest	Helicopter	Lop & scatter
Little Tepee	9	5	Improvement harvest	Helicopter	Lop & scatter
Little Tepee	10	4	Salvage	Helicopter	Lop & scatter
Little Tepee	11	3	Salvage	Helicopter	Lop & scatter
Little Tepee	12	2	Salvage	Helicopter	Lop & scatter
Little Tepee	13	4	Salvage	Helicopter	Lop & scatter

Table B-1. Specific unit information, Alternative 2 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Little Tepee	14	3	Improvement harvest	Helicopter	Lop & scatter
Little Tepee	15	2	Salvage	Helicopter	Lop & scatter
Little Tepee	16	5	Salvage	Helicopter	Lop & scatter
Little Tepee	17	4	Salvage	Helicopter	Lop & scatter
Little Tepee	18	2	Salvage	Helicopter	Lop & scatter
Little Tepee	19	1	Salvage	Tractor	Top attach
Little Tepee	20	5	Thin	Tractor	Top attach
Little Tepee	21	4	Thin	Tractor	Top attach
Owl	1	4	Salvage	Helicopter	Lop & scatter
Owl	2	3	Salvage	Skyline	Lop & scatter
Owl	3	2	Salvage	Skyline	Lop & scatter
Owl	4	3	Salvage	Helicopter	Lop & scatter
Owl	5	3	Salvage	Skyline	Lop & scatter
Owl	7	7	Salvage	Cable	Top attach
Owl	8	1	Improvement harvest	Skyline	Top attach
Owl	9	1	Improvement harvest	Skyline	Lop & scatter
Owl	10	1	Improvement harvest	Skyline	Lop & scatter
Owl	11	<1	Salvage	Tractor	Lop & scatter
Owl	12	3	Salvage	Helicopter	Lop & scatter
Owl	13	1	Salvage	Cable	Lop & scatter
Owl	14	1	Salvage	Cable	Lop & scatter
Owl	15	1	Salvage	Helicopter	Lop & scatter
Owl	16	2	Salvage	Cable	Lop & scatter
Owl	17	1	Salvage	Tractor	Lop & scatter
Owl	18	6	Salvage	Skyline	Lop & scatter
Owl	19	1	Salvage	Cable	Top attach
Owl	20	3	Salvage	Tractor	Top attach
Owl	21	2	Salvage	Cable	Top attach
Owl	22	<1	Salvage	Tractor	Top attach
Owl	23	2	Salvage	Cable	Top attach
Owl	24	3	Salvage	Cable	Top attach
Owl	25	3	Salvage	Cable	Top attach
Owl	26	2	Salvage	Cable	Top attach
Owl	27	8	Salvage	Skyline	Top attach
Owl	28	1	Improvement harvest	Helicopter	Lop & scatter
Owl	29	4	Improvement harvest	Helicopter	Lop & scatter
Owl	30	1	Salvage	Skyline	Top attach
Owl	31	1	Salvage	Cable	Top attach
Owl	32	1	Salvage	Cable	Top attach
Owl	33	3	Salvage	Helicopter	Lop & scatter
Owl	34	7	Salvage	Skyline	Top attach
Owl	35	2	Salvage	Tractor	Top attach
Potosi	1	11	Salvage	Helicopter	Jackpot
Potosi	2	3	Salvage	Helicopter	Jackpot
Potosi	3	5	Salvage	Helicopter	Lop & scatter
Potosi	4	9	Salvage	Helicopter	Jackpot
Potosi	5	5	Salvage	Helicopter	Jackpot
Potosi	6	2	Salvage	Helicopter	Jackpot
Potosi	7	5	Salvage	Helicopter	Lop & scatter
Potosi	8	7	Regeneration	Cable	Underburn
Potosi	9	7	Salvage	Helicopter	Lop & scatter

Table B-1. Specific unit information, Alternative 2 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Potosi	10	4	Salvage	Tractor	Jackpot
Potosi	11	6	Improvement harvest	Cable	Jackpot
Potosi	12	4	Thin	Helicopter	Lop & scatter
Potosi	13	3	Salvage	Helicopter	Lop & scatter
Potosi	14	2	Thin	Helicopter	Lop & scatter
Potosi	15	5	Salvage	Helicopter	Lop & scatter
Potosi	16	5	Salvage	Helicopter	Lop & scatter
Potosi	17	4	Salvage	Cable	Top attach
Potosi	18	2	Salvage	Cable	Top attach
Potosi	19	8	Thin	Skyline	Underburn
Potosi	20	2	Salvage	Cable	Top attach
Potosi	21	4	Salvage	Skyline	Lop & scatter
Potosi	22	1	Salvage	Cable	Lop & scatter
Potosi	23	1	Salvage	Cable	Lop & scatter
Potosi	24	4	Salvage	Cable	Lop & scatter
Potosi	25	5	Improvement harvest	Cable	Jackpot
Potosi	26	2	Salvage	Cable	Jackpot
Potosi	27	3	Thin	Cable	Lop & scatter
Potosi	28	6	Salvage	Cable	Lop & scatter
Potosi	29	4	Thin	Cable	Lop & scatter
Potosi	30	2	Salvage	Cable	Lop & scatter
Potosi	31	2	Thin	Cable	Lop & scatter
Potosi	32	3	Salvage	Horse	Hand pile
Prado	1	6	Salvage	Cable	Top attach
Prado	2	4	Improvement harvest	Tractor	Top attach
Prado	3	3	Improvement harvest	Tractor	Top attach
Prado	4	1	Improvement harvest	Tractor	Lop & scatter
Prado	5	2	Salvage	Cable	Lop & scatter
Prado	6	2	Improvement harvest	Tractor	Lop & scatter
Prichard	1	3	Salvage	Skyline	Top attach
Prichard	2	4	Regeneration	Skyline	Top attach
Prichard	3	4	Salvage	Helicopter	Lop & scatter
Prichard	4	3	Salvage	Helicopter	Lop & scatter
Prichard	5	7	Regeneration	Helicopter	Underburn
Prichard	6	6	Regeneration	Skyline	Top attach
Prichard	7	3	Salvage	Skyline	Top attach
Prichard	8	4	Regeneration	Skyline	Top attach
Prichard	9	3	Salvage	Skyline	Top attach
Prichard	10	3	Salvage	Helicopter	Lop & scatter
Prichard	11	4	Salvage	Helicopter	Lop & scatter
Prichard	12	1	Salvage	Helicopter	Lop & scatter
Prichard	13	8	Salvage	Helicopter	Lop & scatter
Prichard	14	1	Salvage	Helicopter	Lop & scatter
Prichard	15	4	Salvage	Helicopter	Lop & scatter
Prichard	16	2	Salvage	Helicopter	Lop & scatter
Prichard	17	12	Improvement harvest	Helicopter	Jackpot
Prichard	18	8	Improvement harvest	Helicopter	Jackpot
Prichard	19	1	Improvement harvest	Helicopter	Lop & scatter
Prichard	20	1	Improvement harvest	Helicopter	Lop & scatter
Prichard	21	5	Improvement harvest	Helicopter	Jackpot
Prichard	22	7	Improvement harvest	Helicopter	Jackpot

Table B-1. Specific unit information, Alternative 2 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Prichard	23	7	Regeneration	Cable	Underburn
Prichard	24	4	Regeneration	Cable	Underburn
Shoshone	1	7	Salvage	Helicopter	Lop & scatter
Shoshone	2	2	Thin	Helicopter	Lop & scatter
Shoshone	3	7	Salvage	Helicopter	Lop & scatter
Shoshone	4	10	Salvage	Helicopter	Lop & scatter
Shoshone	5	5	Regeneration	Skyline	Underburn
Shoshone	6	4	Regeneration	Skyline	Underburn
Shoshone	7	6	Salvage	Skyline	Top attach
Studer	10	3	Salvage	Cable	Top attach
Studer	11	4	Salvage	Tractor	Top attach
Thompson	15	14	Improvement harvest	Helicopter	Jackpot
Thompson	16	14	Improvement harvest	Helicopter	Jackpot
Thompson	17	8	Improvement harvest	Helicopter	Jackpot
Thompson	18	4	Improvement harvest	Helicopter	Hand pile
Thompson	23	8	Regeneration	Helicopter	Jackpot
White	1	8	Salvage	Cable	Jackpot
White	2	2	Salvage	Cable	Jackpot
White	3	7	Regeneration	Cable	Underburn
White	4	9	Salvage	Cable	Top attach
White	5	6	Salvage	Skyline	Top attach
White	6	5	Salvage	Skyline	Top attach
White	7	82	Salvage	Cable	Lop & scatter
Total	--		--	--	--

Table B-2. Summary of prescription types under Alternative 2.

Area Name	Improvement harvest acres	Regeneration acres	Salvage acres	Thinning acres	Total acres
Blue Creek	66	12	0	0	78
Callis	0	0	312	0	312
Canfield	30	4	0	0	34
Cataldo	7	25	13	0	45
Cedar	9	5	14	0	28
Cougar	0	6	31	0	37
Downey	0	0	16	0	16
East Rutherford	0	0	62	0	62
Fernan	0	9	25	0	34
Fourth of July	15	8	43	0	66
Gimlet	4	0	44	0	49
Hayden	0	0	19	0	19
Little Tepee	15	0	66	9	90
Owl	8	0	76	0	84
Potosi	10	7	97	22	136
Prado	15	0	2	0	17
Prichard	40	33	39	0	111
Shoshone	0	9	30	2	41
Studer	0	0	7	0	7
Thompson	39	8	0	0	47
White	0	7	113	0	120
Total	**258**	**133**	**1,009**	**33**	**1,433**

Table B-3. Summary of yarding methods under Alternative 2.

Area Name	Cable acres	Helicopter acres	Horse acres	Skyline acres	Tractor acres	Total acres
Blue Creek	0	78	0	0	0	78
Callis	0	0	0	220	92	312
Canfield	0	34	0	0	0	34
Cataldo	3	20	0	19	2	44
Cedar	0	28	0	0	0	28
Cougar	9	16	0	0	12	37
Downey	0	1	0	15	0	16
East Rutherford	3	59	0	0	0	62
Fernan	0	34	0	0	0	34
Fourth of July	6	30	4	13	14	67
Gimlet	3	33	0	8	4	48
Hayden	0	13	0	0	6	19
Little Tepee	0	80	0	0	10	90
Owl	26	20	0	32	6	84
Potosi	52	66	3	12	4	137
Prado	2	0	0	0	15	17
Prichard	11	77	0	23	0	111
Shoshone	0	26	0	15	0	41
Studer	3	0	0	0	4	7
Thompson	0	47	0	0	0	47
White	108	0	0	12	0	120
Total	**226**	**662**	**7**	**369**	**169**	**1,433**

Table B-4. Summary of fuel treatments under Alternative 2.

Area Name	Grapple pile acres	Hand pile acres	Jackpot acres	Lop & scatter acres	Top attach acres	Underburn acres	Total acres
Blue Creek	0	0	78	0	0	0	78
Callis	35	0	195	0	82	0	312
Canfield	0	8	26	0	0	0	34
Cataldo	0	0	7	13	0	25	45
Cedar	0	0	7	16	0	5	28
Cougar	0	0	0	16	16	6	38
Downey	0	0	0	0	15	0	16
East Rutherford	0	0	30	32	0	0	62
Fernan	0	0	9	25	0	0	34
Fourth of July	0	7	4	45	2	9	67
Gimlet	0	0	0	48	0	0	48
Hayden	0	3	0	10	6	0	19
Little Tepee	0	0	22	54	13	0	89
Owl	0	0	0	41	43	0	84
Potosi	0	3	47	64	8	15	136
Prado	0	0	0	6	11	0	17
Prichard	0	0	31	39	23	18	111
Shoshone	0	0	0	26	6	9	41
Studer	0	0	0	0	7	0	7
Thompson	0	4	43	0	0	0	47
White	0	0	10	82	21	7	120
Total	**35**	**25**	**509**	**517**	**253**	**94**	**1,433**

Table B-5. Specific unit information, Alternative 3.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Blue Creek	13	26	Salvage	Helicopter	Jackpot
Blue Creek	14	33	Salvage	Helicopter	Jackpot
Blue Creek	20	4	Salvage	Helicopter	Jackpot
Blue Creek	21	9	Salvage	Helicopter	Jackpot
Blue Creek	22	7	Salvage	Helicopter	Jackpot
Callis	1	64	Salvage	Skyline	Jackpot
Callis	2	4	Salvage	Tractor	Grapple pile
Callis	3	57	Salvage	Tractor	Top attach
Callis	4	3	Salvage	Tractor	Grapple pile
Callis	5	5	Salvage	Tractor	Grapple pile
Callis	6	22	Salvage	Skyline	Top attach
Callis	7	29	Salvage	Skyline	Jackpot
Callis	8	13	Salvage	Skyline	Jackpot
Callis	9	29	Salvage	Skyline	Jackpot
Callis	10	21	Salvage	Skyline	Jackpot
Callis	11	4	Salvage	Skyline	Jackpot
Callis	12	16	Salvage	Tractor	Grapple pile
Callis	13	14	Salvage	Skyline	Jackpot
Callis	14	8	Salvage	Tractor	Grapple pile
Callis	15	8	Salvage	Skyline	Jackpot
Callis	16	3	Salvage	Skyline	Top attach
Callis	17	13	Salvage	Skyline	Jackpot
Canfield	6	12	Salvage	Helicopter	Lop & Scatter
Canfield	7	3	Salvage	Helicopter	Lop & Scatter
Canfield	8	4	Salvage	Helicopter	Hand pile
Canfield	9	7	Salvage	Helicopter	Lop & Scatter
Canfield	10	4	Salvage	Helicopter	Lop & Scatter
Canfield	19	4	Salvage	Helicopter	Hand pile
Cataldo	27	3	Salvage	Helicopter	Lop & scatter
Cataldo	28	2	Salvage	Helicopter	Lop & scatter
Cataldo	29	<1	Salvage	Tractor	Lop & scatter
Cataldo	30	1	Salvage	Cable	Lop & scatter
Cataldo	31	2	Salvage	Helicopter	Lop & Scatter
Cataldo	32	1	Salvage	Helicopter	Lop & scatter
Cataldo	33	2	Salvage	Helicopter	Lop & Scatter
Cataldo	34	<1	Salvage	Skyline	Lop & scatter
Cataldo	35	3	Salvage	Helicopter	Lop & scatter
Cataldo	36	6	Salvage	Helicopter	Lop & Scatter
Cataldo	37	2	Salvage	Cable	Lop & scatter
Cataldo	38	12	Salvage	Skyline	Jackpot
Cataldo	39	<1	Salvage	Tractor	Jackpot
Cataldo	40	1	Salvage	Tractor	Jackpot
Cataldo	41	1	Salvage	Cable	Jackpot
Cataldo	42	7	Salvage	Skyline	Jackpot
Cataldo	43	1	Salvage	Helicopter	Lop & scatter
Cedar	1	5	Salvage	Helicopter	Jackpot
Cedar	2	4	Salvage	Helicopter	Lop & scatter
Cedar	3	2	Salvage	Helicopter	Lop & scatter
Cedar	4	3	Salvage	Helicopter	Jackpot
Cedar	5	2	Salvage	Helicopter	Jackpot
Cedar	6	3	Salvage	Helicopter	Jackpot

Table B-5. Specific unit information, Alternative 3 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Cedar	7	1	Salvage	Helicopter	Lop & scatter
Cedar	8	3	Salvage	Helicopter	Lop & scatter
Cedar	9	1	Salvage	Helicopter	Lop & scatter
Cedar	10	5	Salvage	Helicopter	Lop & scatter
Cougar	2	6	Salvage	Helicopter	Lop & scatter
Cougar	3	10	Salvage	Helicopter	Lop & scatter
Cougar	4	6	Salvage	Cable	Jackpot
Cougar	7	11	Salvage	Tractor	Top attach
Cougar	8	1	Salvage	Tractor	Top attach
Cougar	9	3	Salvage	Cable	Top attach
Downey	1	15	Salvage	Skyline	Top attach
Downey	2	1	Salvage	Helicopter	Lop & scatter
East Rutherford	1	29	Salvage	Helicopter	Lop & scatter
East Rutherford	2	30	Salvage	Helicopter	Jackpot
East Rutherford	3	3	Salvage	Cable	Lop & scatter
Fernan	11	25	Salvage	Helicopter	Lop & scatter
Fernan	12	9	Salvage	Helicopter	Jackpot
Fourth of July	1	2	Salvage	Skyline	Lop & scatter
Fourth of July	2	1	Salvage	Cable	Lop & scatter
Fourth of July	3	4	Salvage	Tractor	Jackpot
Fourth of July	4	1	Salvage	Helicopter	Lop & scatter
Fourth of July	5	2	Salvage	Skyline	Lop & scatter
Fourth of July	6	1	Salvage	Skyline	Lop & scatter
Fourth of July	7	2	Salvage	Helicopter	Lop & scatter
Fourth of July	8	1	Salvage	Helicopter	Lop & scatter
Fourth of July	9	<1	Salvage	Helicopter	Lop & scatter
Fourth of July	10	2	Salvage	Helicopter	Lop & scatter
Fourth of July	11	3	Salvage	Helicopter	Lop & scatter
Fourth of July	12	2	Salvage	Helicopter	Lop & scatter
Fourth of July	13	10	Salvage	Helicopter	Lop & scatter
Fourth of July	14	4	Salvage	Helicopter	Jackpot
Fourth of July	15	1	Salvage	Tractor	Lop & scatter
Fourth of July	16	2	Salvage	Tractor	Lop & scatter
Fourth of July	17	<1	Salvage	Helicopter	Lop & scatter
Fourth of July	18	1	Salvage	Tractor	Lop & scatter
Fourth of July	19	3	Salvage	Tractor	Lop & scatter
Fourth of July	20	1	Salvage	Cable	Lop & scatter
Fourth of July	22	3	Salvage	Tractor	Lop & scatter
Fourth of July	23	1	Salvage	Cable	Lop & scatter
Fourth of July	24	1	Salvage	Cable	Lop & scatter
Fourth of July	25	2	Salvage	Skyline	Jackpot
Fourth of July	26	3	Salvage	Skyline	Jackpot
Fourth of July	44	1	Salvage	Tractor	Lop & scatter
Fourth of July	45	2	Salvage	Helicopter	Hand pile
Fourth of July	46	2	Salvage	Helicopter	Lop & scatter
Fourth of July	47	5	Salvage	Horse	Hand pile
Fourth of July	48	1	Salvage	Cable	Top attach
Fourth of July	49	1	Salvage	Cable	Top attach
Fourth of July	50	3	Salvage	Skyline	Lop & scatter
Gimlet	1	2	Salvage	Helicopter	Lop & scatter
Gimlet	2	1	Salvage	Tractor	Lop & scatter

Table B-5. Specific unit information, Alternative 3 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Gimlet	3	2	Salvage	Skyline	Lop & scatter
Gimlet	4	2	Salvage	Helicopter	Lop & scatter
Gimlet	5	2	Salvage	Helicopter	Lop & scatter
Gimlet	6	3	Salvage	Helicopter	Lop & scatter
Gimlet	7	4	Salvage	Helicopter	Lop & scatter
Gimlet	8	1	Salvage	Helicopter	Lop & scatter
Gimlet	9	2	Salvage	Helicopter	Lop & scatter
Gimlet	10	2	Salvage	Helicopter	Lop & scatter
Gimlet	11	3	Salvage	Helicopter	Lop & scatter
Gimlet	12	6	Salvage	Helicopter	Lop & scatter
Gimlet	13	3	Salvage	Cable	Lop & scatter
Gimlet	14	1	Salvage	Tractor	Lop & scatter
Gimlet	15	2	Salvage	Tractor	Lop & scatter
Gimlet	16	2	Salvage	Helicopter	Lop & scatter
Gimlet	17	3	Salvage	Helicopter	Lop & scatter
Gimlet	18	1	Salvage	Helicopter	Lop & scatter
Gimlet	19	5	Salvage	Skyline	Lop & scatter
Gimlet	20	2	Salvage	Helicopter	Lop & scatter
Gimlet	21	1	Salvage	Skyline	Lop & scatter
Hayden	1	6	Salvage	Tractor	Top attach
Hayden	2	3	Salvage	Helicopter	Hand pile
Hayden	3	3	Salvage	Helicopter	Lop & scatter
Hayden	4	5	Salvage	Helicopter	Lop & scatter
Hayden	5	2	Salvage	Helicopter	Lop & scatter
Little Tepee	1	5	Salvage	Helicopter	Jackpot
Little Tepee	2	9	Salvage	Helicopter	Lop & scatter
Little Tepee	3	11	Salvage	Helicopter	Jackpot
Little Tepee	4	7	Salvage	Helicopter	Lop & scatter
Little Tepee	5	3	Salvage	Helicopter	Jackpot
Little Tepee	6	5	Salvage	Helicopter	Jackpot
Little Tepee	7	4	Salvage	Helicopter	Lop & Scatter
Little Tepee	8	4	Salvage	Helicopter	Lop & scatter
Little Tepee	9	5	Salvage	Helicopter	Lop & scatter
Little Tepee	10	4	Salvage	Helicopter	Lop & scatter
Little Tepee	11	3	Salvage	Helicopter	Lop & scatter
Little Tepee	12	2	Salvage	Helicopter	Lop & scatter
Little Tepee	13	4	Salvage	Helicopter	Lop & scatter
Little Tepee	14	3	Salvage	Helicopter	Lop & scatter
Little Tepee	15	2	Salvage	Helicopter	Lop & scatter
Little Tepee	16	5	Salvage	Helicopter	Lop & scatter
Little Tepee	17	4	Salvage	Helicopter	Lop & scatter
Little Tepee	18	2	Salvage	Helicopter	Lop & scatter
Little Tepee	19	1	Salvage	Tractor	Top attach
Little Tepee	20	5	Salvage	Tractor	Top attach
Little Tepee	21	4	Salvage	Tractor	Top attach
Owl	1	4	Salvage	Helicopter	Lop & scatter
Owl	2	3	Salvage	Skyline	Lop & scatter
Owl	3	2	Salvage	Skyline	Lop & scatter
Owl	4	3	Salvage	Helicopter	Lop & scatter
Owl	5	3	Salvage	Skyline	Lop & scatter
Owl	7	7	Salvage	Cable	Lop & Scatter

Table B-5. Specific unit information, Alternative 3 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Owl	8	1	Salvage	Skyline	Lop & Scatter
Owl	9	1	Salvage	Skyline	Lop & scatter
Owl	10	1	Salvage	Skyline	Lop & scatter
Owl	11	<1	Salvage	Tractor	Lop & scatter
Owl	12	3	Salvage	Helicopter	Lop & scatter
Owl	13	1	Salvage	Cable	Lop & scatter
Owl	14	1	Salvage	Cable	Lop & scatter
Owl	15	1	Salvage	Helicopter	Lop & scatter
Owl	16	2	Salvage	Cable	Lop & scatter
Owl	17	1	Salvage	Tractor	Lop & scatter
Owl	18	6	Salvage	Skyline	Lop & scatter
Owl	19	1	Salvage	Cable	Top attach
Owl	20	3	Salvage	Tractor	Top attach
Owl	21	2	Salvage	Cable	Top attach
Owl	22	<1	Salvage	Tractor	Top attach
Owl	23	2	Salvage	Cable	Top attach
Owl	24	3	Salvage	Cable	Top attach
Owl	25	3	Salvage	Cable	Top attach
Owl	26	2	Salvage	Cable	Top attach
Owl	27	8	Salvage	Skyline	Top attach
Owl	28	1	Salvage	Helicopter	Lop & scatter
Owl	29	4	Salvage	Helicopter	Lop & scatter
Owl	30	1	Salvage	Skyline	Top attach
Owl	31	1	Salvage	Cable	Top attach
Owl	32	1	Salvage	Cable	Top attach
Owl	33	3	Salvage	Helicopter	Lop & scatter
Owl	34	7	Salvage	Skyline	Top attach
Owl	35	2	Salvage	Tractor	Top attach
Potosi	1	11	Salvage	Helicopter	Jackpot
Potosi	2	3	Salvage	Helicopter	Jackpot
Potosi	3	5	Salvage	Helicopter	Lop & scatter
Potosi	4	9	Salvage	Helicopter	Jackpot
Potosi	5	5	Salvage	Helicopter	Jackpot
Potosi	6	2	Salvage	Helicopter	Jackpot
Potosi	7	5	Salvage	Helicopter	Lop & scatter
Potosi	8	7	Salvage	Cable	Jackpot
Potosi	9	7	Salvage	Helicopter	Lop & scatter
Potosi	10	4	Salvage	Tractor	Jackpot
Potosi	11	6	Salvage	Cable	Jackpot
Potosi	12	4	Salvage	Helicopter	Lop & scatter
Potosi	13	3	Salvage	Helicopter	Lop & scatter
Potosi	14	2	Salvage	Helicopter	Lop & scatter
Potosi	15	5	Salvage	Helicopter	Lop & scatter
Potosi	16	5	Salvage	Helicopter	Lop & scatter
Potosi	17	4	Salvage	Cable	Top attach
Potosi	18	2	Salvage	Cable	Top attach
Potosi	19	8	Salvage	Skyline	Jackpot
Potosi	20	2	Salvage	Cable	Top attach
Potosi	21	4	Salvage	Skyline	Lop & scatter
Potosi	22	1	Salvage	Cable	Lop & scatter
Potosi	23	1	Salvage	Cable	Lop & scatter

Table B-5. Specific unit information, Alternative 3 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Potosi	24	4	Salvage	Cable	Lop & scatter
Potosi	25	5	Salvage	Cable	Lop & Scatter
Potosi	26	2	Salvage	Cable	Jackpot
Potosi	27	3	Salvage	Cable	Lop & scatter
Potosi	28	6	Salvage	Cable	Lop & scatter
Potosi	29	4	Salvage	Cable	Lop & scatter
Potosi	30	2	Salvage	Cable	Lop & scatter
Potosi	31	2	Salvage	Cable	Lop & scatter
Potosi	32	3	Salvage	Horse	Hand pile
Prado	1	6	Salvage	Cable	Top attach
Prado	2	4	Salvage	Tractor	Top attach
Prado	3	3	Salvage	Tractor	Top attach
Prado	4	1	Salvage	Tractor	Lop & scatter
Prado	5	2	Salvage	Cable	Lop & scatter
Prado	6	2	Salvage	Tractor	Lop & scatter
Prichard	1	3	Salvage	Skyline	Top attach
Prichard	2	4	Salvage	Skyline	Top attach
Prichard	3	4	Salvage	Helicopter	Top attach
Prichard	4	3	Salvage	Helicopter	Top attach
Prichard	5	7	Salvage	Helicopter	Jackpot
Prichard	6	6	Salvage	Skyline	Top attach
Prichard	7	3	Salvage	Skyline	Top attach
Prichard	8	4	Salvage	Skyline	Top attach
Prichard	9	3	Salvage	Skyline	Top attach
Prichard	10	3	Salvage	Helicopter	Lop & scatter
Prichard	11	4	Salvage	Helicopter	Lop & scatter
Prichard	12	1	Salvage	Helicopter	Lop & scatter
Prichard	13	8	Salvage	Helicopter	Lop & scatter
Prichard	14	1	Salvage	Helicopter	Lop & scatter
Prichard	15	4	Salvage	Helicopter	Lop & scatter
Prichard	16	2	Salvage	Helicopter	Lop & scatter
Prichard	17	12	Salvage	Helicopter	Jackpot
Prichard	18	8	Salvage	Helicopter	Jackpot
Prichard	19	1	Salvage	Helicopter	Lop & scatter
Prichard	20	1	Salvage	Helicopter	Lop & scatter
Prichard	21	5	Salvage	Helicopter	Jackpot
Prichard	22	7	Salvage	Helicopter	Jackpot
Prichard	23	7	Salvage	Cable	Top attach
Prichard	24	4	Salvage	Cable	Top attach
Shoshone	1	7	Salvage	Helicopter	Lop & scatter
Shoshone	2	2	Salvage	Helicopter	Lop & scatter
Shoshone	3	7	Salvage	Helicopter	Lop & scatter
Shoshone	4	10	Salvage	Helicopter	Lop & scatter
Shoshone	5	5	Salvage	Skyline	Jackpot
Shoshone	6	4	Salvage	Skyline	Jackpot
Shoshone	7	6	Salvage	Skyline	Top attach
Studer	10	3	Salvage	Cable	Top attach
Studer	11	4	Salvage	Tractor	Top attach
Thompson	15	14	Salvage	Helicopter	Lop & Scatter
Thompson	16	14	Salvage	Helicopter	Jackpot
Thompson	17	8	Salvage	Helicopter	Lop & Scatter

Table B-5. Specific unit information, Alternative 3 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Thompson	18	4	Salvage	Helicopter	Hand pile
Thompson	23	8	Salvage	Helicopter	Jackpot
White	1	8	Salvage	Cable	Jackpot
White	2	2	Salvage	Cable	Jackpot
White	3	7	Salvage	Cable	Jackpot
White	4	9	Salvage	Cable	Top attach
White	5	6	Salvage	Skyline	Jackpot
White	6	5	Salvage	Skyline	Top attach
White	7	82	Salvage	Cable	Lop & scatter

Table B-6. Summary of prescription types under Alternative 3.

Area Name	Improvement harvest acres	Regeneration acres	Salvage acres	Thinning acres	Total acres
Blue Creek	0	0	78	0	78
Callis	0	0	312	0	312
Canfield	0	0	34	0	34
Cataldo	0	0	45	0	45
Cedar	0	0	28	0	28
Cougar	0	0	37	0	37
Downey	0	0	16	0	16
East Rutherford	0	0	62	0	62
Fernan	0	0	34	0	34
Fourth of July	0	0	67	0	67
Gimlet	0	0	48	0	48
Hayden	0	0	19	0	19
Little Tepee	0	0	90	0	90
Owl	0	0	84	0	84
Potosi	0	0	136	0	136
Prado	0	0	17	0	17
Prichard	0	0	111	0	111
Shoshone	0	0	41	0	41
Studer	0	0	7	0	7
Thompson	0	0	47	0	47
White	0	0	120	0	120
Total	**0**	**0**	**1,433**	**0**	**1,433**

Table B-7. Summary of yarding methods under Alternative 3.

Area Name	Cable acres	Helicopter acres	Horse acres	Skyline acres	Tractor acres	Total acres
Blue Creek	0	78	0	0	0	78
Callis	0	0	0	220	92	312
Canfield	0	34	0	0	0	34
Cataldo	3	20	0	19	2	45
Cedar	0	28	0	0	0	28
Cougar	9	16	0	0	12	37
Downey	0	1	0	15	0	16
East Rutherford	3	59	0	0	0	62
Fernan	0	34	0	0	0	34
Fourth of July	5	30	4	13	14	66
Gimlet	3	33	0	8	4	48
Hayden	0	13	0	0	6	19
Little Tepee	0	80	0	0	10	90
Owl	26	20	0	32	6	84
Potosi	53	66	3	12	4	137
Prado	2	0	0	0	15	17
Prichard	11	77	0	23	0	111
Shoshone	0	26	0	15	0	41
Studer	3	0	0	0	4	7
Thompson	0	47	0	0	0	47
White	108	0	0	12	0	120
Total	**226**	**662**	**7**	**369**	**169**	**1,433**

Table B-8. Summary of fuel treatments under Alternative 3.

Area Name	Grapple pile acres	Hand pile acres	Jackpot acres	Lop & scatter acres	Top attach acres	Underburn acres	Total acres
Blue Creek	0	0	78	0	0	0	78
Callis	35	0	195	0	82	0	312
Canfield	0	8	0	26	0	0	34
Cataldo	0	0	21	22	0	0	43
Cedar	0	0	12	16	0	0	28
Cougar	0	0	6	16	16	0	38
Downey	0	0	0	1	15	0	16
East Rutherford	0	0	30	32	0	0	62
Fernan	0	0	9	25	0	0	34
Fourth of July	0	7	9	49	2	0	67
Gimlet	0	0	0	49	0	0	49
Hayden	0	3	0	10	6	0	19
Little Tepee	0	0	22	57	10	0	89
Owl	0	0	0	49	35	0	84
Potosi	0	3	58	68	8	0	137
Prado	0	0	0	6	11	0	17
Prichard	0	0	39	31	42	0	112
Shoshone	0	0	9	26	6	0	41
Studer	0	0	0	0	7	0	7
Thompson	0	4	22	21	0	0	47
White	0	0	23	82	14	0	119
Total	**35**	**25**	**533**	**586**	**254**	**0**	**1,433**

Table B-9. Specific unit information, Alternative 4.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Callis	1	64	Salvage	Skyline	Jackpot
Callis	2	4	Salvage	Tractor	Grapple pile
Callis	3	57	Salvage	Tractor	Top attach
Callis	4	3	Salvage	Tractor	Grapple pile
Callis	5	5	Salvage	Tractor	Grapple pile
Callis	6	22	Salvage	Skyline	Top attach
Callis	7	29	Salvage	Skyline	Jackpot
Callis	8	13	Salvage	Skyline	Jackpot
Callis	9	29	Salvage	Skyline	Jackpot
Callis	10	21	Salvage	Skyline	Jackpot
Callis	11	4	Salvage	Skyline	Jackpot
Callis	12	16	Salvage	Tractor	Grapple pile
Callis	13	14	Salvage	Skyline	Jackpot
Callis	14	8	Salvage	Tractor	Grapple pile
Callis	15	8	Salvage	Skyline	Jackpot
Callis	16	3	Salvage	Skyline	Top attach
Callis	17	13	Salvage	Skyline	Jackpot
Cataldo	27	3	Salvage	Helicopter	Lop & scatter
Cataldo	28	2	Improvement harvest	Helicopter	Lop & scatter
Cataldo	29	<1	Salvage	Tractor	Lop & scatter
Cataldo	30	1	Improvement harvest	Cable	Lop & scatter
Cataldo	31	2	Improvement harvest	Helicopter	Jackpot
Cataldo	32	1	Salvage	Helicopter	Lop & scatter
Cataldo	33	2	Improvement harvest	Helicopter	Jackpot
Cataldo	34	<1	Salvage	Skyline	Lop & scatter
Cataldo	35	3	Salvage	Helicopter	Lop & scatter
Cataldo	36	6	Regeneration	Helicopter	Underburn
Cataldo	37	2	Salvage	Cable	Lop & scatter
Cataldo	38	12	Regeneration	Skyline	Underburn
Cataldo	39	<1	Salvage	Tractor	Jackpot
Cataldo	40	1	Salvage	Tractor	Jackpot
Cataldo	41	1	Salvage	Cable	Jackpot
Cataldo	42	7	Regeneration	Skyline	Underburn
Cataldo	43	1	Salvage	Helicopter	Lop & scatter
Cedar	1	5	Regeneration	Helicopter	Underburn
Cedar	2	4	Improvement harvest	Helicopter	Lop & scatter
Cedar	3	2	Improvement harvest	Helicopter	Lop & scatter
Cedar	4	3	Salvage	Helicopter	Jackpot
Cedar	5	2	Salvage	Helicopter	Jackpot
Cedar	6	3	Improvement harvest	Helicopter	Jackpot
Cedar	7	1	Salvage	Helicopter	Lop & scatter
Cedar	8	3	Salvage	Helicopter	Lop & scatter
Cedar	9	1	Improvement harvest	Helicopter	Lop & scatter
Cedar	10	5	Salvage	Helicopter	Lop & scatter
Cougar	2	6	Salvage	Helicopter	Lop & scatter
Cougar	3	10	Salvage	Helicopter	Lop & scatter
Cougar	4	6	Regeneration	Cable	Underburn
Cougar	7	11	Salvage	Tractor	Top attach
Cougar	8	2	Salvage	Tractor	Top attach
Cougar	9	3	Salvage	Cable	Top attach
Downey	1	15	Salvage	Skyline	Top attach

Table B-9. Specific unit information, Alternative 4 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Downey	2	1	Salvage	Helicopter	Lop & scatter
Fourth of July	1	2	Salvage	Skyline	Lop & scatter
Fourth of July	2	1	Salvage	Cable	Lop & scatter
Fourth of July	3	4	Improvement harvest	Tractor	Jackpot
Fourth of July	4	1	Improvement harvest	Helicopter	Lop & scatter
Fourth of July	5	2	Improvement harvest	Skyline	Lop & scatter
Fourth of July	6	1	Improvement harvest	Skyline	Lop & scatter
Fourth of July	7	2	Salvage	Helicopter	Lop & scatter
Fourth of July	8	1	Salvage	Helicopter	Lop & scatter
Fourth of July	9	<1	Salvage	Helicopter	Lop & scatter
Fourth of July	10	2	Salvage	Helicopter	Lop & scatter
Fourth of July	11	3	Improvement harvest	Helicopter	Lop & scatter
Fourth of July	12	2	Improvement harvest	Helicopter	Lop & scatter
Fourth of July	13	10	Salvage	Helicopter	Lop & scatter
Fourth of July	14	4	Regeneration	Helicopter	Underburn
Fourth of July	15	1	Salvage	Tractor	Lop & scatter
Fourth of July	16	2	Salvage	Tractor	Lop & scatter
Fourth of July	17	1	Salvage	Helicopter	Lop & scatter
Fourth of July	18	1	Salvage	Tractor	Lop & scatter
Fourth of July	19	3	Salvage	Tractor	Lop & scatter
Fourth of July	20	1	Salvage	Cable	Lop & scatter
Fourth of July	22	3	Salvage	Tractor	Lop & scatter
Fourth of July	23	1	Salvage	Cable	Lop & scatter
Fourth of July	24	1	Salvage	Cable	Lop & scatter
Fourth of July	25	2	Regeneration	Skyline	Underburn
Fourth of July	26	3	Regeneration	Skyline	Underburn
Fourth of July	44	1	Salvage	Tractor	Lop & scatter
Fourth of July	45	2	Salvage	Helicopter	Hand pile
Fourth of July	46	2	Salvage	Helicopter	Lop & scatter
Fourth of July	47	5	Salvage	Horse	Hand pile
Fourth of July	48	1	Salvage	Cable	Top attach
Fourth of July	49	1	Salvage	Cable	Top attach
Fourth of July	50	3	Improvement harvest	Skyline	Lop & scatter
Gimlet	1	2	Salvage	Helicopter	Lop & scatter
Gimlet	2	1	Salvage	Tractor	Lop & scatter
Gimlet	3	2	Salvage	Skyline	Lop & scatter
Gimlet	4	2	Salvage	Helicopter	Lop & scatter
Gimlet	5	2	Salvage	Helicopter	Lop & scatter
Gimlet	6	3	Salvage	Helicopter	Lop & scatter
Gimlet	7	4	Improvement harvest	Helicopter	Lop & scatter
Gimlet	8	1	Salvage	Helicopter	Lop & scatter
Gimlet	9	2	Salvage	Helicopter	Lop & scatter
Gimlet	10	2	Salvage	Helicopter	Lop & scatter
Gimlet	11	3	Salvage	Helicopter	Lop & scatter
Gimlet	12	6	Salvage	Helicopter	Lop & scatter
Gimlet	13	3	Salvage	Cable	Lop & scatter
Gimlet	14	1	Salvage	Tractor	Lop & scatter
Gimlet	15	2	Salvage	Tractor	Lop & scatter
Gimlet	16	2	Salvage	Helicopter	Lop & scatter
Gimlet	17	3	Salvage	Helicopter	Lop & scatter
Gimlet	18	1	Salvage	Helicopter	Lop & scatter

Table B-9. Specific unit information, Alternative 4 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Gimlet	19	5	Salvage	Skyline	Lop & scatter
Gimlet	20	2	Salvage	Helicopter	Lop & scatter
Gimlet	21	1	Salvage	Skyline	Lop & scatter
Little Tepee	1	5	Salvage	Helicopter	Jackpot
Little Tepee	2	9	Salvage	Helicopter	Lop & scatter
Little Tepee	3	11	Salvage	Helicopter	Jackpot
Little Tepee	4	7	Salvage	Helicopter	Lop & scatter
Little Tepee	5	3	Salvage	Helicopter	Jackpot
Little Tepee	6	5	Salvage	Helicopter	Jackpot
Little Tepee	7	3	Improvement harvest	Helicopter	Top attach
Little Tepee	8	4	Improvement harvest	Helicopter	Lop & scatter
Little Tepee	9	5	Improvement harvest	Helicopter	Lop & scatter
Little Tepee	10	4	Salvage	Helicopter	Lop & scatter
Little Tepee	11	3	Salvage	Helicopter	Lop & scatter
Little Tepee	12	2	Salvage	Helicopter	Lop & scatter
Little Tepee	13	4	Salvage	Helicopter	Lop & scatter
Little Tepee	14	3	Improvement harvest	Helicopter	Lop & scatter
Little Tepee	15	2	Salvage	Helicopter	Lop & scatter
Little Tepee	16	5	Salvage	Helicopter	Lop & scatter
Little Tepee	17	4	Salvage	Helicopter	Lop & scatter
Little Tepee	18	2	Salvage	Helicopter	Lop & scatter
Little Tepee	19	1	Salvage	Tractor	Top attach
Little Tepee	20	5	Thin	Tractor	Top attach
Little Tepee	21	4	Thin	Tractor	Top attach
Owl	1	4	Salvage	Helicopter	Lop & scatter
Owl	2	3	Salvage	Skyline	Lop & scatter
Owl	3	2	Salvage	Skyline	Lop & scatter
Owl	4	3	Salvage	Helicopter	Lop & scatter
Owl	5	3	Salvage	Skyline	Lop & scatter
Owl	7	7	Salvage	Cable	Top attach
Owl	8	1	Improvement harvest	Skyline	Top attach
Owl	9	1	Improvement harvest	Skyline	Lop & scatter
Owl	10	1	Improvement harvest	Skyline	Lop & scatter
Owl	11	<1	Salvage	Tractor	Lop & scatter
Owl	12	3	Salvage	Helicopter	Lop & scatter
Owl	13	1	Salvage	Cable	Lop & scatter
Owl	14	1	Salvage	Cable	Lop & scatter
Owl	15	1	Salvage	Helicopter	Lop & scatter
Owl	16	2	Salvage	Cable	Lop & scatter
Owl	17	1	Salvage	Tractor	Lop & scatter
Owl	18	6	Salvage	Skyline	Lop & scatter
Owl	19	1	Salvage	Cable	Top attach
Owl	20	3	Salvage	Tractor	Top attach
Owl	21	2	Salvage	Cable	Top attach
Owl	22	<1	Salvage	Tractor	Top attach
Owl	23	2	Salvage	Cable	Top attach
Owl	24	3	Salvage	Cable	Top attach
Owl	25	3	Salvage	Cable	Top attach
Owl	26	2	Salvage	Cable	Top attach
Owl	27	8	Salvage	Skyline	Top attach
Owl	28	1	Improvement harvest	Helicopter	Lop & scatter

Table B-9. Specific unit information, Alternative 4 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Owl	29	4	Improvement harvest	Helicopter	Lop & scatter
Owl	30	1	Salvage	Skyline	Top attach
Owl	31	1	Salvage	Cable	Top attach
Owl	32	1	Salvage	Cable	Top attach
Owl	33	3	Salvage	Helicopter	Lop & scatter
Owl	34	7	Salvage	Skyline	Top attach
Owl	35	2	Salvage	Tractor	Top attach
Potosi	1	11	Salvage	Helicopter	Jackpot
Potosi	2	3	Salvage	Helicopter	Jackpot
Potosi	3	5	Salvage	Helicopter	Lop & scatter
Potosi	4	9	Salvage	Helicopter	Jackpot
Potosi	5	5	Salvage	Helicopter	Jackpot
Potosi	6	2	Salvage	Helicopter	Jackpot
Potosi	7	5	Salvage	Helicopter	Lop & scatter
Potosi	8	7	Regeneration	Cable	Underburn
Potosi	9	7	Salvage	Helicopter	Lop & scatter
Potosi	10	4	Salvage	Tractor	Jackpot
Potosi	11	6	Improvement harvest	Cable	Jackpot
Potosi	12	4	Thin	Helicopter	Lop & scatter
Potosi	13	3	Salvage	Helicopter	Lop & scatter
Potosi	14	2	Thin	Helicopter	Lop & scatter
Potosi	15	5	Salvage	Helicopter	Lop & scatter
Potosi	16	5	Salvage	Helicopter	Lop & scatter
Potosi	17	4	Salvage	Cable	Top attach
Potosi	18	2	Salvage	Cable	Top attach
Potosi	19	8	Thin	Skyline	Underburn
Potosi	20	2	Salvage	Cable	Top attach
Potosi	21	4	Salvage	Skyline	Lop & scatter
Potosi	22	1	Salvage	Cable	Lop & scatter
Potosi	23	1	Salvage	Cable	Lop & scatter
Potosi	24	4	Salvage	Cable	Lop & scatter
Potosi	25	5	Improvement harvest	Cable	Jackpot
Potosi	26	2	Salvage	Cable	Jackpot
Potosi	27	3	Thin	Cable	Lop & scatter
Potosi	28	6	Salvage	Cable	Lop & scatter
Potosi	29	4	Thin	Cable	Lop & scatter
Potosi	30	2	Salvage	Cable	Lop & scatter
Potosi	31	2	Thin	Cable	Lop & scatter
Potosi	32	3	Salvage	Horse	Hand pile
Prado	1	1	Salvage	Cable	Top attach
Prado	2	6	Improvement harvest	Tractor	Top attach
Prado	3	4	Improvement harvest	Tractor	Top attach
Prado	4	3	Improvement harvest	Tractor	Lop & scatter
Prado	5	1	Salvage	Cable	Lop & scatter
Prado	6	2	Improvement harvest	Tractor	Lop & scatter
Prichard	1	3	Salvage	Skyline	Top attach
Prichard	2	4	Regeneration	Skyline	Top attach
Prichard	3	4	Salvage	Helicopter	Lop & scatter
Prichard	4	3	Salvage	Helicopter	Lop & scatter
Prichard	5	7	Regeneration	Helicopter	Underburn
Prichard	6	6	Regeneration	Skyline	Top attach

Table B-9. Specific unit information, Alternative 4 continued.

Area Name	Unit #	Acres	Prescription	Yarding method	Fuel treatment method
Prichard	7	3	Salvage	Skyline	Top attach
Prichard	8	4	Regeneration	Skyline	Top attach
Prichard	9	3	Salvage	Skyline	Top attach
Prichard	10	3	Salvage	Helicopter	Lop & scatter
Prichard	11	4	Salvage	Helicopter	Lop & scatter
Prichard	12	1	Salvage	Helicopter	Lop & scatter
Prichard	13	8	Salvage	Helicopter	Lop & scatter
Prichard	14	1	Salvage	Helicopter	Lop & scatter
Prichard	15	4	Salvage	Helicopter	Lop & scatter
Prichard	16	2	Salvage	Helicopter	Lop & scatter
Prichard	17	12	Improvement harvest	Helicopter	Jackpot
Prichard	18	8	Improvement harvest	Helicopter	Jackpot
Prichard	19	4	Improvement harvest	Helicopter	Lop & scatter
Prichard	20	4	Improvement harvest	Helicopter	Lop & scatter
Prichard	21	5	Improvement harvest	Helicopter	Jackpot
Prichard	22	7	Improvement harvest	Helicopter	Jackpot
Prichard	23	7	Regeneration	Cable	Underburn
Prichard	24	4	Regeneration	Cable	Underburn
Shoshone	1	7	Salvage	Helicopter	Lop & scatter
Shoshone	2	2	Thin	Helicopter	Lop & scatter
Shoshone	3	7	Salvage	Helicopter	Lop & scatter
Shoshone	4	10	Salvage	Helicopter	Lop & scatter
Shoshone	5	5	Regeneration	Skyline	Underburn
Shoshone	6	4	Regeneration	Skyline	Underburn
Shoshone	7	6	Salvage	Skyline	Top attach
Studer	10	3	Salvage	Cable	Top attach
Studer	11	4	Salvage	Tractor	Top attach
White	1	8	Salvage	Cable	Jackpot
White	2	2	Salvage	Cable	Jackpot
White	3	7	Regeneration	Cable	Underburn
White	4	9	Salvage	Cable	Top attach
White	5	6	Salvage	Skyline	Top attach
White	6	5	Salvage	Skyline	Top attach
White	7	82	Salvage	Cable	Lop & scatter

Table B-10. Summary of prescription types under Alternative 4.

Area Name	Improvement harvest acres	Regeneration acres	Salvage acres	Thinning acres	Total acres
Blue Creek	0	0	0	0	0
Callis	0	0	312	0	312
Canfield	0	0	0	0	0
Cataldo	7	25	13	0	45
Cedar	9	5	14	0	28
Cougar	0	6	32	0	38
Downey	0	0	16	0	16
East Rutherford	0	0	0	0	0
Fernan	0	0	0	0	0
Fourth of July	15	9	43	0	67
Gimlet	4	0	44	0	48
Hayden	0	0	0	0	0
Little Tepee	14	0	66	9	89
Owl	8	0	75	0	83
Potosi	11	7	97	22	137
Prado	15	0	2	0	17
Prichard	40	33	39	0	112
Shoshone	0	9	30	2	41
Studer	0	0	7	0	7
Thompson	0	0	0	0	0
White	0	7	113	0	120
Total	**123**	**101**	**903**	**33**	**1,160**

Table B-11. Summary of yarding methods under Alternative 4.

Area Name	Cable acres	Helicopter acres	Horse acres	Skyline acres	Tractor acres	Total acres
Blue Creek	0	0	0	0	0	0
Callis	0	0	0	220	92	312
Canfield	0	0	0	0	0	0
Cataldo	4	20	0	19	2	45
Cedar	0	28	0	0	0	28
Cougar	9	16	0	0	13	38
Downey	0	1	0	15	0	16
East Rutherford	0	0	0	0	0	0
Fernan	0	0	0	0	0	0
Fourth of July	5	30	5	13	14	67
Gimlet	3	33	0	8	4	48
Hayden	0	0	0	0	0	0
Little Tepee	0	79	0	0	10	89
Owl	26	20	0	32	5	83
Potosi	52	66	2	12	4	136
Prado	2	0	0	0	15	17
Prichard	11	78	0	23	0	112
Shoshone	0	26	0	15	0	41
Studer	3	0	0	0	4	7
Thompson	0	0	0	0	0	0
White	108	0	0	12	0	120
Total	**223**	**397**	**7**	**369**	**163**	**1,159**

Table B-12. Summary of fuel treatments under Alternative 4.

Area Name	Grapple pile acres	Hand pile acres	Jackpot acres	Lop & scatter acres	Top attach acres	Underburn acres	Total acres
Blue Creek	0	0	0	0	0	0	0
Callis	35	0	195	0	82	0	312
Canfield	0	0	0	0	0	0	0
Cataldo	0	0	7	13	0	25	45
Cedar	0	0	7	16	0	5	28
Cougar	0	0	0	16	16	6	38
Downey	0	0	0	0	15	0	15
East Rutherford	0	0	0	0	0	0	0
Fernan	0	0	0	0	0	0	0
Fourth of July	0	7	4	44	2	9	66
Gimlet	0	0	0	49	0	0	49
Hayden	0	0	0	0	0	0	0
Little Tepee	0	0	23	54	14	0	90
Owl	0	0	0	41	42	0	84
Potosi	0	3	47	64	8	15	137
Prado	0	0	0	6	11	0	17
Prichard	0	0	31	39	23	18	111
Shoshone	0	0	0	26	6	9	41
Studer	0	0	0	0	7	0	7
Thompson	0	0	0	0	0	0	0
White	0	0	10	82	21	7	120
Total	**35**	**10**	**324**	**450**	**247**	**94**	**1,160**

APPENDIX C
THREATENED, ENDANGERED AND SENSITIVE PLANTS

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.

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 2000) element occurrence records, National Wetlands Inventory maps, timber stand examination records, aerial photographs and topographical maps, past field visits, personal knowledge and professional judgment of the project area by the District botanists and the IPNF Forest 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 judgment. It included a broad-scale assessment (discussed later in this appendix) 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 Coeur d'Alene subbasin.

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 (Croft et al, 1997) (Falk and Holsinger, 1991). 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

Approximately 950 acres of rare plant field surveys have been done for unrelated projects within the analysis areas (Project Files, TES Plants). No sensitive plant surveys have yet been conducted specifically for the Small Sales project. Surveys are planned to begin in the spring 2001, to be completed prior to implementation of ground-disturbing activities. The Coeur d'Alene River Ranger District is committed to carrying out features and mitigation measures identified in Chapter II for TES plants, and have successfully used 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). During field surveys for Icestorm Salvage, approximately 10 new occurrences of Sensitive plants or Forest Species of Concern were discovered. Surveys for the Douglas-fir Beetle project documented 28 new occurrences. In each instance, mitigation measures similar to those listed in Chapter II, Mitigation, TES plants were prescribed by the Botany Coordinator and carried out to ensure protection of the plant population. Survey documentation for these two projects is located in the respective project files. Table II-25 in Chapter II identifies areas in which surveys for Sensitive plants need to occur. Specific features of the alternatives (Chapter II, 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.

Observations and monitoring information indicate that some activities may have little effect or even a beneficial 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).
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.

Refer to Appendix C for a comparison of the relative risks of various types of activities with respect to sensitive plants and habitat.

Previous Plant Surveys

Approximately 950 acres of rare plant field surveys have been done for unrelated projects in the analysis areas. These are documented in the project files. Some past surveys occurred in areas proposed for activities in this assessment, and may be utilized for clearance purposes. The Coeur d'Alene River Ranger District is committed to carrying out features and mitigation measures as specified in NEPA documents. Examples of recent projects for which sensitive plant surveys were completed after the Decision, but prior to implementation include: Icestorm Salvage (1997) and the Douglas-fir Bark Beetle EIS (1999). Survey documentation is located in the respective project files.

Potential Effects in Proposed Treatment Areas

Activities proposed under this project have known specific effects on the landscape as well as other effects that are not well understood. The known impacts are addressed first, followed by the known and suspected effects to particular species and/or their habitats.

Harvest

Direct impacts of timber harvest can include elimination of individual plants through ground disturbance. Indirect impacts to sensitive plants can include changes in fuel loading, duff levels, moisture regime, and light levels. Effects to sensitive plants would vary according to species and harvest prescription A minor amount of wet forest habitat occuring

as microsites within moist forest, may be affected by harvesting; but the timber stand data base does not track microsite acreages. In addition, road construction and fuel break construction and road obliteration and other watershed restoration activities could potentially impact wet forest habitat.

The discussion that follows applies to harvesting exclusive of fuels treatment. Salvage harvest would take place in all action alternatives; improvement harvest and commercial thinning would take place only in Alternatives 2 and 4. Salvage harvest would remove trees killed by the Douglas-fir beetle, with incidental removal of live trees in skid trails and corridors; canopy coverage would be reduced by approxiamtely 20 to 40%. Since large (greater than 14-inch) diameter Douglas-fir are unequally distributed across the landscape, mortality could occur in a scattered to patchy configuration, with resultant openings in salvage units of up to about 2-3 acres in size. 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 the change in fuel loadings in untreated stands and resulting increased risk to sensitive plants from future stand-replacing wildfires. There would be some direct effects from salvage harvest in suitable habitats for sensitive plants of the moist, dry, and wet guilds, especially those that are intolerant of changes in the moisture and light regime (i.e. mycotrophic species, moonworts and orchids). The other species are not likely to be adversely affected by salvage harvest treatment. 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 same as for selective harvest. Commercial thinning is predicted (see Vegetation) to remove about 30% of the canopy cover, the same as in selective harvest. 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 selective harvest.

Regeneration harvest would be done in stands where greater than 50% of the basal area of the stand is predicted to be lost due to beetle mortality. Approximately 80% of the overstory canopy would be removed with regeneration treatment. Live green trees in addition to beetle afflicted Douglas-fir would be cut in order to provide conditions suitable for reforestation with disease resistant tree species. Fuels treatment would occur in most regeneration units, consisting of either underburning or top attached yarding, while hand-piling is designated in a few units. Regeneration harvest would directly affect Moist, Dry, and only slightly Wet Guild sensitive plant habitat. The limited data and observations available indicate that most species in these Guilds are intolerant of major canopy removal. Bank monkeyflower, while not likely to be affected by an increase in sunlight due to canopy removal, could be impacted by excessive ground disturbance. 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 that in which top attached yarding was used 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.

Yarding Methods

The yarding methods employed would include helicopter, cable, skyline, and a small amount of tractor yarding. Yarding effects consist of increased crown damage, removal of additional green trees, and physical disturbance of the ground while moving logs and trees. Helicopter yarding would have an insignificant effect on sensitive plants and habitat because there would be little or no ground disturbance. Some damage to the live crowns of leave trees would be expected, 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. Generally, one end of the log is suspended during skyline yarding, but some ground disturbance would result from the yarding process. Tractor yarding would cause the most detrimental and long lasting impacts to plants and habitats that are sensitive to mechanical disturbance, which will be mainly concentrated on designated skid trails. Here, compaction and soil displacement would be the primary negative effects. In all alternatives, Forest Plan Standards and Guidelines would be met for woody debris retention on site and minimizing soil displacement and compaction.

New Road Construction, Road Reconstruction, and Reconditioning

New road construction, road reconstruction, and reconditioning would take place in all action alternatives. These activities vary in the potential for effects to moist, wet, and dry forest guild habitats and species. New road construction is a high ground disturbance activity, constituting a high risk to sensitive species in these guilds. Prior to new road construction, previously unsurveyed, highly suitable habitat in the activity area would be surveyed, any newly found occurrences deemed critical to species/population viability would be protected. Road reconstruction and reconditioning are low risk

activities in terms of direct or indirect effects to sensitive plants and habitat. For these activities, existing road prisms would be treated which are already disturbed and of very low habitat suitability. While there are a few sensitive plant occurrences on the IPNF on old roads or cutbanks, they are usually individuals isolated from the main occurrence, and generally species that tolerate such disturbance.

Fuels Treatment

Various methods of fuels reduction are proposed under action alternatives, all having the potential to directly and indirectly impact sensitive plants. Slashing, yarding tops and lop and scatter fuels treatments would have a negligible effect on sensitive plant species, because of the lack of additional ground disturbance. Underburning for fuels reduction would be done both inside and outside harvest unit boundaries in all alternatives. Spring burning has the potential to impact sensitive plant individuals, particularly clustered lady's slipper and moonwort species. Project design would minimize the risk of effects to documented occurrences of species vulnerable to burning. Features for TES Plants (Chapter II) would protect populations and highly suitable habitat that may be discovered during field surveys prior to project implementation. There would be a risk of increasing certain noxious weed species with burning, depending on the proximity to existing infestations and the cover type of the area treated. Regeneration units would generally have fireline constructed to contain the fire, which controls undesireable spead, but may create ideal sites for noxious weed infestation. For treatment units where underburning would take place both within and outside of harvest unit boundaries, fire outside the units would be of low intensity. There would be no underburning within designated Riparian Habitat Conservation Areas, effectively buffering riparian wet forest habitats from this type of activity. Therefore, impacts to moist forest habitat would be very low.

Road Obliteration and Removal/Replacement of Road Channel Crossings

Watershed rehabilitation activities have the potential to directly and indirectly impact moist, wet and dry forest guild habitats. Though these treatments often focus on wet forest habitats, a relatively small amount of previously undisturbed habitat is usually affected with these activities. The long term effects of the treatments would be beneficial to sensitive plants because channel stability and riparian community habitat would be improved.

Weed Treatment and Prevention

Noxious weed treatment and prevention would be performed consistent with features for weed treatment found in the Coeur d'Alene River Ranger District Noxious Weeds Final Environmental Impact Statement (IPNF 2000). Weed treatment and prevention measures would reduce, but not eliminate the risk of weed spread in the project area. Mowing along identified, infested haul roads would reduce seed production, thus minimizing the risk of weed spread in treated areas. Mowing is considered a low-risk activity for sensitive plants. Mowing would affect vegetation for approximately eight feet on either side of the roadway. Although there is a slight chance of impacting individual deerfern or moonwort plants with this activity, large occurrences/populations would be unlikely to be impacted. Individuals of these species occasionally colonize disturbed roadsides and cutbanks; however, these locations constitute marginal habitat, and are usually isolated from the main occurrence or population.

Tree Planting

Tree planting would result in a minor amount of soil disturbance with hand tools. The risk of incidental effects to sensitive plants from this activity are predicted to be very low.

Known and Suspected Response of Plants

There is abundant habitat for moist, dry, and wet forest guild species in the analysis areas (see Table 2 above). Moist and dry forest habitats and species have the greatest potential to be affected by proposed activities, as these are the habitats most affected by the Douglas-fir beetles.

Wet forest habitats occupy limited acreage within the analysis areas and in proposed harvest units. There are 12 sensitive species of wet and moist forest habitats that are likely to occur in the project area. These species 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.

Seven sensitive species known only from wet habitats may occur within the project area, including certain moonwort species (*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*). Wet forest habitat represents less than five percent of the total project area acreage.

There are two Forest species of concern found in moist to wet forest habitats that are either documented in the project area 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*).

Two sensitive species of the dry forest guild with a high likelihood of occurrence include clustered lady's slipper (*Cypripedium fasciculatum*) and chickweed monkeyflower *(Mimulus alsinoides*). In addition, one Forest species of concern, bank monkeyflower (*Mimulus clivicola*) is also known from the analysis area, and has the potential to occur on suitable habitat that may be impacted by management activities there.

There are no known current threats to species or habitats of the aquatic and deciduous riparian guilds. The greatest potential threat to these guilds is the invasion of exotic species which could displace native vegetation and lead to extirpation of some sensitive species. Any activity or event which caused broad-scale soil and/or vegetation disturbance in or adjacent to these habitats would increase the risk of invasion by noxious weeds. Weed species of concern for these guilds include purple loosestrife (*Lythrum salicaria*), Eurasian water-milfoil (*Myriophyllum spicatum*) and common tansy (*Tanacetum vulgare*).

The subalpine habitat guild occurs only within the Potosi Beetle portion of the project area. There are no planned activities within this habitat guild. There are no known current or potential threats to species or habitats of this guild within the analysis areas.

Known Occurances of Plants

Previously documented occurrences of the following sensitive plant species and Forest species of concern (ICDC 1999) within the project area indicate that these species/guilds have a high probability of occupying unsurveyed highly suitable habitat.

Table C-1. Known Plant Occurrence in the Analysis Areas.

Rare Plant Guild	Species	# Occurrences/Analysis Area
Moist/Wet Forest Dry Forest	Henderson's sedge (s) bank monkeyflower (fsc)	2/Saddle Bug 2/Potosi Beetle Heli and Good Neighbor Heli
Totals	**2 species**	**4 occurrences**

s = sensitive species
fsc = Forest species of concern

Affected Environment and Existing Conditions

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 2001) 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 Forest Service lands (ICDC 2001) on the the Idaho Panhandle National Forests, although suitable habitat is suspected to occur (Mousseaux 1998). The recent Douglas-fir beetle outbreak has not affected suitable habitat for water howellia or Ute's ladies'-tresses (USDA 1999, Ch. III, p.80) . 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 for this project for more information on water howellia and Ute ladies'-tresses.

There are no Federally listed endangered plants for the Idaho Panhandle National Forests.

Proposed Threatened Plant Species

Spalding's catchfly (*Silene spaldingii*) is suspected to occur on the IPNF. This species was listed by the United States Fish and Wildlife Service as a proposed threatened species on December 3, 1999. There are proposed treatments within potential habitat for this species. There have been no field surveys done in the project area specifically for Spalding's catchfly. Spalding's catchfly habitat cannot be accurately determined using Timber Stand Database information. Therefore, a habitat analysis for Spalding's catchfly was conducted using habitat maps produced using Satellite Imagery Landtype Classification (SILC) (Mousseaux 2000). Suitable habitat consists of grasslands dominated by Idaho fescue (*Festuca idahoensis*) or rough fescue (*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 catchfly. There is a moderate amount of potential habitat present in the analysis areas. A relatively small amount of moderate to highly suitable habitat is actually present in harvest units and other areas where ground-disturbing activities are proposed. Portions of 35 harvest units in 15 analysis areas (a total of approximately 40 acres) are predicted to contain suitable habitat for Spalding's catchfly; these areas would require field surveys to be performed prior to project implementation.

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.

Rare plant guilds were developed for Idaho Panhandle National Forests (IPNF) Sensitive plant species, based on available habitat information from known occurrences, both locally and across the range of the species. Forest Species of Concern have been assigned to one or more of these rare plant guilds.

Table C-2. Threatened, Endangered and Sensitive plants and Forest Species of Concern by rare plant habitat guild, Coeur d'Alene River Ranger District.

Status and Species	Common Name	Habitat Guild
Threatened*		
Howellia aquatilis	water howellia	Aquatic
Spiranthes diluvialis	Ute Ladies'-tresses	Deciduous Riparian
Proposed Threatened		
Silene spauldingii	Spaulding's catchfly	Grasslands/dry forest openings
Sensitive**		
Asplenium trichomanes	maidenhair spleenwort	rock seeps in Moist/Wet Forest
Blechnum spicant	deerfern	Moist/Wet Forest
Botrychium ascendens	upswept moonwort	Wet Forest
Botrychium crenulatum	dainty moonwort	Wet Forest
Botrychium lanceolatum	triangle moonwort	Wet Forest/Moist Forest

Table C-2. Threatened, Endangered and Sensitive plants and Forest Species of Concern by rare plant habitat guild, Coeur d'Alene River Ranger District, continued.

Status and Species	Common Name	Habitat Guild
Botrychium minganense	Mingan moonwort	Wet Forest/Moist Forest
Botrychium montanum	western goblin	Wet Forest
Botrychium paradoxum	paradox moonwort	Wet Forest/Moist Forest
Botrychium pedunculosum	stalked moonwort	Wet Forest
Botrychium pinnatum	northwestern moonwort	Wet Forest/Moist Forest
Botrychium simplex	least moonwort	Wet Forest/Moist Forest
Buxbaumia aphylla	leafless bug-on-a-stick moss	Subalpine
Buxbaumia viridis	green bug-on-a-stick moss	Wet Forest
Cardamine constancei	Constance's bittercress	Deciduous Riparian/Moist/Wet Forest
Carex chordorrhiza	string-root sedge	Peatland
Carex hendersonii	Henderson's sedge	Moist/Wet Forest
Carex livida	pale sedge	Peatland
Carex xerantica	dryland sedge	Subalpine
Cetraria subalpina	Iceland-moss lichen	Subalpine
Collema curtisporum	short-spored jelly lichen	Deciduous Riparian
Cypripedium fasciculatum	clustered lady's slipper	Moist/Wet/Dry Forest
Eburophyton austiniae	phantom orchid	Moist/Wet Forest
Hookeria lucens	clear moss	Wet Forest
Hypericum majus	large Canadian St. John's wort	Peatland (Coeur d'Alene)
Mimulus alsinoides	chickweed monkeyflower	rock cliffs/seeps in Wet/Moist/Dry Forest
Rhynchospora alba	white beakrush	Peatlands (Coeur d'Alene)
Scheuchzeria palustris	pod grass	Peatlands (Coeur d'Alene)
Scirpus subterminalis	water clubrush	Peatlands (Coeur d'Alene)
Thelypteris nevadensis	Sierra woodfern	Wet Forest Seeps
Waldsteinia idahoensis	Idaho barren strawberry	Moist and Wet Forest
Forest Species of Concern* **		
Astragalus bourgovii	Bourgeau's milkvetch	Subalpine
Carex californica	California sedge	Subalpine
Cetraria sepincola	eyed ruffle lichen	Deciduous Riparian, Peatland
Cladonia imbricarica	imbricate lichen	Wet Forest
Cladonia transcendens	transcending reindeer lichen	Wet Forest
Collema furfuraceum	scurffy jelly lichen	Deciduous Riparian
Dodecatheon dentatum	white-flowered shooting star	Wet Forest
Lobaria hallii	Hall's lung wort	Deciduous Riparian
Ludwigia polycarpa	many-fruit false-loosestrife	Peatland/aquatic
Mimulus clivicola	bank monkeyflower	Dry Forests
Romanzoffia sitchensis	Sitka mistmaiden	Subalpine
Platanthera orbiculata	round-leaved orchid	Moist/Wet Forest
Pilophorus acicularis	Devil's matchstick lichen	Wet Forests
Ribes sanguineum	red-flowered currant	Moist forest
Sedum rupicolum	lance-leaved sedum	Subalpine
Sphaerophorus globosus	Christmas tree lichen	Wet Forest
Tauschia tenuissima	Lieberg's tauschia	Dry/Moist Forest, meadows
Trientalis latifolia	western starflower	Deciduous Riparian/Moist/Wet Forest
Vallisneria americana	wild celery	Aquatic

** based on US Fish and Wildlife Service Biannual Forest-wide Species List FWS 1-9-99-SP-158 (105.0000)*
*** based on Northern Regional Forester's Sensitive Species List, March 1999*
**** As directed by the Species of Concern Protocol (Region One Planning Peer Group, Task Group 19, March 1997), species of concern are considered to be secure at the global, Regional and state levels, but may be at risk at the Forest planning level.*

Rare Plant Guilds

There is abundant habitat for moist, dry, and wet forest guild species in the analysis areas, as reflected in Table III-77. 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 areas and in proposed harvest units. As stated in Chapter II (Features Common to all Action Alternatives), Riparian Habitat Conservation Area guidelines effectively exclude most wet forest habitat from timber harvest. New road construction, road obliteration and prescribed fire activities have the potential to impact wet forest and riparian habitats and species. Refer to the Project Files (TES Plants, Guild Descriptions) for additional information about rare plant guilds.

Table C-3. Extent of Suitable Sensitive Plant Habitat in the Analysis Areas.

Analysis Area	Alpine Guild Habitat Acres	Dry Guild Habitat Acres	Moist Guild Habitat Acres	Wet Guild Habitat Acres	Total Acres Suitable Habitat
Blue Creek		152	31		183
Callis		201	278	125	404
Canfield		144			144
Cataldo		1238	363		1601
Cedar		237	565		802
Cougar		205	610		815
Downey			222		222
East Rutherford		150	295		445
Fernan		91	42		133
Fourth of July		629	1061		1690
Gimlet		452	871		1323
Hayden Lake		99			99
Little Teepee		193	1935	32	2131
Owl		736	1150	92	1978
Potosi	121	769	730		1620
Prado		240	175		415
Prichard		431	547		978
Shoshone		88	219	40	347
Studer		235	79		314
Thompson		326	252		578
White		202	1871		2073
Total	121	6,825	11,305	289	18,540

Wet and Moist Forest Guilds

Species of wet to moist forest habitats that are likely to occur in the project area 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*). Wet forest habitat represents less than five percent of the total project area acreage.

There are two Forest species of concern found in moist to wet forest habitats that are either documented in the project area 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 with a high likelihood of occurrence in unsurveyed highly suitable habitat include clustered lady's slipper (*Cypripedium fasciculatum*) and chickweed monkeyflower *(Mimulus alsinoides*). In addition, one Forest species of concern, bank monkeyflower (*Mimulus clivicola*) is known to occur within the project area, and 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 proposed Threatened species Spalding's catchfly (*Silene spaldingii*).

Changes in Sensitive Plant Habitat from Historic Conditions

The current condition of the vegetation in the project area 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, either natural or human-caused. Lands within or adjacent to the Analysis Area that are under other ownership have undergone similar modifications. Private landowners are not required to protect TES plants or their habitats, thus it is assumed that population losses have, and will continue to occur.

The analysis areas involve lands close to human habitation, so past disturbances here are greater than in some interior portions of the Coeur d'Alene basin. The database shows that in the project area, about 11 percent of National Forest System Lands have been regeneration harvested. Although there may be some double counting of acres, records also show that about 23 percent of the total National Forest System acres have had some other form of timber harvest (overstory removal, salvage, commercial thin, selection). Existing riparian- encroaching roads (see Soils and Aquatic Resources) have had and continue to have significant effects on hydrology and riparian plant communities in the project area. While precise data are 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.

Environmental Consequences

Direct and indirect effects were addressed at the Project Area scale only. The cumulative effects analysis area used is the Coeur d'Alene subbasin, and included effects from activities on both Forest Service lands and lands under other ownership.

Alternative 1 (No Action)

Direct and Indirect Effects

The current Douglas-fir beetle infestation, and associated tree mortality encompasses approximately 7,700 acres in the project area based on aerial mapping done in 1999. Ground reconnaissance in combination with the aerial mapping has provided a relatively accurate picture of the extent of the infestation. Alternative 1 (the No-Action Alternative) reflects the extent of the bark beetle infestation in the project area. 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 C-4. Alternative 1 (No Action).

Rare Plant Guild	Acres of Suitable Habitat Potentially Affected by Douglas-fir Beetles
Moist Guild	2,205
Dry Guild	1,914
Wet guild	1
Subalpine	0
Total Acres	**4,120**

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 within the analysis 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, is 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).

Cumulative Effects

A list of reasonably foreseeable and ongoing projects on the Coeur d'Alene River Ranger District is provided in Chapter II. The cumulative effects analysis for Threatened, endangered, and sensitive (TES) plants included the entire Coeur d'Alene River Ranger District (Coeur d'Alene River Basin). The majority of the ongoing projects have already been analyzed in terms of effects to TES plants and had appropriate mitigation measures carried out to protect TES plant populations and habitat. As a result, in most cases these projects contribute only minor cumulative effects to sensitive plant individuals and habitat. Documentation of the analysis and mitigation measures is located in the respective project files for each project. The exception to this is for Forest Service projects with decisions before 1994. Prior to this date, the Idaho Panhandle National Forests did not always analyze for or mitigate effects to TES plants, therefore effects to populations have likely occurred. The cumulative effects of these projects were considered in the TES plant effects analysis for the Small Sales Project.

Since 1994, which accounts for most of the projects listed in these tables, projects have or will be assessed for TES plant effects during development or prior to implementation. Standard mitigation procedures, such as surveys of potential habitat and avoidance of populations, ensure that activities on National Forest System lands would have negligible effects or only effects to individuals but would not have a cumulative effect to TES plant populations. It is generally assumed that no efforts are made to protect TES plants on private ownership, however some TES plants and suitable habitat are likely to occur in those locations and are being impacted. Please refer to Appendix A ("Issues Not Addressed in Detail") and the Project Files (TES Plants) for more information.

The Federal government does not have control over activities taking place on private lands and private landowners are not required to mitigate for the effects of activities on rare plants. Heavy ground-disturbing activities such as land clearing, road building, clearcutting, and development have the potential to extirpate populations of TES plants and have long-term effects on plant habitat. A detailed analysis of effects to TES plants from activities on private lands was not done for this project. For the purposes of this cumulative effects analysis, it is assumed that private lands are not providing suitable habitat for rare plants.

Vegetative changes due to natural and introduced pathogens continue to influence the vegetative components of the ecosystem. Loss of overstory trees due to bark beetle mortality will lead to an increase in fuels in areas that were not salvage harvested during the Douglas-fir Beetle or other timber sales. It is probable that even with the increase in fuel loads and added risks of wildfire, suppression activities will be partially successful at moderating the effects to areas containing sensitive plant habitat should a fire occur. 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. It is also probable that forseeable noxious weed treatments will have some level of positive effect by curtailing rampant weed invasion of some habitats.

The following section discusses some of the cumulative effects predicted for the specific plant guilds most likely to be affected in Alternative 1.

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. Also, cumulatively, most of the land clearing and development activities on private lands has occurred in dry forest guild 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.

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 Appendix C). 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 C-5. Summary acres of suitable sensitive plant habitat potentially affected by harvest treatment, by alternative*.

Rare Plant Guild	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Moist Guild	0	351	351	256
Dry Guild	0	312	312	177
Wet Guild	0	0	0	0
Total Guild Acres	0	663	663	433

**Acreage figures represent Forest Service lands and were derived from Timber Stand Management Records System data.*

The actual effects of selective harvest, commercial thinning and improvement cutting 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, 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 these harvest methods could have incidental, microsite effects to some plants. There would be some direct effects from selective harvest in suitable habitats for sensitive plants of the moist, dry, and wet 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, Dry, and only slightly affect Wet Guild sensitive plant habitat. The limited data and observations available indicate that most species in these Guilds are intolerant of major canopy removal. Bank monkeyflower, while not likely to be affected by an increase in sunlight due to canopy removal, could be impacted by excessive ground disturbance. 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. Acres of treatment can be used to compare the effects to species susceptible to mechanical disturbance**.**

Direct and Indirect Effects

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. 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.

Proposed Threatened Species

Spalding's catchfly (*Silene spaldingii*) has no documented occurrences in the analysis areas, 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. A substantial portion of the proposed harvest would be salvage with subsequent helicopter yarding. These treatments would cause minimal ground disturbance and would therefore pose a low risk of impacts to Spalding's catchfly and its' potential habitat. Road construction and 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 icestorm 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.

Cumulative Effects

Cumulative effects to TES plants are similar between the action alternatives. Any differences in effects are noted for each separate alternative discussion. A list of reasonably foreseeable and ongoing projects on the Coeur d'Alene River Ranger District is included in Chapter II. Ongoing timber sales, road construction and reconstruction, watershed improvement projects, foreseeable noxious weeds treatments and vegetative changes due to natural and introduced pathogens continue to change the vegetative components of the ecosystem. In the past on federal lands, and continuing today on private lands, sensitive plants populations and habitat have likely been impacted. Private landowners are under no legal obligation to protect rare plants or habitat. Projects on the Coeur d'Alene River Ranger District since 1994 have considered the effects of management activities on rare plants. Mitigation measures to protect sensitive plants for ongoing and reasonably foreseeable projects are similar to the mitigation measures included in Chapter II. Given the current 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.

The Forest species of concern, bank monkeyflower, occurs in the project area. Bank monkeyflower is a species which is adapted to disturbed mineral soils (Lorain 1993). Harvest activities proposed to take place in documented occurrences may impact individuals, but would not adversely affect populations of this species

Direct, Indirect and Cumulative Effects

Alternative 2

Alternative 2 would harvest approximately 1,450 acres with selective, regeneration , improvement, and commercial thinning harvest systems. Seventy percent of the harvesting would be selective cutting. Forty-five percent of the selective harvest acres would be yarded by means of helicopter, so effects on habitat in these units would be similar to those of the action of bark beetles alone, as in Alternative 1. The harvesting would impact a total of 663 acres of sensitive plant habitat, split almost equally between the moist and dry guilds. There would be no impacts to documented occurrences of sensitive plants from timber harvesting with this alternative. A relatively small proportion (9%) of the acres proposed harvesting would utilize regeneration harvest treatments and associated site preparation methods which are considered of higher risk to sensitive plants and habitat.

This alternative includes harvesting in designated old growth in the Hayden, Canfield, Fernan, Blue Creek and Thompson Analysis Areas. Late mature and old-growth stands generally provide more highly suitable habitat for many sensitive plant species occuring in the Coeur d'Alene subbasin than younger, immature stands. While some of these areas have been significantly affected by ongoing mortality due to insects, diseases and previous icestorm damage, they may still retain many of the features associated with old growth and provide highly suitable sensitive plant habitat. While the actual harvesting in the designated old growth may not decrease canopy cover greatly over what has already taken place naturally, the subsequent fuels treatments such as piling and burning pose a greater risk of negative effects to plants and habitat.

The impacts of new road construction on sensitive plant habitat would be very low as only about one quarter mile of new prism would be constructed in moist forest sensitive plant habitat with this alternative.

Alternative 2 would include ecosystem burning in the East Rutherford and Prichard Analysis Areas. If conducted in the spring, ecosystem 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. Grassland inclusions in the areas proposed for burning may be suitable for the proposed threatened species Spaulding's catchfly (*Silene spauldingii*) and clearance surveys would need to be conducted in these areas prior to implementation. The risk to moist forest habitat and species would be low because drainages would be buffered from fire application.

Alternative 3

Alternative 3 proposes the same total acreage harvested as Alternative 2, as well as the same acres of suitable sensitive plant habitat impacted. However, proposed harvest is limited to salvage only. Tree removal would focus on dead and dying. In addition, helicopter yarding would be employed on approximately 45% of the treatment acres. The effects to sensitive plant habitat would be very much like that of the bark beetles alone, as reflected by Alternative 1. Under Alternative 3, the risk to sensitive plants from timber harvest and associated site preparation burning would be less than under the other action alternatives, since the regeneration harvest prescription would not be used.

Under Alternative 3, the effects to sensitive plant habitat where treatment occurs in old growth would be slightly less than under Alternative 2 due to the fact that all treatments would be salvage (selective) harvesting.

The impacts to sensitive plant habitat from road building and ecosystem burning would be the same as under Alternative 2. There would be no impacts to sensitive plants as a result of ecosystem burning, because this activity would not occur under Alternative 3.

Alternative 4

Alternative 4 would not include the proposed harvest in old growth and roadless portrayed in Alternatives 2 and 3. A total of 443 acres of moist and dry forest sensitive plant habitat would be impacted, some 230 acres less than Alternatives 2 and 3. Alternative 4 would have the same level of effects to sensitive plant habitat in harvested areas as would Alternative 2, because proposed treatments are the same. The impacts to sensitive plant habitat from road building would be the same as under Alternatives 2 and 3.

Effects of Opportunities

It should be noted that accomplishment of additional watershed/wildlife restoration projects, weed treatment and prevention other than those under contract clauses and timber stand improvement work would be subject to availability of KV or other appropriated funding. Because of policies and regulations affording protection through mitigation measures for all federal projects, the direct and indirect effects would be the same for these potential activities as discussed above.

Timber stand improvement projects would occur in stands with overall low potential to support sensitive plant species. Individual sensitive moonworts could be impacted, with a low level of cumulative impacts expected.

Consistency With the Forest Plan and Other Applicable Regulatory Direction

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

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APPENDIX D
OLD GROWTH

General Assessment of Old Growth Areas

Hayden: This area is located along the western boundary of the National Forest north of Hayden Lake. Private property borders on the north and west side. This is primarily large holding, actively managed for timber, private ownership with an industrial forest to the southwest. Nearest residence is approximately ½ mile to the west. Terrain is moderate, rolling, and slopes of south to western exposure. Generally expected fire pattern would be for fire to burn away from the private holdings with a westerly wind but could move back onto private with a wind shift. Landowner that is immediately adjacent to the west actively salvages his property on an annual basis. His treatments have generally been light, retaining a high timber value on site. He has done considerable salvage over the last few years, as a result of ice storm and beetle infestation, to recover the value loss and to reduce the fire hazard. Landowner maintains a fence line along the property boundary that was damaged during the ice storm. He would like to re-establish it but is concerned about the constant maintenance if numerous dead trees will be falling across it in the years to come.

During field reconnaissance, this area was characterized as being highly variable with stringers of trees and stringers of brush. Stand composition was 60% DF and 40% GF. It was estimated that the beetles infested approximately 50% of the Douglas-fir trees with approximately 400 trees lost in the areas proposed for treatment (12 of the total 57 acres of old growth). There were also moderate ice storm losses to the smaller Douglas-fir component of the stand. Stand exams indicated that the old growth stand is 90-100 years of age but does have a large tree component.

Chapter III (pages 119-120) in the fire and fuels section explains what the expected result of the beetle mortality would be to the area. That section summarizes that in affected stands, within 10-15 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). 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.

The salvage treatment for this area would be to reduce the concentrations of dead material to reduce the future down fuel loadings. This should result in lower fire intensity level in the future. The treatment would not try to eliminate the dead component but reduce the levels. Six of the largest dead trees per acre would be retained on the site for current snag habitat and future down wood recruitment. Ice-damaged timber, almost exclusively the smaller component, would be salvaged if merchantable and the crowns were no longer contributing to the canopy component of the stand. No large green component would be cut. Reducing fire intensity levels may serve to lessen the risk of loss to the remaining large tree component. Reducing intensity may allow us to contain a fire start in this area within the first burning period and allow for cost efficient resource protection. Reducing the snag component would also reduce risks to firefighters. This would be beneficial since an aggressive fire suppression response would likely be in order with this location next to private holdings.

Fuels treatment in this area would be to yard timber with tops attached from the tractor unit right along the property line, hand piling within a helicopter unit that is near the property line, and lop and scatter elsewhere. Lop and scatter will get the limbs and tops onto the ground where they will break down quicker and pose less of a short-term fire risk.

From a silvicultural standpoint, salvage entry generally does not promote old growth character unless it is needed to feature and protect a unique component of the stand, such as large diameter ponderosa pine. The proposed treatment is designed to manage for the live large green component left on the site and most of the timber would be salvaged using a helicopter to minimize disturbance to the area. Due to strong public concern about entry into areas being managed for old growth character, replacement acres of comparable large forest structure will be added to the old growth database. These replacement acres will be away from adjacent private ownership back in the main body of the forest so that this potential conflict does not arise again in the future. The proposed treatment would not change even though replacement acres are identified.

Canfield: This area is located along the western boundary of the National Forest on the western side of Canfield Butte. Private ownership is along the western boundary of this area. Generally, there is about a ½ mile section of undeveloped

mixed ownership along the lower portion of the Canfield face, with varying degrees of partial harvest, before dropping onto the flat in a residential area called Dalton Gardens. Dalton Gardens is a moderately populated area that connects the communities of Coeur d'Alene and Hayden Lake. There is approximately $1,000,000 worth of communications equipment and a structure servicing the Coeur d'Alene area on top of Canfield Mountain just northeast of this old growth area. The south side of Canfield Mountain receives heavy recreational use with numerous trails for motorcycles, mountain bikes, and hikers.

The expected fire pattern would be for a fire to burn uphill away from private lands up toward Canfield Mountain. This area has steep slopes so rate of spread uphill would be expected to be fairly rapid. Several intermittent to dry draws would also likely produce a chimney effect to increase rate of spread up toward Canfield Mountain. This face is located in a highly visible area from the population center so early detection would aid in being able to suppress a fire start before becoming a large fire. This face of Canfield is exposed to the wind. It is the first mountainous area on the district that takes the brunt of southwest to west wind out of the Spokane valley. This could hamper suppression efforts. If a large fire got started, a strong wind shift to the north or south could cause spot fires near timbered residential communities in Nettleton Gulch or Hayden View Estates.

During field reconnaissance, stand composition was estimated at 80% DF and 20% PP. It was estimated that approximately 40-60% of the larger component Douglas-fir trees were infested by the beetles in the areas proposed for treatment (22 of the total 60 acres of old growth). There were also moderate ice storm losses to the smaller Douglas-fir component of the stand. Stand exams indicated that the stand is approximately 100 years of age but does have a large tree component.

As described in the Hayden section above, the affects of the beetles in this area is expected to increase fire intensities and rates of spread into the future. Salvage treatment would be very similar to that described above with a few exceptions. Except for one salvage unit, the harvest treatments in this area are described as improvement harvests. An improvement harvest will salvage, as described above, but will allow for harvest of understory and intermediate Douglas-fir trees that are growing up into and crowding the crowns of larger ponderosa pines. This will reduce competition on the pines and reduce the risk of the understory vegetation providing a ladder for fire to get up into the crowns of the pines. Since the ponderosa pines are few and scattered within the areas scheduled to be treated, this "daylighting" will be a very minor component of the treatment.

Two of the units are scheduled to be hand piled with the remainder scheduled for jackpot burning. Jackpot burning is designed to only burn areas of fuels concentrations as opposed to underburning which is designed to introduce fire across the entire unit, often done to prepare the site for planting. Jackpot burning is designed to reduce down fuel loads (smaller size class material) under controlled conditions so they are not there to be consumed during the fire season. There are risks associated with intentionally introducing fire. However, these risks should be greatly reduced by selecting the right time of year, knowing the weather conditions and forecasts, and using trained personnel.

The proposed treatment is designed to retain the large green component of the stand and maintain some of the biggest dead for wildlife habitat. Again, due to public concern about entry into stands being managed for old growth habitat, this area will be replaced in the old growth database with stands of comparable attributes. The salvage unit will be scheduled for planting because of the opening created by the beetles and the ice storm, but will be retained as a salvage unit to keep as much green canopy on the slope due to visual sensitivity from town. All units will be helicopter yarded even though there is a narrow road going through the middle of the area. Helicopter yarding was selected so as not to expand the road width for equipment access, which would have resulted in losses of timber within the road corridor.

Fernan: This area is located along the lower section of Fernan Creek. There is private ownership along the western side of this area. The private hillslope is steep with an open stand of small sawtimber Douglas-fir. There is a residence and structures along Fernan Creek within ¼ mile of the old growth stand. The old growth stand is well above the residence in elevation. There is a special uses private shooting range with structures ½ mile north of this area on the National Forest. Approximately 160 acres of private ownership to the south and east of this area was transferred to the Forest Service under a land exchange agreement about a year ago.

A major ridgeline divides this old growth area. Most of the stand is Douglas-fir with a wide range of sizes from pole to large sawtimber. There is a large diameter ponderosa pine component that runs the ridgeline with understory Douglas-fir. The understory fir on the ridgetop, though smaller, is actually part of the old growth component. This stand was salvaged after the ice storm. It was helicopter logged and tops were yarded. After this entry, due to the large ponderosa

pine component, this area was added to the old growth database so that its unique features could be tracked. Field reconnaissance indicated that approximately 70% of the larger Douglas-fir were lost to the bark beetles on the eastern side of the ridge. The western side of the ridge had far less mortality but the size component is smaller. Stand exams in this area suggest that the stand is generally about 160 years old.

The expected fire pattern for this area would depend on which side of the ridge a fire start would occur. Fire would generally burn up toward the ridgeline and push to the northeast away from private ownership. If fire got on the west side of the ridge, either from a start or from a spot fire from an intense fire on the east side, the slopes are steep enough that fire would likely back down toward private ownership from burning firebrands rolling out of the fire. A wind shift from out of the north, which often occurs during a dry cold front passage, would hasten the movement onto private land. Reducing fire intensity on eastern slope would increase the change that a fire that started on that side would stop at the ridge.

The proposed treatment would be to salvage the majority of the beetle mortality, to reduce future fuel loadings and fire intensities, while still maintaining some of the large dead tree component for wildlife habitat. Mortality on the east side (approximately 9 acres) of the ridge is significant enough to warrant jackpot burning and planting the openings with ponderosa pine and larch. In the remainder of the area the salvage was felt to be light enough to warrant a lop and scatter fuels treatment. The option to fly the timber with tops attached to the last log is limited since this dead material will likely break the tops out when felled.

This stand will be maintained in the old growth database, with it's larger size ponderosa pine component, even though enough replacement acres have been identified to cover this area.

Blue Creek: This area is several miles south of the Fernan Creek site and again is along the western edge of the National Forest east of Coeur d'Alene. There is private ownership along the western and southern boundaries with additional private ownership to the east about half a section away. There is a subdivided area over the main ridge northwest of the proposed treatment area that has not been developed yet. Due west of the area (uphill) is a private holding with a new home constructed on a ridgeline that separates Fernan Creek from Blue Creek. To the southwest and south (downhill) are multiple private holdings with several residences within ¼ mile of the National Forest. To the southeast and east is approximately 1000 acres of private industrial forest. A natural gas pipeline runs just to the east of the old growth area across the National Forest. Timber types on private ownership would be generally characterized as second growth to the west and mature sawtimber to the south. The industrial forest invested in aerial fertilization after salvaging ice storm damage in 1996, which has increased the value of this timbered area.

During initial field reconnaissance stand composition was estimated at 70% Douglas-fir, 20% ponderosa pine and 10% grand fir. It was estimated that approximately 40-60% of the larger component Douglas-fir trees were infested by the beetles in the areas proposed for treatment (which is the majority of the old growth area). This area was salvaged after the ice storm to remove the smaller component that was uprooted and damaged, to reduce fire risks to the larger stand component. Prior to that entry, the local chapter of the Audubon Society reviewed the site with the Forest Service. At that time, the old growth database was tracking the small triangular area southwest of the treatment area as old growth. During the field review it was determined that the area proposed for ice-damage salvage had better old growth attributes than the area to the southwest. Audubon supported the proposed treatment to remove the smaller damaged component using helicopter yarding systems and the swapping of the stands in the old growth data base.

This area is bisected by numerous finger ridges. The expected fire pattern would be for fire to burn uphill to the north and northwest. Prevailing wind pattern would tend to push fire to the northeast away from private ownership. A significant portion of the mortality is on the lower portions of the slopes. A running fire, burning up toward the main ridge to the north, would likely increase in intensity with the chimney effect created by the dry draws in the upper reach and could spot across the ridge into the subdivided area. The home on the ridgeline would definitely be at risk with any kind of wind push from the east. Fire would likely cross the upper portion of the draw where it is dry and run uphill through the second growth toward the homesite. Homes to the south are at less risk, being downhill. Spread would be much slower unless pushed by wind from the north. Normal evening downslope winds may increase spread down toward these homesites but normal increases in humidity may counteract this affect.

Proposed treatment is designed to reduce future fuel loads and future fire intensity with the desire to catch a fire start while it is still small. This area is a fairly dry site so rates of spread would be expected to be higher than moist site stands. Beetle killed timber would be salvaged using helicopter yarding methods, while still retaining 6 of the largest

dead trees per acre for wildlife habitat. Areas where mortality has not left much overstory component remaining would be planted back to pines and larch. The existing ponderosa pine component would be favored by removing smaller Douglas-fir from around them with an improvement harvest treatment. Fuels concentrations would be jackpot burned, concentrating on the ridgelines, to create natural fuelbreaks through the area to reduce the continuity of fuels. Fuels would also be treated to prepare some of the sites for planting. The objective will be to retain the remaining large green component of this stand. However, due to location and loss of much of the old growth attributes, this area will be dropped from the old growth database and replaced with comparable mature forest acres.

Thompson: This area is located south of interstate 90 along the southwestern corner of the National Forest. Private ownership borders on the southwest corner (downhill) of the old growth area with industrial forest on the south border (sidehill). This industrial forest, approximately 160 acres, is part of a land exchange package. This land exchange is scheduled to occur during the summer or fall of 2000 with this 160 piece being acquired by the Forest Service. Approximately 1 mile south of this area, in the Blue Lake Creek drainage, is Hidden Creek Ranch. Hidden Creek Ranch is a recreational retreat where activities and lodging is provided for guests. Trail rides on horseback is one of the main activities at the Ranch. There are trails that run just east of the old growth area that take guest up to Carrill Peak. About a mile northeast of this old growth is the Red Horse Research Natural Area (RNA). Timber type on the private ownership to the southwest is primarily fully stocked, sapling-size timber. The industrial forest is second growth to small sawtimber size class. The closest residential structure is approximately ¾ miles from the old growth area.

The expected fire pattern would be for fire to burn uphill to the southeast toward the main ridgeline separating Thompson from Blue Lake Creek. Prevailing wind would tend to push the fire to the northeast into the National Forest and toward the Red Horse RNA. A fire running up toward the main ridge would likely spot across the ridge but would still be on the National Forest. A wind shift out of the north, such as after a dry cold front passage, would likely result in the fire being driven down toward private ownership but at a slower pace.

Field reconnaissance indicated that this old growth area had a mix of grand fir, Douglas-fir, ponderosa pine, and larch becoming two-storied regenerating to fir underneath. Significant beetle mortality was associated with finger ridges that bisect the slope. These areas are where the larger Douglas-fir and ponderosa pine component exist. Most of the large Douglas-fir component has been killed in these areas due to the beetles. From 20-50 dead trees per acre are associated with these ridgelines. Stand exams suggest that trees in this area are approximately 125 years old with some older component.

The proposed treatment would be to reduce this dead tree component to reduce future fire intensity levels. Six of the largest dead per acre would be retained for wildlife habitat. Improvement harvests would be implemented to harvest the understory fir from around the large ponderosa pines to reduce competition and potential ladder fuels. Areas would be jackpot burned to reduce short-term fire risks except for a small area adjacent to the private ownership, which would be hand, piled. One area that is quite open now from root disease and beetle losses would be planted to pines and larch. It will naturally regenerate back to fir and brush if the opportunity to plant seral species is not taken now.

Silvicultural assessment of this area was that since we are only treating a portion of this old growth stand and the other areas already have a fairly high dead component, entry into the beetle mortality areas will not significantly reduce the risk of catastrophic fire replacing this stand. Replacement acres of comparable mature forest structure have been identified if entry is made into this stand in Thompson.

Table D-1. Old Growth, by Old Growth Units.

Analysis Area	Old Growth Unit (OGU)	OGU Acres	Old Growth Acres in OGU			Percent of OGU
			Allocated [1] Field Verified	Allocated [2] Not Field Verified	Recruitment [3]	
Hayden Lake	21	8,309		96		1
Canfield Face/Fernan Creek	26	10,356	65	107	100	3
Blue Creek	28	8,819	256	157		4
Thompson Creek	33	13,986	512	133	634	9
Cedar Creek/East Rutherford	30	9,914	1,749	935		27
Fourth of July	19	12,546	184	272	297	6
Cataldo Face, Prado Creek, Owl Creek (LLNF)[4]	18	12,036		239		2
Gimlet (LLNF)	17	11,978	615	271	283	10
Little Teepee (LLNF)	16	12,451		524		4
Cougar/Studer	125	12,842	1,479			12
Cougar	129	11,519	1,113			10
Beaver (Potosi)	115	10,757	616			6
Beaver(Potosi)/Prichard	116	9173	899			10
Beaver (White)	122	12,819	441			3
Prichard Creek	110	13,358	2,349			17
Shoshone Creek	105	9,342	1,480			16
	107	8,739	552			6
Downey Creek	128	11,377	1,688			15
Callis Creek	8	12,566	221	26	75	2

[1] *9 = Allocated Old Growth that has been field verified and meets minimum criteria or Old Growth identified by an ID team as old growth.*
[2] *10 = Allocated Old Growth that has been photo identified as likely meeting minimum criteria, but not field verified.*
[3] *11 = Recruitment stands allocated for old growth management to create large blocks, corridors, or logical Old Growth landscape management units.*
[4] *LLNF = Lower Little North Fork*

Table D-2 provides information on the large tree and dead tree components of currently allocated old growth proposed for harvest in Alternatives 2 and 3. Table D-3 provides information for proposed replacement old growth stands. Although it was preferred that replacement old growth stands be in the same Old Growth Unit (OGU) as stands proposed for harvest, stand exam information indicated that suitable replacement old growth was not available within the Hayden Lake and Canfield/Fernan OGU's. Replacement old growth areas for stands entered in the Hayden Lake Analysis Area have been identified in the Cedar Creek Analysis Area. Replacement old growth areas for stands entered in the Canfield Analysis Area have been identified in the Fortier Creek area. Fortier Creek is in the same OGU as stands proposed for harvest in the Thompson Creek Analysis Area and provides replacement old growth for these stands. Old growth stands harvested in the Blue Creek Analysis Area would be replaced by old growth in the Stella Creek area. Stella Creek is in the same OGU as Blue Creek. Old growth stands to be harvested in the Fernan Creek Analysis Area would still retain a large, old tree component and these stands would continue to be managed to provide old growth characteristics, although replacement acres have been identified and will be added to the old growth data base.

Approximately 159 acres is proposed for harvest within 427 acres of allocated old growth stands in Alternatives 2 and 3. Thirty acres would continue to be managed as old growth, while the old growth database would be increased by 511 acres of newly allocated old growth. Additionally, 242 acres of recruitment old growth would be identified to link existing and/or replacement old growth stands together.

Table D-2. Current old growth areas proposed for entry.

Area		Habitat	Live Tree Component >20"				Dead Tree Component		Major	Total
Name	Acres	Type	Avg. DBH	Avg. TPA	Avg. Age	Oldest	Avg. DBH	Avg. TPA	Species	BA
Hayden[1]	43	520	25.4	21	93	105	25.4	15	DF/GF	87
Canfield[1]	84	260	23.3	26	102	135	19.6	36	DF/PP	180
Fernan[1]	30	260	25.0	21	163	208	24.5	27	DF/PP	80
Blue[1]	72	260	25.2	6	118	157	20.0	32	PP/DF	80
Thompson[2]	198	570	23.0	28	126	190	13.9	37	GF/DF	167

Table D-3. Proposed replacement old growth.

Area		Habitat	Live Tree Component >20"				Dead Tree Component		Major	Total
Name	Acres	Type	Avg. DBH	Avg. TPA	Avg. Age	Oldest	Avg. DBH	Avg. TPA	Species	BA
Cedar Cr.[1]	66	578	30.1	17	155	200+	25.0	15	C/WH	160
Fortier Cr.[2]	343	570	24.7	16	118	250	14	34	C/WH	155
Stella Cr.[1]	102	570	26.2	21	134	250	22	16	GF/WH	145

[1] Stand exam data collected in May 2000.
[2] Stand exam data collected in 1993.

Habitat Type 520 = Grand fir/queencup beadlily
Habitat Type 260 = Douglas-fir/ninebark
Habitat Type 570 = Western hemlock/queencup beadlily
Habitat Type 578 = Western hemlock/wild ginger

DBH = Diameter 4.5 feet from ground
TPA = Trees Per Acre
BA = Basal Area

DF = Douglas-fir
GF = Grand fir
PP = Ponderosa Pine
C = Cedar
WH = Western Hemlock

Hayden Area: This old-growth stand retains a substantial large tree component although the overall stand age is less than 100 years. The number of snags in the stand is fairly moderate although they tend to be concentrated in areas of beetle activity. Proposed replacement old growth is generally older than the Lancaster stands but currently has fewer large trees. Due to the high component of Douglas-fir and grand fir, it may be difficult to maintain the old growth character of the stand over the long term. However, this stand is not a high priority to enter from a vegetation standpoint.

Canfield Area: This old growth stand also retains a substantial large tree component and again the stand age is generally about 100 years although there are some older trees. This stand is on a dry habitat type with a minor component of ponderosa pine. There are about 36 dead trees per acre, which will create high fuel loading as these trees fall to the ground. Due to the high component of Douglas-fir, it may be difficult to maintain the old growth character of the stand over the long term. Based on the potential for a stand replacing fire, it is appropriate to harvest within the stand while trying to maintain some of the old growth character.

Fernan Area: This old growth stand also retains a substantial large tree component and the stand age is generally about 160 years. This stand is on a dry habitat type with a substantial component of ponderosa pine. There are about 27 dead trees per acre, which will create high fuel loading as these trees fall to the ground. Due to the high component of Douglas-fir, it may be difficult to maintain the old growth character of the stand over the long term but the ponderosa pine should provide a large tree component. Based on the potential for a stand replacing fire, it is appropriate to harvest within the stand while trying to maintain some of the old growth character.

Blue Creek Area: This stand has lost most of its old growth character due to ice storm damage, Douglas-fir beetles, and western pine beetle. Root disease is also prevalent within the stand. There are only six trees per acre over 20 inches in diameter and about 32 dead trees per acre. The project silviculturist recommends harvesting this stand and replacing it with suitable old growth.

Thompson Area: This stand retains a substantial old growth character. The average age of large trees is 126 years and there is a component of older trees. There was also a substantial component of dead trees (37 trees per acre) before Douglas-fir beetle mortality. Because of the previously existing dead tree component and high fuel loading I do not believe salvage will substantially reduce the risk of a stand replacing fire. The project silviculturist recommends no entry in this stand.

Cedar Creek Area: This proposed replacement old growth stand is a riparian stringer that contains large, old cedar, hemlock and grand fir. Due to the wet habitat type and species composition, it should be possible to maintain the old growth character of the stand over the long term.

Fortier Creek Area: This proposed replacement old growth stand is on a moist habitat type and is dominated by cedar and hemlock but has a component of Douglas-fir, grand fir, white pine and ponderosa pine. Although average age of the larger trees is only 118 years, there is a component of older trees.

Stella Creek Area: This proposed replacement old growth is on moist habitat types dominated by grand fir, hemlock, cedar, and Douglas fir. Average age of the large tree component is about 134 years with some older trees. The dead tree component is heavy to white pine killed by blister rust.

RECREATION

Regulatory Framework

Recreation goals and objectives identified in the Forest Plan are to provide for the projected use of developed recreation areas with development of new sites as budget becomes available, to provide for a variety of dispersed recreation opportunities, to pursue opportunities to increase and improve the recreation trail system, and to continue to increase cooperative trail programs with organizations, clubs and other public agencies (Project Files, Recreation). The following standards were established by the Forest Plan in compliance with the NFMA:

- *Recreation Standard 1: Continue to provide a share of recreation opportunities*
- *Recreation Standard 7: Provide a broad spectrum of dispersed and developed recreation opportunities*
- *Recreation Standard 8: Treat and maintain timber stands in a manner compatible with recreation objectives*
- *Recreation Standard 10: Trails will be managed in accordance with management area requirements*

The Multiple Use Act of June 1960 establishes recreation to be administered as a resource equal in value to timber, watersheds, wildlife and fish, and range.

The Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin, and Coeur d'Alene Geographic Assessment:

- *Establishes the Recreation Opportunity Spectrum as a guide to meet recreation goals.*
- *Defines geographic importance of places for recreation opportunities and facilities.*
- *Directs that opportunities to extend expand and protect recreation facilities be explored in planning documentation.*
- *Identifies existing recreation facilities and sites and areas of concentrated recreation use.*

Guidance for management of recreation resources is provided in various National Forest manuals and handbooks, as well as professional publications and documents.

Methodology

Determination of the existing conditions for recreation activities, facilities and opportunities is derived from facility inventories, facility maintenance work, observation by recreation specialists and technical personnel, and contact with recreation user groups and individuals. The following describes existing conditions as well as direct, indirect and cumulative effects to recreation for each of the analysis areas.

Direct, Indirect and Cumulative Effects at the Analysis Area Scale

Hayden Lake

Proposed harvest units lie in an area where there are no recreation developments or known dispersed (undeveloped) camping or picnicking sites. Under the Recreation Opportunity Spectrum (ROS), the affected area is classified as roaded and modified in appearance.

Under Alternatives 1 and 4 conditions would remain the same. Alternative 2 would have no more than short-term disruptive effects (for example, someone walking through the area in pursuit of some recreation benefit may have to work around an active logging unit for safety's sake). Visitors may also encounter sites and sounds of various timber management operations. Timber operations would be compatible with a Recreation Opportunity Spectrum, (ROS) classification of (roaded modified). Alternative 3 would be the same as Alternative 2.

Canfield

The proposed harvest units lie on the west face of Canfield Butte. They occupy an area that is traversed by approximately 1.4 miles of the 32-mile Canfield Trail System which is managed principally for motorcycles but also used by mountain bikers, hikers and infrequently, horseback riders. Just to the north of this project area there is a trail developed for horseback riders known locally as the "Bud Howard Trail" (Forest Trail #29). There are no other recreation developments in this area. The ROS classification for the area is rural as it is within sight and sound of urbanized lands (approximately one-half mile away).

Under Alternatives 1 and 4 existing condition would be maintained. Beetle-infected trees could create additional down tree clearing work on trails in the area. Alternative 2 would create disruption in the far western portion of the Canfield Trail System, in effect prohibiting use of about 3 miles of trail by the public for the duration of the project and some post harvest activities. Trails would be protected by timber sale contract clauses and/or trust funds collected to reestablish trails and associated developments if necessary. Over the long term, implementation of this alternative would have no effect on the use and enjoyment of trail users. Other than noise and the sight of some helicopter logging operations, Trail 29 would not be directly impacted.

The Canfield Trail System has been considerably impacted by timer harvest activities since 1997. This is due to tree damage that occurred during the 1996 ice storm, followed by the Douglas-fir beetle epidemic that has struck the area hard. Although salvage of timber is not critical to the trail recreation itself, failure to act would certainly increase hazards to trail users in the form of increased wildfire probability and more down trees and debris to deal with.

Alternative 3 would have no additional effects beyond that described above.

Fernan

These units reside on a hillside with no recreation facilities. Adjacent to the operation area is the Fernan Rod and Gun Club shooting range under Forest Service special use permit also there is a very popular site where the public comes to target shoot in the same vicinity. A parking facility for the Canfield Trail System is also on site this facility is the principal trailhead for the Trail System. ROS classification for the project area lands is roaded rural.

Alternatives 1 and 4 would have no effect on recreation resources. Alternative 2 would create short-term operation disruption of the Rod and Gun Club facilities due to helicopter flights over the area, but use of the range would not be halted. The public site would need to be closed for a short time to allow helicopter over flight. The parking facility for the trails would be used as a helicopter landing and would therefore be unavailable for public use during the operation. Timber sale purchasers would be responsible for immediate clean up of the parking lot following flight operations. Further cleanup of the parking area and sign rehabilitation may be necessary and should be purchased with timber sale trust funds.

Similar to the Canfield project, the parking area at Fernan has been intermittently unusable by the public due to the need to use it as a helicopter landing site.

Alternative 3 would have no different effect than that previously described.

Blue Creek

The Blue Creek project area has no recreation developments and is rated as Roaded Natural Appearing under ROS.

Alternatives 1 and 4 would have no effect on recreation. Alternatives 2 and 3 could creat short-term interruption of what limited general access occurs in the area.

Thompson

The area occupied by the Thompson units is classified by the ROS as roaded natural appearing. While there are no actual Forest Service maintained public recreation facilities with in the area a guest ranch under special use permit does maintain a trail system for the use of their guests, allowed under the permit, part of which is in the operation area.

Alternatives 1 and 4 would not result in any change to recreation for the time being. Alternative 2 would have direct and indirect effects on Hidden Creek Ranch operations and on the experience the guests enjoy at the ranch. Direct effects would be to the trail system they have developed for horse back and hiking activities. There is a good possibility that the ranch might use other trails for the duration of the timber harvest. Of more concern are the indirect effects that helicopter logging sites and sounds may have on the experience of the ranch guests. Most of the guests at this facility do not expect helicopter and logging noise to be part of their experience in the forested hills of Idaho. There will no doubt be such effects. The number of people affected by logging operations and disruptions to the ranch program could be minimized by season restrictions that do not allow logging operations to occur in the period June through September. The bulk of visitors to the ranch are present during that period.

The Ranch maintained trails will need to be protected and immediately reopened upon completion of the logging. Timber sale trust funds may be needed to assist in the completion of the job.

Alternative 3 would have a smaller overall effect and might take a shorter period to complete the project.

East Rutherford

There are no recreation developments within this area. The Rider Ranch, which operates under a special use permit, does utilize a trail that runs along the ridge that forms the north boundary of the project area. The ROS for the area is roaded natural appearing in the location of unit number 1 and the ROS class for the balance of the area is semi-primitive non-motorized. The focus of the non-motorized designation is in the Marie Creek drainage along the Marie Creek Trail 241. Trail 241 is well out of the proposed project area. The semi-primitive ROS characteristics of the greater Marie Creek roadless area would be retained.

Alternative 2 would affect the Rider Ranch Trail with at least noise and sight disturbance. It is also possible that logging activities in Unit 2 could interrupt use of the trail for a short period. This trail must be protected by sale contract provisions and possibly require trust fund application if necessary.

Alternatives 1 and 4 would have no effect on recreation. Alternative 3 would have the same effects as Alternative 2.

Cedar

There are no recreation developments in the area other than Roads 413, 3097, and 3098, which serve as snowmobile trails in the winter season. The proposed operation area is also in the vicinity of the Mullan Road Historic site. ROS class for the area is roaded natural appearing.

There would be no effect to recreation under Alternative 1. Alternative 2 would have no effect on recreation unless operations were to occur in the winter, when there could be some disruption of snowmobiling on Roads 3097 and 3098. For this reason it best to prohibit logging of the Cedar units from December 15 through March 1.

Alternatives 3 and 4 would be similar in effect.

Fourth of July

There are no recreation developments in the area other than Roads 413, 3097 and 3098, which serve as snowmobile trails in the winter season. The proposed operation area is also in the vicinity of the Mullan Road Historic site. ROS class for the area is roaded natural appearing.

Under all action alternatives there would be the potential for snowmobile trail disruption. Currently Roads 3097 and 3098 are proposed as haul routes for this area; if Road 413 were identified as an alternate haul route, there could be disruption to the snowmobile trail. It is recommended that logging activities be suspended for from December 15 through March 1. Trust funds may be needed to repair or replace snowmobile signing if a decision is made to allow wintertime operations.

Cataldo Face

There are no recreation developments in the area. Road 3097, proposed as the main haul route for this area, serves as a snowmobile trail in the winter season. The proposed operation area is also in the vicinity of the Mullan Road Historic site. ROS class for the area is roaded natural appearing and rural in lower Hardy Creek.

Alternative 1 would have no effect; all action alternatives would have marginal and temporary effects on recreational opportunities.

Downey

There are no recreation developments in or near the area. The ROS class is roaded modified appearing. Alternative one would have no effect; the action alternatives would have short-term transient effects on recreation opportunities.

Prado, Studer, Cougar

There are no recreational developments in or near these areas. The ROS class for all these units is roaded natural appearing.

Alternative 1 would have no effect; the action alternatives would have transient effects.

Gimlet

There are no recreation developments in or near this area except Road 3097, which is a snowmobile trail in winter. The ROS class is roaded natural appearing.

Alternative 1 would have no effect on recreation. Alternatives 2, 3 and 4 would have transient effects on recreation opportunities that could be lowered to negligible if winter log haul is prohibited on Road 3097.

Owl

There are no recreation developments in this area; access to the area for recreation is quite limited. The ROS class is roaded natural appearing.

Alternative 1 would have no effect; the action alternatives would have very limited short-term effects. Alternatives 2, 3 and 4 would have transient effects on recreation opportunities that could be lowered to negligible if winter log haul is prohibited on Road 3097.

Little Tepee

There is only one recreation development within the area, which is the Shell Ridge Trail 630. The trail runs along the ridge that forms the eastern boundary of the area. The trail is considered a secondary trail and is maintained at a maximum frequency of once every four years. The Bumblebee Campground is near the area and there are 14 undeveloped (dispersed) campsites just to the south of the area along the Little North Fork of the Coeur d'Alene River. The ROS class for the area is roaded natural appearing.

Alternative 1 has no effect on developments or opportunities in or near the operation area. Alternatives 2,3 and 4 would have transient effects on recreation opportunities, which in this case include sound from helicopters that may be heard from the Campground and dispersed sites. Harvest Units 15, 16 and 17 lie immediately adjacent to the Shell Ridge Trail and could have short-term effects on use of the trail. The trail, if affected at all by logging, should be protected by contract clauses in the timber sale package or trust funds could be collected for additional trail work or sign rehabilitation.

Callis

There are no recreation developments within the Callis area. The area is classed in ROS as semi primitive with motorized travel permitted. This area has a fair amount of hunter activity in the Fall hunting season. There are three dispersed campsites located along Road 436 used almost entirely in the hunting season.

Alternative 1 has no effects on recreation opportunities. Alternatives 2, 3 and 4 have transient effects and certainly have the capacity to disrupt hunters for whom these ridges are popular haunts. Also, while not within the area there are several key snowmobile trails that reside to the south and west of the project area. If winter log haul were proposed one or more of these roads/trails would be required to be used. These routes are so important to the orderly operation of the snowmobile trail system and travel objectives of users, snowplowing should be prohibited to access the area.

The semi primitive characteristics of this area will be retained as all the logging units are salvage cuts and the area has seen similar logging in the past.

Prichard

There are no recreation developments in or near the individual sub divisions of the Prichard area. Two subdivisions are adjacent to Forest Highway 9 also called the Murray-Thompson Falls Scenic Route. (See Scenery section for effects analysis). The ROS for all the divisions is roaded natural appearing.

Alternative 1 has no effect. Alternatives 2,3 and 4 have short-term effects on recreation access and opportunities in all the sub divisions.

Potosi and White

There are no recreation developments in or near these project areas. The ROS for each is roaded natural appearing and roaded modified.

Alternative 1 would have no effect. Alternatives 2, 3 and 4 would have transitory effects on recreation opportunities.

Shoshone

Berlin Flats Campground lies within the north most division of this operational area. “Hawkseye Camp” is a very popular group campground that is undeveloped with the exception of a fault toilet facility that also is within the north sub division of the area. There are seven very popular dispersed camping site in addition to Hawkseye in or in the vicinity of the areas. These sites are occupied almost every weekend from July through October. The north sub division is a central camping and staging site for hunting in season. The Shoshone Creek road number 412 serves as a snowmobile trail in the winter. The ROS for both subdivisions of the Shoshone area is roaded natural appearing.

Alternative 1 would have no effects on the existing condition in the area. Alternatives 2,3 and 4 would have disruptive effects on recreation dependent on the season of operation. From mid-May to the end of September campers at Berlin Flats Campground would be affected by helicopter operation noise as would other undeveloped campsites. Fall operations would be very unappreciated by the mass of hunters that frequent the area. Winter operations would cause disruption of snowmobile riding on Road 412. The proposed helicopter landing and Hawkseye will be met with some opposition if it were to occur in the hunting season especially. The best operational period to have the least effect on recreation in the Shoshone area would probably be in the spring and early summer or March through mid June. Again as in the many other areas the effects on recreation are transitory and do not change ROS or other recreational value.

Cumulative Effects at the Coeur d'Alene River Basin Scale

The scenery and recreation resources consider cumulative effects at the Coeur d'Alene River Ranger District scale. The National Forest provides a wide range of scenic views and recreational opportunities scattered across the district. The National Forest also provides for a wide range of uses. The ongoing and reasonably foreseeable projects and activities identified in Chapter II (Tables II-1 through II-15) fall within that wide range and natural variation. The Small Sales EIS and other ongoing and foreseeable projects are designed to meet Forest Plan visual quality objectives for the overall landscape. Short-term disturbances to recreational usage in any given area may occur, but dispersal to other parts of the forest where activities are not occurring is always available.

Combined, these projects would not alter the Coeur d'Alene River Basin ROS. These projects would have only transitory effects on recreation access and opportunities. Site disturbances would be minimal as most logging prescriptions are for salvage and improvement harvests. Various harvest and post harvest activities could temporarily displace some recreation visitors to other parts of the Coeur d'Alene River District or perhaps adjacent Districts. The action alternatives propose six short segments of temporary road totaling less than one mile of road. These roads would be closed to motorized public access after use. The Coeur d'Alene River Ranger District Travel Plan (Order No. D3-00-005, January 8, 2001) prohibits public motorized access off of established routes (with the exception of winter travel). This restriction is supported by CFR (federal regulation) closure orders (Project Files, Transportation). None of the alternatives would affect the amount of public access to National Forest System lands on the Coeur d'Alene River Ranger District.

No developed recreation sites will be directly affected. Indirect effects might include the sounds of helicopters and logging trucks passing a recreation site.

Consistency With Forest Policy and Legal Mandates

The Forest Plan identifies recreation goals and objectives (Forest Plan, Chapter II, pages II-1 through II-3), with specific standards (Forest Plan, Chapter II, pages II-24 and II-25). Applicable standards are addressed below.

Recreation Standard 1: Continue to provide a share of recreation opportunities. This standard would be met under all alternatives.

Recreation Standard 7: Provide a broad spectrum of dispersed and developed recreation opportunities. This standard would be met under all alternatives.

Recreation Standard 8: Treat and maintain timber stands in a manner compaticble with recreation objectives. Current recreation objectives within these areas would be maintained under all alternatives. Potential for future recreation developments and programs would be unaffected.

Recreation Standard 10: Trails will be managed in accordance with management area requirements as identified in a more site-specific analysis of needs. Alternative 1 (No Action) would have no effect on trail management. Under all action alternatives, standards would be met for trails in all management areas.

In the absence of specific standards or direction, all alternatives would be consistent with recommendations and findings of the Interior Columbia Basin Ecosystem Management Project and Geographic Assessment.

APPENDIX F
WATERSHED HYDROLOGIC RESPONSE ESTIMATES AND WATSED

WATSED is the cumulative effects model used to evaluate the effects of forest management on the Coeur d'Alene River Ranger District. It is designed for watersheds ranging from approximately 2,000 acres to 50 square miles in size (Patten 2000, R1/R4 WATSED Manual). WATSED estimates the cumulative effects of four management activities (logging, road building, road maintenance, and burning) on peak flow and sediment yield.

WATSED was used to model effects for the period between 1980 and 2031 (WATSED Project Files). The approximate twenty-year period prior to harvest displays the effects of past management on existing condition. The 30 years following harvest displays the effects of the proposed management activity. Effects estimates were presented as percent (%) change over the predicted "natural" (unmanaged) conditions. Three basic scenarios were analyzed:

- ***Existing Condition***: *The present condition of the watershed reflecting the cumulative effects of past management. In an unmanaged watershed, the percent change over natural conditions for water yield, peak flow, and sediment yield is zero. In most watersheds, however, Existing Condition estimates are greater than zero because the land has been actively managed in the past.*
- ***Forseeable Actions***: *Foreseeable management activities that are not connected with the project being analyzed, but will occur in addition to proposed management activities.*
- ***Proposed Management Alternatives***: *Proposed management activities.*

The WATSED model predicts cumulative effects based on the average, measured response of the gauged watersheds used to develop the model. Different watersheds respond differently to stress due to a vast number of climatic and environmental factors (Brooks and others 1991, Harr 1986, Troendle and King 1985, Megahan 1983, Christner and Harr 1982, Jones and Grant (1996), Thomas and Megahan (1998)). WATSED cannot account for the multitude of factors that cause variability among watersheds. Therefore, it uses simplified rules and assumptions set by the author (Patten 1989, Patten 2000, USFS unpublished). As a result, *WATSED outputs should not be interpreted as measured values.* Natural variability, technical limitations, measurement error, and model limitations were taken into account when interpreting WATSED results. For example,

- *WATSED assumes that a road prism stays open and maintained to perpetuity. Many forest roads are little-used and heavily re-vegetated. In these cases, WATSED overestimates sediment yield.*
- *WATSED does not explicitly evaluate the risk of stream crossing failure, which is a major contributor of bedload in the Coeur d'Alene River sub-basin. A separate analysis procedure is used for evaluating crossing failure.*
- *WATSED is not well-suited for evaluating watershed restoration activities because it was designed for road development, road maintenance, logging, and prescribed burning.*
- *Watersheds differ in resiliency to disturbance. Low-level changes in sediment yield and peak flow do not usually cause measurable changes in stream condition unless they are sustained for long periods of time (Patten 2000).*

Model error, measurement error, and natural variability all cause model variance as seen in preliminary validation monitoring of WATSED on the IPNF (USFS 1999). Validation results for Central Zone watersheds were as follows:

Peak Flow: *predicted values ranged from 83% to 97% of measured values.*

Flow Duration: *predicted values ranged from 87% to between 95% and < 105% of measured values.*

Sediment: *predicted values ranged from 106% to 300% of measured values.*

Validation results correlated reasonably well with measured values. For peak flow and flow duration, WATSED estimates were slightly low, but very good. For sediment, WATSED tended to overestimate both sediment yield and the recovery period management activities.

The preceding discussion suggests that WATSED results should be interpreted as relative indicators of watershed response rather than absolute values (USDA Forest Service, unpublished). For this reason, general risk categories were developed and presented in the document (see WATSED Project Files, p. 3). Analysts using WATSED, or others interpreting its results, must be familiar with the model and its limitations in order to draw meaningful conclusions. In this NEPA document, WATSED was used in conjunction with other sources of information discussed in the Methodology section of Chapter III.