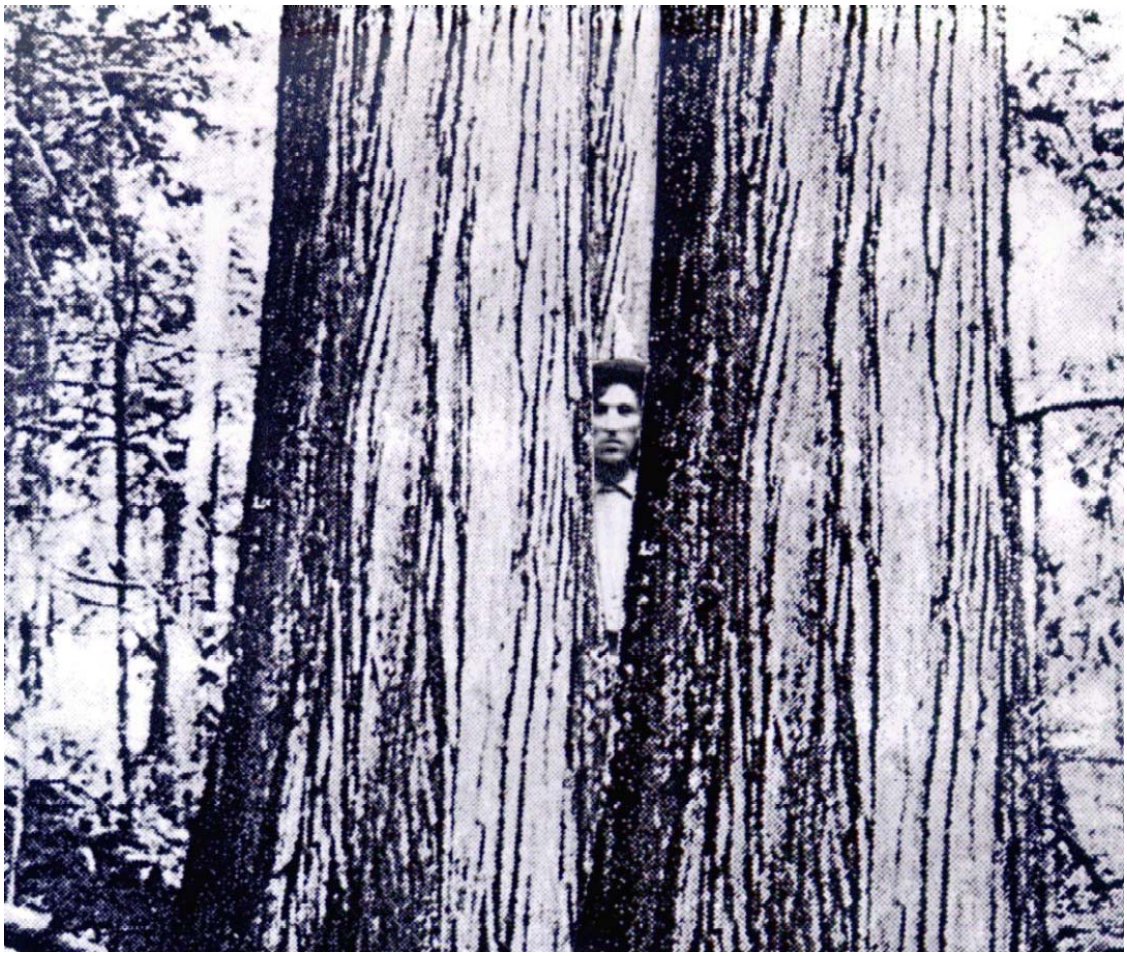
HIDDEN CEDAR PROJECT

FINAL ENVIRONMENTAL IMPACT STATEMENT



United States
Department of
Agriculture

Forest Service

Idaho Panhandle
National Forests
St. Joe Ranger District
June 2002

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HIDDEN CEDAR PROJECT

FINAL ENVIRONMENTAL IMPACT STATEMENT

Idaho Panhandle National Forests

St. Joe Ranger District

Shoshone, Latah and Clearwater Counties, Idaho

June 2002

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Abstract: This Final Environmental Impact Statement (FEIS) documents the analysis of six alternatives developed for the Hidden Cedar project, which respond differently to the major issues, including existing road management, new road construction, and watershed restoration.

Alternative A is the no action alternative.

There is new road construction in all alternatives, except A, associated with requests to build road on National Forest System land to reach private or State land.

Alternative B is the proposed action, which includes timber harvest with associated road construction, precommercial thinning and watershed restoration.

Alternative C includes the same activities as Alternative B, but has no new road construction associated with Forest Service activities.

Alternative D has no new road construction associated with Forest Service proposed harvest and has dropped harvest units associated with the new road construction. This alternative removes riparian road in Wood and Hidden Creeks and includes other watershed restoration activities. New road would be constructed for administrative access to the upper end of Hidden Creek and East Fork of Emerald Creek, which would be lost with removal of Hidden Creek road.

Alternative E has no commercial timber harvest. It consists of precommercial thinning, removal of roads in Wood and Hidden Creeks, and watershed restoration, with no new road construction for timber management access.

These five alternatives (A-E) were considered in the Draft EIS. Another alternative was added to the FEIS, Alternative F. This alternative is a combination of Alternatives B and D. It provides watershed restoration similar to Alternative D, which is much more than Alternative B, while treating more acres for forest health than Alternative D.

Table of Contents

CHAPTER 1 – PURPOSE AND NEED 1-1
SUBSTANTIVE CHANGES BETWEEN DRAFT EIS AND FINAL EIS 1-1
Introduction 1-1
Project Area Description 1-1
Forest Plan Direction 1-2
Purpose and Need for Action 1-3
Scope of This Project 1-7
Decisions To Be Made 1-8
CHAPTER 2 - ALTERNATIVES 2-1
Substantive Changes between Draft EIS and Final EIS 2-1
Introduction 2-3
Alternative Development 2-3
Alternative Descriptions 2-8
Summary Comparison of Alternatives 2-33
CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 3-1
SUBSTANTIVE CHANGES BETWEEN THE DRAFT EIS AND FINAL EIS 3-1
In This Chapter 3-4
FOREST VEGETATION 3-9
TRANSPORTATION 3-31
SOILS 3-45
WATER 3-57
FISHERIES 3-87
Summary of Alternative Effects 3-98
Blair Creek: 3-105
Cat Spur Creek: 3-107
Cedar Creek: 3-108
Hidden Creek 3-111
Keeler Creek: 3-115
Kitten Creek: 3-118
Log Creek: 3-118
Long Slim: 3-119
Mazie Creek: 3-120
West Fork St. Maries: 3-123
Wood Creek: 3-126
Lower St. Maries River: 3-129
WILDLIFE 3-134
TERRESTRIAL WILDLIFE HABITAT 3-145
Vegetation/Habitat/Successional Stages 3-145
Old Growth 3-147
Dry Site Habitat 3-151
Riparian Habitat 3-151
Disturbance/Access 3-153
Connectivity 3-156
MANAGEMENT INDICATOR SPECIES 3-158
Old Growth Associated MIS -Pileated Woodpecker 3-160

Elk 3-163
THREATENED AND ENDANGERED WILDLIFE SPECIES 3-170
Gray Wolf.....3-171
SENSITIVE WILDLIFE SPECIES 3-173
Fisher and Marten.....3-174
Wolverine 3-179
Northern Goshawk 3-180
Black-backed Woodpecker.....3-184
Flammulated Owl 3-186
Coeur d'Alene Salamander 3-187
Boreal Toad 3-188
PLANT SPECIES AT RISK 3-191
NOXIOUS WEEDS 3-204
VISUAL QUALITY..... 3-212
FIRE AND FUELS MANAGEMENT..... 3-216
RECREATION..... 3-223
RANGE 3-229
AIR QUALITY 3-239
MINERALS..... 3-246
HERITAGE RESOURCES..... 3-248
FINANCES 3-250
Disclosures 3-255

List of Tables

Table 1-1 - Forest Plan Management Area Descriptions for Proposed Action.....1-3
Table 2-1 - Pre-commercial Thinning 2-12
Table 2-2 – Snag Guidelines 2-16
Table 2-3 - Summary of INFish Widths.....2-21
Table 2-4 - Site-Specific Mitigation Measures And Design Features.....2-25
Table 2-5 – Roads with gravelling to reduce sediment 2-26
Table 2-6- Watershed Restoration to occur prior to or concurrent with Road Construction 2-26
Table 2-7- Harvest Treatment Summary.....2-27
Table 2-8 - Road Construction, Reconstruction and Decommissioning 2-27
Table 2-9 - Harvest Treatment Summary.....2-28
Table 2-10 - Road Construction, Reconstruction and Decommissioning 2-28
Table 2-11 - Harvest Treatment Summary.....2-29
Table 2-12 - Road Construction, Reconstruction and Decommissioning 2-30
Table 2-13 - Alternative D Existing NFSR Decommissioning.....2-30
Table 2-14 - Road Construction, Reconstruction and Decommissioning 2-31
Table 2-15 - Alternative E Existing NFSR Decommissioning 2-31
Table 2-16 - Harvest Treatment Summary.....2-32
Table 2-17 - Road Construction, Reconstruction and Decommissioning 2-32
Table 2-18 - Alternative F Existing NFSR Decommissioning.....2-32
Table 2-19 - Summary Comparison of Purpose and Need Objectives.....2-34
Table 2-20 - Summary Comparison of Issue Indicators by Alternative.....2-35
Table 2-21 - Long Term Monitoring Core Data.....2-36

Table 2-22 - Summary of Road Core Data....2-36
Table 3-1 - Distribution of Habitat Types on NFS in Hidden Cedar Analysis Area....3-11
Table 3-2 - Species Composition Changes in Idaho....3-12
Table 3-3 - Forest Type Changes in the St. Joe River Basin and Hidden Cedar Project Area....3-13
Table 3-4 - Size Class Distribution for the St. Joe River Basin and the Hidden Cedar Area....3-15
Table 3-5 - Comparison of Vegetation Components by Alternative....3-21
Table 3-6 - Existing Condition of the Road System in the Project Area....3-34
Table 3-7 - Alternative A Summary of the Roads by Road Management and Jurisdiction....3-38
Table 3-8 - Alternative B Summary of the Roads by Road Management and Jurisdiction....3-39
Table 3-9 - Alternative C Summary of the Roads by Road Management and Jurisdiction....3-40
Table 3-10 - Alternative D Summary of the Roads by Road Management and Jurisdiction....3-42
Table 3-11 - Alternative E Summary of the Roads by Road Management and Jurisdiction....3-43
Table 3-12 - Alternative F Summary of the Roads by Road Management and Jurisdiction....3-43
Table 3-13 - General Soil Types....3-46
Table 3-14 - High Sensitivity Landtypes in the Hidden Cedar Area....3-46
Table 3-15 - Road Lengths on Sensitive Landtypes for Hidden Cedar Area....3-47
Table 3-16 - Road Construction on Private land on High Sensitivity and High Mass Movement Landtypes....3-49
Table 3-17 - Summary by Watershed of Timber Harvest Proposed (acres and %)....3-49
Table 3-18 - Roads* Stored or Decommissioned on Sensitive Landtypes on NFS lands....3-52
Table 3-19 - Reconstruction on National Forest land on High Sensitivity and High Mass Movement Landtypes....3-53
Table 3-20 - Road Construction on Private land on High Sensitivity and High Mass Movement Landtypes....3-53
Table 3-21 - Net Change in Sediment from Road Decommission and Storage on Soils....3-54
Table 3-22 - Watersheds in the Hidden Cedar Area....3-59
Table 3-24 - Embry Estimated Flood Frequency....3-61
Table 3-25 - WATSED - Water Yield on Existing Condition....3-61
Table 3-26 - Average Estimated Percent (%)Water Yield by Watershed....3-72
Table 3-27 - Cedar Creek Water Yield Increases from Proposed Activities....3-73
Table 3-28 - Estimated Sediment Yields (WATSED) (First year or largest increase from activities and recovery by the year 2006.)....3-75
Table 3-29 - Percent Decrease in Sediment from Road Decommissioning-St. Maries River....3-75
Table 3-30 - Forest Service Activity Effects on the Watershed*Summary Table....3-82
Table 3-31 - Cumulative Effects Estimated Combined FS and Private Activities....3-84
Table 3-32 - Fish Distribution Based on Various Survey Methodologies....3-90
Table 3-33 - Watershed Conditions and Habitat Access....3-91
Table 3-34 - Stream Channel Conditions....3-92
Table 3-35 - Miles of Stream by Habitat Condition....3-97
Table 3-36 - Issue Indicators of Influences on Limiting Factors for Fish....3-98
Table 3-37 - Cumulative Effects on the Fishery (long term)....3-100
Table 3-38 - Summary of miles of functioning stream by alternative....3-101
Table 3-39 - Summary of Effects of Current and Reasonable Foreseeable Actions....3-101
Table 3-40 - Summary of Effects Common to All Action Alternatives....3-102
Table 3-41 - Species Relevance Screen....3-139
Table 3-42 - Issue Indicators for Wildlife....3-144

Table 3-43 - Existing Vegetation by Size Class Group (NFS lands) in Wildlife Analysis Area.....3-145
Table 3-44 - Size Class by Alternative.....3-146
Table 3-45 - Acres Proposed for Harvest Treatment by Size Class.....3-146
Table 3-46 - Road Densities and Miles.....3-154
Table 3-47 - Wildlife MIS for the St. Joe District.....3-160
Table 3-48 - Existing EHP, Security Acres, and Road Miles by Elk Analysis Area.....3-165
Table 3-49 - EHP and Security by Alternative.....3-166
Table 3-50 - Listed Wildlife Species.....3-170
Table 3-51 - Density and Prey Availability by Alternative.....3-172
Table 3-52 - Sensitive Wildlife Species and Habitats.....3-173
Table 3-53 - Guidelines for Forest Structure.....3-175
Table 3-54 - Acres and percent of Forest Structure by Alternative.....3-176
Table 3-55 - Effects on Road Density (miles/mile^2).....3-177
Table 3-56 - Existing and Desired Conditions for Goshawk.....3-181
Table 3-57 - Existing and Desired Condition of the Goshawk PFA.....3-182
Table 3-58 - Desired Condition of Goshawk Habitat and the Acres/Percentage Present.....3-182
Table 3-59 - Acres of size class proposed for harvest treatment.....3-185
Table 3-60 - Summary of Timber Harvest Prescriptions Characteristics and Guilds Affected.....3-196
Table 3-61 - Approximate Acres Impacted by Each Harvest Prescription and Method.....3-208
Table 3-62 - Approximate Acres or Miles of Ground Disturbance on NFS Land.....3-211
Table 3-63 - Forest Plan Visual Quality Objectives of the Hidden Cedar Project Area.....3-213
Table 3-64 - Existing Fuel Conditions in Hidden Cedar Project Area (NFS land only).....3-218
Table 3-65 - Fire Behavior by Fuel Model.....3-221
Table 3-66 - Summary of Fuels Treatment By Alternative.....3-221
Table 3-67 - Recreation Opportunity Spectrum.....3-224
Table 3-68 - Hidden Cedar Project Activities within Range Allotment Boundaries.....3-231
Table 3-69 - Estimated PM_{10} and $PM_{2.5}$ Emissions.....3-242
Table 3-70 - Approximate Fuel Treatment Acres.....3-243
Table 3-71 - Financial Issues Indicators.....3-251
Table 3-72 - Additional Features used in Financial Analysis.....3-251
Table 3-73 - Timber Sale Economic Efficiency by Alternative.....3-252
Table 3-74 - Miles of Road Decommissioning and Storage by Funding Source.....3-252
Table 3-75 - Projects Funded by Other than TS.....3-252
Table 3-76 - Road Funding Percents.....3-253
Table 3-77 - Total Sale Values.....3-254

List of Figures

Figure 3-1- Wildlife Analysis Area.....3-135
Figure 3-2 - Road Construction in Old Growth (Alternatives D and F).....3-150
Figure 3-3 - Pileated Woodpecker Home Range.....3-161
Figure 3-4 - Elk Evaluation Areas.....3-164
Figure 3-5 - Goshawk Analysis Area.....3-181

Appendices

Appendix A - Vegetation Treatment Summary
Appendix B - Summary of Roads by Ownership and Jurisdiction
Appendix C - Road Definitions
Appendix D - Access Management Plan
Appendix E - Monitoring
Appendix F - Biological Evaluations Summary of Effects for Wildlife, Fish and Plants
Appendix G - Fisheries Forest Plan Standard (Fry Emergence)
GLOSSARY
LITERATURE CITED
LIST OF PREPARERS
LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE STATEMENT WERE SENT

MAPS

M-1 - Project Area and Vicinity Map
M-2 - Regeneration Harvest History Map
M-3 - Management Areas
M-4 - Project Related Opportunities
M-5 - Alternative B, Timber Harvest, Precommercial Thinning and Access Requests
M-6 - Alternative B Road Management
M-7 - Alternative C, Timber Harvest, Precommercial Thinning and Access Requests
M-8 - Alternative C Road Management
M-9 - Alternative D, Timber Harvest, Precommercial Thinning and Access Requests
M-10 -Alternative D Road Management
M-11 -Alternative E, Precommercial Thinning and Access Requests
M-12 -Alternative E Road Management
M-13 -Alternative A Existing Road Management
M-14- Alternative F, Timber Harvest, Precommercial Thinning and Access Requests
M-15 -Alternative F Road Management
M-16 -Current and Foreseeable Map
M-17 -Watershed Analysis Areas
M-18 -Watershed Analysis - Sensitive Landtypes and Areas of High mass Movement Potential
M-19 -Recreation Opportunity Spectrum
M-20 -Grazing Allotments

CHAPTER 1 – PURPOSE AND NEED

SUBSTANTIVE CHANGES BETWEEN DRAFT EIS AND FINAL EIS

Under Purpose and Need for Action:

- This section has been reformatted for understanding and readability and expanded to further explain the need of this project.
- Additional reference to and discussion of the Forest Plan
- Purpose and Need related to roads has been changed from Reduce the impacts of existing roads to: management of the transportation system for protection of resources and management of the transportation system for development and utilization of resources.
- A discussion on how to move current forest conditions toward desired conditions with the activities of Alternative B- proposed action is displayed for each need identified.

Introduction

In January of 2000, an interdisciplinary team was formed to identify activities in the Hidden Cedar area within the Sherwin – Staples Landscape Assessment Area (LAA) that would move this area toward desired conditions as defined in the Forest Plan. The St. Joe Geographic Assessment provided information that was used in developing management recommendations.

This chapter describes what the Idaho Panhandle National Forest proposes to do, explains why the Proposed Action is needed, defines the scope of the analysis; and defines the decision to be made with this project.

Project Area Description

The Hidden Cedar project area is approximately 26 miles from St. Maries Idaho in Shoshone, Clearwater and Latah Counties, along the St. Maries River in portions of Township 41, 42, and 43 North, Range 1 and 2 East. The project area is in the Upper St. Maries and West Fork St. Maries River drainages. (See Project Map, M-1). The project area is approximately 33,000 acres and includes the Cedar, Blair, Christmas, and Staples Creek drainages in the Upper St. Maries and the Bechtel, Mazie, Wood, Hidden, Cat Spur, Long Slim and Keeler Creek drainages in the West Fork. Besides National Forest System Lands, the project area contains private industrial land, State lands, private residential land, railroad and highway right-of-ways and a powerline corridor. Approximately 53% of the analysis area is in private ownership. There are no roadless areas within or adjacent to the project area.

The area has a favorable climate and good site conditions for forest vegetation. Average annual precipitation is 35 to 40 inches. The forest types are primarily mixed conifer. It is dominated by stands characterized by mid and late seral species composition and small to medium size classes. The overall stand structures in this area are both even- and uneven-aged with an increase in the uneven-aged stand structure beginning to develop. Patch size appears to be relatively small.

Many sites within the assessment area have been managed through timber harvest and reforestation. The Forest Service acquired most of its ownership between 1932 and 1934. Before Forest Service ownership, some of the lands had timber harvest in the 1910's and 1920's. Beginning in the 1940's, timber harvest on Forest Service lands occurred in all subsequent decades and varied from white pine salvage to stand replacement harvest. (see Regeneration Harvest History Map, M-2)

The area supports populations of elk, white-tailed deer, moose, black bear, mountain lions and other common wildlife species.

The West Fork St. Maries River and the main stem St. Maries River are listed by the State of Idaho on its 303(d) list as water quality limited for cold water biota. Sediment and temperature are primary pollutants of concern for the West Fork and nutrients, habitat alteration and sediment for the Main Stem. Streams within the Hidden Cedar area are used for spawning, rearing, and over-wintering by the westslope cutthroat trout (sensitive species). Bull trout (threatened species) were in the Hidden Cedar area historically and are an appropriate management indicator species (MIS) for the project area.

Forest Plan Direction

The National Environmental Policy Act of 1969 established requirements for programmatic planning, such as the Idaho Panhandle National Forests Plan, and site specific planning, such as this Environmental Impact Statement (EIS).

Management direction defined in the Idaho Panhandle National Forests Plan, along with other laws and regulations, help define the human values and needs. It sets forth the general direction for managing all of the resources for the Forest, and consists of both Forest-wide and area-specific goals, standards, and guidelines that provide for land uses with anticipated resource outputs. It also contains a cumulative effects analysis of anticipated actions on a landscape level. This EIS documents the analysis of the second level of planning, Forest Plan implementation, for the Hidden Cedar project area.

Management Area Direction

The Idaho Panhandle National Forests Plan divided National Forest system land into 20 Management Areas (MAs). MAs affected by the proposed treatments have been validated by the interdisciplinary team for suitability. National Forest System lands within the project area are comprised of MA - 1 (6690 acres), MA - 4 (8525 acres), MA - 5 (271 acres), and MA-16 (West Fork of the St. Maries and Log Creek). A full description of management area direction is in the Forest Plan (IPNF, 1987).

A brief description of the Management Area direction pertinent to the proposed activities for this project is displayed in Table 1-1. The MA's for the project area are displayed on the Management Areas Map, M-3.

Table 1-1 - Forest Plan Management Area Descriptions for Proposed Action

MA-1: Timber Production (Forest Plan Vol. 1, III-2) Description: Lands are variable. Vegetation is mostly mixed conifer, all major habitat types are present. Goals: Manage lands suitable for timber production for the long term growth and production of commercially valuable wood while protecting soil, meet water quality standards, provide wildlife habitat, dispersed recreation and meet visual quality.
MA- 4: Big Game Winter Range with Timber Production (Forest Plan Vol. I, III-17) Description: Lands are generally below 4,000' elevation. Vegetation includes brush fields and all stages of forest cover. Elk winter range, white tailed deer winter range Goals: Manage big game winter range through scheduled timber harvest and permanent forage areas and provide long term growth and production of commercial wood products, cost effective timber production, protect soils, meet water quality standards, provide dispersed recreation consistent with wildlife needs and meet visual quality objectives.
MA –5: Big Game Winter Range (Forest Plan Vol. I, III-23) Description: Lands are below 4,000' elevation along the breaks of the St. Joe River. Vegetation is brush fields with some cover. Majority of land is unsuitable for timber production, and has high visual sensitivity. Goals: Manage to provide sufficient cover and forage while meeting water quality standards, providing dispersed recreation consistent with wildlife needs, and meet visual quality objectives.
MA-16: Aquatic Ecosystems and Adjacent Uplands (Forest Plan vol. I, III-68 Description: Includes important fisheries streams. Contains a great diversity of vegetation. Provides access with major roads either within or adjacent to the management area. Receives highly concentrated recreation use. Goals: Manage to feature riparian dependent resources, maintain natural channels and certain vegetation and wildlife communities. Produce other resource outputs that meet state water quality standards, protect soils, cost effective timber production, provide wildlife habitat and dispersed recreation and meet visual quality objectives.

Purpose and Need for Action

The purpose and need was developed through an assessment of the project area and identifying the desired condition as defined by the Idaho Panhandle Forest Plan goals and objectives. The need for the Proposed Action is generated by the difference between the current and projected conditions in the project area and the desired conditions for resources. The interdisciplinary team reviewed the Interior Columbia Basin Ecosystem Management Project (ICBEMP), The Northern Region Overview (USDA April, 1999), the Forest Service Natural Resource Agenda (USDA, 1998) and the St. Joe Geographic Assessment (GA). The St. Joe GA is a landscape level assessment of the St. Joe River Basin, which identified ecosystem uses, conditions, trends, and risks in the St. Joe River Basin (IPNF, 1997). Using the larger scale assessments mentioned above and information specific to the project area, the interdisciplinary team completed an Ecosystem Analysis at the Watershed Scale (EAWS) for the Hidden Cedar Project Area (located in the project file) to document resource conditions and note opportunities to move the landscape towards the desired condition. The following needs for the Hidden Cedar area were derived from the Ecosystem Analysis at the Watershed Scale (EAWS). Detailed information on project proposals to meet the purpose and need is presented under the Alternative Descriptions section of Chapter 2 of this FEIS.

The purpose and need for a changed condition in the project area:

1. There is a need to manage for vegetative conditions that in the long term encourage more resilient and sustainable forest conditions. This includes a need for treatments to address increased stand densities, increase in pole and medium sized trees and loss of species diversity and improving species composition and structure.

More specifically:

a. In the moist habitat types, there is a need to treat stands where western larch and western white pine forest types have been reduced. There is a need to promote long-term forest health by increasing species diversity to reduce both stand and landscape susceptibility to insect and diseases.
b. There is need to encourage one and two-aged stand structures to reduce risk of stand loss to fire and insects.
c. There is a need to reduce overall tree density to encourage retention and development of larger sized trees. There is a need to manage stands, individually and cumulatively, to develop increased resiliency to various disturbances and contribute to a landscape that is more reflective of historic conditions.

The Forest Plan (pgs. II-1-2) includes several goals and objectives that relate to improving forest health: (1) maintain diverse age classes of vegetation for viable populations of all existing native vertebrate wildlife species; (2) manage the forest resources to protect against insect and disease damage; (3) begin harvest in stands created by the 1910 fire to better distribute the harvest and provide for future age class distribution.

In addition, the Natural Resource Agenda (USDA, 1998) states that to accomplish the goal of restoring and maintaining healthy watersheds, the Forest Service will implement a nine-point strategy, including "restore degraded ecosystems and attain desirable plant conditions."

The Northern Region Overview (USDA, 1999) describes the changes in vegetation that are contributing to the Purpose and Need: "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 rot 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. (Northern Region Overview Detailed Report; USDA October 1998, p.22).

The representation of long-lived early seral tree species (primarily western white pine, western larch and ponderosa pine) has generally declined as a percent of stand composition. Additionally, stands that were dominated by one or more early seral species have also declined. Western white pine was once a dominant feature of the area but has been severely impacted as a result of the blister rust fungus. Stand structure is altered from natural conditions, including a reduction of mature large old trees and an increase in pole sized to medium sawtimber sized trees. Additionally, stands have shifted from even-aged stands to multi-aged stands. Stand density has increased over historical conditions when stands were less dense and more open. There has been a reduction of the St. Joe dry site open forests with large trees. A policy of wildfire suppression since the early 1900's has also interrupted the natural vegetation cycle. Riparian areas are under-stocked with trees leading to increased stream temperatures.

To move current forest conditions toward the desired condition, the following activities are proposed (more specific information is available in Chapter 2, Alternative B - proposed action and the alternative maps):

- Intermediate harvest is proposed to reduce tree densities (by 30-50%) from both the lower and upper size classes and open the canopy cover. It would promote larger diameter trees and increase individual tree growth and vigor. Intermediate harvest will also maintain or increase the percent of early serals through preferential retention of white pine, western larch, and ponderosa pine (when present). The results are to produce a more resilient stand condition with a greater representation of fire tolerant trees and to reduce ladder fuels. This situation has the added benefit of maintaining thermal cover for wildlife, creating small canopy gaps for browse, and retaining forest conditions that support continuing options for future management. This treatment is prescribed on approximately 80% of the proposed harvest treatment acreage (see project file – treatment objectives by unit).

- In areas that are predominately grand fir/Douglas fir, the forest composition would trend towards long-lived seral species (western larch and white pine) when regeneration harvest methods are implemented. Regeneration harvest proposed would convert stands to white pine and western larch forest types. This treatment is prescribed on approximately 20 percent of the proposed harvest treatment acreage (see project file – Treatment Objectives by Unit).

- Approximately 1368 acres will be harvested with 188 of those acres broadcast/jackpot burned, 556 acres excavator piled, 12 acres of hand piling and 119 acres of lopping to reduce fuels, and/or prepare the site for planting and trend toward improvement of ecosystem health (alternative b – proposed action). All planting will be with a species mixture of at least seventy percent (70%) rust resistant white pine, western larch and ponderosa pine (where appropriate) to enhance representation of long lived early seral species.

2. There is a need to address the management of the transportation system (roads in the analysis area) for *protection* of lands and resources.

More specifically:

a) There is a need to improve water quality and reduce long-term sedimentation to streams caused by existing roads. The State of Idaho has the West Fork St. Marie's river and the main stem of the St. Marie's river below Clarkia listed under Section 303(d) of the Clean Water Act as water quality impaired. The pollutant of concern is temperature and sediment for the W. Fork and nutrients, habitat alteration and sediment for the Main Stem.

The existing roads in the project area can negatively affect water quality, by producing sediment, intercepting subsurface flows and increasing water yield. Roads within riparian areas have lead to stream bank instability, channel erosion and loss of riparian vegetation.

The Forest Plan states that management activities will comply with state water quality standards.

b) There is a need to improve fish habitat by reducing barriers caused by road/stream crossings. The Forest Plan states that the forest road system is to be managed to avoid adverse effects on inland native fish. Specific direction with respect to roads includes: stabilizing or obliteration of roads not needed for future management activities. Forest Plan standards are to provide fish passage to suitable habitat by design of road crossings of streams to allow fish passage or remove in-stream migration barriers and pursue fish habitat

improvement projects. Additional standards were identified in INFish, which amends the Forest Plan.

The Natural Resource agenda states, "Forest Service policy is to restore and maintain healthy watershed for use by current and future generations." In support of this policy, the Agenda states that the Forest Service will 1) restore degraded ecosystems; 2) reconstruct, relocate, and decommission roads to help restore degraded watersheds, and 3) conserve and recover threatened, endangered, and sensitive species and their habitats." The Natural Resource Agenda: Forest Roads (USDA, 1999) presents new action items for managing forest roads, including selectively upgrading forest roads and decommissioning unneeded substandard roads that damage the ecosystems.

c) There is a need to improve wildlife security. The existing open road density in the project area increases wildlife species vulnerability to hunting and trapping and increases disturbance levels, which may displace animals. Reductions in road density (open roads) will increase acres of wildlife security. The Forest Plan goals for Management Area 1 are to provide wildlife habitat. Standards related to this are to utilize road use restrictions to enhance wildlife habitat except as needed for timber activities. In MA-4, goals are to provide for opportunities for dispersed recreation consistent with wildlife habitat needs and wildlife standards state that road closures may be used as needed to meet wildlife habitat needs. In the Forest Plan (II-27), Wildlife, Elk standards: utilize the "Guidelines for evaluation and Managing Summer Elk Habitat in Northern Idaho" (Leege,1984) for evaluating effects of proposed activities on elk habitat. Although the analysis area has a considerable amount of winter range (MA-4), these areas also provide year round habitat for elk.

d) There is a need to improve soil conditions on existing roads and landings where soils have been detrimentally impacted from past management activities. Past activities including harvest, skid trail and road building continue to impact soil productivity in the project area. Old landings and existing roads have had the most impact on soil productivity. The Forest Plan states that soil disturbing management practices will strive to maintain 80 percent (85% R1, update) of activity areas in a condition of acceptable productivity and projects should maintain sufficient large woody debris.

To move current conditions toward desired conditions and protection of resources, the following activities are proposed:

- Put into long term storage approximately 7.7 miles of existing National Forest System (NFS) roads, decommission approximately 1.1 miles of existing NFS roads and 10.2 miles of existing unclassified roads, and remove 51 stream crossings in 5.7 miles of riparian roads.

- Implement Best Management Practices (BMPs) on project activities in all watersheds. Existing roads will be closed (lower maintenance level), reconstructed (better drainage, surfacing, seeding) or decommissioned to reduce erosion and sedimentation. Roads decommission or put into long term storage will have their surfaces decompacted to improve water infiltration and reduce peak flow.

- Riparian planting will be done on approximately five miles of stream in Wood Creek, Hidden Creek, and the West Fork of the St. Marie's river to improve riparian functionality and channel stability.

- Placement of large woody debris on approximately 1.2 miles of the West Fork to improve fish habitat.

3. There is a need to address the management of the transportation system (roads in the analysis area) for the *development* and *utilization* of lands and resources.

More specifically:

a) There is a need to provide access to State and Potlatch land in the Hidden Cedar analysis area due to existing cost share agreements on roads and granting reasonable access.

Since the project area contains approximately 53% lands owned by private individuals, private corporations, and the State of Idaho, coordination of road design, operations and maintenance should occur to provide reasonable access. Regulatory framework, such as, National Forest Roads and Trails Act (FRTA) authorizes the road systems for the National Forests, and granting of easements across Forest Service administered lands. Forest Plan objectives state that private landowners will not be denied reasonable access to their property, if unavailable across private land, subject to compliance with applicable regulations and Forest Service policies and where ownerships compromise 25% or more of a major drainage. Coordinated management plans between owners are encouraged through mutual participation.

b) Roads are needed to meet forest plan goals and objectives related to the development and utilization of Forest Service lands in the project area.

Forest Plan goals for transportation facilities is to construct, manage and maintain transportation facilities to meet the management area goals in a cost effective way while meeting safety, user and resource needs. Forest Plan standards are to utilize the lowest standard road to meet transportation objectives compatible with resource protection and area management goals. The roads analysis process (RAP, FSM 7712) was used to identify the minimum transportation system needed and roads not needed (36 CFR 212.5) in the project area. The need for new roads and evaluating the opportunities for reconstruction and decommissioning of roads can be found in roads analysis.

To meet the access needs of private landowners and the needed transportation system for the Forest Service the following activities are proposed:

Access across National Forest lands consists of approximately 2.3 miles of road construction. There are requests to access Potlatch and State lands in Blair Creek, Catspur Creek, Long Slim, Swede John, and West Fork St. Maries drainages. Road construction would be designed to: 1) minimize the miles of road constructed and 2) minimize roads constructed on undesirable areas, thus reducing the environmental impacts to other resources (Project File, Roads Analysis Process Appendix 2A-5).

Scope of This Project

The scope of the project refers to both the geographical area affected and the timeframe of the proposal, including any connected or cumulative actions. The scope of the Proposed Action addressed in this EIS is specific to timber harvest, watershed rehabilitation, pre-commercial thinning, road construction and rehabilitation and other activities associated with the Proposed Action within the project area. Other activities include State and Private Access Requests, of which the activities taking place on private land are considered a cumulative action. The road

construction on Forest Service administered lands is considered in Direct and Indirect effects of Chapter 3 for each resource. All activities associated with the access requests both on private land and Forest Service administered land are described in Chapter 2 - Activities Common to the Action Alternatives (40CFR 1508.25). The effects analysis for the activities associated with the road construction and timber harvest on private land is in the Cumulative effects section.

The proposed Garnet Stars and Sands Mineral exploration is a cumulative action (40CFR 1508.245), that has a FEIS completed (9/01) and could be implemented within the next five years (see Chapter 3 – Planned Agency Actions for a detailed description). The proposed actions associated with this were included in the pertinent resource analyses for this EIS for cumulative effects analysis.

This FEIS documents and evaluates the effects caused by the proposed activities and various alternatives. These site-specific proposed actions and alternatives are identified in Chapter 2.

Decisions To Be Made

1. Whether to implement timber management practices (silvicultural prescriptions, logging methods, fuels treatment, reforestation), and if so, the site-specific location of these practices, road construction/reconstruction necessary to provide access and achieve other resource objectives, and appropriate mitigation measures.
2. Whether road access restrictions or other actions are necessary to meet resource objectives, and if so, to what extent.
3. What amount, type, and distribution of watershed rehabilitation projects will be implemented, if any.
4. What, if any, specific project monitoring requirements are needed to assure mitigation measures are implemented and effective, or to evaluate success of project objectives.
5. Whether to grant access and share in joint construction and use of cooperative road systems.

CHAPTER 2 - ALTERNATIVES

Substantive Changes between Draft EIS and Final EIS

Changes have been made to this EIS based on field verification and review of the draft EIS from both the public and the Forest Service. A new alternative, Alternative F, has been added to address the sediment increases in the Cedar Creek drainage. Alternative F drops three harvest units and road construction associated with those units in the Cedar Creek drainage. Alternative F also drops the road construction associated with units in Keeler Creek drainage.

Under Alternative Development:

- A new section (Issues that Framed the Alternatives) has been added to better clarify the steps in alternative development.
- Under each issue, the measurement criteria and the elements of the issue are re-formatted to clarify how issues are addressed and used in the analysis.
- Under Other Concerns, access requests, soils, fish passage and forest health have been brought forward from the Purpose and Need to clarify and show how they were addressed and used in the analysis.
- Alternative F has been added. This alternative was developed from sediment increase concerns in Cedar Creek, and it overall better meets the purpose and need and resolves issues. It is a combination of Alternative B timber harvest and associated activities and Alternative D road decommissioning with some modifications.

Under Activities Common to the Action Alternatives:

- Merry Creek White Pine Progeny Test Site has been moved to Chapter 3, Agency Authorized Activities.
- Under Access Request – Adjacent Landowners and Jurisdictions: additional information has been provided describing proposed activities associated with the access requests. The activities taking place on private land are a cumulative action and a reference has been added to Chapters 1 (Scope of Action) and Chapter 3 (Current and Reasonably Foreseeable Actions – State and Private Actions).
- All watershed restoration activities have been put together in this section and now include reference to the decommissioning of roads.
- Under Fuels Reduction – underburning has been removed and replaced with jackpot burning, there is no underburning activity proposed. Yarding tops was removed due to the infeasibility to yard tops on a unit with the Soils Design Criteria of letting all slash over winter , and Lop and Scatter and Hand Piling were added.
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Under Design Features and Mitigation Common to the Action Alternatives:

- Air Quality: added the statement that PM_{10} and $PM_{2.5}$ projections will be sent to North Idaho Smoke Management Group prior to ignition and a notice will be posted in the local newspapers prior to burning describing where, when and why burning will be conducted.
- Soil and Water: added a reference to the Forest Service Handbook 2509.22 (Soil and Water Conservation Handbook) which outlines BMP's and through a memorandum of understanding with the State of Idaho (9/19/88) replaces the Forest Plan Appendix S – Best Management Practices.
- Soil and Water: Grapple piling has been added to the list of methods that must be done over slash to minimize disturbance to soils.
- Fisheries: added reference to Appendix G of the EIS, which is clarification of Fry Emergence standard and documentation that it is no longer applicable.

Under Site Specific Mitigation Measures and Design Features:

- The objective to prevent mass movement has been removed. The road construction listed in the DEIS occurs on private land and the Forest Service cannot specify mitigation or design features.
- To mitigate the increase in sediment from road construction, equal miles of road will be decommissioned prior to or concurrent with road construction. This has been displayed in Table 2-6
- Specific mitigation related to gravelling roads to reduce sediment and the timing of decommissioning some roads prior to or concurrent with road construction has been added.

Under Activities Specific to the Action Alternatives:

- A reference to road management maps has been added under each alternative. The road management maps display the information from the road activity tables listed with each alternative. These maps (M -5, 7, 9 and 11 in the DEIS) showed the road management for each alternative. In the FEIS, these maps (M-6, 8,10, 12, and 15) will highlight the *changes* from existing condition for each alternative and make it easier to compare alternatives.
- Fuels treatment acres and type of treatment has been corrected to reflect removal of yarding tops in each table under the action alternatives.

Under Summary Comparison of Alternatives:

- In Table 2-19, the number of stream crossings have been corrected following further examination of the intersection of the road and stream GIS layers produced for the project. This is documented in the project file and in the Roads Analysis Process under AQ-4.
- A second table has been added. Table 2-20 which is a Comparison of the Issue Indicators by Alternative.

- In Table 2-19 the figures under Alternatives B, C, D, and E are adjusted by 40 acres, because the Merry Creek White Pine Progeny Test Site has already been authorized under a decision. In Alternative E, the percent should be 9%.
- Adjustments and updates to acres of western white pine, ponderosa pine and western larch due to a transposing of the numbers in the DEIS.

Under Core Data Tables:

- All Core Data Tables have been removed from Chapter 2 and put into the Project file except the Long Term Monitoring Core Data Table and the Summary of Road Core Data. The row with acres of hydrologic openings by alternative has been corrected due to an error in reading the supporting data.

Any other changes made were formatting for readability, additional narrative to describe tables, and correcting grammar and typographical errors.

Introduction

This chapter describes how alternatives were developed, including how public comments helped formulate the alternatives; the alternatives considered but eliminated from detailed study; and the alternatives considered in detail. Five action alternatives are carried forward and analyzed in detail in Chapter 3, along with the no action alternative. Alternatives that were considered but not given detailed study are discussed in this chapter.

Alternative Development

Scoping and Public Involvement

The scoping and public participation for this project began in March 2000 when the project was listed in the Idaho Panhandle National Forests Quarterly Schedule of Proposed Actions. A Scoping Notice was sent to the mailing list for the project that included local landowners, government agencies, and interested groups. The concerns of the Coeur D'Alene tribes were solicited through project scoping. There was no concern expressed by the tribes. A Notice of Intent to prepare an Environmental Impact Statement was published in the Federal Register on March 22, 2000. Four letters were received in response to scoping.

Issue Identification

Comments received were used to identify issues. Subsequently, these issues became the focus for alternatives presented in the draft Environmental Impact Statement. Documentation of the review of scoping comments and potential issues can be found in the Hidden Cedar Project File.

The scoping comments were reviewed by the Interdisciplinary (ID) Team and categorized. Some concerns were determined to be outside the scope of this project or are addressed in the Forest Plan process, other issues are addressed through mitigation and design features or by contrasting the no action and action alternatives. Issues representing an unresolved conflict with the Proposed

Action were used to help formulate alternatives to the Proposed Action. In addition to issue identification, the ID Team considered the following elements in design of the alternatives:

- The goals, objectives, standards and guidelines, and desired future condition for the project areas, as outlined in the Forest Plan and St. Joe Geographic Assessment Area.
- The affected environment of natural resources within the project area as described in Chapter 3.
- The laws, regulations, and policies that govern land use of the National Forest System lands.
- The Roads Analysis (FS-643, August 1999) for National Forest Transportation System.
- The scientific findings of the Interior Columbia Basin Ecosystem Management Project.

Issues That Framed Alternatives

Comment related about the project include concerns about ecosystem health and the effects of past activities and proposed activities associated with the project (e.g. timber harvest and road construction) on various resources. Comment from the public and the interdisciplinary team included:

- Loss of wildlife security
- Erosion and sedimentation from existing roads and new road construction on water quality and fish habitat
- Existing soil compaction from roads and landings used for timber harvest
- Access to private lands
- Access for recreational opportunities
- Commercial timber harvest in an area needing watershed restoration
- Decrease in forest health caused by current vegetative structure and composition trends

Some of these comments revealed issues representing unresolved conflict with the Proposed Action. The IDT summarized those comments into the following **alternative driving issues** that were used to develop alternatives to the Proposed Action:

Issue #1 - Road Construction

Some people objected to road construction because of potential effects on forest resources such as water quality, fisheries, and wildlife habitat. They were also concerned about future maintenance of those roads. **Alternative C was developed to specifically address concerns related to new road construction.**

1. Effects of new road construction on water and fish in the project area. Under the Proposed Action, new road construction can impact water quality and fish habitat[1] by increasing the potential for sediment delivery to the stream system. Sediment production from new road construction would be compared in the alternatives. ***Measurement criteria***: sediment production (as predicted by Burroughs model).

2. The effects of road construction on wildlife security in the project area. Road construction may alter wildlife habitat by changing wildlife movement or habitat connectivity. A comparison of alternatives takes into account the long-term effects of roads as they relate to open road densities. The project has all new road construction closed/put into storage/or decommissioned post harvest. Current levels and changes in disturbance/security resulting from implementation of the project are displayed by alternative. ***Measurement criteria***: total road densities (wildlife analysis area).

Issue #2 - Existing Road Management (addressed in Alternative D)

People were concerned that the proposed action did not go far enough to restore watersheds, particularly, the obliteration of existing roads in riparian areas. Some were concerned with the effects existing roads have on wildlife security. Others were concerned that changing access in an area by restricting or obliterating roads would affect their recreation opportunities. **Alternative D was developed to specifically address the concerns related to roads in riparian areas and wildlife security.**

1. The effects of existing roads on water quality and fish habitat. Riparian roads and road/stream crossings intercept and alter natural water flow patterns and fluvial process, which can increase sediment supply to the stream system, which in turn increases channel degradation or aggradation and may adversely affect fish habitat.

This is addressed in the comparison of alternatives through water and sediment yield analysis, number of stream road crossings and miles of road in Riparian Habitat Conservation Areas (RHCA's). ***Measurement criteria***: sediment yield (% reduction of sediment from road decommissioning), miles of road in RHCA's and number of stream crossings.

2. Effects of existing roads on wildlife security. Human use (motorized vehicle) on roads reduces wildlife security. A comparison of acres of secure habitat (acres greater than ½ mile from an open road) is derived from changes in road management prescriptions (see elk analysis in Chapter 3). ***Measurement criteria***: acres of secure habitat and changes in road management prescriptions.

3. Project effects on motorized recreation opportunities. The existing road systems provide access to National Forest lands for recreationists. This can be addressed in the comparison of alternatives by miles of open road available to the recreationist. ***Measurement criteria***: miles of open road.

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[1] a trend of fish habitat in functioning condition defined by population characteristics, watershed conditions, *water quality*, access to habitat, elements of habitat stream channel condition, flow and hydrology. (see Tables 3-29 and 3-49)

Issue #3 - Commercial logging (addressed in Alternative E)

A concern was expressed during public scoping regarding the use of timber harvest and road building while trying to achieve objectives related to watershed restoration. Those persons suggested an alternative with no commercial timber harvest. **Alternative E was developed to address the concern of conducting timber harvest while restoring watersheds.**

1. The effects of timber harvest on the watershed and restoration of the watershed. A comparison of the alternatives would indicate acres impacted from timber harvest, and improvements in conditions for soil, water, and fish. Vegetative treatments move composition and structure toward more natural conditions and natural vegetative conditions assumedly equate to natural hydrologic conditions. Openings in the forest canopy can result in increased peak flows on tributary watersheds, which may in turn aggravate sediment delivery that could to affect water quality and fish habitat. Improvements in water and fish habitat conditions would be measured through water yield and peak flow measurements. ***Measurement criteria:*** number of acres impacted by timber harvest and water yield (% change in peak flow).

Other Concerns

Other comments helped frame the scope of the analysis, and were evaluated by the team during the scoping process. These concerns were not considered major issues and, therefore, were not used to develop alternatives analyzed in detail. It was determined that most issues could be adequately mitigated, or addressed by design or other aspects of the proposed Hidden Cedar project. These concerns are addressed in the effects analysis by resource in Chapter 3 of this EIS.

Openings

Comments were received (during scoping) reflecting concerns and opposition to openings (regeneration harvests especially in the form of clearcuts and road construction) and their effects on water yield, rain on snow, and habitat fragmentation.

These concerns are addressed through design of action alternatives (see Design Features and Mitigation Measures Common to all Action Alternatives, Soil and Water, and Wildlife sections of Chapter 2)

Visual Quality Objectives

A concern was raised internally that 20% of the proposed units are in the Visual Quality Objective (VQO) of “retention” and logging methods and silvicultural prescriptions in the proposed action may not meet FP standards. This was addressed in the action alternatives- treatment objectives for each unit. Changes were made to silvicultural prescriptions to meet VQOs (see project file, Doc. VIS #3 and #4).

Access Requests

The feasibility of accessing private land without going across National Forest System lands was considered. Minimizing environmental impacts and miles of road constructed was the main concern of the interdisciplinary team in handling the access requests. Utilizing existing roads was a priority before building any new roads, and to avoid or mitigate road building on less than

desirable conditions such as difficult terrain or crossing rivers/streams (Project File, Roads Analysis Process (RAP), Appendix A-Section Pvt/Potlatch/State). The access requests were modified to serve all parties' lands, because many of the areas are cost share agreement areas (State, private and Federal).

Soil Quality

A concern for maintaining soil quality was expressed. The most significant component of the soil quality standards is the limitation of detrimental soil conditions to 15 percent or less of an activity area (R1, supplement FSM 2500). Soil quality is maintained when erosion, compaction, displacement, rutting, burning, and loss of organic matter are maintained within defined soil quality standards. This is addressed in the Design Criteria and Mitigation, Soil and Water, Chapter 2 of the FEIS for all action alternatives. In Chapter 3 (Soils- Effect Analysis), the alternatives display the *overall* changes in soil quality from activities including road decommissioning planned in the analysis area.

Stream Crossings

Number of road/stream crossings in riparian areas and effect on fish habitat was expressed as a concern. The project harvest units and road building were designed to limit and reduce number of stream crossings (project file, Roads Analysis Process – Appendix 5a-1).

Forest Heath

Forest structure and composition in the project area is lacking in diversity of species composition and stand structure. Forest health issues become apparent in stands lacking both structure and composition. These concerns were addressed in Chapter 3 under "Forest Vegetation."

Issues Beyond the Scope of This Analysis

A few comments were made that are outside the scope of this analysis. They include: Global warming, competition with alternative (non-timber) fiber sources, loss of business and revenue by people practicing ecologically sensitive timber harvest on private lands due to subsidized public timber sales, loss of life or personal injury from collisions with or accidents caused by log trucks (The potential for conflict with road management is recognized and described in the Roads Analysis Process (RAP) under Step 4 (GT-4) also, note in Chapter 2 – there is Design Criteria and Mitigation- Recreation that addresses recreation and harvest operation traffic conflicts).

Range Of Alternatives

Section 102(2)(e) of the National Environmental Policy Act (NEPA) states that all Federal agencies shall "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflict concerning alternative uses of available resources."

An Environmental Assessment must also "rigorously explore and objectively evaluate all reasonable alternative" [40 CFR 1502.14(a)].

The courts have established that this direction does not mean that every conceivable alternative must be considered, but that selection and discussion of alternatives must permit a reasoned choice and foster informed decision making and informed public participation.

The range of alternatives presented in this chapter was determined by evaluating public and internal comments and the Purpose and Need for the project. Other influences included Forest Plan goals, objectives, desired future condition, and standards and guidelines; federal laws, regulations, and policies, and economic viability. Within these parameters, the alternatives developed by the ID team display a reasonable range of outputs, treatments, costs, management requirements, mitigation measures, and effects on resources. In addition to the alternatives considered in detail, the ID team examined a number of other alternatives during the analysis process.

Although these alternatives contributed to the reasonable range, they were eliminated from further consideration for the reasons listed below.

Alternatives Considered But Eliminated From Detailed Study

Conventional logging systems only, no helicopter – This alternative was originally proposed for the area. It consisted of 25 miles of new road construction. Based on knowledge of the conditions of the resources, this would not meet environmental standards or Forest Plan standards. Resources of concern were: 303(d) listed streams, historical bull trout habitat, loss of wildlife security and sediment /peak flow increases from high road densities. Forest Plan standards related to the Clean Water Act or the Purpose and Need to improve water quality would not be met with this alternative.

No Road Construction – This alternative was proposed to address the controversy over road construction on NFS lands. Alternative C was developed with no road construction on NFS lands associated with timber harvest; however, it includes approximately 2.2 miles of road construction on NFS lands tied to requests for access to private land that also access three harvest units. Alternative E has no road construction except for that associated with access requests. An alternative that has no road construction was not considered in detail because of State and Potlatch access requests.

ANILCA- Alaska National Interest Lands Conservation Act provides owners of non-federal land adequate access to their land. 36 CFR 251 Subpart D governs procedures by which landowners may apply for access across national forest system lands. The National Forest Roads and Trails Act (FRTA) authorizes the granting of easements across Forest Service Administered lands to those landowners who join the Forest Service in providing a permanent road system that serves lands administered by the Forest Service and lands or resources of the landowner.

This act authorizes the Secretary of Agriculture to acquire, construct, and maintain Forest development roads to obtain and grant easements under a cooperative program. Both the State and Potlatch have existing construction and use agreements (cost-share) with the Forest Service for the areas where they have identified new construction.

Alternative Descriptions

Alternative A – No Action

The National Environmental Policy Act (NEPA) requires that an EIS include a “no action’ alternative to serve as a baseline to compare action alternatives. The no action alternative is based on the premise that ecosystems change in the absence of active management.

This alternative proposes to maintain an existing level of management within the Hidden Cedar project area. Fire suppression, road maintenance, recreation use, and vegetative treatments such as planting would continue. It does not propose any new management. A list of ongoing activities can be found at the beginning of Chapter 3 under Past, Present and Reasonably Foreseeable Activities.

Activities Common To The Action Alternatives

These activities apply to Alternatives B, C, D, E and F. ***Note*** that Alternative E has no commercial timber harvesting so activities specific to harvesting (timber harvest, fuels treatment, reforestation, gopher control, and white pine leave tree guidelines) do not apply to Alternative E.

Vegetation Management

Timber Harvest

All harvest is on lands identified as suitable for timber production or where timber harvest is allowed according to the Forest Plan. The timber harvest and fuels treatments are designed to meet one or more of the following objectives for vegetation management (see Appendix A for a detailed description of harvest treatment and fuels reduction method by unit):

- Reduction in stand density;
- Promote or maintain fire tolerant species;
- Emphasis on restoration of western larch and white pine;
- Contribute timber products to the economy.

Various harvest methods described below are prescribed depending on individual stand conditions:

Clear Cut with Reserves (CC w/RES): This is a stand replacement activity; removing nearly all the standing crop for the purpose of creating a new, even-aged stand. Reserves are any tree or group of trees left uncut and kept for part of or the entire next rotation. Reserves are safe snags and live culls, healthy early seral trees, and other individuals/groups of trees with specific resource value scattered throughout stand. This treatment develops an even-aged stand structure. This treatment would receive site preparation and reforestation. Reforestation would be through hand planting with a species mix of greater than 60% early seral species appropriate for the site.

Commercial Thin (CT): This is an intermediate harvest in an immature stand in order to accelerate diameter increment and improve the average form of the trees that remain, without permanently breaking or opening the canopy. No site preparation or planting would be required.

Treatment is to regulate stand density to promote tree growth and vigor. Generally, smaller trees would be harvested and larger trees would be retained. This treatment can be applied to both even and uneven-aged stand structures.

Shelterwood Cut (SW): Often called an Irregular Shelterwood due to the variable treatment intensities that may be applied within a stand or unit. This is usually a mixture of variable

density commercial thinnings due to the variable conditions encountered within the stand or unit. This may also include creation and reforestation of openings within the same stand, with these openings restricted to less than five acres in size. This treatment generally includes two or more of the various treatments generally associated with the shelterwood method to manage forest stands.

Shelterwood Preparatory Cut (SW1): An intermediate treatment of the shelterwood system to improve tree growth, promote better crown development and correct other unfavorable stand conditions. This is usually applied to even-aged stand structures; however, it does not preclude converting to an uneven-aged structure in the future. This treatment generally removes trees near the end of rotation to open the canopy and enlarge the crowns of seed bearers and/or shelter providers, with a view to improving conditions for seed production and natural regeneration in a shelterwood system. Generally, smaller trees would be harvested and larger trees would be retained. Site preparation and planting may be required in the openings.

Shelterwood Seed Cut (SW2): An intermediate treatment of the shelterwood system to begin regeneration of a mature, or near mature, stand. Involves removing trees in a mature stand so as to affect permanent opening of its canopy and so provide conditions for securing regeneration from the seed of trees retained for that purpose and/or sheltering natural and artificial regeneration in a shelterwood system. This is a stand replacement activity designed to provide for regeneration as well as site mitigation (such as shade and protection) to that regeneration. This treatment may also be applied where mitigation for other resource values such as visuals or to meet certain needed stand structure objectives. Although this treatment retains moderate numbers of trees throughout the stand, it is still regarded as an opening. This treatment is generally applied for development of even-aged stand structure. Although this treatment would utilize natural seed for regenerating the stand, it often requires site preparation and artificial reforestation to achieve desired regeneration characteristics in a timely fashion. As with other regeneration harvests, this treatment often includes hand planting with a species mix of greater than 60% early seral species appropriate for the site to influence a more desirable species composition.

Shelterwood Removal or Final Cut (SW3): This is a final, or near final, entry of the shelterwood system. This is a removal of seed/shelter trees after regeneration is established following a shelterwood seed cut. This is designed to gradually reduce the shelter and admit more light to aid the new trees and encourage establishment of additional regeneration. There can be multiple removal cuts pending the stand needs.

If gradual removal of seed/shelter trees is not needed, then only one removal cut would be implemented and this would be referred to as a Shelterwood Final Cut.

Group Shelterwood (GSH): This is a modification of the shelterwood system which creates a stand consisting of 2-3 crown classes **by even-aged groups.** This treatment would develop openings in stands ranging in size from three to five acres, and often includes thinning or other management activities in portions of the unit not included in the openings. In general, the openings would require adequate site preparation and planting with an appropriate species mixture in support of the identified resource objectives, especially assisting in reestablishing early seral species in the stand. Although this treatment develops a multi-storied even-aged stand, it is restricted to development of three crown classes or less.

White Pine Leave Tree Guidelines (Schwandt and Zack, 1996):

These guidelines will be utilized in all silvicultural prescriptions for timber harvest (Alternatives B, C, D, and F). The objective of these guidelines is to retain and protect genetic resources, which may contribute to long-term white pine restoration.

Fuels Reduction

When harvest unit slash is expected to be greater than 5 tons per acre of material less than 3 inches diameter (fine fuels), one or more of the following fuels reduction treatments are prescribed:

Jackpot burns: Jackpot burning breaks up and reduces fuel concentrations. It can be used in commercial thins and shelterwood harvest methods.

Broadcast burning: Broadcast burning is a type of burn treatment designed to reduce fuel accumulations in a clearcut with reserves, and prepare the site for reforestation.

Excavator piling: To facilitate fuel reduction while protecting remaining trees, woody debris would be gathered and piled mechanically using a excavator. The piles would be ignited in the late fall during periods of optimum smoke dispersal. The piles will not be placed next to leave trees, or leave islands to protect them from possible ignition.

Lopping: This method of slash treatment entails lopping (cutting) slash to reduce fuel concentrations and slash depth. The lopped limbs are more subject to compression by snow loads. This proximity to the ground increases the rate at which the slash sheds its needles.

Hand Piling: This method entails piling by hand hazardous fuels (those 4” and less diameter) with the rest left on site. The piles would be ignited in the late fall during periods of optimum smoke dispersal.

Reforestation

Where regeneration harvest occurs, planting would supplement the expected natural regeneration. Planted conifer seedlings will enhance diversity, assure timely reforestation, and contribute to long-term desired habitat conditions. All planting would be a mix of species, but predominantly early seral western white pine, western larch, and ponderosa pine (where appropriate), mixed with Douglas-fir and other species appropriate for the habitat type and site conditions.

A review of reforestation indices for the St. Joe Ranger District, as well as for the Hidden Cedar analysis area (see project file, Vegetation – Reforestation Indices) shows successful reforestation within five years following harvests. This complies with reforestation requirements of NFMA.

Gopher Control

This is a treatment applied in regeneration areas (units with regeneration harvest methods) to protect both natural and artificial regeneration from pocket gopher damage during establishment. It consists of placing poisoned baits in the burrows or runs or the trapping of pocket gophers. There is an initial treatment and up to two follow up treatments, if needed, to minimize losses in the regeneration.

Pre-commercial Thinning

For ***all*** action alternatives (Alternatives B, C, D, E and F), approximately 615 acres of pre-commercial thinning is proposed to improve the growing conditions of the selected trees by eliminating competition for light and nutrients (see Table 2-1).

These are previously harvested units. This treatment is applied to immature stands to improve or accelerate diameter increment growth and to improve the average form of the trees that are retained in the stand. Please refer to alternative maps for locations.

Table 2-1 - Pre-commercial Thinning

Unit	Acres	Drainage
A	29	St. Maries River 4
B	83	St. Maries River 4
C	77	St. Maries River 4
D	15	St. Maries River 4
E	8	Bechtel
F	18	Bechtel/W. Fork St. Maries
G	31	W. Fork St. Maries
H	7	Bechtel/W. Fork St. Maries
I	15	Wood
J	16	Wood
K	14	Mazie
L	13	Mazie
M	16	Mazie
N	9	Hidden
O	12	W. Fork St. Maries
P	24	Keeler
Q	45	Keeler

Unit	Acres	Drainage
R	7	Long Slim Creek
S	6	Long Slim Creek
T	24	Long Slim Creek
U	17	Long Slim Creek
V	6	Long Slim Creek
W	15	Long Slim Creek
X	5	Long Slim Creek
Y	11	Long Slim Creek
Z	2	Long Slim Creek
AA	6	Long Slim Creek
BB	9	Long Slim Creek
CC	3	Long Slim w/ 2% in Log drainage
DD	19	Long Slim w/ 2% in Log drainage
EE	10	Long Slim w/ 2% in Log drainage
FF	22	Long Slim w/ 2% in Log drainage
GG	21	Keeler Creek
Total	615	

Access Requests-Adjacent Landowners and Jurisdictions

Access requests across National Forest lands from adjacent landowners (State of Idaho and Potlatch Corporation) are included in all action alternatives. There will be 2.2 miles road construction on National Forest land. The road construction on Forest Service Administered Lands (2.2 miles) is assessed in the Direct and Indirect Effects section of each resource (Chapter 3).

There is 5.6 miles of new road construction proposed on private land associated with access requests from State and Private landowners. The State and private corporate landowners are planning on harvesting timber on their parcels. Activities on private land (road construction and timber harvest) associated with the access requests are analyzed as a cumulative effect in each resource section. Proposed harvest is described below:

Potlatch proposes to harvest:

- 30 acres (shelterwood) in T43N R1E section 25;
- 60 acres (regeneration – clearcut) in T43N R2E section 30;
- two 35 acre units(regeneration –clearcut) in T43N R2E sections 19 and 30;
- 40 acres (partial cut, shelterwood) in T43N R2E section 19 and 30 acres
- 30 acres (partial cut/shelterwood) in T 43N R1E section 24.

The State of Idaho proposes to harvest:

- 685 acres using a shelterwood silvicultural system. 285 acres in T42N R2E section 30 and 400 acres in T42N R1E sections 25 and 26.

The acres are approximate in all cases because they are the entire blocks of land and do not take into account acres taken out for riparian area buffers and other features.

The activities on private lands are assessed in the Cumulative Effects sections for each resource (Chapter 3) as it is reasonably foreseeable that they will harvest timber after the road construction

Construction, Reconstruction, and Temporary Road Construction Associated with Timber Harvest

All temporary road construction will be decommissioned upon completion of activities. All new road construction proposed on NFS lands (except access requests (2.2 miles, alternative B, C, D, E, and F)) and the replacement access (.7 miles for Hidden Cr. road #498 in Alt. D and Alt. F) will be put into road management prescriptions C (long term storage), D (decommission with partial re-contour) or E (decommission with full re-contour) upon completion of activities. Some existing roads would require reconstruction to allow for safe timber haul, improve drainage, and improve water quality. Reconstruction may include the installation of drain dips and culverts, grading, clearing, dust abatement, and resurfacing.

Watershed Restoration Work

To meet the purpose and need to: 1) protect and improve aquatic habitat in watersheds supporting native trout; and 2) maintain and improve water quality conditions in a Water Quality Limited Stream, watershed restoration work is proposed. Based on opportunities identified by the interdisciplinary team for the project area, to improve fish habitat and watershed condition, the following activities are proposed. It would be accomplished as funding becomes available, within 10 years following harvest activities. Several funding sources have been utilized in the past by the District to accomplish activities such as these. Some of the road decommissioning would be accomplished through contract associated with the timber harvest (project file).

Riparian Planting

This will occur on approximately five miles (20-30 acres) of stream in Wood Creek, Hidden Creek, and the West Fork of the St. Maries River. Cottonwood, conifers, shrubs and possibly sedge would be planted to increase riparian functionality and channel stability. In the long term

these plantings would provide for large woody debris recruitment into the stream channel system, thus improving stability and habitat. Some temporary fencing may be needed to protect the plantings, and possibly permanent fencing on the lowest reach of Hidden Creek, below the highway (see Map M-4, Project Related Opportunities).

Large Woody Debris Placement

Replace large woody debris elements and structure to approximately 1.2 miles of the West Fork St. Maries River in sections 25, 26, of T. 42N. R1E. Logs would be placed in the stream with a track-hoe or Spyder-hoe. Approximately .8 miles in section 25 has the potential for KV funding. (see Map M-4, Project Related Opportunities)

Road Decommissioning

Between 19 and 38.2 (Alternative B through F) miles of existing road would be decommissioned. A determination was made through an interdisciplinary process that there is no foreseeable use for these roads (Project File – Roads Analysis Process). Some roads are blocked with vegetation, or contain washouts and slumps. Following decommissioning they would not be open to motor vehicles. Access (foot, horseback) would vary dependent on terrain and type of treatment. The majority of this work would be done with funding other than from the sale of timber. See Table 2-18, Summary of Road Core Data and individual alternative descriptions later in this chapter for more detail. Road Management Maps: M-6, M-8, M-10, M-12, and M-15 display the change in road management from the existing condition.

Roads identified to go into long-term storage roads are not needed in the near future, but use is expected in the future (10-20 years). The road bed would be left intact except where fill removal was necessary to reduce the risk of mass failures. Stream crossing would be left in self-maintaining conditions. Roads would be allowed to naturally re-vegetate.

Some of the miles of NFSR roads identified to be decommissioned (see alternative descriptions) are to be used for the harvest of timber and would be decommissioned using funds from the timber sale (see project file, roads analysis process).

Fish Pond

This opportunity brought to the interdisciplinary team for a community project involving the Idaho Fish and Game, Potlatch Corporation, Clarkia Better Roads Highway District and the Forest Service. It does not meet the purpose and need of the proposal; however, due to its location and timing with the Hidden Cedar Project it is an opportunity that needs analyzed, so that efforts to build a partnership could be initiated. Analysis will be on the physical aspect of making the pond and stocking it with fish to be used as a put and take fishery.

Location is T42N, R1E SW ¼ of section 28. The development of a recreational fish pond would be dependent on creation of a partnership with the Idaho Fish and Game, Clarkia Better Roads Highway District and Potlatch Corporation.

Funding would not be guaranteed until the partnership is formed. To develop the pond, water from a tributary to the headwaters of the West Fork of the St. Maries River may be backed up against road 765A, or construction of separate structure. Road 765A is a county road. The

Clarkia Better Roads Highway District is the authority that maintains this road. Water is already damming behind a dike near the road. Small brook trout can be found in the pond.

Water forming the pond would be approximately one acre and is on NFS and Potlatch Corporation lands. A parking area would need to be designated, currently there is an old road adjacent to the pond on Potlatch property.

Anticipated Timing of Activities

The action alternatives would result in timber sales that will produce a variety of forest products. Any resulting timber sales would be planned for sale in 2003 and 2004.

Timber harvest is expected to be completed by 2008, with slash disposal and reforestation completed by 2009. These dates are tentative based upon anticipated budgets, workforce, weather and other considerations. Actual dates of implementation and accomplishment could vary.

Design Features and Mitigation Common to the Action Alternatives

The following is a description of design features and mitigations included to protect resource values. Site-specific design features and their objectives area described in Table 2-4. The effectiveness of mitigation or design features is based on literature and research, administrative studies, professional experience, results of previous monitoring on other projects, and logic and is referenced or discussed here or in Chapter 3 – Effects Section for the different resources.

Threatened, Endangered, and Sensitive Plants and Wildlife

Plant species presence is assumed for un-surveyed habitat that is highly suitable to support threatened, endangered, sensitive and proposed (TESP) species (see Table 3-42 on page 3-139, for Wildlife Species Presence). If TESP species were discovered during project implementation, protection measures would be taken. This could include altering management activities. Timber Sale Contract provisions for Protection of Endangered Species, and Settlement for Environmental Cancellation will be included in any subsequent timber sale contracts.

Modifications to alternatives or new locations of any Threatened, Endangered, or Sensitive (TESP) species found prior to or during project implementation would be reported to the District Botanist and District Wildlife Biologist so measures can be taken to maintain population viability.

Field surveys for **rare plants** will be conducted where necessary, prior to project activities, to verify or negate presence. Measures to protect population viability and habitat for all known and newly discovered occurrences would include altering or dropping proposed units from activity, modifying the proposed activity, or implementing buffers around plant occurrences.

The design criteria and mitigation measures listed above for plants and below for wildlife have a high to moderate estimated *effectiveness*. All recommendations and design criteria are based on scientific literature which are referenced in each section. These measures would be implemented through silvicultural prescriptions, unit layout and marking guidelines, contract provisions and compliance monitoring. The district has a TRACKS program that monitors implementation of NEPA projects.

Wildlife

Slash depths next to new and reconstructed roads would not exceed 1.5 feet or if that is not practical, 16-foot wide openings every 200 feet (especially on ridges and across game trail).

To provide elk security, timber sales in adjacent areas would have a ridgeline between the disturbance and security area (see Project File, Leege, 1984). This would be done by either subdivisions (larger sales) or scheduling (smaller sales) in the timber sale contract.

Travel cover will be maintained. Vegetation management will avoid making openings (i.e. areas with <30% canopy cover) within 200 feet of the ridge top or 400 feet if the other side if the ridge does not provide cover. Any openings created on ridges designated as potential travel areas would meet the following criteria:

- less than 300 feet wide,
- Limited to one side of the ridge top
- Minimum of 800 feet between openings
- None to be situated in a saddle
- Less than 25% of the distance from the peak of the ridge to the drainage will consist of openings.

The following snag management recommendations (Table 2-2) from the Northern Region Snag Management Protocol (January 2000) would be met (where these or higher levels exist). The retention of snags and snag replacements would be applied at the scale of every 5 to 25 acres. Replacement snags would be retained at 5 times the number of snags per acre.

Table 2-2 – Snag Guidelines

Habitat	Snag/acre retention prescriptions
Warm dry ponderosa pine and Douglas-fir	1-2 greater than 20” dbh
Cool Douglas-fir, warm grand fir, slope <30%	4 greater than 20” dbh
Cool Douglas-fir, warm grand fir, slope >30%	6-12 total, with 2-4 greater than 20” dbh
Cool, wet, and dry spruce, grand fir, hemlock, and alpine fir	6-12 total with 2 greater than 20” dbh
Low elevation cedar and hemlock	12 total with 4 greater than 20” dbh
High elevation spruce/fir/lodgepole pine	5-10 greater than 10” dbh
Whitebark pine/limber pine	All available

To meet the objectives listed above in Table 2-2 Snag Guidelines:

- Snags that show signs of decay, loose bark, or broken tops would not be designated for harvest. Exceptions would be made for road construction and log landings.
- The Reserve Tree Guide (IPNF, 1995) would be followed to reach objectives of the Snag and Woody Debris Guidelines (IPNF Forest Plan, Appendix X) and worker safety.
- Tree marking guidelines for wildlife reserve trees would favor the retention of large diameter trees, particularly hollow and broomed trees except when they pose a safety

concern. Western larch, ponderosa pine, and western red cedar greater than 20 inches dbh would be marked as first choices for snags and reserve trees.

- Snags cut for safety reasons will be left in the unit - preferably where they fall.
- Silvicultural and burning prescriptions will be prepared with the goal of protecting snag and green tree replacement snags, and retaining recommended levels and distribution of coarse woody material during site preparation and fuels treatment.

Excavator piled slash should be left at a rate of one slash pile per 5 acres and constructed to provide wildlife habitat.

Surveys to determine the status of the known goshawk nest-site and Post Fledging Area will be conducted prior to unit layout and implementation of unit activity (see Appendix E- Monitoring).

Existing goshawk nests and any nests found before and during implementation would be protected by a 30 acre no activity buffer (see Project File, Reynolds, etal. 1992).

Project activity would be suspended within the post fledgling area of any active goshawk nests between March 15 and August 15. Activity restrictions can be removed after June 30 if the nest site is determined by the district biologist to be inactive or unsuccessful.

Activity within an approximately 420-acre area surrounding each active goshawk nest would comply with the following management recommendations (Reynolds, etal. 1992):

- 20% or less in shrub/seed/sapling size class;
- 60% or more canopy closure in immature and older size classes;
- created openings are less than 2 acres with a minimum of 300 feet between existing or other created openings and snag retention guidelines are applied on each acre of created opening,
- non-regeneration treatment in immature and older stands is thinning from below using irregular spacing of leave trees;

Design criteria specific to pre-commercial thinning:

- The maximum diameter of felled trees would be 7 inches. Cull trees that exceed the diameter limit would be girdled in lieu of felling to provide additional cavity-nesting habitat.
- Snags or dead trees would not be cut.
- Directional felling would be used to minimize slash depths. Trees that cannot be directionally felled would be bucked in lengths not to exceed 6 feet.
- Slash would be pulled back a minimum of four feet away from all system roads, cut banks and fill slopes.
- Established game trails would be kept clear of slash by directional felling and slash pullbacks to maintain travel linkages.
- All slash resulting from project activities would be removed from riparian zones.

- A 50-foot no-activity buffer would be maintained along all wetted defined channels, springs, and seeps within and adjacent to thinning units.
- Existing closed gates would be locked after each entry and exit.
- Activity behind closed gates would be scheduled for completion prior to the opening of the elk any weapon hunting season. An extension may be allowed based on extenuating circumstances (fire, weather, etc.) after interdisciplinary review.
- Earthen barriers removed to allow access for project activities would be replaced upon completion of the unit and before October 10th.
- If access is desired via roads that have naturally closed through revegetation, interdisciplinary field reviews would be conducted to evaluate options and make recommendations regarding opening the road.

Roads

Sediment Control: Road plans and specifications will include measures to minimize sediment production based on site-specific evaluation. This could include, but are not limited to slash filter windrows, surfacing, gravel or slash blankets, interim seeding, mulching, controlling the timing or extent of activities, and sediment traps. *Effectiveness* is high, because this type work is in the road package, which is a part of the Timber Sale Contract.

New Road Construction: Any new roads would be single lane facilities, suitable for log truck or lowboy use.

Reconstruction: Any existing road used for timber activities could be rebuilt to its approved traffic service level or improved to increase safety, operational efficiency or resource protection. For this document, reconstruction includes rebuilding roads to their original standards.

The overall condition of the road is generally inadequate for resource protection or anticipated use or impassable for the design vehicle.

Spot reconstruction may also occur, where the primary disturbance is confined to a limited area, such as culvert installations, rebuilding a shoulder or addition of turnouts.

Areas between the spots generally would need reconditioning (reshaping and processing the road surface and ditches and brushing the shoulders). Most of the reconstruction and reconditioning is actually maintenance (FSM 7705) to restore the road to its' original condition.

Road Maintenance: The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective. The overall condition and standards of the road are adequate for the anticipated uses.

Cost Share Agreements: The Forest Service has cost share agreements with Potlatch and the State of Idaho in the analysis area. Cost Share principles apply to construction, reconstruction, maintenance and use of shared facilities. Cost Share roads are National Forest System Roads.

Soil and Water

All activities would comply with:

- Standards identified in the Inland Native Fish Strategy (INFS) EA Decision Notice and Finding of No Significant Impact, signed in July 1995. All alternatives will implement the default Riparian Habitat Conservation Areas (RHCA) widths specified by INFS (see Table 2-3). These buffer zones are no entry for harvest and equipment. Exceptions are described in the Standards and Guidelines, General Riparian Area Management (RA-2) that states: Trees may be felled in riparian habitat conservation areas when they pose a safety risk. Keep felled trees on site when needed to meet woody debris objectives. When necessary to fall trees (for skyline/cable units); the sale administrator may approve the minimum number required and ensure that they remain where dropped. (See Project File for description of each InFISH standard and estimated *effectiveness)*

- Objectives of Appendix O of the IPNF Forest Plan, Stream Protection.

- Activities would be designed to protect water quality. Best Management Practices (BMPs) are used to achieve water quality standards. The Forest Service Handbook 2509.22 (Soil and Water Conservation Handbook) outlines BMP's that meet the intent of the water quality protection elements of the Idaho Forest Practices Act, and through a memorandum of understanding with the State of Idaho (9/19/88) replaces the Forest Plan Appendix S – Best Management Practices. BMP's would be implemented (see Applicable BMPs and Soil and Water Conservation Practices, White Paper, IPNF, 2002). Site-specific BMP's are identified and developed during layout, design or implementation of proposed activities. *Effectiveness* of BMP's are described in Seyedbagheri,1996, Lynch and Corbett, 1989,1990 and Idaho's 2000 Forest Practices Water Quality Audit – Final Report, Applicable BMPs and Soil and Water Conservation Practices, White Paper, IPNF, 2002, Best Management Practices Effectiveness Monitoring Report, USDA Forest Service Lolo National Forest , March 2002 (Project File).

- Requirements and Erosion control Guidelines of the Rules and Regulations pertaining to the Idaho Forest Practices Act, Title 18, Chapter 13, Idaho Code.

Areas of recent or historic landslides and slumping are considered landslide-prone and constitute Category 4 – RHCAs (INFish). Harvest and road design would avoid known sites (see project file) using INFish buffers. (Small areas of instability may be found on roads).

Restrict or limit tractor logging on slopes over 35%.

A minimum of 100 feet is suggested between skid trails.

Use of excavated skid trails should be kept to a minimum and reclaimed to original condition.

To minimize disturbance (soil compaction or displacement), practices such as skidding, grapple-piling and mechanical harvesters will occur over slash (Forest Plan Monitoring Reports). Units will be designed to utilize non-excavated skid trails, and directional falling.

To minimize erosion and sediment delivery on skid trails, no skid trials will be constructed on slopes over 30% and all skid trails will be water-barred and seeded after use to comply with Idaho Forest Practices Act (IFPA) Rules (IDL, 1998).

Skid trails in tractor-yarded units will be limited to less than 15% of the unit acreage to comply with Region One Soil Quality Standards.

Decommissioned roads whose management prescription changes to level C, D or E would **at a minimum** remove all culverts, remove all fill within the crossing sites, and return stream gradient and valley side-slopes to natural conditions. Decommissioning would also de-compact road surfaces to a minimum of 18 inches to facilitate and augment infiltration.

Closure at the beginnings of roads may require full obliteration for 300 feet or sight-distance to prevent motorized access.

Prescribed burning plans will be reviewed, by a hydrologist, prior to implementation. Prescribed burning will be done during the spring or when soil moistures exceed 25% to maintain soil productivity (IPNF, Updated Soil Guidelines, 1998). McNabb and Cromack (1990) recommend mass ignition firing techniques to reduce flaming fronts and the smoldering phase to avoid creating water repellency and increasing erosion hazards on surface-ash soils.

The soils in the activity areas are inherently low in potassium, a key nutrient for vegetation. The Intermountain Forest Tree Nutrition Cooperative assembled data suggesting that potassium levels may be conserved in treatment units by allowing logging slash to over-winter. By leaving sufficient levels of wood on site, long-term soil productivity would be protected.

- Potassium sources such as needles and limbs would be maintained on site by allowing slash to over-winter prior to all slash disposal treatments (Intermountain Forest Tree Nutrition Cooperative- Garrison,Moore, 1998).

Silvicultural and burning prescriptions will retain sufficient levels of coarse woody debris on site **after** slash disposal. The following recommendations will be used in prescriptions:

- Douglas fir, larch, and pine minimum coarse woody residues of 4-6 inches diameters well distributed through a treatment area at 10-15 tons/acre (Harvey et al. 1987).
- Grand fir/beargrass types at 7-14 tons/acre of coarse woody residues (greater than 3 inches diameter), western hemlock/beadlily types at 17-33 tons/acre coarse woody residues (greater than 3 inches diameter)
- Subalpine fir/beargrass types at 12-23 tons/acre coarse woody residues (greater than 3 inches diameter) Graham and others (1994).

Wetlands identified during field review or harvest preparation will be excluded or protected by INFISH buffers (50 feet for those < one acre and 150 feet for those > 150 feet). A resource protection clause in the timber sale contract will be utilized if any are identified.

Fish

INFish Standards and Guidelines are specific based upon the activity being proposed, i.e. timber harvest, road management, recreation etc. Standard buffer widths (summarized in Table 2-3) will apply to activities within this project area unless otherwise designated by the district fisheries biologist or district hydrologist (see Project File for list of specific standards and *effectivness*). These standards are:

Table 2-3 - Summary of INFish Widths

INFS category	Description	RHCA width
1	Fish bearing streams	300’ from either side of channel
2	Permanent, flowing, non fish bearing stream	150’ from either side of channel
4	Seasonal, flowing or intermittent streams Wetlands < 1 acres Landslide prone	50’ (non-priority watersheds)

- Activity in and around streams should occur during baseflows, after fry emergence and prior to fall spawning of bull trout.
- See Appendix G for clarification of the fry emergence standard.

Recreation

Dispersed recreation sites used for harvest operations activities would be restored or rehabilitated. Contractors will follow timber sale contracts and any other permits required for camping.

In areas where logging traffic may interfere with increased recreational traffic roads will be signed informing visitors of logging activities.

Air Quality

Proposed burning activities follow procedures outlined by the North Idaho Smoke Management Memorandum of Agreement. Currently, the period of air quality monitoring and restriction is March 1 to November 30.

- During this period, all burning by the Forest Service is regulated to prohibit or restrict burning where stagnant weather conditions result in poor smoke dispersion and by conducting prescribed burns when ventilation and air quality conditions are good.
- The project is within Airsheds 12a and 12b, which contain no EPA designated non-attainment areas for pollutants nor does it contain any Class I airsheds as designated by the Clean Air Act.
- Burning during any time of the year is regulated by the Idaho State Department of Environmental Quality, which issues burning closures when necessary to protect air quality. The Forest Service cooperates with the State in meeting the State implementation Plan.
- PM10 and PM2.5 projections will be sent to the North Idaho Smoke Management Group one day prior to ignition.

- A notice to local newspapers prior to burning season will explain to the public when, where and why burning will be conducted.

Measures used to mitigate effects of prescribed burning on air quality would include:

- Broadcast and understory burning would be accomplished as much as practical in the spring and early summer with spring-like conditions. This would reduce the total emissions by burning less of the duff and larger fuels. Spring atmospheric conditions are best for smoke dispersion. Risk of fire escape is also less in the spring.
- The discretion to terminate burns when air quality is threatened.
- Slash piles would be constructed as clean as practical and burned as dry as practical to enhance efficient combustion.

Noxious Weeds

A number of preventative measures will be taken to reduce the risk of noxious weed introduction and spread in accordance with the St. Joe Weed Control EIS (ROD – 10/12/99).

Measures include:

- Existing populations of weeds along haul roads would be treated prior to harvest activities. This would be accomplished by the Forest Service with appropriated funds.
- All off-road logging and construction equipment (including machinery used in restoration projects) would be cleaned prior to entering the project area to remove dirt, plant parts, and material that may carry weed seeds. A provision will be included in the sale contract.
- Mulching agents, such as hay or straw, would be certified weed free before being allowed.
- All seed used for re-vegetation and erosion control purposes would be certified weed free.
- Areas where ground-disturbing activities have occurred would be inspected for new populations of noxious weeds should funds be available.
- Appropriate action, within funding limitations, would be taken if new populations of noxious weeds were discovered within the project area.

Heritage Resources

All known heritage resource sites would be protected, as directed by the National Historic Preservation Act. Any future discovery of heritage resources sites or caves would be inventoried and protected if found to be of cultural significance. Timber Sale Contract provision (protection of cultural resources) will be included in all timber sale contracts to ensure protection of the sites.

Public Motorized Access/Access Management

At a minimum, the following National Forest System Roads (NFSR) will be managed as unrestricted routes, available for all legal motorized vehicle use (see Road Management Map 13):

- East Elk Road 1451 (Staples Creek), from SH 3 to Road 1491

- Christmas Creek Road 3321, from County Road to the end of road
- Bluebell Road 3685, from segment 1 of Road 1486 to 3685C
- Cat Spur Road 361, from Road 1486 (County Road) to Road 1450
- Log Creek Road 1450, from Road 361 to Road 1480
- Keeler Connection Road 765, from SH 3 to Road 765A
- County Line Road 765A, from Road 765 to SH 3
- Clarkia Emerald Creek Road 504, from SH 3 to Road 447
- Bechtel Mountain Road 3478, from Road 504 to the top of Bechtel Butte
- Anthony Peak Road 1486, segment I, from the Road 361 (County Road) to Road 3685
- Anthony Peak Road 1486, segment III, from Road 3685 to Road 3686

Some roads that are currently restricted would be opened to accommodate timber harvest operations. Public travel will not be permitted on these roads due to safety concerns, wildlife security, and soil and water concerns (see Appendix D for detailed description of access management actions; Alternative Road Maps M-5, M-7 and M-9):

- 504A (Clarkia Peak road) at the junction with Road 504 (gate)
- 498 (Hidden Cr. road) gate at mile post 2.8
- 3380 (Q chalk road) at the junction with state highway 3 (gate)
- 3557 (Cedar Butte road) at the junction with Road 447 (gate)
- 3335(Poacher road) at road to warehouse (Clarkia Workcenter)
- 3327j (Palouse road) at the junction with Road 3327G (gate)

New road construction will have gates installed on the following roads:

- Off of Road 765 (to units 30,31,32)
- Off Powerline Road 361C (to units 27 & 28)

Powerlines

Special concerns for operations near the large transmission lines are discussed below.

Timber sale roads would be kept reasonably free of equipment, products, and debris. The Bonneville Power Administration (BPA) may need to have road access for emergencies.

In this case "reasonably free" would mean that the road could be cleared within an hour of notice and roads would be left clear and passable when the timber sale purchaser or contractors leave the area for more than an hour at a time.

Logging trucks and equipment should be parked on the right-of-way only during emergencies.

When this occurs, the truck/equipment should be grounded with a flexible wire connecting the chassis to a ground rod driven into the ground, or by making the connection to ground with a drag chain attached to the truck/equipment chassis.

- Where units are planned adjacent to the transmission line right-of-way, timber would be harvested to reduce the risk of blowdown into the powerline. Trees immediately adjacent to or under the powerline would be harvested. If this is not possible, enough timber would be left to maintain wind firmness and reduce the risk of wind-throw into the powerline.
- Haul roads shall remain a minimum of 50 feet from the point where steel lattice tower legs enter the earth. If this clearance cannot be met, use of road may be permitted if adequate protection for BPA structures from vehicles is provided by the use of guard devices (guard rails, posts, Jersey-type barriers, etc.) If guard devices are used, their location and design must be approved by the BPA.
- Yarders used near the powerline would be grounded with copper wire attached to a copper rod pounded six to eight feet in the ground. Skyline cables would be grounded as described above at the tailhold.
- Chokers would be allowed to hit the ground before they are touched. Track mounted equipment is recommended near transmission lines to drain off induced voltage. If rubber mounted machines are used, a chain would be dragged behind on the ground to drain off voltage. Maintain a minimum separation of 20 feet between equipment and transmission line conductors.
- No high-lead or skyline yarding across the right-of-way.
- Powerlines sag on warm days or when they are weighed down by snow or heavy frost. Lines that span long distances have greater potential to sag. The distance between equipment and powerline cables in the same place can be different with different conditions. The timber sale prospectus would describe this to potential timber sale bidders.
- Concentrated columns of smoke would be avoided in order to prevent electrical arc. Burning planned within the right-of-way will be discussed with the BPA prior to writing the burn plan.
- No loading of logging trucks, fueling of vehicles or equipment, log decking or storage of logs or flammable materials on the right-of-way
- Logging trucks shall not be loaded to a height greater then 14 feet above the roadbed. If a tree comes in contact with the transmission line, do not attempt to remove it. Contact BPA Dittmer Dispatcher immediately, 24 hours per day, seven days per week: 360-693-4703 or 800-392-0816.
- For extreme safety hazard trees near the transmission line, and with advance notification, BPA may be able to provide personnel at the work site.
- The right-of-way width for the Dworshak-Taft No. 1 500-kV transmission line is 150 feet, measured 75 feet on each side of transmission line centerline.

Site Specific Mitigation Measures

Table 2-4, Table 2-5 and Table 2-6 describe site-specific mitigation measures and design features common to all the action alternatives (except E, because it has no harvest or road construction).

Table 2-4 - Site-Specific Mitigation Measures And Design Features

Objective	Site-Specific Mitigation Measures And Design Features
Maintain Visual Quality	No grapple piling or underburning in Units 3 and 4; Grapple piling is restricted to the southern portion of unit 5; No grapple piling/underburning between rd.#504 and new road construction in unit 8, 16, and 17
Meet Soil Quality Standards	**Unit 48** has proposed ground base logging. To meet standards the timber sale administrator should implement alone or in combination: 1) skid trail spacing at minimum of 100 feet, 2) deompact skid trails and landings. 3) create ½ acre reserve within the unit, where no equipment could operate. **Unit 5** is currently over the standard. To prevent further detrimental soil impacts on the four acres proposed for ground based operations: skid trails and landings must be decompacted, and equipment must operation on existing skid trails or utilize helicopter harvest methods.
Reduce Sediment Production	Miles of new road construction and reconstruction listed in Table 2-5 below would be surfaced with gravel. These roads are currently needed and are to be maintained. The intent of the treatment is to reduce sediment and minimize the effect of the road on the watershed hydrology.
Maintain Water Quality	11.7 miles of roads will be decommissioned prior to or concurrent with road construction. See Table 2-6 below.

Table 2-5 – Roads with gravelling to reduce sediment

Watershed	Road No.	Miles	Road Status
Cedar	504A spur	.27	Construction – unit 18, NFS
Cedar	504A spur	1.03	Construction – units 2,3,9,19 - NFS
Cedar	504a spur	.87	Construction - units 7,8,16,17 - NFS
Emerald	3557	1.01	Reconstruction- FRTA
Emerald	3557	2.2	Reconstruction - NFS
Hidden	3478-3914 Bechtel connection	.55	Construction-NFS
Hidden Creek	3901-3343 Bechtel conection	.12	Construction. NFS
Hidden Creek	3478 UB-Bechtel connection	.4	Reconstruction. - NFS
Hidden Creek	3914 UD Bectel Connection.	.11	Reconstruction -NFS
Hidden Creek	3343UB	.29	Reconstruction - NFS
Long Slim	765 B	.74	Construction.- cost share
L. St. Maries	1420- potlatch access	.66	Reconstruction. – cost share
L. St. Maries	1452 - potlatch access	.16	Reconstruction.- Cost share
L. St. Maries	504A spur	.32	Construction NFS – to unit 18
L. St. Maries	361 C	.93	Reconstruction -NFS
L. St. Maries	3321	.11	Construction –Cost Share
Mazie	765-SH-3, NF sale rd	.22	Construction - Cost share
Mazie	765-SH-3 to units 25,30	.45	Construction -NFS
Mazie	765/SH-3	.57	Construction - NFS
W. Fk. St. Maries	361C west	.50	Construction – Cost share
W. Fk. St.	361C west NF sale rd	1.03	Construction -Cost share
TOTAL		**12.54**	

Table 2-6- Watershed Restoration to occur prior to or concurrent with Road Construction

Watershed	Road No.	Miles	Road Status
Bechtel	3340	1.16	Long term storage
Bechtel	3340 A	.46	Long term storage
Cedar Creek	3557	.17	Long term storage
Emerald Creek	3556	.60	Long term storage
Hidden Creek	498 UC	.65	Decommmission
Hidden Creek	498 UD	.34	Decommission
Hidden Creek	498 UH	.2	Decommission
Hidden Creek	498 UH	.23	Decommission
Hidden Creek	498 UB	.62	Decommission
Hidden Creek	3343 UD	.31	Decommission
Hidden Creek	3343 spurs; UB, UC	.30	Decommission
Hidden Creek	3343	.19	Long term storage
L. St. Maries	3321 AUA	.45	Decommission
L. St. Maries	3321 AUC	.17	Decommission
Lower St. Maries	3321 A	.27	Long term storage
L. St. Maries	3321 BUA	.59	Decommission
Mazie	3340	3.83	Long term storage
W. Fk St. Maries	3340 UB	.36	Decommission
W. Fk. St. Maries	3380	0.16	Decommission
W.Fk. St.Maries	3340	.33	Long term storage
Wood	3340	.33	Long term storage
TOTAL		**11.72**	

Activities Specific to the Action Alternatives

Alternative B - Proposed Action

Alternative B includes all actions described in Activities Common to the Action Alternatives. Treatment acres are summarized in Table 2-7. Approximately 32% of the harvest units will be harvested using helicopter. Alternative B addresses the issue of roads (existing/new construction) and fish, wildlife, water and soils by putting new road construction into long-term storage, decommissioning temporary roads and decommissioning about 19 miles of existing roads. Proposed activities are displayed on the Alternative B Map (M-5). Table 2-8 summarizes road activities. Map M-6 displays changes in road prescriptions from the existing condition.

Table 2-7- Harvest Treatment Summary

Timber Harvest Method	Acres
Intermediate Harvest	
Commercial Thin	843
Shelterwood Prep Cut	207
Regeneration Harvest	
Shelterwood Seed Cut	40
Shelterwood Removal Cut	16
Irregular shelterwood Cut	73
Group shelterwood cut	58
Clearcut with reserves	131
Total Acres treated with timber harvest to meet objectives	1,368
Fuels Treatment *	Acres
Jackpot and Broadcast Burning	188
Excavator Piling	556
Lopping	114
Hand piling	12

*Fuels treatment acres do not equal total harvest acres since some units have more than one type treatment. (Several units have multiple objectives)

Table 2-8 - Road Construction, Reconstruction and Decommissioning

Road Activity	NFSR Miles	Private miles
Construction/Reconstruction:		
Temporary Road Construction	3.0	
New Road Construction (NFSR)	6.2	
Road Reconstruction	7.3	
NFSR Cost share Construction	2.2	
Private Construction* (Access Request-cumulative action)		5.6
Total	18.7	5.6
Stabilization and Restoration:		
Existing NFSR put into long term storage	7.7	
Existing Classified NFSR decommissioned **	1.1	
Existing Unclassified road decommissioned	10.2	
Total	19.0	

NFSR – National Forest System Roads

* For Display purposes only **Existing NFSR decommissioned is .5 miles of Road 1452 and .6 miles of Road 341a.

Alternative C

Alternative C contains the elements of Activities Common to All Action Alternatives sections described above, and additionally was designed to address the following issues: **Issue #1 – Road Construction:** Under Alternative C, there would be **no new road construction** for Forest Service Activities. Exception is road construction required for access to private land will occur on NFS lands). This alternative has more helicopter harvest (83%). **Issue #2 – Existing Roads:** This alternative addresses the issue of existing road management by proposing 19 miles of road decommissioning. Alternative C proposed activities are displayed on Map (M-7). The changes in road management prescriptions (as described in Table 2-10) from the existing situation are displayed on Map (M-8)

Table 2-9 - Harvest Treatment Summary

Timber Harvest Acres by Harvest Method	**Acres**
Intermediate Harvest	
Commercial Thin	871
Shelterwood Prep Cut	207
Regeneration Harvest	
Shelterwood Seed Cut	40
Shelterwood Removal Cut	16
Irregular shelterwood Cut	73
Group shelterwood cut	58
Clearcut with reserves	131
Total Acres treated with timber harvest to meet objectives	**1,396**
Fuels Treatment Acres*	**Acres**
Jackpot and broadcast Burning	188
Excavator Piling	556
Lopping	119
Hand piling	19

*Fuels treatment acres do not equal total harvest acres since some units have more than one type treatment. (Several units have multiple objectives)

Table 2-10 - Road Construction, Reconstruction and Decommissioning

Road Activity	**NFSR Miles**	**Private miles**
Construction/Reconstruction:		
Temporary Road Construction	0.0	
New Road Construction (NFSR)	0.0	
Road Reconstruction	7.3	
NFSR Cost share Construction	2.2	
Private Construction * (Access Request-cumulative action)		5.6
Total	9.5	5.6
Stabilization and Restoration:		
Existing NFSR put into long term storage	7.7	
Existing Classified NFSR decommissioned **	1.1	
Existing Unclassified road decommissioned	10.2	

Total	19.0	

NFSR – National Forest System Roads * For Display purposes only **Existing NFSR decommissioned = road # 1452 - .5 miles and road #341a - .6 miles. See alternative maps for locations of road construction and reconstruction.

Alternative D

Alternative D was developed for watershed restoration and vegetation management with emphasis on decommissioning and storing existing roads. It includes Activities Common to the Action Alternatives. It also addresses **Issues #1 and 2 - new road construction and existing road management**: 38.2 miles of existing road would be decommissioned including a) removing riparian roads in Wood and Hidden Creeks to improve fish habitat and water quality (long term) and b) long- term storage of Mazie Creek road to improve wildlife security, water and fish. No new road construction is associated with harvest on NFS lands. About 72% of the units will be helicopter harvesting. There is 2.2 miles of road construction on NFS lands from access requests.

To maintain access to existing transportation system and NFS and other lands, .7 miles of road would be constructed (and gated) to replace the access lost with the decommissioning of Road 498. Map (M-9) shows activities and Map (M-10) shows changes in road management.

Table 2-11 - Harvest Treatment Summary

Timber Harvest Acres by Harvest Method	**Acres**
Commercial Thin	333
Shelterwood Prep Cut	118
Regeneration Harvest:	
Shelterwood Seed Cut	
Shelterwood Removal Cut	
Irregular shelterwood Cut	
Group shelterwood cut	43
Clearcut with reserves	109
Total Acres treated with timber harvest to meet objectives	603
Fuels Treatment Acres*	**A**
Jackpot and broadcast Burning	123
Excavator Piling	221
Lopping	38
Hand piling	14

*Fuels treatment acres do not equal total harvest acres since some units have more than one type treatment. (Several units have multiple objectives)

Table 2-12 - Road Construction, Reconstruction and Decommissioning

Road Activity	NFSR Miles	Private miles
Construction/Reconstruction:		
Temporary Road Construction	0.0	
New Road Construction (NFSR)	0.7	
Road Reconstruction	6.3	
NFSR Cost share Construction	2.2	
Private Construction* (Access Request-cumulative action)		5.6
Total	9.2	5.6
Stabilization and Restoration:		
Existing NFSR put into long term storage	16.8	
Existing Classified NFSR decommissioned (see Table 2-13)	7.5	
Existing Unclassified road decommissioned	13.9	
Total	38.2	

* For Display Purposes only

Table 2-13 - Alternative D Existing NFSR Decommissioning

Road	Approx. Miles
Road 1452	.5
Road 341a	.6
Road 3380	.6
Road 3499	1.3
Road 1457A	.2
Road 498	1.4
Road 341	1.0
Road 3334	1.5
Road 3321	.3
Road 1457	.2

Alternative E

This alternative addresses the issue of commercial timber harvest and its compatibility with watershed restoration. No commercial timber harvest is proposed. Alternative E includes pre-commercial thinning, watershed improvements, access requests, and other non harvest related activities as described in Activities Common to All Action Alternatives. It addresses the **issues #1 and #2 Road Construction and Existing Roads** by placing 38.9 miles of existing roads into long term storage and decommissioning, which benefits fish, water, soil, and wildlife. Road decommissioning is almost identical to Alternative D in that is removes riparian road in Wood and Hidden Creek and puts Mazie Creek into long-term storage. In addition, it addresses **Issue #3 - Commercial Logging** because there is no commercial timber harvest proposed. Alternative E activities are displayed in Map (M-11). Road Activity (changes from existing condition are displayed in Map (M-12).

Table 2-14 - Road Construction, Reconstruction and Decommissioning

Road Activity	NFSR Miles	Private miles
Construction/Reconstruction:		
Temporary Road Construction	0.0	
New Road Construction (NFSR)	0.0	
Road Reconstruction	1.8*	
NFSR Cost share Construction	2.2	
Private Construction** (Access Request-cumulative action)		5.6
Total	4.0	5.6
Stabilization and Restoration		
Existing NFSR put into long term storage	16.8	
Existing Classified NFSR decommissioned (see Table 2-15)	7.5	
Existing Unclassified road decommissioned	14.6	
Total	38.9	

See alternative maps for locations of road construction and reconstruction.

*This is related to the access requests and is part of cost share roads in Blair Creek and road 361C.

** For Display purposes only

Table 2-15 - Alternative E Existing NFSR Decommissioning

Road	Approx. Miles
Road 1452	.5
Road 341a	.6
Road 3380	.6
Road 3499	1.3
Road 1457A	.2
Road 498	1.4
Road 341	1.0
Road 3334	1.5
Road 3321	.3
Road 1457	.2

Alternative F – Preferred Alternative

Alternative F includes all actions described in Activities Common to the Action Alternatives. Table 2-16 summarizes treatment acres. Approximately 30% of the harvest units will be harvested using helicopter. Alternative F addresses the **Issues # 1 and 2** of roads (existing/new construction) by putting into long term storage any new road construction, decommissioning temporary road construction and decommissioning (approximately 37.3 miles) existing roads. The decommissioning of roads also addresses issues related to fish, wildlife, water and soils. Decommissioning is similar to Alternative D in that Hidden Creek riparian road is removed and the Mazie Creek road is put into long-term storage. Approximately 8.2 miles of road would be constructed of which 2.2 miles occurs on NFS lands is associated with the access requests. To maintain access to existing transportation systems and NFS and other lands, .7 miles of road would be constructed to replace the access lost when Road 498 is decommissioned. Activities are

displayed on the Alternative F Map (M-14). Table 2-17 summarizes road activities and the changes in road management are displayed on Map (M-15).

Table 2-16 - Harvest Treatment Summary

Timber Harvest Method	Acres
Intermediate Harvest	
Commercial Thin	852
Shelterwood Prep Cut	207
Regeneration Harvest	
Shelterwood Seed Cut	40
Shelterwood Removal Cut	16
Irregular shelterwood Cut	22
Group shelterwood cut	58
Clearcut with reserves	105
Total Acres treated with timber harvest to meet objectives	1300
Fuels Treatment*	**Acres**
Jackpot and broadcast Burning	188
Excavator Piling	500
Lopping	144
Hand piling	19

*Fuels treatment acres do not equal total harvest acres since some units have more than one type treatment.

Table 2-17 - Road Construction, Reconstruction and Decommissioning

Road Activity	NFSR Miles	Private miles
Construction/Reconstruction:		
Temporary Road Construction	2.0	
New Road Construction (NFSR)	6.2	
Road Reconstruction	4.6	
NFSR Cost share Construction	2.2	
Private Construction* (Access Request-ccumulative action)		5.6
Total	18.7	5.6
Stabilization and Restoration:		
Existing NFSR put into long term storage	17.5	
Existing Classified NFSR decommissioned See Table 2-18	5.7	
Existing Unclassified road decommissioned	10.2	
Total	19.0	

* For display purposes only .

Table 2-18 - Alternative F Existing NFSR Decommissioning

Road	Approx. Miles
Road 1452	.5
Road 341a	.6
Road 3380	.6
Road 3499	1.3
Road 1457A	.2
Road 498	1.4
Road 3334	1.5

Road 3321	.3
Road 1457	.2

Monitoring

Monitoring is conducted on a sample basis and is designed to verify that the projects are implemented as designed, are effective and most efficient in meeting the project and Forest Plan objectives, and determine whether the project and Forest Plan goals and objectives for the area are still appropriate. For this project, monitoring and evaluation would be conducted as described in Appendix E. Monitoring activities are discussed by environmental component in Appendix E. Those monitoring components not specifically discussed in this appendix tier to the monitoring described in the Forest Plan. The Idaho Panhandle National Forest annually conducts a review of BMP implementation and effectiveness. The results of this and other monitoring are summarized in an Annual Monitoring and Evaluation Report. The report provides information about how well the management direction of the Forest Plan is being carried out and measures the accomplishment of anticipated outputs, activities and effects.

Summary Comparison of Alternatives

The following tables display a tabular comparison of the alternatives considered in detail and how they meet the purpose and need (Table 2-19) and the environmental effects of each alternative expressed by issue “indicators” (Table 2-20).

Table 2-19 displays activities proposed on National Forest System (NFS) administered lands and NFS roads, unless noted differently. **Assumptions:**

1. Road densities in Riparian Habitat Conservation Areas (RHCAs) use miles of road within Forest Service jurisdiction.
2. The calculation for wildlife security assumes all road decommissioning **will** take place and are post project acres and include acres on private lands. Existing elk security is 660 acres in the project area.

Table 2-19 - Summary Comparison of Purpose and Need Objectives

Measurement Parameters	A		B		C	D		E	F	
Move Vegetation toward historical conditions										
Composition:										
Increase long-lived early seral tree species of Forest Types: western larch and white pine and ponderosa pine Acres (%)	1328 (9%)		1551 (10%)		1551 (10%)	1457 (9%)		1328 (9%)	1569 (10%)	
Stand structure:	**Acres**	**%**	**Acres**	**%**		**Acres**	**%**		**Acres**	**%**
Brush-seedling sapling – acres and % Pole-small-medium – acres and % Mature-large in acres and % Old Growth = allocated acres and % unallocated acres and %	3265 9456 1872 831 14	21 61 12 5 ≤1	3476 9245 1872 831 14	23 60 12 5 ≤1	Same as Alt B	3390 9331 1872 831 14	22 60 12 5 <1	Same as Alt. A	3441 9280 1872 831 14	22 60 12 5 <1
Stand density Reduction in stand density (acres) **Improve growing conditions for overstocked seedling/sapling stands** (acres)	0 0		1132 615		1160 615	478 615		0 615	1108 615	
Improve water quality, aquatic habitat, soil conditions and wildlife security through reduced miles of road, road stabilization and restoration and riparian area work.										
Increased soil productivity (acres)	0		56		56	88		92	99	
Miles of open, gated, barriered roads in RHCAs (miles). Roads are Forest Service Jurisdiciton (cost share and NFSR).	18.8		13.1		13.1	8.7		8.5	8.6	
Road Restoration and Decommission (miles)	0		18.8		18.8	38.2		38.9	37.5	
Reduction in stream crossings* (# of crossing reduced)	0		58		51	69		71	76	
Riparian Planting (5 miles = 20-30 acres)	0		5 miles		5 miles	5 miles		5 miles	5 miles	
Woody debris placement	0		1.2 instream miles		1.2 instream miles	1.2 instream miles		1.2 instream miles	1.2 instream miles	
Acres of wildlife security	455		1009		1009	2240		2240	1834	
Provide access for other landowners										
	no		yes		yes	yes		yes	yes	

* The numbers include road construction

Table 2-20 displays the alternatives issue by issue and is National Forest System lands and roads unless noted differently.

1. Miles of road by management prescription (under Issue 2) **includes** proposed miles of new road construction and the connected action (access request) of 5.6 miles construction on private land.

Table 2-20 - Summary Comparison of Issue Indicators by Alternative

Indicators	A	B	C	D	E	F
Issue #1 – Road Construction Activity						
Miles of new road construction (FS)		11.4	2.2	2.9	2.2	8.8
Sediment production (% increase in sediment)		14.6	2.8	3.7	2.8	13.3
Wildlife security (total road density – mi/sq.mi. in wildlife analysis area)	3.5	3.4	3.0	2.8	2.8	3.1
Issue #2 –Road Management						
Miles of road by road management prescription:						
Open road	94	91.1	91.1	82.9	82.9	83.8
Gated – Mgmt. Prescription A	76.5	76.5	76.5	74.4	73.2	78.3
Barrier – Mgmt. Prescription B	61.1	52.1	52.1	52.0	51.7	52.1
LTS[1] – Mgmt. Prescription C	57.5	82.3	75.3	68.6	69.4	73.6
Recontour[2] - Mgmt. Prescriptions D & E	9.2	13.2	11.1	29.0	29.0	29.1
TOTAL	**298.4**	**315.3**	**306.2**	**306.8**	**306.2**	**313.0**
Miles of road in project area in long term storage, partial or full recontour (road prescriptions C, D, or E). to address soil and water issues.	66.7	95.5	86.4	97.6	98.4	102.7
Trend of fish habitat in functioning condition:						
Total number of stream crossings [3]	141	92	90	72	70	77
Miles of road in RHCA's	18.8	13.1	13.1	8.7	8.5	8.6
Sediment Yield: % reduction of sediment from road decommissiong	0	9.4	21.2	35.5	36.7	26.3
Acres of security for Wildlife	455	1009	1009	2240	2240	1860
Issue #3 – Commercial Logging						
Water Yield [4] (% change in peak flow)	0	3.1	3.2	1.6	0	3.0
Acres impacted by timber harvest	0	1,368	1,396	603	0	1300

[1] LTS = long term storage (includes: de-compaction, culvert removal, and revegetation)

[2] Recontour = Mgmt. Prescription D are decommissioned roads using re-contouring or partial pullback of fill; also stabilizing slopes to restore site productivity, and re-establish natural water infiltration and drainage. Mgmt. Prescription E roads are decommissioned to restore slopes and drainages to near pre-road conditions.

[3] For the action alternatives (example for ALT. B): take Alt. A stream crossings (141) add new construction stream crossings (9) and subtract number of stream crossings removed ((58) see Table 2-19) = 92 stream crossings. Alt C & E have no new stream crossings, Alternative D has 6 new crossings and Alternative F has 13 new crossings (RAP, App. 5A-1, Tables 2 and 7).

[4] For the St. Maries River. Increase displayed is an average of Packer and Kapperser (harvest only) and Watsed (harvest and roads).

The following Long Term Monitoring Core Data Table is for Forest Plan Monitoring. Other Core Data tables (Aquatic, Terrestrial, Landscape and Management Direction) can be found in the Project File.

Table 2-21 - Long Term Monitoring Core Data

Project Area	Alt. A		Alt. B		Alt. C		Alt. D		Alt. E		Alt. F	
Road Density* (Mi/mile^2)	5.8		6.1		5.9		6.0		5.9		6.1	
Open Road Density* (Mi/m^2)	1.8		1.8		1.8		1.6		1.6		1.6	
Hydrologic Openings (Ac)	2673		3083		3109		2913		2673		3062	
Forest Composition: (Acres and % of project area – NFS lands only)												
Forest Cover Types	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Ponderosa pine	57	<1	57	<1	57	<1	57	4	57	<1	57	<1
Western larch and white pine	1271	8	1556	10	1550	10	1439	9	1271	8	1512	8
Douglas fir	3396	22	3337	22	3337	22	3396	22	3396	22	3360	22
Grand fir and western hemlock	8182	52	7982	52	7988	52	8029	52	8182	53	7988	52
Western red cedar	1374	9	1374	9	1374	9	1374	9	1374	9	1374	9
Lodgepole pine	973	6	947	6	947	6	958	6	973	6	962	6
Sub-alpine fir	185	1	185	1	185	1	185	1	185	1	185	1

* Road density and open road density include Forest Service, State and private lands and all roads (classified, unclassified and temporary)

** ECA (equivalent clearcut areas) are derived from the WATSED model and include private land activities.

Table 2-22 below summarizes the data on road construction, reconstruction and decommissioning previously displayed in alternative tables above.

Table 2-22 - Summary of Road Core Data

Road Construction and Reconstruction	Alt A	Alt B	Alt C		Alt E	Alt F
Miles of Road Reconstructed		7.3	7.3	6.3	1.8	8.1
Miles of Temporary Road Construction		3.0	0.0	0.0	0.0	2.0
Miles of NFSR (non Cost Share)		6.2	0.0	0.7	0.0	4.6
Miles of NFSR Cost Share Constructed		2.2	2.2	2.2	2.2	2.2
Miles of Private Constructed (access request)		5.6	5.6	5.6	5.6	5.6
Closed, Stored or Decommissioned						
Miles of open road closed or decommissioned		2.9	2.9	11.2	11.2	10.2
Miles of existing NFSR Decommissioned		1.1	1.1	7.5	7.5	5.7
Miles of Existing NFSR put into Storage	0	7.7	7.7	16.8	16.8	17.5
Miles of Unclassified Road Decommissioned	0	10.2	10.2	13.9	14.6	14.2
National Forest System Roads (NFSR)						
Miles of Cost-Share and Utility Roads	40.7	46.0	46.0	46.0	46.0	46.0
Miles of Non-cooperative Agreement Roads	46.4	52.3	46.2	41.2	39.8	46.8
Open Miles, Maintenance Levels 3-5	54.5	54.0	54.0	45.7	45.7	46.7
Gated Miles, Maintenance Level 2	18.4	17.1	17.1	14.9	13.8	14.8
Barrier Miles, Maintenance Level 1	5.5	4.3	4.3	4.2	3.9	4.3
Stored Miles, Maintenance Level 1	8.6	23.0	16.9	22.5	22.5	27.1
Total Miles National Forest System Roads	87.1	98.4	92.2	87.3	85.8	92.8

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

SUBSTANTIVE CHANGES BETWEEN THE DRAFT EIS AND FINAL EIS

Discussion of the new Alternative F is included throughout this chapter in each resource section.

Under Current and Foreseeable Actions:

Agency Authorized Actions: the acres of harvest activities adjacent to the analysis area in the Dutch Cat and Tri-County timber sales has been added. Also Merry Creek White Pine Progeny Test Site has been added to this section.

Planned Agency Actions: updated information on the Garnet Stars and Sands Project relating to publishing of the draft EIS and exploratory testing in Wood Creek portion removed from the DEIS and put into a Decision Memo. Proposed Pocket Gopher Control 2002 Project has been added.

Current and Reasonably Foreseeable State and Private Actions: Forest Practices Act applications (an updated list as of 6/10/02) are provided for the project area. Two roads in the "Road building on other lands" section are already built-.5 miles of Road 765 to Junction A, (Potlatch) and .7 mile extension of Road 765b from Potlatch to State portions.

Under Analysis Methods – Transportation

Additional information was added regarding the Roads Analysis Process (RAP) and how road management was categorized using road management prescriptions.

Under Analysis Methods – Finances

The model used to estimate the value of stumpage was updated using the most current costs and market conditions, which changed the overall results of the analysis (net value). Additional information was added regarding costs of other planned activities.

Under Analysis Methods – Fire/Fuels

A description of the models used has been added.

Under Analysis Methods – Soils and Affected Environment

The method is described for collecting site specific information and the specific nutrient levels are given in the affected environment section.

Under Existing Condition – Transportation

Explanation of jurisdictional changes and cost share or cooperative use agreements has been added to this section.

Under Existing Condition – Fire/Fuels

A table of existing fuel conditions has been added

<u>Effects Assessments by Resource</u>:

Under Vegetation:

-Affected Environment Vegetative Conditions Related to Past Harvest***:***

-Acres of clearcut and other regeneration harvest in the Dutch Cat and Tri-County timber sales adjacent to the Hidden Cedar analysis area have been addressed.

-The vegetation portion of the purpose and need comparative table in Chapter 2 was inserted in front of the effects section for easy reference to the written effects analysis.

-Consistency with Forest Plan and Laws

-more detail on how project is consistent has been added.

Under the Transportation Section

– Present and Reasonably Foreseeable Activities

This section has been added to define those activities pertinent to the road resource.

Under Soils

- Roads on Sensitive Landtypes – Mass Movement Potential: Road construction is on Private lands not National Forest Lands. This differentiation also pertains to conclusions of the cumulative effects analysis of Alternatives B, C, and D.

Analysis is added under cumulative effects of Alternatives B, C, and D to show how maintenance of haul roads relates to sediment.

A discussion on nutrient levels has been added.

All Resources

-No Action Alternative – Cumulative Effects***:***

Merry Creek White Pine Progeny site was looked at as a current or reasonably foreseeable action for all resources. See Introduction to Chapter 3 for reason was moved to cumulative effects.

Under Water

-Effects Common to All Action Alternatives – Cumulative Effects***:***

Additional information from a field inspection has been added related to the cumulative impacts from grazing on soil productivity and water quality.

– Direct and Indirect Effects Under Alternatives B, C, and D and F***:***

Proper functioning of Basin hydrology - Further explanation for the conditions responsible for channel stability and how they relate to channel changes. Sediment Yield – updated information

related to WATSED validation has been added. Discussion on water yield relative to stream channel morphology has been expanded.

Under Fisheries

- A Summary Table of Effects of Current and Reasonably Foreseeable Actions replaces narrative based text. NOTE change for Wood Creek in that it does not realize a negative effect from the Garnet Stars and Sands Project due to that projects requirements to meet INFish and Clean Water Act.
- Also the Summary Table of Long Term Cumulative Effect on Fisheries also displays that Wood Creek no longer has a negative effect from Garnet Stars and Sands. Cedar Creek no longer shows a decrease for Alternative B and C (due to expanded information in the Water Resource section on Cedar Creek) in Table 3-38 and Table 3-39. Table 3-38 has been moved from the end of the Fisheries Section to the beginning of Environmental Consequences.

Under Sensitive Wildlife Species

– Fisher/Marten, Environmental Consequences

Additional discussion explaining the consequences of effects on fisher and marten has been added under direct and indirect effects common to all alternatives.

Cavity Habitat

-Under Rationale for No Further Analysis:.

Additional data and discussion regarding cavity habitat and the existing condition has been added to the FEIS.

Under Disclosures:

<u>Probable Environmental Effects that cannot be Avoided</u>: a discussion on noxious weeds has been added.

<u>Irreversible and Irretrievable Commitments of Resources</u>: a discussion of Potassium and soils has been added.

A discussion on Available Information has been added to the FEIS this section is titled Incomplete or Unavailable Information.

Under Literature Cited:

The reference Seyedbagheri (1996) has been added to the list of citations.

A reference to the IPNF Forest Plan Monitoring Report - 2000 has been added.

The citation for TSPIRS was corrected (see response to comments).

Under Maps:

M-12 Current and Foreseeable Map (now M-16), has been updated per changes from DEIS to FEIS and the In Between Timber Sale KV project has been completed and is now a part of existing condition and not a reasonably foreseeable action, so has been removed from this map. Map M-4 has been added -Project Related Opportunities to display those items separately.

In This Chapter

Chapter 3 describes the environment (including human elements) in and around the project area and discusses the environmental consequences by resource that may result from implementation of each of the alternatives. It provides the scientific and analytic basis for the comparison of alternatives presented in Chapter 2. Maps referred to in the analysis are located at the end of this document.

The Council on Environmental Quality Regulations (CEQ) describes three types of effects:

Direct Effects are caused by an action and occur at the same time and place.

Indirect effects are caused by an action but occur later in time or farther removed in distance.

Cumulative Effects result from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions, regardless of what agency or person undertakes the other actions (40 CFR 1508.7 and. 8).

Current and Foreseeable Actions

Analysis of cumulative effects presented in Chapter 3 consider past, present, proposed, and reasonably foreseeable activities that could affect the issues pertinent to this analysis. Reasonably foreseeable actions include those management activities that are on-going or scheduled to occur and that we have developed a proposed action. These activities may occur regardless of which alternative is selected for implementation.

The following` list identifies those current and foreseeable actions that the ID team determined were appropriate for inclusion in the analysis of environmental effects.

Agency Authorized Actions

Dutch Cat Timber Sale: This activity was authorized under the Dutch Cat Decision Notice dated May 30, 1997. There are 346 acres of harvest units (311 acres commercial thin, and 35 acres regeneration cut) within the Hidden Cedar analysis area. Approximately 1 mile of road construction is planned for the project. There are approximately 200 acres of harvest units adjacent to the Hidden Cedar analysis area.

Tri County Timber Sale: This activity was authorized under the Emerald Resource Unit FEIS decision dated April 30, 1992. The timber sale is still in progress and is scheduled to terminate in 2002. This activity utilizes two roads (Road 3478 and Road 504) as haul routes within the Hidden Cedar Project Area. There are no harvest units associated with this timber sale in the Hidden

Cedar analysis area; however, 105 acres of regeneration harvest have taken place adjacent to the analysis area.

Merry Creek White Pine Progeny Test Site: This 45-acre project was originally part of the proposed action alternatives. Since the DEIS, a separate decision has been prepared. This is now considered a current activity.

Campground Operations: Operation and maintenance of the Cedar Creek campground will continue.

Outfitter Permits: Two outfitters hold special use permits in the project area. One is for guided deer hunting in the western portion of the analysis area and the other is guiding people to the Emerald Creek Garnet area located adjacent to the project area in 281 Gulch. There are no designated camps for either outfitter in the Hidden Cedar Analysis Area.

Grazing Permits: There are four grazing permits in the project area. Cat Spur Creek Allotment, Keeler Creek Allotment, Emerald Creek Allotment and Merry Creek Allotment. Both Cat Spur and Keeler Creek allotments are entirely within the Hidden Cedar project area. Portions of Merry Creek and Emerald Creek Allotments overlap with the Hidden Cedar project area. All four are cattle allotments. Cat Spur is 26 animals/104 animal months and Keeler Creek is 10 animals/40 animal months. All four allotments are in the process of having their allotment management plans updated. No change in animals or animal months is anticipated in the update of the allotment management plans, however, increased monitoring for vegetation, soils, and fish habitat is proposed.

Planned Agency Actions

Garnet Stars and Sands Project: This is a proposal for garnet exploration activities for the St. Joe Ranger District. A Draft EIS was completed on September 28, 2001 and a Notice of Availability was published in the Federal Register on October 12. This request includes garnet exploration activities within the Hidden Cedar Analysis Area: Wood Creek, Cat Spur Creek and the ridge west of Bechtel Butte.

Exploration activities include:

Wood Creek – exploratory testing includes digging 3-15 feet deep trenches with a backhoe within the riparian area and along the ridge on the other side of the road from the creek. The trenches are dug at intervals of 50 feet or less. After testing, it is possible that this drainage would be entered for gemstone digging. This part of the exploration activities has been removed from the Garnet Stars and Sands EIS and will be addressed in a Separate Decision Memo so that the decision maker can determine the full extent of the gemstone resource.

Cat Spur Creek – This area has had prospecting permits and testing in the past. Currently there are no pending permits or lease applications for this area. If prospecting permits are proposed for this tributary, site-specific NEPA would be conducted. Prospecting permits typically allow for hand dug trenches and pits on both sides of the tributary. Hand dug trenches would include yearly rehabilitation of the site.

Bechtel Butte: - There is a preference right lease application on this ridge. If the lease is approved, hand dug pits up to 6 feet deep along this ridge would occur. Operating plans will be

approved on a yearly basis. It is estimated approximately 5 acres would be excavated over the next 10 years in hand dug trenches on the ridge-top. These would be rehabilitated. No new road construction.

Mitigation and design criteria will be developed to minimize environmental disturbance. Meeting Endangered Species Act (ESA), Clean Water Act (CWA) and other regulations will be incorporated into the project.

2002 Pocket Gopher Control Project: A proposal to apply gopher bait on up to 3000 acres over the next five years on the St. Joe Ranger District has been proposed. Many of these acres have been treated in the past (Decision Memos for Gopher Baiting, 1997 and 1998) and are still in need of treatment. The new areas proposed are not within the Hidden Cedar analysis area. There are approximately 530 acres in this proposal that are within the Hidden Cedar Analysis area that were previously addressed in the 1997 and 1998 Decision Memos that will have gopher control treatments.

Reasonably Foreseeable Agency Actions

Data gathering activities: field surveys to gather resource data are likely to occur within the project area within the next five years. Types of data collection may include vegetation surveys, fire history sampling, cultural resource surveys, wildlife habitat surveys, snorkel and electro-fishing surveys for fisheries, noxious weed surveys, stream surveys, road maintenance surveys, and fuels surveys.

Road Activities: routine road maintenance is likely to occur as needed on existing roads in the project area. The roads most likely to receive maintenance are those open to vehicle traffic.

Fire Suppression: consistent with current policy, efforts will be made to suppress all fires which occur within the project area.

Weed Control: Spraying to control noxious weeds is proposed within the Hidden Cedar analysis area under the St. Joe Noxious Weed Control Project EIS and associated Decision Notice and FONSI, dated 10-6-99.

Public Activities likely to occur: Firewood cutting is likely to continue along open roads. Recreation use will continue; including driving open roads, snowmobiling, hunting, hiking, berry picking, and other activities.

Current and Reasonably Foreseeable State and Private Actions

Corporate Timberlands – continued harvest, road construction, and reconstruction on corporate lands owned by Potlatch and formerly Crown Pacific is reasonably foreseeable. The Idaho Forest Practices Act and State water quality standards apply. Harvest activities and road construction will most likely occur on all corporate lands within the Hidden Cedar analysis area, **except** for the Potlatch land in the upper end of Cat Spur (N. of Cat Spur Creek) and the Staple Creek – Crown Pacific Lands, because these areas have recently been managed (project file documents provide details to planned management and assumptions made by Forest Service for private lands).

State Lands: activities are currently ongoing in Blair Creek and are in the planning stages in N. Cat Spur.

Private Lands: Throughout the St. Maries River bottoms, continued development of private land is expected. Development will include commercial timber harvest, land clearing, home construction, road construction, septic field installation, water well drilling, livestock grazing, and rip rap of migrating stream banks.

Forest Practices Act Applications: the State database was queried (9/28) for applications in the Hidden Cedar analysis area. There were 5 permits for timber sales greater than 3 mmbf by corporate landowners in the past year and 10 permits for sales greater than 3 MMbf currently active. One permit for a private citizen greater than 20,000 Mbf pending and one completed. And one permit for harvest less than 20,000 Mbf still pending for a private citizen (details of these are in the project file). Updates as of 6/10/02 are: There are still 10 permits for sales > 3mmbf currently active and two new permits (> 3mmbf) for corporate landowners and one permit for < 20,000 mbf for a private land owner pending. Forest Practices Act permit requests will continue as private land continues to be developed within the watershed on a regular basis. For any point in time we can assume that one or all of these activities are occurring on private land within the watershed. We can also assume that some of these requests will actually happen on the ground while others will never happen. The effect of these activities has been considered in appropriate analysis.

Fossil Bowl Motorcycle Area – activities occur on a weekly basis from May – October with a yearly average of 5,000 persons using the developed motorcycle track. Digging for fossils also occurs - with a yearly average of 2,400 persons participating in fossil digging. There are six parking spots also used as camping spots that in the future may be improved for weekend racers.

Road Building on other lands**:**

6.5 miles of road construction:

Staples Creek Spur Road, north of Road 1451 in Section 24 **(.78 miles).** This road is entirely on Potlatch Corporation land off of cost shared Road 1451. The road provides access only to Potlatch lands. Potlatch finished construction of this road in 2000.

Cat Spur Creek, Potlatch spur road extension, east of Road 361B in Sections 29 and 20 **(.41 miles)**. This road is on Potlatch and State lands and does not provide any direct or potential access to National Forest lands.

Cat Spur Creek, Potlatch spur road, north of Road 1450 in Sections 29 and 30 **(.62 miles).** This road is entirely on Potlatch land and only serves their needs. Adjacent National Forest lands are accessible from existing cost share Road 1450. A flag-line for the route has been established on the ground.

Keeler Creek Roads, between Keeler and Long Slim Creeks in Sections 26, 34, 35 and 3.

0.2 miles, State-Potlatch property line, on State
1.2 miles, Jct A to State-Potlatch property line, on Potlatch
0.80 miles, Jct A on Potlatch
0.5 miles, Rd 765 to Jct A, on Potlatch (already completed)

1.4 miles, Rd 765 to NF-Potlatch property line, on Potlatch
0 .7 miles, extension of Rd 765b; Potlatch/State property line to National Forest/State property line. (already completed)

Powerline maintenance: Tall trees and shrubs will be controlled under the powerlines. Access roads to the powerlines and towers are presently controlled, mostly with gates and will remain as such. Slash resulting from maintenance activities will normally be lopped and scattered. Herbicides are also used. If herbicides are used BPA is required to notify the Forest Service in October before the year they will be applied.

FOREST VEGETATION

Introduction

The forest vegetation of northern Idaho displays strong diversity in both composition and structure. This diversity is attributable to climate, geology, and disturbance patterns (insects, disease, fire history and extreme weather events). These elements combine to create some of the most varied and productive forest communities found in the Inland Northwest. The most dominant vegetative feature of the northern Idaho forests is trees. The major tree species growing in this area include western hemlock, mountain hemlock, western red cedar, grand fir, Douglas-fir, western larch, western white pine, lodgepole pine, ponderosa pine, subalpine fir, and Engelmann spruce.

This section addresses the purpose and need for vegetation treatment. The forest vegetation in the Hidden Cedar Area will change through the interaction of plant succession and the influence of disturbances (both natural and human disturbance). Forest vegetation across the landscape will be impacted by these changes. This analysis focuses on the composition, structure, patterns and processes which affect change to forests expressed by the tree component but recognizing that associated layers of vegetation are important parts of the plant communities in the area.

Regulatory Framework

The regulatory framework providing direction for the management of forest vegetation is provided through the *National Forest Management Act of 1976* and the *Forest Plan for the Idaho Panhandle National Forests* (USDA Forest Service, 1987).

NFMA provides for balanced consideration of all resources. It requires the Forest Service to plan for diversity of plant and animal communities. The Forest Plan, in compliance with NFMA, establishes Forestwide management direction, goals, objectives, standards and guidelines for the management for forest vegetation and plant communities.

Direction concerning implementation of NFMA and the Forest Plan can be found in Forest Service Manuals (FSM) and Handbooks (FSH), as well as various written communications from the Forest Service's Washington Office, Regional Office and the Supervisor's Office for the Idaho Panhandle National Forests.

Analysis Area

The analysis area for the forest vegetation resource is the Hidden Cedar Analysis Area and contains approximately 32,957 acres with approximately 15,438 acres under USDA-Forest Service jurisdiction. The remaining 17,519 acres are under private, State or other ownership (see Vicinity Map, M-1).

Analysis Methods

The information used in this forest vegetation section is a combination of the available data, research material, literature, assessments and field reviews. Vegetation attributes such as forest cover type, stand size class, as well as habitat group were compiled from the Timber Stand Management Record System (TSMRS). In addition, field reviews were conducted during the process of diagnosis and analysis to verify site conditions (see Project File). Proposed harvest units were reviewed in the field by the silvicultural forester.

Large scale context for the terrestrial vegetation and landscape ecology was provided by the *Integrated Scientific Assessment for the Interior Columbia Basin (*Quigley et al, 1996) and the St. Joe geographic area assessment titled, *Toward a Forest Ecosystem Approach: An Assessment for the St. Joe Area* (IPNF, 1997). This information and the objectives described under the purpose and need section of this document, as well as the IPNF Forest Plan, were used in evaluating the Hidden Cedar Project area's existing condition for forest vegetation and comparing it to the landscape and desired forest stand conditions.

Forest stands were reviewed for current insect and disease activity, current production (growth rates), productive potential, regeneration potential, species composition and stand structure. Areas unsuitable for timber production were not considered for treatment related to timber production. In addition to field reconnaissance, determining reforestation potential involved review of the reforestation indices for the District and the analysis area (see Project File –Reforestation Indices). Thee indices display our ability to regenerate these sites within a period of five years as required under NFMA.

Forest stand treatment needs were identified by a silvicultural forester based on insect and disease activity and potential, existing vegetation conditions and desired stand conditions identified by target stands. Desired stand conditions were developed which are ecologically compatible with the site, as well as the current and historic disturbance patterns and successional pathways of the landscape vegetation. These desired stand conditions are also based on the IPNF Forest Plan management area direction for the sites. See management area direction in Table 1-1. Treatment needs were based on a comparison of the existing stand condition to the target condition and the Alternative Actions that would move the existing condition toward the target condition over time. Consideration included stand composition, especially the condition and amount of long-lived early seral species and stand structure, and the potential of the stand to provide mature stand structures with large trees in the future.

The target stands, site-specific data and stand diagnosis can be found in the project file. A description of the features of various silvicultural systems and their effects are included in the Forest Plan and Forest Plan FEIS.

Affected Environment

Habitat types were used for the project planning and site-specific considerations in this environmental assessment. *Forest Habitat Types of Northern Idaho: A Second Approximation* (Cooper et al, 1991) outlines the classification and characteristics of the habitat types. This information was used for stand level diagnosis and analysis.

Specific field determined habitat types and phases can be found in the St. Joe District's TSMRS (Timber Stand Management Records System) data base. Additionally, habitat types were grouped to facilitate landscape level analysis and planning. Habitat type grouping aggregates habitat types that fall within similar temperature and moisture environments. As a result of similar environments and vegetation characteristics, the habitat group can be used to describe similar productivity, fire and other disturbance regimes, stand dynamics, susceptibility to insect and disease, forage and cover potential, rare plant potential, cover types, structural stages and successional pathways. *A Biophysical Classification, Habitat Groups and Descriptions* (USDA, 1996) was used for this analysis. The Hidden Cedar Analysis Area includes six of the forest habitat type groups described in that document. The relative distribution of the habitat type groups occurring in the project area is displayed in Table 3-1, and is characterized in the subsequent description. Habitat Groups indicate the potential natural vegetation within the area.

Table 3-1 - Distribution of Habitat Types on NFS in Hidden Cedar Analysis Area

Habitat Group	Potential Vegetation	Temperature and Moisture	% Area
2	Dry Forest	Moderately Warm and Dry	2
4	Moist Forest	Moderately Warm and Moist	4
5	Moist Forest	Moderately Cool and Moist	90
6	Moist Forest	Moderately Cool and Wet	3
7	Cool Forest	Cool and Moist	1
8	Cool Forest	Cool and Moist	<1

Habitat Group 2 is primarily at lower elevations on south and southwest aspects. This group makes up a Dry Forest Potential Natural Vegetation Group and occurs over approximately 2 percent of the Hidden Cedar project area.

Habitat type groups 4, 5 and 6 are primarily found on lower and mid-slope elevations throughout the Hidden Cedar Project Area. Habitat type group 4 corresponds to the more moist grand fir habitat type series. It generally occurs on the more southern exposures on the low and mid slope level. Habitat type groups 5 and 6 correspond to the western red cedar and western hemlock habitat type series, which are generally present on the other aspects on low and mid-elevation slopes. These three groups are highly diverse and nearly all conifer species in northern Idaho can occur in these groups. They can be characterized as the sites where western white pine has the capability to thrive and represent a major component of forest stands. It is also where western larch is most productive and capable of growing to large diameter trees sooner than in other habitat type groups. These three groups make up a Moist Forest Potential Natural Vegetation Group and occur over 97 percent of the Hidden Cedar analysis area.

Habitat type groups 7 and 8 are generally located on the higher elevations slopes and ridges within this area. They correspond to the subalpine fir and mountain hemlock habitat type series. These two groups make up a Cool Forest Potential Natural Vegetation Group and occur over less than 2 percent of the area.

Forest Composition

Throughout the Interior Columbia River Basin, there has been a decline in shade intolerant early seral species and an increasing dominance of shade tolerant species (Quigley et al, 1996). This same trend is seen at a step down in scale to the State of Idaho. Table 3-2 displays the trend away

from potentially long-lived early seral species (white pine (WP), western larch (L) and ponderosa pine (PP)) and towards more shade tolerant and shorter-lived species grand fir (GF), subalpine fir (SAF), Spruce (S), lodgepole pine (LP), Douglas-fir (DF) (O'Laughlin et all, 1993) from 1952 through 1987 in Idaho.

Table 3-2 - Species Composition Changes in Idaho

Idaho Forest Type	WP	PP	GF/SAF	S/ L/ Other	LP	DF
% Change 1952-1987	-60%	-40%	+60%	+30%	+38%	+15%

In stepping down to the St. Joe River Basin we find a similar major decline in long-lived early seral species, particularly western white pine, western larch and ponderosa pine (IPNF, 1997).

There are ecological implications of changes in forest composition. Western larch, ponderosa pine and white pine are fire adapted, relatively drought resistant and more root disease resistant than other species, and are capable of dominating the forest stands from establishment to 350 years (Shiplett and Neuenschwander, 1994). Additionally, they are capable of producing tall trees of large diameter that serve important ecological functions. Western hemlock and grand fir are two of the more moisture demanding tree species. They are highly stressed during drought. The increase of these drought sensitive species at levels substantially higher than historical levels creates increased risk of large scale insect and disease outbreaks during periodic droughts.

Western hemlock and grand fir are also less adapted to surviving fires than more seral species. As stand composition shifts to greater proportions of fire susceptible species there is an increase in the risk of higher mortality when fires do occur.

Grand fir and Douglas-fir are highly susceptible to root diseases. Conversion of forests to these more shade tolerant and disease prone species has contributed to an increase in the incidence of losses and damage associated with Armillaria root disease (Byler and Zimmer-Grove, 1991). Historically, root pathogens acted more as a thinning agent. Increased dominance of these more susceptible species can change the relationship of root pathogens from one of thinning to a major disturbance agent in forest stands and across the landscape.

Lodgepole pine is a relatively short-lived seral, especially in the moist forest sites of northern Idaho. Conversion from white pine, western larch and ponderosa pine forest types to Douglas-fir, grand fir, lodgepole pine and western hemlock types trends these sites not only to a reduced species composition, but also subsequent potential increases in the risk of probable loss when disturbances such as fire, insect outbreaks, drought, etc. do occur. An increased risk of loss effects both the stand and landscape scales.

Table 3-3 displays the current stand composition (defined by the forest type of the species with the greatest basal area represented in the stand) for the historic and the current stand composition for the St. Joe River Basin. It also displays the trend in forest composition in this project area. PP-ponderosa pine, WP-western white pine, WL-western larch, DF-Douglas-fir, GF- grand fir, WH-western hemlock, C-western red cedar, LP-lodgepole pine, SAF- subalpine fir, MH-mountain hemlock, ES-Engelmann spruce, WBP-white bark pine.

Table 3-3 - Forest Type Changes in the St. Joe River Basin and Hidden Cedar Project Area

Forest Type	PP	WP	WL	DF	GF/ WH	C	LP	SAF/MH/ ES/ WBP
St. Joe Historic Forest	4.3%	24.1%	16.7%	9.4%	9.7%	7.8%	7.1%	20.9%
St Joe Current Forest	2.9%	2.2%	4.8%	22.3%	32.6%	4.3%	14.4%	16.3%
Hidden Cedar Project Current Forest	<1%	4%	5%	22%	53%	9%	6%	1%

There have been corresponding increases in the shorter-lived seral species such as lodgepole pine and Douglas-fir, and in the more shade tolerant grand fir and western hemlock. Historic records of the St. Joe National Forest show much higher acreages of forest cover types in white pine, ponderosa pine and western larch than occur today for this area. The early timber inventory methods were plots distributed over large blocks of ground and were not tied to individual stands as done today. The differences in methodology of these timber surveys makes it difficult to do a direct comparison to today's inventories, however, the data does indicate a shift away from the long-lived early seral species and towards lodgepole pine, Douglas-fir, grand fir and hemlock.

Past timber harvest often focused on removal of the largest-sized trees and the most market valuable species. The large, dominant, more valuable western white pine, western larch and ponderosa pine were preferentially removed over other size classes and species. Large dominant western red cedar was also removed due to its market value. This practice reduced the contribution these species made to the individual stand composition, as well as their contribution to the analysis area and general landscape.

With the advent of effective fire suppression over the last 60 years, we have essentially eliminated the primary natural thinning agent which encouraged retention and effective regeneration of intolerant early seral species, and subsequently encouraged increased representation of the more shade tolerant, less fire adapted species over time. The result of essentially eliminating natural fire has also reduced site preparation which provided appropriate seed bed for germination and establishment of natural regeneration of early seral species. Additionally, the lack of fire has allowed increased stand densities and the natural establishment of more shade tolerant species such as grand fir, hemlock and Douglas-fir. As these species occupy the site, they increase shading and other competitive conditions, which generally exclude adequate establishment of the less shade tolerant early seral species such as western larch and ponderosa pine.

The accidental introduction of the exotic white pine blister rust (*Cronartium ribicola*) decimated the white pine component, which was historically a major stand component. Western white pine has a natural rust resistance of less than ten per cent (10%), and as a result, there has generally been a loss of ninety per cent (90%) or more of the western white pine throughout this analysis area and over the landscape in general.

The combined effects of these elements have resulted in substantial reductions in the representation of these long-lived, intolerant seral species in the overstory, and a substantial reduction in seed source to provide for natural regeneration of these species.

The reduced amount of thinning with subsequent increased establishment of more shade tolerant species has resulted in an increase in competition and a loss of adequate sites to encourage

germination and effective establishment of early serals that may have originated from an already reduced seed source.

Forest Structure

Forest structure refers to the vertical, horizontal and other spatial characteristic patterns of various components over time. Structure classifications of forest vegetation can be used to reflect processes which operate across landscapes and their component stands. Throughout the Interior Columbia River Basin there has been substantial reduction of older forest structures compared to historic structures (Quigley et al, 1996). Over approximately the last 100 years this reduction ranges from 27 to 60 percent from historic levels, depending on the forest type.

During this same period, large residual trees and snags have decreased by about 20 percent. The *Assessment for Ecosystem Management of the Interior Columbia River Basin* indicates that forest composition and structures have become more homogeneous compared to historic conditions. Within the St. Joe River basin, as well as within the Hidden Cedar analysis area, there has been a shift from historic conditions to a more homogeneous structure and species composition. Late seral structures (forests dominated by large late seral species including grand fir, western red cedar and western hemlock) and early seral structures (forests dominated by shade intolerant early seral species including ponderosa pine, lodgepole pine, western larch, western white pine and Douglas-fir) have been declining. There has been an increase in mid-seral structures dominated by grand fir and Douglas-fir, which have become contiguous and created a more homogeneous landscape.

When comparing the structural change within the St. Joe River Basin from mean historical vegetation to the current condition, there are indications of a reduction in large diameter trees, large snags and stands dominated by large old trees (IPNF, 1997). There has been a reduction of stands typified by an old open overstory of large early seral species with an understory of mixed species of varying shade tolerances. There has been an increase in stands typified by small and medium-sized young trees. These stands are generally more uniform in structure and more densely stocked compared to historic conditions. The primary causal factors influencing this shift have been the commercial harvest of the older and larger overstory, and the efficiency of fire suppression reducing the incidence and extent of mixed severity fires. This same trend in structure change is probably more pronounced on private lands within the St. Joe River Basin and private lands within this project area. This is primarily due to extensive harvest of larger, older, more marketable trees as influenced by the management objectives of the landowners.

Current and historic forest structure, based on size class groupings, within the St. Joe River Basin is presented in Table 3-4. Also, the current forest structure for the Hidden Cedar analysis area, located within the St. Joe River Basin, is also presented in Table 3-4. There is a trend away from mature/old and old growth forest structure, toward smaller trees (IPNF, 1997).

Acres in the shrub/seedling/sapling size class are predominantly the result of past regeneration harvests. These areas do have some residual larger trees and snags, however, they are generally under-represented in these past harvest units. Stands which fall into the pole/small/medium sawtimber size class are generally densely stocked with trees where canopies are closed, or nearly closed, and little light reaches the plant communities in the understory. These stands are experiencing competition for growing space (Oliver and Larson, 1996) and are developing under

strong competition. Many of these stands have relatively small trees for their age and are more susceptible to drought and damage or destruction by wildfire, insects and diseases.

Table 3-4 - Size Class Distribution for the St. Joe River Basin and the Hidden Cedar Area

Forest Structure	Shrub/Seed/ Sapling	Poles/Small/ Medium	Mature/ Large/OG
St. Joe Basin (all lands) - Mean Historic Vegetation	20%	35%	45%
St. Joe Basin (all lands) - Current Vegetation	28%	50%	22%
Hidden Cedar Area (NFS Lands) - Current Vegetation	21%	61%	18%

Stands that are allocated as old growth and old growth recruitment, currently meet or are expected to meet in the near future, the draft minimum criteria for old growth habitat for Region 1 of the Forest Service. Past natural disturbances, primarily wildfire, appear to be the reason that the amount of old growth stands with large trees are relatively limited on National Forest lands in the Hidden Cedar area. Stand ages in this area are almost entirely less than 120 years of age. White pine blister rust has also had a large effect on reducing the amount of large trees in this landscape. Logging in the early 1900s over much of this area may have removed the mature and old component structure of stands; which if not harvested might be old growth today if they had also survived past wildfire or other major disturbances.

Stand structures in the Hidden Cedar project area include a few stands that have an open overstory of moderately old large trees with an understory of younger smaller trees. These stands appear to be the result of a mixed severity fire that killed 20 to 80 percent of the previous stand. The relic trees from the previous stand are often western larch, Douglas-fir, western red cedar and a few scattered ponderosa pine. This stand structure would be more common if not for the past logging practices. In many stands in this analysis area, large stumps of mostly western larch, white pine, western red cedar and ponderosa pine are found below the dense canopies of pole and small sawtimber stands. These larger trees and snags were logged for their high value in the past. This type of harvest has led to both a more homogeneous stand structure and a decrease in the diversity of tree species within these stands and the reduction of these larger size classes and species as stand components within the analysis area. Many of the stands in this analysis area have a weakly developed three age-class structure and canopy level observed during field reconnaissance.

These stands are trending towards uneven-aged structure. The historical condition in this analysis area was generally even-aged, one and two-storied stands of moderate to large area.

Stand structures on land other than National Forest in the Hidden Cedar area and the St. Joe River Basin are believed to be even more homogeneous and have less large wood than occurs on National Forest lands. Additionally, very little old growth structure is believed to exist on lands other than National Forest. Stand structures in these areas are expected to be maintained in the two smaller size classes (Shrub/Seedling/Sapling and Pole/Small/Medium Sawtimber) in the future by the timber management associated with these ownerships.

The apparent decrease in the amount of large trees, large snags and stands of mature large timber and the subsequent increase of the smaller size class stands has ecological effects. For instance, species that associate with younger stands benefit and those that associate with older stands and larger trees suffer a loss of habitat.

Historically, the landscape of the St. Joe River Basin included openings. These openings ranged in size from small openings of only a few acres, to large openings ranging in size from several hundred acres to greater than a thousand acres in size. The smaller openings were generally the result of low intensity fires or losses to insects, disease, wind or snow. The larger openings in the forest were generally created by wildfire. A series of large fires around 1830 burned nearly half of the St. Joe Basin. These fires were not all stand replacing fires, however, they did create large openings and killed large acreages of forest. The large fire of 1910 burned over half of the St. Joe Basin. The Coeur d'Alene Basin fire study showed that over the last 450 years there was one major stand replacing fire episode somewhere in the basin every 19 years (Zack and Morgan, 1994). There have been openings created in the Hidden Cedar analysis area by fire. Records show that there were mixed severity fires within this analysis area in 1919, 1922 and 1931 (District Fire History Map). These fires involved acreages from a few hundred acres to greater than a thousand acres. Due to fire suppression and other activities, the majority of openings created since the 1930s have been created by timber harvest activities, as well as losses due to insects and disease.

The combined effects of these elements have resulted in a substantial reduction in the mature and large tree component. There is a substantial reduction in both the vertical and horizontal structure and an increase in homogeneity within the project area. Along with the general reduction in the size class of stands, there has been a general increase in the relative stand densities, such as trees per acre, and reduction in the average tree size and age within stands from historic levels. As a consequence, the risk of large area losses to fire, weather events, insects, disease and other major natural disturbances is increasing compared to historical conditions.

Vegetative Conditions Related to Past Harvest

Much of the land managed by the Forest Service in the Hidden Cedar analysis area was acquired in the early to mid 1930s. Few records relating to timber harvest and other management activities are available for that period; however, there is evidence of some early activity such as very old stumps and remnants of skid roads that indicate that some harvest did occur prior to the 1940s. This early activity may have been related to salvage activity and removal of specific products such as large western larch, western white pine, ponderosa pine, Douglas-fir and western red cedar.

Through review of the historical records, it was found that numerous post and pole permits, salvage sale contracts as well as timber sale contracts have been issued within this analysis area since 1942. The more intensive timber management contracts were not prevalent until the early 1960s. Approximately 5,353 acres (35%) of the 15,438 acres under Forest Service jurisdiction have received some type of commercial timber harvest from 1962 to the present. Of this, approximately 52% (2,810 acres) was regeneration harvest (2,236 acres clearcut, 547 acres see tree and 27 acres shelterwood seed tree), 27% was commercial thinning including some individual tree selection, 12% was sanitation/salvage, and 9% was liberation/improvement harvest.

The most recent timber harvest activity on National Forest lands <u>near</u> the analysis area is the Tri-County Timber Sale. There are seven units adjacent to the Hidden Cedar analysis area. The seven units total 105 acres of which 68 acres are regeneration harvest.

The Dutch Cat T.S. was sold in March 2001. Approximately 346 acres of this timber sale are located within this analysis area. Of these, 311 acres are intermediate harvest (commercial thinning) and 35 acres are in regeneration harvest (group shelterwood, group seed tree and seed tree harvests). Adjacent to Hidden Cedar analysis area there are approximately 211 acres proposed for harvest (105 acres regeneration harvest and 106 acres intermediate harvest).

Timber harvest data related to ownership other than Forest Service within this analysis area is generally not available. Through review of aerial photos and other information, it is believed that a substantial percentage (greater than 50%) of non-NFS land has received some form of commercial timber harvest.

Environmental Consequences

Alternative A

Direct and Indirect Effects

Forest Composition

As presented earlier, there has been a decline in shade intolerant early seral species and an increasing dominance of shade tolerant species within the Hidden Cedar project area. For this area and the associated potential vegetation, these early seral species are identified as western white pine, western larch and on the more dry sites ponderosa pine. Lodgepole pine and Douglas-fir are also regarded as seral species on certain habitats within this analysis area. One of the needs identified in the purpose and need for action for this proposed project is to encourage species composition towards more historic conditions. This includes encouraging establishment of long-lived serals of western larch, western white pine and ponderosa pine. The retention of existing long-lived serals is also important to meeting this purpose and need for action.

Alternative A, which proposes no stand treatment, would maintain the existing condition and trends of the forest stands which are proposed for treatment in the other alternatives. This existing condition includes a continued decrease in the percent composition of western white pine, western larch and ponderosa pine within the forest stands.

The loss of white pine is primarily the result of white pine blister rust infections causing mortality. White pine blister rust will continue to infect and kill all or most of the remaining naturally occurring white pine as well as the natural regeneration resulting from these existing seed sources.

Natural resistance to blister rust is generally less than ten percent and available natural seed sources in the Hidden Cedar project area is relatively low and decreasing as mature white pine continue to die from blister rust infection and other factors. White pine is currently a minor component (less than five percent) in the forest stands considered for treatment in this assessment and would continue to decrease under Alternative A.

The percent composition of western larch, currently approximately five per cent, in the forest stands considered for treatment in this proposal would decrease with Alternative A. The development of western larch is related to its intolerance of shade. Western larch is the most shade intolerant species in its range and the most resistant to fire (Fiedler and Lloyd, 1995). To regenerate, western larch needs fire or other major disturbance to provide appropriate seed bed

conditions (Schmidt and Shearer, 1995) for effective germination and establishment. To survive in the stand, larch must maintain a dominant position in the canopy. When stocking is high, even dominant larch trees can be severely suppressed in both height and diameter growth.

Historically, low and mixed severity fires favored larch by thinning out some of the competition (Arno and Fischer, 1995). Alternative A proposes no commercial harvest to encourage retention and/or establishment of western larch within the project area. The current policy to suppress all fires in this area would continue. As a result, the composition of western larch would depend on the survival of existing trees. Due to the severe intolerance of western larch to shading it does not effectively compete once its position in the canopy is not dominant. In the absence of fire or other thinning agents (natural or man caused) the more shade tolerant species will continue to develop and compete with the western larch. In areas where root rot or other forest pathogens are performing a thinning effect, some retention of larch, if present, is expected. In those areas, however, the natural regeneration will continue to be the more shade tolerant species and thus the impact of competitive trees will continue, and little long range benefit in retention of western larch is expected. The live crown ratio of existing western larch will generally reduce over time due to both abrasion and shading from the more shade tolerant species, resulting in decreased diameter and height growth. The existing western larch in the stands considered for treatment in other alternatives is demonstrating a current decline in live crown and growth rate. In the absence of fire or other thinning agents, this decline is expected to continue and over time western larch would be substantially reduced or even eliminated from these stands under Alternative A.

Ponderosa pine has historically dominated a relatively small percentage (four to five percent) of both the project area as well as the St. Maries and St. Joe River Basins. Where it dominated stands was generally on drier sites typified by dry rocky ridges and on south or west aspects. It was, however, a minor component over much of the area being present on drier inclusions of larger stands and as co-dominants established at the same time as the surrounding trees.

Ponderosa pine, like western larch, is shade intolerant and relatively fire resistant. In the absence of fire or other thinning agents the more shade tolerant species will continue to develop and compete with the ponderosa pine as it does with western larch. It is expected that competition for growing space from the more shade tolerant species will decrease the growth and vigor of the ponderosa pine in these stands. This component will reduce or potentially be eliminated from these stands.

Current conditions have resulted in much higher proportions of the more shade tolerant species, especially the grand fir and Douglas-fir forest types, than historically existed in the area. This trend is expected to continue with Alternative A, which does not harvest timber while current fire suppression policies continue.

This alternative would result in decreased numbers of western white pine, western larch and to a lesser extent ponderosa pine in the forest stands considered for treatment in this environmental assessment.

Under Alternative A, stand composition is expected to change over time with a continued reduction in the existing component of long-lived early seral species and a continued increase in more shade tolerant mid and late seral species. As a result of this shift in species composition, the risk of insect and disease losses in stands would increase. These increased losses would be

expected from the existing diseases and insects in these stands (*Armillaria melia, Echinodontium tinctorium, Phaeolus schweinitzii* and *Dendroctous pseudotsugae, Scolytus ventralis*).

This shift in stand composition to more shade tolerant species, predominantly grand fir, Douglas-fir and hemlock, would also increase the risk and extent of loss from fire. These species are less adapted to surviving fire than are the more seral intolerant species. As these more fire sensitive species increase as a percent of stand composition, the risk of losing entire stands increases should fire occur.

Forest Structure

Alternative A would result in no direct management induced changes to forest structure.

Indirectly, forest structure will change with time in stands in the project area. Forest stands in this project area can generally be classified as stands where the canopy is moderately closed, trees are crowded (heavily stocked), live crowns are generally small to medium and declining in both crown width and height.

In the majority of the stands the trees are competing for growing space. Competition will result in a decline in the western larch and western white pine over time. Both diameter and height growth is decreasing, and stands are experiencing an increase in susceptibility to disease and insect attack. The small and medium size classes are the dominant stand components in these stands. Although growth rates are declining, these stands are expected to continue development towards the mature/large size class, but would experience little change in vertical and horizontal homogeneity within the next 25 to 30 years.

Forest cover types are determined by the species with the greatest percent composition (by basal area) in the stand. Within this proposal area, 76% of the acres are in Douglas-fir, grand fir, mountain hemlock and subalpine fir forest types.

Douglas-fir and grand fir contribute from 15 to 97 percent, and average 50 percent, of the composition of the stands in this project. These species are the most susceptible to root disease of all the native forest trees in northern Idaho. The majority of are in the cedar/hemlock habitat types. A study on the Coeur d'Alene River Basin (Matthews, 1995) simulated effects of root disease on mature stands of Douglas-fir and grand fir cover types on these habitat types. Reductions of stand basal area was significant (net decline over 100 years), mean diameters never exceeded 9 inches over a 50 year period (without root disease it exceeded 14 inches) and canopy closure decreased from 75 percent to 45 percent and did not regain 75 percent closure for a period of approximately 80 years. This would indicate the effects severe root disease can have on these habitat types. Crown closure, average diameters and other stand characteristics recover over time when western red cedar and hemlock become predominant components. This recovery process may take up to 100 years to occur.

The occurrence of root disease is currently at endemic levels within the project area. With declining growth and vigor, these stands are expected to have increasing effects of root disease. Increased mortality from root disease and other agents can be expected in the larger sized, more susceptible trees. This would create small openings due to losses of individual and small groups of medium and large trees throughout the project area. These openings would regenerate with shade tolerant species. As we lose the larger trees over time, the vertical structure in these stands

would be reduced, as well as mean tree size. Over time, this would create a more homogeneous structure, one with fewer crown classes, within the individual stands as well as for the project area in general. As a result, over the next 30 to 50 years, these stands are expected to decrease in mean diameter and decrease in canopy closure resulting from individual tree and small group mortality. This could potentially extend the time needed for these stands to achieve a large/mature size class.

Cumulative Effects

Forest Composition and Structure

Upon implementation of the Dutch Cat T.S. there would be an increase of 35 acres dominated by long lived early seral species and improved retention of existing early serals on approximately 311 acres planned for commercial thinning within the Hidden Cedar analysis area. These changes in composition affect approximately two percent of the **NFS land** within this analysis area.

Alternative A of this project would cumulatively maintain the current composition trends on the remaining approximately 98% of National Forest lands in this analysis area. The number and extent of western larch, western white pine and ponderosa pine would continue to decrease on almost all National Forest lands in the area. The number and extent of grand fir, western hemlock, Douglas-fir and western red cedar would continue to increase. An exception to this would be those areas that were previously reforested and/or pre-commercially thinned to promote early seral species composition. The regeneration of the 35-acre unit in the Dutch Cat T.S. would only incrementally change forest composition for the project area, affecting only two tenths of one percent (0.2%) of the National Forest System lands and only one tenth of one percent (0.1%) of the total area within this analysis area.

The effects on composition of Alternative A would only differ by the incremental changes relating to its direct and indirect effects on lands under Forest Service jurisdiction.

The effects on structure of Alternative A would only differ by the incremental reduction of seral species related to its direct and indirect effects. Over the next 25 to 30 years, stands throughout the project would continue to grow bigger trees and move towards larger size classes in the absence of disturbance of fire or other disturbance agents. Due to species composition and the expected increases in the incidence of root disease and insect damage, this trend towards larger tree size is expected to begin a subsequent decline as a result of mortality. Over the longer term, vertical stratification and horizontal differentiation may also be expected to decline by only incremental amounts.

On private and state land within the analysis area, the decrease of potentially long lived early serals and the increase of shade tolerant species is expected to occur more rapidly due to the continued harvest of stands which contain western larch, white pine and areas with ponderosa pine. These harvested areas have historically had little site preparation and planting to favor long-lived early seral species.

The management practices on lands other than national forest ownership generally favor the regeneration of shade tolerant species over the shade intolerant species. It is also anticipated that the stand structures will continue to be predominantly in the brush/seedling/sapling and pole/small/medium size classes, and little area will develop to the large mature/old growth size class.

The Merry Creek Progeny Test Site is a 45-acre existing plantation (currently in brush/seedling/sapling size class). This activity will convert up to 45 acres of grand fir/Douglas-fir forest type to western white pine forest type.

The effects on this analysis area as a result of management of lands other than Forest Service are expected as only incremental changes in forest composition and structure.

Table 3-5 summarizes the effects of the proposed action on vegetation in the analysis area.

Table 3-5 - Comparison of Vegetation Components by Alternative

Measurement Parameters	A		B		C		D		E		F	
Composition:	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Increase long-lived early seral tree species:	1328	9	1607	10	1607	10	1501	9	1328	9	1569	10
Stand structure:					Same as				Same as			
Brush-seedling sapling	3265	21	3476	23	Alt B		3390	22	Alt A		3441	22
Pole-small-medium	9456	61	9245	60			9331	60			9280	60
Mature-large	1872	12	1872	12			1872	12			1872	12
Old Growth = allocated	831	5	831	5			831	5			831	5
unallocated	14	<1	14	<1			14	<1			14	<1
Stand density (Acres)												
Reduction in stand density	0		1132		1160		478		0		1108	
Improve growing conditions for overstocked seedling/sapling stands	615		615		615		615		615		615	

Alternative B

Direct and Indirect Effects

Forest Composition

The commercial thinning and shelterwood preparatory treatments (1,050 acres) in Alternative B would maintain and/or increase the percent of the early serals in stands proposed for treatment in this alternative. There would be a slight increase in early seral representation, predominantly western larch, on approximately 832 acres where these species are present but are a minor stand component. On an additional 65 acres, through retention of the existing seral component and reduction in the more shade tolerant species, the forest type is expected to change from grand fir/Douglas-fir to western larch. There are 153 acres of western larch forest type that will be maintained in that forest type long term through preferential removal of species other than western larch and western white pine.

The shelterwood seed cuts and clearcut w/reserves in Alternative B would regenerate 171 acres currently occupied by grand fir and Douglas-fir with potentially long lived seral species, primarily western larch and western white pine. Openings as a result of these proposed treatments would range from 6 acres to 40 acres in size. This would result in an increase of 171 acres of potentially long-lived early seral species through artificial regeneration.

In the group shelterwood and irregular shelterwood treatment units (131 acres), approximately 43 acres would receive a regeneration harvest. This treatment would develop small openings ranging from 3 to 5 acres in size distributed throughout the harvest units and would be regenerated with

predominantly western larch and western white pine. An additional estimated 88 acres would receive commercial thinning with retention of early serals, where present. These units would remain in grand fir or Douglas-fir forest types, but the percent of early seral species would be maintained in the thinned areas and would increase for the units overall due to reforestation activities in the openings.

In the Shelterwood Removal cut unit, approximately 16 acres would have a portion of the remaining overwood removed. The existing component of early seral would be retained, however, this unit would remain in Douglas-fir forest type.

These proposed stand treatments have a relatively low potential to increase the current incidence of root and stem decays within treatment areas. Due to expected improvement in growth and vigor in areas of intermediate harvest treatments and the increased representation of more seral species, the impact of root and stem decays is expected to remain at, or near, current endemic levels. The risk of stand loss to insects and other diseases is expected to remain at endemic levels as a result of increased representation of long-lived early seral species in the areas proposed for treatment under this alternative.

Under Alternative B there are 615 acres of existing plantations planned for pre-commercial thinning for this and the other action alternatives. Stand composition for these stands is currently early seral, predominantly western white pine and western larch. Through selective thinning, the early seral component will be maintained on these acres.

Forest Structure

Alternative B would directly change forest structure on all proposed units. The change in structure in proposed commercial thin and shelterwood preparatory treatment units would reduce stand density by 30% to 50% (averaging 40%) and open the canopy cover by a corresponding amount. This harvest treatment would remove smaller trees and favor retention of larger diameter and more vigorous trees. This treatment would increase individual tree growth and vigor. This would result in developing mature/large-sized trees over a shorter time frame than would be expected with no treatment. The vertical structure would be reduced by removal of smaller tree classes. Additionally, stand density and crown closure would be reduced. These stand characteristics would increase over time following this proposed activity. These intermediate harvest activities would affect up to 1,050 acres. These treatments would not directly change stand size class due to few trees currently in the large/mature size class currently present in these stands.

The areas proposed for group shelterwood and irregular shelterwood harvests would directly change structure of the stands. Vertical structure is decreased and horizontal structure is increased by creating openings in the existing homogeneous stands. In total this activity would create approximately 43 acres of openings, ranging in size from 2 acres to 5 acres in size, scattered throughout the units. These openings would be regenerated with predominantly seral species, and will become brush/seed/sapling size class. The remaining 88 acres within these proposed units would have the same effects as discussed for commercial thinning and shelterwood preparatory treatments above.

The areas proposed for shelterwood seed cut and clearcut with reserves would directly change structure of 171 acres within the analysis area. This treatment would result in two-aged stands with the larger reserved trees scattered throughout the treatment area as an overstory above the

planted and naturally regenerated new age class. The larger trees would remain the dominant structure in these stands. These treatments would directly change stand size class in as much as the primary size class would shift from the pole/small/medium size class to the brush/seedling/sapling size class. These treatments would decrease the vertical structure and increase the horizontal structure on 171 acres through creation of openings (ranging in size from 6 acres to 40 acres) in the existing homogeneous stand density.

The area proposed for the shelterwood removal cut directly changes elements of stand structure on approximately 16 acres. Removal would be from the larger mature overstory currently overtopping a layer of well established saplings and poles. Vertical structure would be reduced through the removal of approximately 40% to 50% of the existing overstory. Horizontal structure would increase only slightly from this treatment. This stand would remain two-storied, even-aged and would not change in stand size class.

These proposed stand treatments have a relatively low potential to increase the current incidence of root and stem decays within treatment areas. Due to expected reduction in stand densities and subsequent improvement in growth and vigor in harvest treatment areas, the impact of root and stem decays is expected to remain at, or near, current endemic levels. The risk of stand loss to insects and other diseases is expected to remain at endemic levels as a result of reduced stand densities and subsequent improvement in growth and vigor creating conditions where trees are less stressed and better able to resist attack or infection.

The precommercial thinning activities (approximately 615 acres) would not directly affect forest structure. These stands will remain in the brush/seedling/sapling size class after this treatment.

Alternative C

Direct and Indirect Effects

Forest Composition

The direct and indirect effects of Alternative C on forest composition would be the same as described in Alternative B, except for the commercial thinning and shelterwood preparatory treatments. In this alternative, these treatments would involve approximately 1,078 acres. These treatments would maintain and/or slightly increase the percent of the early seral component on approximately 860 acres where these species are present but are a minor stand component. On an additional 65 acres, through retention of the existing seral component and reduction in the more shade tolerant species, the forest type is expected to change from grand fir/Douglas-fir to western larch. There are 153 acres of western larch forest type that will be maintained in that type longer into the future due to preferential removal of species other than western larch and western white pine.

All other direct and indirect effects would be the same as discussed for Alternative B.

Forest Structure

The direct and indirect effects on forest structure of harvest proposals in Alternative C would be the same as described in Alternative B, except for the commercial thinning and shelterwood

preparatory treatments. For Alternative C these treatments would be the same as Alternative B, but would affect 1,078 acres.

All other direct and indirect effects would be the same as discussed for Alternative B.

Alternative D

Direct and Indirect Effects

Forest Composition

In Alternative D the commercial thinning and shelterwood preparatory treatments (451 acres) would maintain and/or increase the percent of the early serals in stands proposed for treatment in this alternative. There would be a slight increase in early seral representation, predominantly western larch, on approximately 340 acres where these species are present but are a minor stand component. On an additional 44 acres, through retention of the existing seral component and reduction in the more shade tolerant species, the forest type is expected to change from grand fir/Douglas-fir to western larch. There are 67 acres of western larch forest type that will be maintained in that type long term due to preferential removal of species other than western larch and western white pine.

The clearcut w/reserves in Alternative D would regenerate 109 acres currently occupied by grand fir and Douglas-fir with potentially long lived seral species, primarily western larch and western white pine. Openings as a result of these proposed treatments would range from 6 acres to 31 acres in size. There are no shelterwood seed treatments proposed in this alternative. This would result in an increase of 109 acres of potentially long-lived early seral species through artificial regeneration.

In the group shelterwood units for Alternative D, approximately 20 acres would receive a regeneration harvest. This treatment would develop small openings ranging from 3 to 5 acres in size distributed throughout the harvest units and would be regenerated with predominantly western larch and western white pine. An additional estimated 23 acres would receive commercial thinning with retention of early serals, where present. These units would remain in grand fir or Douglas-fir forest types, but the percent of early seral species would be maintained in the thinned areas and would increase for the units overall due to reforestation activities in the openings. There are no irregular shelterwood treatments proposed in this alternative.

There are no Shelterwood Removal treatments proposed in this alternative.

All other direct and indirect effects would be the same as discussed for Alternative B.

Forest Structure

Alternative D would directly change forest structure on all proposed units. The change in structure in proposed commercial thin and shelterwood preparatory treatment units would reduce stand density by 30% to 50% (averaging 40%) and open the canopy cover by a corresponding amount. This harvest treatment would remove smaller trees and favor retention of larger diameter and more vigorous trees. This treatment would increase individual tree growth and vigor. This would result in developing mature/large-sized trees over a shorter time frame than would be expected with no treatment. The vertical structure would be reduced as a result of removal of

smaller tree classes. Additionally, stand density and crown closure would be reduced. These stand characteristics would increase over time following this proposed activity. These proposed harvest activities would affect up to 451 acres. These treatments would not directly change stand size class due to few trees in the large/mature size class currently present in these stands.

The areas proposed for group shelterwood harvests would directly change structure of the stands. Vertical structure is decreased and horizontal structure is increased by creating openings in the existing homogeneous stands. In total this activity would create approximately 20 acres of openings, ranging in size from 3 acres to 5 acres, scattered throughout the units. These openings would be regenerated with predominantly seral species, and will become brush/seed/sapling size class. The remaining 23 acres within these proposed units would have the same effects as discussed for commercial thinning and shelterwood preparatory treatments above.

The areas proposed for clearcut with reserves would directly change structure of 109 acres within the analysis area.

This treatment would result in two-aged stands with the larger reserved trees scattered throughout the treatment area as an overstory above the planted and naturally regenerated new age class. The larger trees would remain the dominant structure in these stands. These treatments would directly change stand size class in as much as the primary size class would shift from the pole/small/medium size class to the brush/seedling/sapling size class. These treatments would decrease the vertical structure and increase the horizontal structure on 109 acres through creation of openings (ranging in size from 6 acres to 31 acres) in the existing homogeneous stand density.

All other direct and indirect effects would be the same as discussed for Alternative B.

Alternative E

Direct and Indirect Effects

Forest Composition and Structure

There are no commercial treatments proposed under Alternative E, and there will be no direct or indirect effects related to commercial activity in this alternative. Direct and indirect effects will be the same as described under Alternative A.

The proposed precommercial thinning (615 acres) are, however, included in this alternative proposal. The direct and indirect effects for the precommercial thinning proposal are the same as discussed under the other action alternatives.

Alternative F

Direct and Indirect Effects

Forest Composition

The commercial thinning and shelterwood preparatory treatments (1,059 acres) in Alternative F would maintain and/or increase the percent of the early serals in stands proposed for treatment in this alternative. There would be a slight increase in early seral representation, predominantly western larch, on approximately 841 acres where these species are present but are a minor stand

component. On an additional 65 acres, through retention of the existing seral component and reduction in the more shade tolerant species, the forest type is expected to change from grand fir/Douglas-fir to western larch. There are 153 acres of western larch forest type that will be maintained in that forest type long term through preferential removal of species other than western larch and western white pine.

The shelterwood seed cuts and clearcut w/reserves in Alternative F would regenerate 145 acres currently occupied by grand fir and Douglas-fir with potentially long lived seral species, primarily western larch and western white pine. Openings from these proposed treatments would range from 6 acres to 40 acres in size. This would result in an increase of 145 acres of potentially long-lived early seral species through artificial regeneration.

In the group shelterwood and irregular shelterwood treatment units (80 acres), approximately 31 acres would receive a regeneration harvest. This treatment would develop small openings ranging from 3 to 5 acres in size distributed throughout the harvest units and would be regenerated with predominantly western larch and western white pine. An additional estimated 49 acres would receive commercial thinning with retention of early serals, where present. These units would remain in grand fir or Douglas-fir forest types, but the percent of early seral species would be maintained in the thinned areas and would increase for the units overall due to reforestation activities in the openings.

In the Shelterwood Removal cut unit, approximately 16 acres would have a portion of the remaining overwood removed. The existing component of early seral would be retained, however, this unit would remain in Douglas-fir forest type.

These proposed stand treatments have a relatively low potential to increase the current incidence of root and stem decays within treatment areas. Due to expected improvement in growth and vigor in areas of intermediate harvest treatments and the increased representation of more seral species, the impact of root and stem decays is expected to remain at, or near, current endemic levels. The risk of stand loss to insects and other diseases is expected to remain at endemic levels as a result of increased representation of long-lived early seral species in the areas proposed for treatment under this alternative.

Under Alternative F there are 615 acres of existing plantations planned for pre-commercial thinning for this and the other action alternatives. Stand composition for these stands is currently early seral, predominantly western white pine and western larch. Through selective thinning, the early seral component will be maintained on these acres.

Forest Structure

Alternative F would directly change forest structure on all proposed units. The change in structure in proposed commercial thin and shelterwood preparatory treatment units would reduce stand density by 30% to 50% (averaging 40%) and open the canopy cover by a corresponding amount. This harvest treatment would remove smaller trees and favor retention of larger diameter and more vigorous trees. This treatment would increase individual tree growth and vigor. This would result in developing mature/large-sized trees over a shorter time frame than would be expected with no treatment. The vertical structure would be reduced as a result of removal of smaller tree classes. Additionally, stand density and crown closure would be reduced. These stand characteristics would increase over time following this proposed activity. These intermediate harvest activities

would affect up to 1,059 acres. These treatments would not directly change stand size class due to few trees currently in the large/mature size class currently present in these stands.

The areas proposed for group shelterwood and irregular shelterwood harvests would directly change structure of the stands. Vertical structure is decreased and horizontal structure is increased by creating openings in the existing homogeneous stands. In total this activity would create approximately 31 acres of openings, ranging in size from 2 acres to 5 acres in size, scattered throughout the units. These openings would be regenerated with predominantly seral species, and will become brush/seed/sapling size class. The remaining 49 acres in these proposed units would have the same effects as the commercial thinning and shelterwood preparatory treatments above.

The areas proposed for shelterwood seed cut and clearcut with reserves would directly change structure of 145 acres within the analysis area. This treatment would result in two-aged stands with the larger reserved trees scattered throughout the treatment area as an overstory above the planted and naturally regenerated new age class. The larger trees would remain the dominant structure in these stands. These treatments would directly change stand size class in as much as the primary size class would shift from the pole/small/medium size class to the brush/seedling/sapling size class. These treatments would decrease the vertical structure and increase the horizontal structure on 145 acres through creation of openings (ranging in size from 6 acres to 40 acres) in the existing homogeneous stand density.

The area proposed for the shelterwood removal cut directly changes elements of stand structure on approximately 16 acres. Removal would be from the larger mature overstory currently overtopping a layer of well established saplings and poles. Vertical structure would be reduced through the removal of approximately 40% to 50% of the existing overstory.

Horizontal structure would increase only slightly as a result of this treatment. This stand would remain two-storied, even-aged and would not change in stand size class.

These proposed stand treatments have a relatively low potential to increase the current incidence of root and stem decays within treatment areas. Due to expected reduction in stand densities and subsequent improvement in growth and vigor in harvest treatment areas, the impact of root and stem decays is expected to remain at, or near, current endemic levels. The risk of stand loss to insects and other diseases is expected to remain at endemic levels as a result of reduced stand densities and subsequent improvement in growth and vigor creating conditions where trees are less stressed and better able to resist attack or infection.

The precommercial thinning activities (approximately 615 acres) would not directly affect forest structure. These stands will remain in the brush/seedling/sapling size class after this treatment.

Alternative B, C, D E, and F

Cumulative Effects

Forest Composition Resulting from Stand Treatments (Alternatives B,C,D,F)

On NFS lands the contribution of long-lived seral species to stand composition is expected to increase. This is the result of preferential removal of species other than long-lived seral in

intermediate treatment activities, and reforestation activities that preferentially select and maintain long-lived early serals within the stands.

On ownerships other than Forest Service, the contribution of long-lived seral species is expected to be static or potentially decrease. This is the result of preferential removal of these species due to market value. During reforestation activities the preferential selection and maintenance of long-lived seral species has not been as intensive on other ownerships as on NFS lands.

Cumulatively, there is expected to be only a slight incremental increase in the contribution of long-lived seral species resulting from vegetation management activities within this analysis area.

Forest Structure Resulting from Stand Treatments (Alternatives B,C,D,F)

On NFS lands the tree and stand size classes in intermediate harvest areas are expected to increase due to retention of larger tree classes combined with improved growth and vigor of trees and stands. In areas receiving regeneration treatments the tree and stand size classes are expected to decrease due to removal of overstory trees. In areas planned for precommercial thinning and other cultural work the tree and stand size classes are expected to increase over time due to improved growth and vigor resulting from treatment.

Intermediate harvest activities on ownerships other than Forest Service are expected to occur. On intermediate harvest areas the tree and stand size classes are expected to increase, but at a lesser extent than on Forest Service ownership. This is due to management policies that preferentially remove the larger tree classes. The effects of regeneration and timber stand improvement activities on these ownerships would be similar to those on NFS lands.

Cumulatively, there is expected to be only a slight incremental increase in tree and stand size class resulting from vegetation management activities within this analysis are.

The vertical structure complexity is expected to decrease, and horizontal structure complexity is expected to increase on both Forest Service and other ownerships within this analysis area. This is due to removal of tree classes (vertical structure) and creation of openings (horizontal structure) related to various management activities. Both of these structural elements would recover over time. Cumulatively, the decrease in vertical structure and increase in horizontal structure for the analysis overall would be slight, or incremental.

Root and stem decays are expected to have only a slight increase in intermediate treatment areas, remain at low (endemic) levels in regeneration treatments, and increase in untreated areas of all ownerships within this analysis area. Losses from insects and diseases other than root/stem decays are expected to decrease on all ownerships due to improved growth and vigor resulting from management activities. An exception to this is losses to western white pine due to blister rust, which is expected to continue at or near the current rate. The effects of slight decrease in tree/stand size class and vertical structure, and a slight increase in horizontal structure are expected. This is primarily due to the improvement in growth and vigor, and improvement in species composition throughout the analysis area. Cumulatively, the effects of insects and disease on vertical and horizontal structure, as well as tree/stand size class would be incremental.

Cumulative Effects On Vegetation From Other Activities (Alternatives B, C,D,E,F)

Aggressive suppression of wild fires is expected to continue. As a result, the trends in stand structure and composition related to the absence of fire are also expected to continue. The rate of change influenced by the lack of wildfires is relatively slow over time, resulting in expected incremental cumulative effects on the vegetation resource over time. Prospecting and exploration, as well as recreational digging, for garnets will involve removal of some trees and would minimally disturb other vegetation. This activity would have no cumulative effect on vegetation.

Field survey and other data gathering would not impact vegetation and would have no cumulative effects on the vegetation resource.

Weed control will impact populations of noxious weeds, but would not impact trees and other general vegetation in this analysis area. No cumulative effects on the vegetation resource are expected from weed control.

Wildlife habitat improvement projects are expected to kill a small number of trees, but these trees would remain standing. Due to the small scale of the project, no change in vertical structure or stand composition is expected, and only slight increase in horizontal structure would be expected. This activity is expected to have no, or only incremental, cumulative effects on vegetation.

Public activities, primarily related to various recreational activities, are expected to have only slight direct and indirect effects, and no cumulative effects on the vegetation resource. Examples of this type of activity are berry picking, hiking, hunting, wood gathering and similar activities.

Powerline, railroad and forest road maintenance activities are repetitive and ongoing. These activities generally keep these facilities in a relatively static condition and little to no change occurs over time. As a result, no cumulative effects on the vegetation resource are expected.

Potential road construction impacts structure through incrementally decreasing vertical structure, and incrementally increasing horizontal structure. Cumulatively, this activity is expected to have only slight, or incremental, effects on the vegetation resource for this analysis area.

Current and potential permitted grazing impacts are minimal throughout this analysis area. Isolated minor grazing damage, either from feeding or trampling, has been seen or noted in the existing plantations and regeneration areas on lands under Forest Service jurisdiction. Cumulatively, this activity is expected to have no or very slight, incremental effects on vegetation.

Consistency with Forest Plan and Laws

Specific goals, objectives and standards for timber management are described in the Forest Plan on pages II-2, II-8 and II-32. All action alternatives are consistent with these guidelines. All action alternatives comply with Appendix A, Summary of Timber Information and Vegetation Management, providing direction for silvicultural practices on the Idaho Panhandle National Forests. The activities described for the action alternatives are consistent with this direction.

Proposed management activities are designed to improve stand health and vigor, and maintain or enhance species composition and stand structure. This will minimize risk of stand loss from forest insects and disease as well as reduce risk of stand loss to weather, fire or other disturbances.

All proposed openings are within size limitations directed by NFMA and the Forest Plan. Openings will be naturally or artificially regenerated. Review of regeneration indices for the District and the analysis area display adequate ability to regenerate these openings within the five year period as directed in NFMA and the Forest Plan.

All proposed vegetative treatments integrated other resource needs either through design or mitigation development during alternative development and analysis.

All proposed vegetative treatments are on lands classified as suitable for timber production.

TRANSPORTATION

Introduction

The Hidden Cedar transportation infrastructure has evolved through changes in technology, land ownership and human uses that have occurred over time. The network has served a multitude of activities, creating the system that is in place today. The design, operation and maintenance of the transportation system can have consequences that affect the physical, biological and social environments. This section focuses on the social or human aspects of the transportation system along with the composition and juxtaposition of the network. The physical and biological aspects are discussed in detail in each resource section.

Regulatory Framework

National Forest Management Act (NFMA): Directs that roads be designed to standards appropriate for intended uses and requires the re-vegetation of roads within 10 years of the termination of temporary and undeveloped roads created under contract, permit or lease.

Clean Water Act (CWA): Section 404 of the Clean Water Act authorizes the Secretary of the Army to issue permits for the discharge of dredged or fill material into wetlands (33 CFR 322). Roads for timber management are exempt from the permit process if they are constructed and maintained with the use of BMPs listed in 40 CFR 323.a as well as those approved in the rules and regulations of the Idaho Forest Practices Act.

State of Idaho Forest Practices Act (FPA): The purpose of Rule 040, Title 38, Chapter 13 of the Idaho Code is to provide standards and guidelines for road construction and maintenance that will maintain forest productivity, water quality, and fish and wildlife habitat.

Alaska National Interest Lands Conservation Act (ANILCA): Access to non-Federal inholdings is governed by Section 1323(a) of this act. Implementing direction for this authority is found in regulations at 36 CFR 251 Subpart D-Access to Non-Federal Lands.

National Forest Roads and Trails Act: Authorizes the road and trail systems for the National Forests, the granting of easements across Forest Service administered lands, the construction of maximum economy roads and the imposing of requirements on road users for maintaining and reconstructing roads.

36 CFR 219: Sets the requirements for integrating forest resources, including transportation access and travel management, into the planning process, integrating biological, physical, social, and economic factors and environmental design criteria. Integration could involve the Endangered Species Act, the Clean Water Act and the National Historic Preservation Act.

36 CFR 212: Establishes the requirements for the administration of the forest transportation system and provisions for acquisition of rights-of-way. Describes a minimum road system and requires a science-based analysis to plan the road system.

36CFR 251, subpart D: Governs procedures by which landowners may apply for access across National Forest System lands, the terms and conditions that govern any special use authorization that is issued by the Forest Service to permit such access, and the criteria that authorized officers must consider in evaluation such applications. The rules provide that, subject to the terms and conditions set out in the rules, "landowners shall be authorized such access as the authorized officer deems to be adequate to secure them reasonable use and enjoyment of their land".

36 CFR 261.12 and 261.54: Establishes prohibitions on National Forest System road that are enforceable by the Forest Service.

Road Easements, Agreements or Memorandums of Understanding

State of Idaho, Department of Transportation

Clarkia Better Roads Highway District

Bonneville Power Administration

Potlatch Corporation

State of Idaho, Department of Lands

Crown Pacific

Clearwater Power Company

FSM 2700

Provides direction for special uses management on National Forest System lands. Chapter 2730 – Road and Trail Rights-of-way Grants, covers policies, authorities, and direction for granting rights-of-way for roads and trails across National Forest System lands and interests in lands.

FSM 5400, Chapter 5460

Provides direction concerning rights-of-way acquisition.

FSM 7700

Provides direction for the planning, construction, reconstruction, operation and maintenance of the Forest Transportation System. Sets forth the authority, objectives, policy, responsibility and definitions related to the Forest Transportation System.

IPNF Forest Plan

Forest-wide management direction in the form of goals, objectives and standards are contained in Chapter II. Goals for transportation facilities is to construct, manage and maintain transportation facilities to meet management area goals in a cost effective way while meeting safety, user, and resource needs. Chapter III of the Forest Plan provides more specific management direction for individual management areas. The Forest Plan provides some specific direction related to access and road management. Forest Plan standards for lands in the analysis area are to utilize the lowest standard road meeting transportation objectives compatible with resource protection and area management goals.

For wildlife, road restrictions and closures can be used as needed to meet habitat goals. In MA-16 (riparian), new construction should be limited to cases where no reasonable alternative exists and

to pursue replacement of existing stream crossing barriers with structures allowing fish passage. All standards related to roads are listed in the Hidden Cedar Roads Analysis in the project file. The Inland Native Fish Strategy amends the Forest Plan and contains additional guidelines and standards related to the design, operation and maintenance of the transportation system, these are also listed in the Roads Analysis of the Project File.

Analysis Area

For transportation purposes, the analysis area corresponds with the project area with some discussion of routes that pass through the area, serve adjacent lands or provide access to the project area. All proposed activities related to the transportation network are within the project area, except for timber hauling, road maintenance or restoration of an existing route to original standards to implement the alternatives, or road management for a road that extends beyond the project area.

Analysis Methods

A GIS road layer was developed using several data sources including: various maps, aerial photography, prior transportation planning efforts, Timber Sale Road Plans, GPS surveys, road maintenance logs and condition inventories, cost share and other road use agreements, the INFRA road database and land status and rights-of-way records. The State of Idaho Department of Lands and Potlatch Corporation provided additional information on planned and existing roads across their ownerships. Road segments were assigned attributes according to their jurisdictional status and road management prescription.

Most of the roads on National Forest lands or under Forest Service jurisdiction within the project area have been driven or walked within the last few years. Information for roads that have not been visited recently was based on prior work experience in the area and observation of similar roads built in the same time period and area. Historic photos and maps, past timber sale files and stand data were used to produce an overlay of the development history of the road network. This historic information was used to verify road locations and to provide an indication of their condition if they had not been visited. The road jurisdiction and management prescriptions provide an indication of the use, design, operation and maintenance of the road. All mileages were derived from the GIS road layer.

The Roads Analysis Process (RAP, FSM 7712) was utilized to identify the minimum road system needed and roads not needed (36 CFR 212.5) for the project area. Needed equates to classified roads. Classified roads consist of public, private and NFS (includes cooperative and FS) roads. The analysis uses the following road prescriptions to categorize road management:

a) Open – roads used by the public,
b) Road Management Prescription A – gated,
c) Road Management Prescription B – barrier,
d) Road Management Prescription C – long term storage (LTS) or low level decommission,
e) Management Prescriptions D and E – recontouring (partial or full).

See Appendix C for Road Management Prescription definitions. This analysis documents the need for the addition of new roads and evaluates the opportunities for reconstruction and decommissioning of roads (Project file, Hidden Cedar Roads Analysis).

Existing Condition

Past Human Uses

Land ownership patterns have continued to shift through land exchanges and acquisitions from the early settlement days to the present. Several exchanges have occurred to consolidate various ownerships for the State of Idaho, Potlatch Corporation and the National Forest System. Potlatch Corporation also acquired Milwaukee Land Company holdings in the area, greatly increasing their ownership. Several Bureau of Land Management and National Forest parcels have been acquired by the State of Idaho. The land ownership patterns have influenced the development of the road system, where roads are located and the standards they were constructed to. Roads were often built to avoid crossing ownerships.

Present Human Uses

The transportation network within the analysis area provides access that facilitates a variety of uses. State Highway 3 provides primary access to and from the area, along the main stem and the West Fork of the St. Maries River.

Land ownership surrounding Clarkia is a mix of private individuals, the State of Idaho Department of Lands, Potlatch Corporation and National Forest. Private ownership is mostly within corridors extending south and east from Clarkia in the valley bottom up to Cat Spur Creek and Gold Center Creek. National Forest ownership is primarily west of the West Fork, and in blocks surrounding Anthony Peak, in the upper portion of Cedar Creek and within the Log Creek Drainage. State of Idaho lands are scattered mostly through the Long Slim, Cat Spur and Middle Fork drainages. Potlatch lands are primarily in the Keeler Creek, Kitten Creek, lower Cedar Creek, Merry Creek and Middle Fork areas. The mixed ownership pattern has resulted in a road network with mixed jurisdictions, rights of way and agreements.

Table 3-6 - Existing Condition of the Road System in the Project Area.

Road Management (miles)	Open	Gated	Barrier	LTS	Re-contour	Total	% in Project Area
NFS land	40.2	25.8	14.6	29.1	3.1	112.8	39
Private	46.8	59.0	43.1	29.1	0.1	178.1	61
Project Area	87.0	84.8	57.7	58.2	3.2	290.9	
Road Jurisdiction (miles)	**Public**	**Private**	**NFSR coop**	**NFSR**	**Unclassified**	**Temporary**	**Total Miles**
NFS land	8.5	0.77	17.7	50.86	35.57	0.0	113.0
Private	10.5	144.6	19.0	3.2	0.8	0.0	178.0
Project Area	18.9	145.9	36.17	54.0	36.3	0.0	290.89

Road development within the project area has been extensive. The base transportation network of arterials, collectors and major local roads is well established. Even though the project area is well roaded, timber harvest using conventional ground based and cable logging systems would require

additional local road development. The classified (long-term motor vehicle access) road system is comprised of: 1) public roads under the jurisdiction of the State of Idaho Department of Transportation and the Clarkia Better Roads Highway District, 2) roads used for utility and transmission line access by the Bonneville Power Administration and Clearwater Power Company (NFSR Coop), 3) private roads on individual, corporate and State of Idaho, Department of Lands ownerships, and 4) National Forest System roads (NFSR) under the jurisdiction of the Forest Service. There are also unclassified roads on National Forest system lands. Please refer to Appendix C for definitions of roads used in this section.

Major Routes within and Adjacent to the Project Area

Jurisdictional changes from BPA, private and Forest Service existing roads to joint use agreements, as well as sharing in requests for access across National Forest System lands are identified as *cost share* opportunities. Cooperative use agreements (cost share) develop and use a single road system when such a system serves or can be made to serve the needs of both the Forest Service and other landowners (FSM 5467.02 and 36CFR 212). Cost share roads are National Forest System Roads. Cost share principles apply to construction, reconstruction, maintenance and use of shared facilities. The Forest Service has existing cost share agreements with Potlatch and the State of Idaho.

State Highway 3 is a double lane paved highway. The alignment on some segments reduces travel speed to 35-45 miles per hour. Fog and icy conditions are prevalent from fall through spring. Commercial truck traffic is primarily associated with log and wood chip transport. The highway provides regional access to the Clarkia area from Moscow-Pullman, Lewiston-Clarkston, Grangeville, St. Maries and Interstate 90 (Wallace, Coeur d'Alene and Spokane). The route serves as an alternative to US 95 between Interstate 90 and US 12. A gradual increase in use can be expected.

The St. Maries River Railroad is used primarily to transport logs from the Potlatch log yard in Clarkia to their plywood mill and sawmill in St. Maries with cedar logs transported to Bovill. The rail line also provides rail links from the Potlatch facilities, Regulus Stud Mill in St. Maries, the Medley Cedar Mill and Scott Paper chip plant in Santa and Emerald Creek Garnet south of Fernwood to major rail carriers and the Port of Lewiston. There has been a recent decline in use that is likely to continue for the near future. Market conditions, Potlatch operations, truck haul competition and timber availability in the Clarkia/Floodwood area will all play a role in the future status of the railroad.

The primary forest arterial for the Upper St. Maries River Basin is the Fishhook Gold Center Road 301. This route receives heavy truck traffic primarily from State and Potlatch lands in the Floodwood area by way of the Middle Fork St. Maries River Road 382 and the Stony Cr Road 1475. Road 301 continues past Road 382 to White Rock Springs providing access to Windy Creek, Stony Butte and Glover Creek. The segment from Clarkia to White Rock Springs is cost shared with Potlatch Corporation.

From White Rock Springs the standard of Road 301 decreases to a primitive road along the St. Joe Clearwater Divide past Marks Butte, Freezeout Mountain and Crater Peak. Road 301 eventually crosses the Little North Fork of the Clearwater and becomes a major haul route up over Breezy Saddle and down Fishhook Creek to FH 50 at Avery. In addition to being an important haul route,

the primitive portion of Road 301 provides a variety of recreational opportunities. There are several dispersed campsites with toilet facilities and trailheads along the route. Hunting, berry picking and sightseeing are the primary uses. The route is also a designated snowmobile trail that also receives cross-country ski traffic. Heavy truck traffic levels are expected to remain constant and recreational use is expected to increase.

Another important arterial is the Clarkia Marble Cr Road 321 that intersects with Road 301 near Clarkia, continues over Hobo Pass and down Marble Creek to FH 50. Portions on both ends of the route are cost-shared. The tributary area of Road 321 to Clarkia includes Merry Creek, Bussel Creek, Hobo Creek and Cornwall Creek and includes Potlatch and State lands. Road 321 provides the primary access to Marble Creek and the associated historical recreation and interpretive sites. The combination of FH 50, SH 3 and Road 321 provide an easily accessible scenic loop normally suitable for passenger cars. Generally, Road 321 receives heavy truck traffic on an intermittent basis and use is expected to continue to be heavy at times. Recreational use is expected to increase.

Road 504 connects SH 3 with the Palouse Emerald Creek Road 447 providing alternate secondary access to the Emerald Creek Campground and the Emerald Creek Garnet Area. Road 504 also collects timber traffic from the Mazie and Becthel Creek drainages (Rd 3340), Clarkia Peak (Road 504A), Bechtel Mountain (Road 3478) and Cedar Butte (Road 3557). This route serves only National Forest lands and is currently a haul route for the active Tri-County Timber Sale.

Road 447 lies to the north and west of the project area that connects SH 3, between Fernwood and Clarkia to SH 6 near Harvard. Established uses and levels are not expected to change.

The combination of Cat Spur Cr Road 361 and Log Creek Rd 1450 is a cost share collector route providing access to National Forest, Potlatch and State lands. The tributary area includes the Anthony Peak area (Rds 1486 & 3685), Kitten and Log Creeks (Rds 361, 1450 & 3354) and the Long Slim drainage (Road 1450). The Dworshak Taft transmission line also crosses through the tributary area, giving the Bonneville Power Administration an interest in some of the tributary roads. Permits for grazing and mineral extraction have been issued for the Cat Spur area. Other uses are primarily related to hunting with some dispersed camping and general forest day use activities. There are some primitive roads that connect the 1450 road system with the Keeler Creek Road 765 and the East Fork Potlatch River road system out of Bovill. The condition of the connecting routes limits their use and most traffic is terminal. The current trend for the next decade is increased use for commercial timber haul that may discourage other public uses.

Prior to the construction of State Highway 3 at its current location, access to Bovill followed a wagon route that is now part of Roads 765 and 765A. Road 765 begins at SH 3, crosses the West Fork of the St. Maries River where it also crosses the railroad grade and then continues up Keeler Creek. Where Road 765 starts up Keeler Creek, Road 765A continues up the West Fork parallel to the river and railroad grade and eventually ties back into SH 3 near the St. Maries Potlatch Divide.

Road 765 from SH 3 to Road 765A and Road 765A are county roads maintained by the Clarkia Better Roads Highway District. From Road 765A, Road 765 was recently relocated out of the riparian area of Keeler Creek. The old route location has been obliterated.

The new location is partially cost-shared with Potlatch Corporation, with the State of Idaho Department of Lands expressing an interest in utilizing the route. The current use and trend of these roads is similar to Road 361.

East Elk Road 1451 is a cost shared route connecting SH 3, near the Cedar Creek Campground to Road 1491 in the West Fork of Merry Creek. This road, locally referred to as the Staples Creek Road, has a tributary area that extends into the Norton, Toles and Lines Creek Drainages. The route also has a buried powerline that continues to a BPA microwave site on Incline Ridge. The road serves intermingled owned lands in the project area between Blair Creek and East Elk Peak.

Christmas Creek Road 3321 is a combination public, private and cost share route serving Christmas Creek and the south side of the Blair Creek Drainage. Private roads also connect road 3321 to Roads 1451 and 1491.

The only other collector roads available for unrestricted use are the Wood Creek Rd 341 from SH3 to Rd 3499 and the Hidden Creek Road 498 from Road 765, across SH 3 to just short of the Hidden Emerald Divide. Both roads continue beyond these points, but use is restricted or barriered. Road 3499 connects Road 341 with Road 498 but the culverts across Hidden Creek and Wood Creek have been removed, physically blocking passage. Road 498 provides access to most of the Little East Fork of Emerald Creek, which has an area restriction on motorized use. Road 3340, between Roads 341 and 504 is also open, providing local access across the Mazie and Bechtel Creek Drainages. See Map 9 – Road Management for Alternative A (existing road system).

Environmental Consequences

Present and Reasonably Foreseeable Activities

Within the next ten to twenty years, current uses can be expected to continue.

Indications are that timber harvest on corporate and State lands will continue at or near their current levels. Roads will continue to be developed on State and private lands to facilitate primarily tractor and cable logging systems. Potlatch Corporation and the State of Idaho, Department of Lands have indicated that they plan on constructing 6.5 miles of road on their lands that would not involve crossing any National Forest System lands. Potlatch Corporation has also been in the process of decommissioning unneeded roads on their lands, meeting the requirements for an abandoned road (Idaho Forest Practices Act, Rule 040, section 04(e)).

The Dutch Cat decision constructs new system road, new temporary road and makes changes to the operation and maintenance of the existing road network under Forest Service jurisdiction in the Anthony Peak and Cat Spur areas. Several roads were identified for obliteration or to be put into long-term storage following use. A timber sale is planned to accomplish the road construction and to implement some of the road management changes and decommissioning. Some of the decommissioning is dependent upon KV or other funding.

The Tri-County Timber Sale has harvest units adjacent to the Hidden Cedar area in the vicinity of Bechtel Butte and Road 504. Roads 3478, 504, and 3457 are used for haul within the project area. The timber sale contract was awarded 12/10/1997 and has a termination date of 12/31/2002.

Road maintenance activities will continue on public, private and National Forest roads. BPA and Clearwater Power need continued access across NFS lands to maintain power line facilities.

Alternative A

Direct, Indirect and Cumulative Effects

Alternative A would maintain public access to National Forest System lands. Implementation of present and reasonably foreseeable actions will increase the amount of cost-shared road, reducing the maintenance responsibility of the Forest Service on National Forest System roads. The Forest Service and the Bonneville Power Administration (BPA) also cooperated to provide alternate access for the transmission line to eliminate a segment of road prone to erosion and cut slumping. The net amount of system road would drop slightly from the existing condition, while the total miles in the project area and roads available for public use would increase. Most of the present and reasonably foreseeable road construction would occur on private ownership. Alternative A would not provide adjacent landowners additional access across National Forest System lands needed to develop or manage their land. Maintenance of National Forest System roads would occur primarily on cost share and major forest routes that provide open public access. Secondary gated and closed roads (road management prescriptions A and B) would be maintained at a minimal level to prevent environmental damage and as funding allows. Some unclassified roads would not be rehabilitated through decommissioning activities. The Forest Service and BPA would continue to cooperatively maintain BPA roads that occur on National Forest System lands.

Table 3-7 provides a *summary* of Alternative A road miles by road management and jurisdiction for the project area. (See Appendix B for complete road data information by alternative.)

Table 3-7 - Alternative A Summary of the Roads by Road Management and Jurisdiction.

Road Management (miles)	Open	Gate	Barrier	LTS	Recontour	Total	% Project Area
NFS land	46.4	15.3	14.6	28.5	9.1	113.9	38
Private land	47.7	61.2	46.5	29.1	0.1	184.5	62
Project Area	94.1	76.5	91.1	57.5	9.2	298.4	
Road Jurisdiction	**Public**	**Private**	**NFSR coop**	**NFSR**	**Unclassified**	**Temporary**	**Total Miles**
NFS land	8.5	0.8	19.3	44.4	41.0	0.0	113.9
Private land	10.5	149.8	21.5	2.0	0.8	0.0	184.5
Project Area	19.0	150.6	40.7	46.4	41.8	0.0	298.4

Effects Common to Alternatives B, C, D, E and F

Direct, Indirect and Cumulative Effects

All the action alternatives provide adjacent landowners access across National Forest System lands that would enable them to develop and manage their lands. All of the 7.8 miles of proposed road construction associated with access requests occurs within existing cost share areas. Of the 7.8 miles, 2.2 miles would also serve National Forest System lands and would be cost-shared. About 2.4 miles would cross National Forest System lands. The Forest Service would be granting 1.5 miles of cost share easements and 0.9 miles of non-cost-shared easements. The Forest Service would be acquiring 0.7 miles of cost-share easements. In addition, cost share easements would be

exchanged on 8.2 miles (8.0 miles within the project area) of existing road occurring on both private and National Forest System lands. 5.0 miles of the existing roads that would be shared also serve the Dworshak-Taft No. 1, 500kV Transmission Line, necessitating acquisition of 1.3 miles of rights of way easements from the Bonneville Power Administration. 0.5 miles of existing road providing access to a Clearwater Power Company buried electric line would be put into long-term storage. About 1.8 miles of existing road would need improvement to facilitate anticipated uses and to reduce erosion.

By exchanging easements and constructing 7.8 miles of road, the private road system would have a net increase of 3.5 miles and the cost shared road system would increase 10.2 miles. The net amount of cost shared and BPA road combined (coop NFSR) increases by 5.3 miles. The amount of public road remains constant for all alternatives. Amount of BPA, cost share, private and public roads by road management prescriptions and the changes from Alternative A (no action), can be found in Appendix B.

Alternative B

Direct, Indirect and Cumulative Effects

Alternative B would construct 6.2 miles of new National Forest System road (NFSR) that would be put into long-term storage following use. Another 3.0 miles of temporary road would be constructed and rehabilitated following use. Alternative B also decommissions 1.1 miles of existing NFSR, and converts 1.9 miles of unclassified road to NFSR (see glossary under Roads for definition of unclassified). In addition to the cost share activities common to all action alternatives, there is a net gain of 6.0 miles to the NFSR system and 2.2 miles of unclassified and temporary road. Alternative B also does road improvement, rehabilitation and obliteration to reduce maintenance needs and the potential for environmental damage. Road management changes include putting 1.6 miles of open low use system road, 3.7 miles of gated system road and 1.9 miles of barriered system road into long-term storage. Approximately 9.3 miles of unclassified existing roads that currently fit a road management A or B prescription and 0.8 miles of open unclassified road would be decommissioned and rehabilitated to a C, D or E prescription. Reconstruction and restoration to original road standards would occur on approximately 5.5 miles in addition to the 1.8 miles associated with cost share activities. Overall, public access on open roads would be reduced from 94.1 miles within the project area to 91.1 miles available for unrestricted use. The open road density for the project area and for NFS lands within the project area would be 1.8 miles per square mile (See Appendix B).

Table 3-8 - Alternative B Summary of the Roads by Road Management and Jurisdiction.

Road Management (miles)	Open	Gated	Barrier	LTS	Re-contour	Total	% Project Area
NFS land	43.5	12.5	3.9	52.3	13.1	125.3	40
Private land	47.7	64.0	48.3	30.0	0.1	190.0	60
Project Area	91.1	76.5	52.1	82.3	13.2	315.3	
Road Jurisdiction	**Public**	**Private**	**NFSR coop**	**NFSR**	**Unclassified**	**Temporary**	**Total Miles**
NFS land	8.5	1.6	21.8	50.2	40.3	3.0	125.3
Private land	10.5	152.4	24.3	2.1	0.7	0.0	190.0
Project Area	19.0	154.0	46.0	52.3	41.0	3.0	315.3

Increased timber traffic from Alternative B, would have the greatest impact to open single lane roads available for public use. The possibility of mixed user conflicts is highest on Road 504, where public use tends to be higher and timber traffic may not be expected. Increased timber traffic on Roads 341, 361, 498, 1451 and 3321 is not as likely to cause user conflicts because the roads historically have been used primarily for timber purposes.

For public safety, some roads may have use restrictions placed upon them limiting public use or the timing of haul activities. Public traffic that uses Road 504 could be routed over Road 447 during periods of peak logging activity.

Alternative C

Direct, Indirect and Cumulative Effects

Alternative C would not allow any new road construction other than access requests. Alternative C decommissions 1.1 miles of existing NFSR, and converts 1.9 miles of unclassified road to NFSR. In addition to the cost share activities common to all action alternatives, there is a net loss of 0.2 miles to the NFSR system and 0.8 miles of unclassified and temporary road. Alternative C also does road improvement, rehabilitation and obliteration to reduce maintenance needs and the potential for environmental damage. Road management changes include putting 1.6 miles of open low use system road, 3.7 miles of gated system road and 1.9 miles of barriered system road into long-term storage. Approximately 9.3 miles of unclassified existing roads that currently fit a road management A or B prescription and 0.8 miles of open unclassified road would be decommissioned and rehabilitated to a C, D or E prescription. Reconstruction and restoration to original road standards would occur on approximately 5.5 miles in addition to the 1.8 miles associated with cost share activities. Overall, public access on open roads would be reduced from 94.1 miles within the project area to 91.1 miles available for unrestricted use. The open road density for the project area and for NFS lands within the project area would be 1.8 miles per square mile.

Table 3-9 displays a *summary* of the road system by road management and jurisdiction according to ownership (See Appendix B for complete road data by alternative).

Table 3-9 - Alternative C Summary of the Roads by Road Management and Jurisdiction.

Road Management (miles)	Open	Gated	Barrier	LTS	Re-contour	Total	% Project Area
NFS land	43.5	12.5	3.9	45.4	10.9	116.2	38
Private land	47.7	64.0	48.3	30.0	.1	190.0	62
Project Area	91.1	76.5	52.1	75.33	11.1	306.2	
Road Jurisdiction	**Public**	**Private**	**NFSR coop**	**NFSR**	**unclassified**	**temporary**	**Total Miles**
NFS land	8.5	1.6	21.8	44.0	40.3	0.0	116.2
Private land	10.5	152.4	24.3	2.1	0.7	0.0	190.0
Project Area	19.0	154.0	46.0	46.2	41.0	0.0	306.2

Increased timber traffic from Alternative C would have the greatest impact to open single lane roads available for public use.

The possibility of mixed user conflicts is highest on Road 504, where public use tends to be higher and timber traffic may not be expected. Increased timber traffic on Roads 341, 361, 498, 1451 and 3321 is not as likely to cause user conflicts because the roads historically have been used primarily for timber purposes. For public safety, some roads may have use restrictions placed upon them limiting public use or the timing of haul activities. Public traffic that uses Road 504 could be routed over Road 447 during periods of peak logging activity.

Alternative D

Direct, Indirect and Cumulative Effects

Alternative D would construct 0.7 miles of new National Forest System road (NFSR) that would provide access to the road system serving the upper reaches of Hidden Creek and a portion of the East Fork of Emerald Creek Drainage. Alternative D also decommissions 7.5 miles of existing NFSR, and converts 2.8 miles of unclassified road to NFSR. To offset the 2.2 miles of new NFSR associated with cost share activities common to all action alternatives, there is a net reduction of 4.6 miles to the non-coop NFSR system and a net increase of 4.2 miles of unclassified road. Alternative D also does road improvement, rehabilitation and obliteration to reduce maintenance needs and the potential for environmental damage. Road management changes include putting 7.5 miles of open system road, 5.6 miles of gated system road and 2.2 miles of barriered system road into long-term storage. About 0.7 miles of unclassified existing road currently in a road management A or B prescription (gate/barrier) would be decommissioned and rehabilitated to a C prescription (de-compaction with culvert removal). 0.8 miles of open unclassified road and 12.4 miles currently managed with a B or C prescription would be decommissioned and rehabilitated with partial or full re-contouring (D or E prescription).

Reconstruction and restoration to original road standards would occur on approximately 4.6 miles in addition to the 1.8 miles associated with cost share activities. Overall, public access on open roads would be reduced from 94.1 miles within the project area to 82.9 miles available for unrestricted use. The open road density for the project area would be 1.6 miles per square mile. For NFS lands within the project area, the open road density would be 1.5 miles per square mile.

Table 3-10 displays a summary of the road system for Alternative D by road management and jurisdiction according to ownership (See Appendix B for complete road data for Alternative D and the net changes from Alternative A).

Increased timber traffic from Alternative D would not have much impact to open single lane roads available for public use. The possibility of mixed user conflicts is highest on Road 504, where public use tends to be higher and timber traffic may not be expected. The anticipated timber volume that would use Road 504 is greatly reduced from the proposed action. Increased timber traffic on Roads 361 and 498 is not likely to cause user conflicts because the roads historically have been used primarily for timber purposes. For public safety, some roads may have use restrictions placed upon them limiting public use or the timing of haul activities. Public traffic that uses Road 504 could be routed over Road 447 during periods of peak logging activity or timber traffic could be routed down Road 3557 and the double lane segment of Road 447.

The greatest impact to public use of roads would occur with the elimination of portions of Roads 361 and 498 and placing Road 3340 into storage. Administrative traffic and private access for the area tributary to Road 498 would be accomplished with the construction of 0.7 miles between

Roads 3478 and 3914. In the project area, administrative and public traffic would essentially be eliminated on National Forest lands north and west of SH 3 and south of Roads 504 and 3478.

Table 3-10 - Alternative D Summary of the Roads by Road Management and Jurisdiction.

Road Management (miles)	Open	Gated	Barrier	LTS	Re-contour	Total	% Project Area
NFS land	35.2	10.4	3.7	38.8	28.7	116.9	38
Private land	47.7	64.0	48.3	29.8	0.3	190.0	62
Project Area	82.9	74.4	52.0	68.6	29.0	306.8	
Road Jurisdiction	**Public**	**Private**	**NFSR coop**	**NFSR**	**Unclassified**	**Temporary**	**Total Miles**
NFS land	8.5	1.6	21.8	39.1	45.9	0.0	116.9
Private land	10.5	152.4	24.3	2.1	0.7	0.0	190.0
Project Area	19.0	154.0	46.0	41.2	46.6	0.0	306.8

Alternative E

Direct, Indirect and Cumulative Effects

Alternative E does not construct any new road in addition to the activities common to all action alternatives. Alternative E decommissions 7.5 miles of existing NFSR, and converts 1.9 miles of unclassified road to NFSR. To offset the new 2.2 miles associated with cost share activities common to all action alternatives, there is a net reduction of 6.1 miles to the non-coop NFSR system and a net increase of 5.0 miles of unclassified and temporary road.

Alternative E also does road improvement, rehabilitation and obliteration to reduce maintenance needs and the potential for environmental damage. Road management changes include putting 7.5 miles of open system road, 5.6 miles of gated system road and 2.2 miles of barriered system road into long-term storage. Approximately 2.5 miles of unclassified existing roads that currently fit a road management A or B prescription (gate or barrier) would be decommissioned and rehabilitated to a C prescription (de-compaction with culvert removal). 0.8 miles of open unclassified road and 12.4 miles currently managed with a B or C prescription would be decommissioned and rehabilitated with partial or full re-contouring (D or E road prescription). Reconstruction and restoration to original road standards would occur only on the 1.8 miles of cost share.

Overall, public access on open roads would be reduced from 94.1 miles in the project area to 82.9 miles available for unrestricted use. The open road density for the project area would be 1.6 miles per square mile and 1.5 miles per square mile on NFS land. Table 3-11 displays a summary of the road system for Alternative E by road management and jurisdiction according to ownership (See Appendix B for complete road data on Alternative E and the net changes from Alternative A).

The greatest impact to public use of roads in the project area would occur with the elimination of portions of Roads 361 and 498 and placing Road 3340 into storage. Administrative traffic and private access for the area currently tributary to Road 498 would be eliminated, leaving approximately 20.4 miles of existing classified road inaccessible. In the project area, administrative and public traffic would essentially be eliminated on National Forest lands north and west of SH 3, west and south of Roads 504 and 3478, south of the East Fork of Emerald Creek and East of the Little East Fork of Emerald Creek.

Table 3-11 - Alternative E Summary of the Roads by Road Management and Jurisdiction.

Road Management (miles)	Open	Gated	Barrier	LTS	Re-contour	Total	% Project Area
NFS land	35.2	9.2	3.4	39.6	28.7	116.2	38
Private land	47.7	64.0	48.3	29.8	0.3	190.0	62
Project Area	82.9	73.2	51.7	69.4	29.0	306.2	
Road Jurisdiction	**Public**	**Private**	**NFSR coop**	**NFSR**	**Unclassified**	**Temporary**	**Total Miles**
NFS land	8.5	1.6	21.8	37.7	46.7	0.0	116.2
Private land	10.5	152.4	24.3	2.1	0.7	0.0	190.0
Project Area	19.0	154.0	46.0	39.8	47.4	0.0	306.2

Alternative F

Direct, Indirect and Cumulative Effects

Alternative F would construct 4.7 miles of new National Forest System road (NFSR). 4.0 miles would be put into long-term storage following use. The remaining 0.7 miles would provide access to the upper reaches of Hidden Creek and the East Fork of Emerald Creek, replacing the access currently provided by Hidden Creek Road 498. Another 2.1 miles of temporary road would be constructed and rehabilitated following use. Alternative F also decommissions 5.7 miles of existing NFSR, and converts 3.2 miles of unclassified road to NFSR (see glossary under Roads for definition of unclassified). In addition to the cost share activities common to all action alternatives, there is a net gain of 0.4 miles to the NFSR system and 5.4 miles of unclassified and temporary road. Alternative F also does road improvement, rehabilitation and obliteration to reduce maintenance needs and the potential for environmental damage. Road management changes include putting 8.0 miles of open low use system road, 5.6 miles of gated system road and 3.4 miles of barriered system road into long-term storage and 2.3 miles of open or gated road would be barriered. About 0.4 miles of unclassified existing road currently in road management A or B prescription would be decommissioned and rehabilitated to a C prescription. Approximately 0.8 miles of open unclassified road and 13.0 miles managed with a B or C prescription would be decommissioned and rehabilitated to a D or E prescription. Reconstruction and restoration to original standards would occur on about 6.3 miles in addition to 1.8 miles associated with cost share. Overall, public access on open roads would be reduced from 94.1 miles to 83.8 miles available for unrestricted use. The open road density for the project area would be 1.6 miles per square mile and 1.5 miles per square mile for NFS lands within the project area (See Appendix B).

Table 3-12 - Alternative F Summary of the Roads by Road Management and Jurisdiction.

Road Management (miles)	Open	Gated	Barrier	LTS	Re-contour	Total	% Project Area
NFS land	36.2	10.3	3.8	43.9	28.8	123.0	39
Private land	47.7	64.0	48.3	29.8	0.3	190.0	61
Project Area	83.8	74.3	52.1	73.6	29.1	313.0	
Road Jurisdiction	**Public**	**Private**	**NFSR coop**	**NFSR**	**Unclassified**	**Temporary**	**Total Miles**
NFS land	8.5	1.6	21.8	44.7	44.4	2.1	123.0
Private land	10.5	152.4	24.3	2.1	0.7	0.0	190.0
Project Area	19.0	154.0	46.0	46.8	45.1	2.1	313.0

Increased timber traffic from Alternative F, would have the greatest impact to open single lane roads available for public use. The possibility of mixed user conflicts is highest on Road 504, where public use tends to be higher and timber traffic may not be expected. Increased timber traffic on Roads 341, 361, 498, 1451 and 3321 is not as likely to cause user conflicts because the roads historically have been used primarily for timber purposes.

For public safety, some roads may have use restrictions placed upon them limiting public use or the timing of haul activities. Public traffic that uses Road 504 could be routed over Road 447 during periods of peak logging activity.

Consistency with Forest Plan and Other Regulation

The Hidden Cedar Road Analysis (project file) documents the compliance of the proposed Hidden Cedar project with the regulatory framework identified in the beginning of this section. The roads analysis documents roads identified as needed or not needed, the determination of a minimum road system, roads identified for cost share, utilities, developed recreation and administrative sites. It also identifies how the project is in compliance with the Forest Plan and other resource standards. (Project File, Hidden Cedar Roads Analysis).

SOILS

Regulatory Framework

Idaho Forest Plan

The Idaho Panhandle National Forests' Forest Plan (IPNF, 1987) directs the following standards for the soil resources on NFS lands:

Objectives

Management activities on Forest Service administered lands will not significantly impair the long-term productivity of the soil or produce unacceptable levels of sedimentation resulting from soil erosion. This will be accomplished using technical guidelines developed in conjunction with the soil survey and Best Management Practices necessary to protect soil productivity and minimize sedimentation.

Forest Wide Standards

Soil disturbing management practices will strive to maintain at least 80 percent of the activity area in a condition of acceptable productivity potential for trees and other managed vegetation. Unacceptable productivity potential exists when soil has been detrimentally compacted, displaced, puddled, or severely burned as determined in the project analysis. Projects should strive to maintain sufficient large woody debris to maintain site productivity. Large woody debris is essential for maintenance of sufficient microorganism populations. In the event of whole tree logging, provisions for maintenance of sufficient nutrient capital should be made in the project analysis USDA, 1998).

Management Areas 1, 4 and 5

Refer to Best Management Practices.

Region 1 Standard

Region One’s Standard has changed to require 85% of an activity area’s soils are at an acceptable productivity potential (USDA 2000). The reason for this change is that roads have been taken out of the detrimentally impacted soil category because they are considered committed resources.

Analysis Area

The analysis area for soil resources is the activity area of the timber harvest units, landings, and roads proposed for rehabilitation.

Analysis Methods

Existing conditions and effects on soils will be discussed in terms of productivity and erosion, determined using the analysis procedure in the Updated Soil Guidelines for NEPA Analysis (IPNF 1998). These guidelines emphasize soil management standards and issues, long-term productivity, erosion, and sediment production. Effects on long-term soil productivity are calculated by totaling

average soil disturbance values from logging methods and equipment, and from slash treatment. Erosion and sediment production hazards are gathered from landtype descriptions in the IPNF Land System Inventory (IPNF 1999).

Coarse woody debris and slash guidelines have been adopted as design criteria to ensure soil nutrient continuity, (see Design Features and Mitigation, SOILS- Chapter 2). The Forest Service Handbook 2509.22 (Soil and Water Conservation Handbook) outlines Best Management Practices (BMP's) that meet the intent of the water quality protection elements of the Idaho Forest Practices Act, and through a memorandum of understanding with the State of Idaho (9/19/88) replaces the Forest Plan Appendix S – Best Management Practices. BMP's – both standard and site-specific (see *Applicable BMP's and Soil and Water Conservation Practices*, White paper, IPNF, 2002) are included as design criteria (Chapter 2) and will be applied during timber harvest, road decommissioning and road construction to minimize soil erosion and maintain acceptable soil productivity (Seyedbagheri 1996, Lynch and Corbett 1989, 1990, Idaho DEQ 2001, USDA 2001).

To determine potassium limited sites, a map of the proposed harvest units was overlaid on a map of geologic formations to determine which of these units overlapped with low potassium geologic formations. This can be found in the soil productivity section of the project file. Site specific monitoring was done on a sampling of these sites to determine potassium and other nutrient levels. Research from the Intermountain Forest Tree Nutrition Cooperative (IFTNC.1998) and its recommendations to retain maximum possible potassium on site after logging will be followed in this project.

Throughout the Soil Resource Section, acres are calculated by ARCINFO GIS and these are rounded off, which may cause slight discrepancies between different resources analysis numbers.

Affected Environment

Soils in the Hidden Cedar area are generally formed in volcanic ash-influenced loess overlying weakly to highly weathered subsoil and substratum material derived from the underlying bedrock. The highly weathered soils have low strength and higher potential for mass wasting.

Table 3-13 - General Soil Types

Soil derived from:	Acres	% of Analysis Area
Alluvium	3,421	10.3%
Residual belt	9,409	28.5%
Residual granitics	6,675	20.3%
Residual schists	13,465	40.9%

High Sensitivity Landtypes are identified considering surface erosion hazard, sediment delivery efficiency and landslide potential (see High Sensitivity Landtype Matrix, Project File). There are approximately 5343 acres of Sensitive Landtypes or 16.2% of the Hidden Cedar area (Table 3-14).

Table 3-14 - High Sensitivity Landtypes in the Hidden Cedar Area

Landtype	**455***	456	477	478	**479***	480	**718***	483	488	**517***	518	**579***	**717***
Acres	698	289	261	178	227	172	1569	183	100	140	760	225	541

In Table 3-14, *landtypes with high mass movement potential* are identified above with an **asterisk (*)** and **bold highlight**. Refer also to Map M-18, which shows mass movement potential areas and proposed harvest units with buffering required by INFISH (USDA 1995.)

Past Harvesting on Sensitive Landtypes

There are 658 acres of past harvest on landtypes rated with high sensitivity.

Existing Roads on Sensitive Landtypes

Table 3-15 - Road Lengths on Sensitive Landtypes for Hidden Cedar Area

Ownership	Length on Sensitive Landtypes	Percent road miles by ownership
Private	29.20 miles	61.7%
USFS	18.10 miles	38.3%

Detrimentally Impacted Soils

The results of soil disturbance calculations based on past timber harvest activities on current National Forest System (NFS) administered lands can be found in the Project File (document SW-16). There is an estimated total of 650 acres of detrimentally impacted acres in the project area (1.97%). The 650 impacted acres divided by the total 4370 acres of past timber harvest multiplied by 100 gives a percent of the activity acres impacted [(650/4370) x (100) = 14.89 %]. This represents the *existing condition* from past cumulative effects. A summary table of activity area (stand), activity acres, type of activity, average percent of area impacted and applied to activity acres, and the percent of activity area impacted can be found in the Project File, Document SW-11.

The current level of detrimentally impacted acres for the soil resource is 14.89% of activity areas. This is within the Regional Standard of 15%.

There is very little overlap between the areas proposed for harvest in this project and previous harvest activity.

Nutrient Levels

Foliar analysis was conducted to determine nutrient levels. This analysis covered the Upper Wallace, Lower Wallace, and granitic geologic formations that have proposed harvest units. The result of this analysis indicates that the *potassium level is **above*** the critical level (IFTNC, 1998) for the *Lower Wallace formation*. For the *Upper Wallace and granitic formations* the *potassium level is **below*** the critical level (IFTNC, 1998). Nitrogen and sulfur are above the critical level on the Upper Wallace, but below the critical level (IFTNC, 1998) on the Lower Wallace and granitic formations. The nutrient levels of phosphorous, calcium, magnesium, manganese, zinc, copper, iron, and boron are all above the critical level (IFTNC, 1998, Project File).

Environmental Consequences

Alternative A

Direct and Indirect Effects

Past Harvesting on Sensitive Landtypes

Past timber harvest occurred on 658 acres rated with high sensitivity landtypes. This will not change. Nine areas of past harvest on sensitive landtypes were inspected for soil problems and no surface erosion was noted within the harvest units or on road surfaces (field notes in Project File).

Existing Roads on Sensitive Landtypes

There are about 47 miles of road on high sensitivity landtypes. This will not change.

Riparian Roads

There are approximately 58 miles of road located in Riparian Habitat Conservation Areas. Of this 27.3 miles are on private land. Another 7.2 miles are open public roads. There are 18.8 miles of road that are within Forest Service jurisdiction. This will not change.

Detrimentally Impacted Soils

There would be no detrimental impacted soils as a result of timber harvest. Soil productivity will remain constant over the short-term with an improving long-term trend as old roads grow in, and disturbed soils rebuild horizons and organic debris rebuilds. Some of this increase would be attributable to fire suppression by preventing wildfires from consuming this material. This alternative does not decommission or place into storage any roads so there would be no increased soil productivity. Soil productivity is defined as the capacity of a soil in its normal environment to produce a specific plant or sequence of plants under a specific system of management (SPCA, 1982.)

Nutrient Levels

Nutrient levels are not expected to change in the short-term. In the long-term nutrient levels are expected to increase as nutrients tied-up in vegetation are released after mortality through natural decomposition processes.

Cumulative Effects

Cumulative soil impacts on Federal land are estimated at 14.9% overall for activity areas within the Hidden Cedar area (Project File). Individual activity areas impacts are identified in the project file. Soil productivity on private land may be below pre-management levels because of the extent of harvest, and combined with the level on Federal land the soil productivity may be diminished overall in the Hidden Cedar area. The State of Idaho has jurisdictional authority for practices on private land.

Table 3-16 - Road Construction on Private land on High Sensitivity and High Mass Movement Landtypes

Watershed	High Sensitivity	High Mass Movement
W. Fk. St. Maries R.	0.1 mi.	0.0 mi.
Lower St. Maries R.	0.01 mi.	0.2 mi.
Long Slim Cr.	0.01 mi.	0.0 mi.
Cat Spur Cr.	0.1 mi.	0.1 mi.

Alternatives B, C, D and F

Direct and Indirect Effects

The proposed level of harvest (percentage) and acres by watershed and alternative is identified in the following table.

Table 3-17 - Summary by Watershed of Timber Harvest Proposed (acres and %)

Watershed	Alt B	Alt. C	Alt. D	Alt. E	Alt. F
Wood	14 (2%)	14 (2%)	0	0	14 (2%)
Hidden	218 (13%)	218 (13%)	132 (8%)	0	218 (13%)
West Fork. St. Maries	282 (6%)	282 (6%)	198 (4%)	0	282 (6%)
Maize	74 (5%)	74 (5%)	0	0	74 (5%)
Lower St. Maries	128 (2%)	128 (2%)	0	0	128 (2%)
Keeler	74 (3%)	102 (4%)	102 (4%)	0	102 (4%)
Cedar	510 (24%)	510 (24%)	168 (8%)	0	385 (18%)
Blair	40 (2%)	40 (2%)	0	0	40 (2%)
Bechtel	9 (1%)	9 (1%)	0	0	9 (1%)

Timber harvest activities may result in some soil disturbance. Soils are adversely impacted by building roads and landings, operating heavy equipment, skidding logs, and piling and burning slash. Most physical damage with harvest units occurs from log skidding and operation of heavy equipment. The amount of detrimental disturbance depends on landtype, soil moisture, slope steepness, complexity of topography and the number of passes over the same ground by equipment or logs. Combinations of these may increase the magnitude or area of disturbance. In Alternatives B and F, approximately 30% of the proposed area to be harvested is designated for helicopter harvest. As a result, felling and yarding operations would have very little impact on soil productivity. In some units, harvest may be assisted by track mounted mechanized harvesters. Impacts from this equipment are expected to be similar to an excavator for slash piling. The rest of the units will be using skyline/cable systems or ground based, which have varying levels of disturbance. Effects from these are discussed below under detrimentally impacted acres. Effects on soil productivity and erosion were determined using the analysis procedure in the Updated Soil Guidelines for NEPA Analysis (IPNF 1998).

Alternatives C and D vary from 72-83% percent helicopter logging with minimal impacts on those acres as indicated previously.

New Road and Access Construction on Federal land

Alternative B proposes 9.2 miles, Alt C 0.0 miles, Alt D 0.7 mile and Alt F 6.8 miles of new construction. In all action alternatives, 2.2 miles of new road construction is proposed to provide private landholders access to their land.

Harvesting on Sensitive Landtypes

There are 3.5 acres (part of Unit 47) in Hidden Creek and 5.5 acres (part of Unit 49) in Keeler Cr. in Alternative B, which would be ground/skyline units. There are 3.5 acres (part of Unit 47) in Hidden Creek and 8.6 acres (parts of Units 49, 50, & 51) in Keeler in Alternatives C,D, and F which would be helicopter/skyline units.

No effects are expected from harvesting these units because of harvesting systems and RHCA buffers on drainages (see field notes on past harvest on sensitive landtypes in Project File). In all alternatives the units in Keeler and Hidden Creeks are on landtype 518, which is rated low for surface erosion hazard and moderate landslide potential. It has high sediment delivery ratings because of proximity to drainages. No sediment generation is expected with a low surface erosion hazard rating and application of BMPs. These proposed harvest units are RHCA buffered and this should prevent sediment, if any is generated, from reaching the drainage. In Alternative C and D these units would be helicopter/skyline harvested.

Proposed harvest units are **not** located on areas with high landslide potential. This is true for all alternatives. All potential high mass movement landtypes were buffered, as required by INFish and used to prevent harvest unit locations on high mass movement potential areas.

Detrimentally Impacted Soils

Soil productivity standards are met for all action alternatives for all activity areas. The ground based harvesting system specified for Unit 48 is estimated to cause impacts over 18% of the activity area (IPNF, Updated Soil Guidelines, 1998). The design criteria specified in Chapter 2: (skid trail spacing at 100' minimum and/or create a ½ acre reserve with-in the unit where no mechanical equipment is allowed to operate, or decompact skid trails and landings) will prevent impacts from going over the 15% standard.

Past Activity in Proposed Units

Stand 429-02-002 (unit 5) was previously treated with 37 acres of sanitation salvage in 1967. Soil conditions in this stand were observed during field visits for timber stand evaluation. Vegetative growth appears un-impacted by past activities – skid trials are well vegetated with forbs, shrubs and lots of 1-2 inch, up to 6-8 inch diameter conifers. No surface erosion or soil displacement was noted within the timber stand, except one area in an ephemeral drainage where an old skid trail was evident from the imprint left here, which is about 500 feet long by 10 feet wide, or about 0.1 acre (Ware, personal comm., 2002). This would be about 0.3% impact to the activity area (37 acre stand).

Unit 5 activity in Alternatives B, C, D, and F is to commercially thin 19.4 acres with 4 acres of ground-based operations and 15.4 acres of skyline. The percent of the activity area's soil impacted from this past harvest is estimated at 18%, which is over the Region 1 Standard of 15%.

The Regional standard calls for no increase in detrimental soil impacts within past activity areas and to move toward a net improvement in soil quality. Ground-based operations have the potential to create 18% detrimental soil impacts on the 4 acres proposed for this type of treatment. Decompacting skid trails and landings is one method of improving soil quality. Use of existing skid trails is another way to remain within the Regional standard.

Site specific design criteria for Unit 5 includes either decompaction of skid trails and landings, or use of existing skid trails or helicopter or cable yarding harvest systems (see Site Specific Design Criteria and Mitigation Table 2-4 in Chapter 2).

Fuels Treatment

Reducing fuels after vegetative treatments includes broadcast burns, underburning and pile burning and lopping and scattering slash. Burns are prescribed for the spring when soil moisture conditions are at least 25% and snow is often in the draws. The soil moisture level will prevent burning of the protective organic layer and moisture levels in the draws will prevent fires from entering those areas (USDA, 2001). Design criteria for grapple piling requires operation of equipment over an adequate slash mat. Soils will not be detrimentally impacted by fuel treatments if design criteria are followed. See Appendix A, Vegetation Treatment Summary for a list of fuel treatments by unit for each alternative. Acres of each fuel treatment by unit is in the Project File, Hidden Cedar Fuels Treatment.

Nutrient Levels

Soil nutrient levels for potassium, nitrogen and sulfur are below the critical level (Project File Document SW-39). To maintain the long-term site productivity with adequate soil nutrients, Chapter 2 – Soil and Water Design Criteria - requires that all slash be allowed to over winter before treatment for fuels reduction. This over-wintering will allow nutrients tied-up in the vegetation to leach back into the soil (IFTNC, 1998).

Road Decommissioning and Storage

Soil productivity will improve from the existing condition by the approximately 19 miles of road decommissioned or put into long-term storage in Alternatives B and C and approximately 30 miles of road decommissioned or put into long-term storage in Alternatives D, E and F. Since roads are considered a “committed” resource and not counted in the analysis for impacted soils the level of detrimentally impacted soils will not change even though soil productivity increases on 56 acres (Alt B), 56 acres (Alt C), 88 acres (Alt D) and 99 acres (Alt F).

Alternatives B, C, D, E and F

Pre-commercial Thinning

Pre-commercial thinning is done by hand (chainsaws), and the felled trees are left on site with no further treatment. Since there is no soil compaction, and no removal of biomass, there is no effect on soil productivity or quality.

Riparian Roads

Riparian Habitat Conservation Area (RHCA) road mileage decreases due to putting roads into long-term storage or decommissioned status (Road Management Prescriptions C, D, and E). See Appendix C of the FEIS – Road Definitions. In Alternatives B and C, RHCA mileage decreases by 5.7 miles. This is a 30% reduction in RHCA roads within Forest Service jurisdiction. RHCA road mileage decreases in Alternative D by 10.2 miles or 46%, Alternative E by 10.3 miles or 46%, and Alt. F by 10.2 miles or 46%, within Forest Service jurisdiction.

Soil productivity will increase on these rehabilitated roads. Riparian vegetation improvements will occur through plantings and seeding. Erosion and sediment generation will decrease through removal of these riparian roads.

In Alternative B there are 58 crossing reductions, Alternative C removes 51 crossings, Alternative D removes 69 crossings, Alternative E removes 71 crossings and Alternative F removes 76 crossings. Alternatives D, E, and F remove the riparian road in Hidden Creek.

Roads on Sensitive Landtypes

Decommissioning and storage of roads on sensitive landtypes, should realize a reduction of sediment. Alternatives B and C have 3.8 miles decommissioned or put into storage on High Sensitivity Landtypes compared to Alternative A. Alternatives D, E and F have 4.8 miles decommissioned or put into storage on High Sensitivity Landtypes compared to Alternative A.

Table 3-18 - Roads* Stored or Decommissioned on Sensitive Landtypes on NFS lands

Road Management	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Road Prescription C (miles)	5.5	7.4	7.4	5.4	5.4	5.4
Road Prescription D (miles)	0.7	2.7	2.7	4.9	4.9	4.9
Road Prescription E (miles)	0.1	.02	.02	0.8	0.8	0.8
Total Miles	6.3	10.1	10.1	11.1	11.1	11.1

*includes cost-share, non-system, and FDR (no private)

In Alternatives C and E, no road construction other than cost share associated with access requests is planned. Access request roads are the same for all action alternatives, with a total of .13 miles of road construction on high sensitivity landtypes. All sensitive landtypes with road construction have low surface erosion hazard and moderate mass movement potential except as noted in the following tables. Design Features and Mitigation listed under Roads in Chapter 2 will prevent sediment generation and movement, which will prevent effects on water quality or impairment of beneficial uses.

Mass Movement Potential: In Alts. B and F, there are 176 feet of proposed new construction in Wood Cr. on National Forest administered land on a potential mass movement area. Road design criteria for this area should not concentrate water or increase soil-water *enough* to reduce shear strength and initiate earth movement. A field review of this site (project file, document SW #46) indicated construction at this location would not cause mass movement because of its location on a ridge top. This road will be obliterated once treatments are complete.

Table 3-19 - Reconstruction on National Forest land on High Sensitivity and High Mass Movement Landtypes

Watershed	Miles on High Sensitivity		Miles on High Mass Movement	
	Alt B/C	Alt D/E/F	Alt B/C	Alt D/E/F
Hidden Cr.	0.2	0.1	0	0.1
W. Fk. St. Maries R.	0.1	0.2	0.1	0.1
Lower St. Maries R.	0.5	0.3	0.6	0.3
Wood Cr.	0.2	0.0	0.2	0.0

Utilization of Best Management Practices and engineering construction specifications will prevent significant effects from occurring on reconstructed or new road construction on these landtypes (Seyedbagheri, 1996, Lynch and Corbett, 1989, 1990, Idaho DEQ ,2001, USDA FS, 2002).

Cumulative Effects of Alternatives B, C, D and F

In Alternatives B, C, D and F detrimental soil impacts are within the Regional standard of 15%. The design criteria and mitigation (see Chapter 2 – Soils) for these units will prevent exceeding the 15% standard. Improved soil productivity on decompacted and re-contoured roads occurs on 56 acres for alternatives B and C, 88 acres for alternative D, and 99 acres for alternative F. Short-term increases in soil movement are expected from the road decommissioning/storage, but in the long-term soil erosion and movement is expected to substantially decrease from these road treatments compared to the existing condition. Mitigation to minimize soil movement from decommissioning and storage activities include establishment of sediment basins, seeding and mulching of disturbed sites. Any short-term increase is inconsequential compared to long-term reductions in sediment and risk of sediment pollutant entering the streams if these crossings fail. See stream crossing restoration sediment monitoring in Project File (document SW 43).

Table 3-20 - Road Construction on <u>Private</u> land on High Sensitivity and High Mass Movement Landtypes

Watershed	High Sensitivity	High Mass Movement
W. Fk. St. Maries R.	0.1 mi.	0.0 mi.
Lower St. Maries R.	0.01 mi.	0.2 mi.
Long Slim Cr.	0.01 mi.	0.0 mi.
Cat Spur Cr.	0.1 mi.	0.1 mi.

<u>Alternative E</u>

Direct and Indirect Effects

No harvest activities will take place. The only change in soil quality expected from this alternative is through road treatments. Road decommissioning/storage would take place over 30.4 miles. This would lead to improved soil productivity on about 92 acres. Roads located in RHCAs would decrease by 46% or 10.3 miles. Road decommissioning/storage would remove 71 stream crossings. A temporary increase in soil erosion and movement would occur from these road treatments, but this would be short-term. The short-term increase is inconsequential compared to long-term reductions in sediment and risk of sediment pollutant entering the streams if these crossings fail. See stream crossing restoration sediment monitoring in Project File(SW-43). In the

long-term, there will be a decrease in soil movement and erosion once treatment is complete and vegetation is established on these treated areas.

Nutrient Levels

Nutrient levels are not expected to change in the short-term. In the long-term nutrient levels are expected to increase as nutrients tied-up in vegetation are released after mortality through natural decomposition processes.

Cumulative Effects of Alternative E

No cumulative effects on the soil resource are expected from this alternative because only restoration activities are planned. There may be a short-term increase in soil movement before vegetation becomes reestablished within 1-2 years on the re-contoured surfaces and stream crossing restoration sites, but this is expected to be inconsequential because mulching and seeding are part of the restoration work. In the long-term, there will be a reduction of soil movement.

Cumulative Effects

The overall sediment budget from Federal lands is expected to decrease in all action alternatives because of the level of roads being decommissioned and put into long-term storage. Private activities of timber harvest, road construction and grazing will continue and these activities may contribute sediment to the stream system. Private land activities are regulated by the State of Idaho. Monitoring grazing sites on the St Joe Ranger District found that there was about a 5% impact to the soil resource from compaction attributable to cattle grazing. This monitoring was conducted on areas in the Hume Creek drainage where cattle use was very evident from the existence of trails and cow manure. From personal observations during the field seasons of 1999-2001, other areas with permitted grazing do not have the concentrated use evident in Hume Creek and with more dispersed grazing soil impacts are going to be less than that found in Hume Creek.

Road decommissioning will lead to a reduction in sediment generation. These reductions will improve conditions and move toward the goal of attainment of beneficial use support. Calculation of reduction in sediment from road decommissioning on National Forest land is based on Burroughs et al., (1983) using road lengths from the Transportation section.

Table 3-21 - Net Change in Sediment from Road Decommission and Storage on Soils

Alternative	A	B	C	D	E	F
Miles of Road Stored or Decommissioned	0	27.4	18.4	29.6	30.4	29.6
Estimated Percent Reduction in Sediment*	0	9%	21%	34%	36%	25%

*Proposed new and access construction is used to arrive at the final value displayed.

Cat Spur Creek has road construction occurring on private land on 370 feet of high potential mass movement landtype. Design criteria for the proposed construction should prevent concentration of water to this area to prevent slope failure.

Minimum levels of harvest are proposed on areas identified as sensitive landtypes. No effect is expected to the soil resource from this proposed activity because there are only 2.6% detrimental impacts for Unit 47 and 0.8% detrimental impacts in Unit 49. These values are well below the

Regional soil standard. Units 50 and 51 also have small amounts of land identified as sensitive but these are helicopter units with no predicted impacts.

The Region One's 15% detrimental impact soil standard is not applicable to private land.

Consistency with Forest Plan and Laws

Both the Regional Standard of 85% and the Forest Plan Standard of 80% for soil health and productivity are maintained. Impacts for activity areas were calculated at 14.89% - for the existing condition. Combining the existing condition with proposed treatments in Alternative B the soil impacts are 12.83% and for Alternative C 12.77%. Alternatives D, E and F treat less acreage and the impacts will be less than that for Alternatives B and C so they will also comply.

Large Woody Debris, soil nutrients and soil movement will be protected through design criteria listed in Chapter 2.

WATER

Introduction

The West Fork St. Maries River, including tributaries, is about 36.5 square miles, 10 miles long and flows east and then north from headwater elevations up to 5200 feet. The confluence of the Middle and West Forks of the St. Maries River occur at an elevation of about 2700 feet near the town of Clarkia. There is an additional 15.4 sq. miles north of this confluence within the Hidden Cedar area, identified in this report as Lower St. Maries River. The Middle Fork of the St. Maries lies outside the analysis area. This area receives about 40 inches of precipitation annually. Approximately 80% of the area is within the 3000-4500 foot contour interval "rain-on-snow" zone (St. Joe GA 1997).

Valleys are broad in the lower reaches of the main tributaries and the St. Maries River. Upper reaches have narrow valleys and moderately-steep to steep side slopes. Ridge tops are broad and rounded. Slopes are highly dissected and for the most part heavily vegetated with conifers, shrubs, forbs and grasses. Valley bottoms in lower reaches are meadows utilized for grazing and hay production.

Regulatory Framework

Idaho Panhandle Forest Plan

The Forest Plan directs the following pertaining to water:

Maintain water quality to meet or exceed State Water Quality Standards: To help accomplish this objective, BMPs must be applied to management activities. Monitoring efforts must focus on the implementation of BMPs and their effectiveness in protecting water quality. Water quality that does not meet State Water Quality Standards (IDAPA 58.01.02 [Note: IDAPA 16.01.02 is now IDAPA 58.01.02]) should be improved through restoration projects, through scheduling of timber harvest and road building activities so beneficial uses are supported.

Manage resource development to protect stream channel integrity: Manage riparian areas to meet objectives for dependent resources (fish and wildlife habitat, water quality, stream channel integrity, and vegetation) while producing other resource outputs.

Forest Wide Standards

Management activities will not significantly impair the long-term productivity of the water resource and ensure that state water quality standards will be met or exceeded.

Maintain concentrations of total sediment or chemical constituents within State standards.

Implement project level standards and guidelines for water quality contained in the Best Management Practices (Appendix S, available upon request), including those defined by State regulation or agreement between the State and Forest Service such as:

a. Idaho Forest Practices Rules (IDAPA 20.02.01)

b. Stream Channel Alterations Rules IDAPA 37.03.07

c. Best Management Practices (Applicable BMPs & Soil and Water Conservation Practices)

Cooperate with the states to determine necessary instream flows for various uses. Instream flows should be maintained by acquiring water rights or reservations.

Manage public water system plans for multiple use by balancing present and future resources with public water supply needs. Project plans for activities in public water systems will be reviewed by the water users and the State. Streams not defined as public water systems, but used by individuals for such purposes, will be managed to the standards stated below or to the fisheries standards whichever is applicable.

Activities within non-fishery drainages, including first and second order streams, will be planned and executed to maintain existing biota. Maintenance of existing biota will be defined as maintaining the physical integrity of these streams. Best Management Practices (Forest Plan – Appendix S), Forest Plan – Appendix O, and riparian guidelines will be used to accomplish this objective.

It is the intent of this plan that models be used as a tool to approximate the effects of National Forest activities on water quality values. The models will be used in conjunction with field data, monitoring results, continuing research and professional judgment, to further refine estimated effects and to make recommendations.

Management Areas 1, 4 and 5

Forest Plan direction is to refer to Best Management Practices.

INFish Amendment to the IPNF Forest Plan

Riparian Habitat Conservation Areas are determined for watersheds to safeguard water quality benefits through stream shading, vegetative buffers for sediment control, and channel stabilizing features of woody debris and streambank vegetation.

Clean Water Act

A declared objective of the Clean Water Act (33 U.S.C. 1323) is to "...restore and maintain the chemical, physical, and biological integrity..." of streams (U.S., 1988). The CWA directs the Forest Service to meet state substantive and procedural requirements respecting control and abatement of pollution. Through a Memorandum of Understanding with the State of Idaho (IDWR, 1993), the Forest Service is responsible for implementing nonpoint source pollution control and the Idaho Water Quality Standards (IDAPA 58.01.02) on National Forest System lands. Forest Service water quality policy is to; promote the improvement, protection, restoration and maintenance of water quality to support beneficial uses, promote and apply approved Best Management Practices (BMPs) to control non-point source pollution, comply with state and national water quality goals, and design monitoring programs for specific activities and practices that might affect in-stream beneficial uses (IDWR, 1993).

Water Quality Limited Segments

The West Fork St. Maries River and the main stem St. Maries River below Clarkia are listed on Idaho’s 1998 list of Water Quality Limited Water Bodies (303(d) list). The pollutants of concern are temperature and sediment for the West Fork, and nutrients, habitat alteration, and sediment for the main stem St. Maries River below Mashburn to the confluence with the St. Joe River. The segment from Clarkia to Mashburn is listed for unknown pollutants.

Idaho Water Quality Law

The State of Idaho established the Idaho Water Quality Law (§39-3601 et. seq.), water quality standards (IDAPA, 58.01.02) designed to protect beneficial uses, and an Anti-degradation Policy (IDAPA, 58.01.02) which directs that existing uses and the level of water quality necessary to protect those uses must be maintained and protected.

Designated beneficial uses for the St. Maries River are Cold Water Aquatic Life, Primary Contact Recreation, Domestic Water Supply and Special Resource Water Beneficial Use designations (IDAPA 58.01.02.110.11; IDHW, 1996). Tributaries are Undesignated Surface Waters (IDAPA 58.01.02.101.01). Existing beneficial uses in these tributaries are aquatic life (cold water biota), and primary or secondary contact recreation (IDAPA 58.01.02.101.01.a).

Analysis Methods

The water resource will be assessed using the proper functioning of basin hydrology (water yield, vegetative and soil conditions), stream channels, and water quality and beneficial uses (pollutant sediment levels, stream temperature, etc.). Water yield and peak flow are interchangeable in the analysis that follows.

Analysis Area

The Hidden Cedar area is composed of the West Fork of the St. Maries River, its named tributaries, the lower St. Maries River below Clarkia to the confluence with Emerald Creek and some unnamed “face” drainages of the main St. Maries River. Direct, indirect and cumulative effects of the proposed activities are evaluated on the St. Maries River watershed and its tributaries within the Hidden Cedar Project Area and defined on the Watershed Analysis Area Map (M-17). Table 3-22 identifies named drainages, their seventh-level Hydrologic Unit Code (HUC-7) and their size in acres from ARCINFO Geographic Information Systems (GIS).

Table 3-22 - Watersheds in the Hidden Cedar Area

Watershed	HUC-7	Size (acres)
Blair Creek	17010304504600	1849
Staples Creek	17010304504300	360
Cedar Creek	17010304506600	2126
Bechtel Creek	17010304505011	1328
Maize Creek	17010304505010	1407
Wood Creek	17010304505009	777
Hidden Creek	17010304505008	1677
West Fk. St. Maries R.	17010304505000	5245
Keeler Creek	17010304505006	2665
Long Slim Creek	17010304505005	2474
Cat Spur Creek	17010304505003	7675
Lower St. Maries River	17010304504100	5373

The Middle Fork of the St. Maries is not within the analysis area and is only considered in the cumulative effects analysis. The Middle Fork has minimal extent of Federal land; private ownership and timber companies have the largest roles in managing this area. Cumulative effects will consider activities in the Middle Fork St. Maries River (see page 3-78). Throughout the Soil and Water Resource Sections, acres were calculated by ARCINFO GIS, and these are rounded off, which may cause slight discrepancies between resource analysis numbers.

Sediment increases from anthropogenic influences to the St. Maries River system will be felt in the river to the slack water portion backed-up by Lake Coeur d'Alene. Once the stream reaches the slack water section, sediment will drop out to due to decreased stream velocity. In general, water yield increases (if they are significant increases to peak flows) may cause changes in channel geometry to about this same location.

Affected Environment

Proper Functioning of Basin Hydrology (Vegetative and Soil Condition and Water Yield)

Vegetative and Soil Conditions

A purpose of vegetative treatments is to move composition and structure toward more natural conditions. Natural vegetative conditions assumedly equate to natural hydrologic conditions. However, hydrologic effects from roads or channel modifications do not represent natural conditions and may preclude some benefits of vegetative treatments. Roads which currently affect hydrologic function will continue to do so, yet unused roads will become overgrown and rooted, at least partially restoring hydrologic function over the long term

Past vegetative treatments, fire and fire suppression have all affected basin hydrology through change of the hydrologic cycle. Change in canopy cover or density affects transpiration, interception, snow accumulation, evaporation from the ground surface (wind velocity and radiation balance changes), sublimation, and organic material accumulation. Changes in water yield and peakflows may also result from change in the vegetative structure. Basin hydrology responds to these changes by adjusting components of the hydrologic cycle.

If one considers geologic timeframes, a watershed has experienced all vegetative conditions from complete fire holocaust that created hydrophobic soil conditions and extreme runoff events to overstocked dense stands of timber that utilized most soil moisture and intercepted much precipitation (especially snow) and reduced water yields to minimal levels.

Water Yield

Peakflows are estimated using Embry's (1981) procedure (see Table 3-23). However, Embry's (1981) procedure does not account for management activities. Increases in water yield will be estimated using the WATSED model and procedures developed by Kappesser (1991) and Flood using Packer's (1971) research in North Idaho (Project File, SW-26). WATSED estimated current conditions based on activities, including private activities within the drainages modeled.

The following table lists estimated peakflow for the two- and fifty-year recurrence intervals in cubic feet per second (cfs) for selected drainages in the Hidden Cedar area. These are the drainages with activities under the proposed action.

Table 3-23 - Embry Estimated Flood Frequency

Watershed	Annual Precipitation	2 Year Peakflow	50 Year Peakflow
Wood Creek	42 inches	22 cfs	57 cfs
Hidden Creek	42 inches	45 cfs	112 cfs
W. Fk. St. Maries R.	44 inches	129 cfs	324 cfs
Maize Creek	41 inches	37 cfs	94 cfs
Lower St. Maries R.	40 inches	121 cfs	304 cfs
Long Slim Creek	42 inches	63 cfs	159 cfs
Log Creek	42 inches	56 cfs	141 cfs
Kitten Creek	42 inches	41 cfs	102 cfs
Keeler Creek	43 inches	69 cfs	174 cfs
Cat Spur Creek	42 inches	97 cfs	244 cfs
Cedar Creek	40 inches	53 cfs	138 cfs
Blair Creek	40 inches	47 cfs	117 cfs
Bechtel Creek	40 inches	35 cfs	87 cfs

The WATSED model estimates water yield increases over “natural” conditions for the existing condition. Road and harvest activities on all lands within the identified drainages, including private were used to estimate watershed response using WATSED. The following table shows these values by drainage.

Table 3-24 - WATSED - Water Yield on Existing Condition

Watershed	Percent increase over “natural”
Wood Creek	12%
Hidden Creek	8%
W. Fk. St. Maries R.	5%
Maize Creek	9%
Lower St. Maries R.	10%
Long Slim Creek	3%
Log Creek	5%
Kitten Creek	5%
Keeler Creek	9%
Cat Spur Creek	3%
Cedar Creek	5%
Blair Creek	15%
Bechtel Creek	6%

In the Cat Spur watershed the WATSED model can be compared to actual measured discharge from the years 1987-1997. The model had a range of values that over-predicted water yield by as much as 2.16 times in 1994 to under-prediction 0.75 times the measured value. Over this period, the average increase in peak month discharge that was measured is equal to the modeled value. (USDA Forest Service Annual Monitoring Report, 2000).

Stream Channels

Stream Channel Integrity

The project area boundary encompasses W. Fk. St. Maries River, its tributaries and the lower St, Maries River and its tributaries below Clarkia to the confluence with Emerald Creek. Stream channel conditions and effects are assessed for the individual tributaries and cumulative stream channel effects are assessed downstream through the W. Fk. St. Maries River and the lower St. Maries River.

Stream channel integrity is assumed to mean a channel system in which water and sediment yields are balanced such that the channels maintain a form reflective of what might be naturally expected (Leopold et al., 1964). Fundamental to this discussion are channel types, response potential, and cause-effect evaluation. The channel types referred to here are from Montgomery and Buffington (1997) and Rosgen (1994). Sediment and water yield predictions are evaluated against channel response potential and cause-effect linkages to indicate a potential for compromising stream channel integrity.

Given the inherent diversity, complexity, and measurement uncertainty of sediment production and transport processes, universal sedimentary cumulative effects' modeling is not realistic (NCASI, 1999). There is no sediment monitoring data for the St. Maries River to indicate current vs. natural loading and transport rates. Therefore, probability of erosion and sediment delivery is determined pragmatically from cause-effect rationale based on field investigations of past activities and change in road miles from decommission, storage or construction.

Stream Channels

Using the Rosgen (1994) classification system, the channel of the West Fork St. Maries River is a low sinuosity moderate gradient "B" channels in upper reaches, an incised low gradient "F" and meandering low gradient "C" in lower elevations (Project File). The Lower St. Maries below Clarkia to the confluence with Emerald Creek is a meandering low gradient "C" channel and incised low gradient "F" channel. In the Montgomery and Buffington (1997) classification, upper reaches classify as colluvial, cascade, step-pool to forced pool riffle; and pool riffle in lower reaches. Tributaries of the St. Maries River (and West Fork) like Hidden, Maize and Wood Creeks have Rosgen sinuous low gradient "E" channels in the lower reaches, transitional "C" channels and "B" channels in the upper reaches and in the Montgomery-Buffington system, pool riffle and forced pool riffle in lower reaches and cascade, step pool and forced pool riffle in upper reaches. Both Bechtel and Maize Creek have short reaches of Rosgen "D" channels – multiple channels associated with past beaver pond deposition. Cedar Creek field notes (Hallisey, Field Notes, Project File, W-5) indicate wetland meadows and discontinuous channels with some areas of pool-riffle and a dry Rosgen "E" channel near the mouth.

Alluvium ranges from fine sands and silts to gravels and cobbles. This material has been transported and resorted at high discharges, although flows at or near the average annual peak (QF2P at bankfull or less) do not appear to cause significant mobilization and redistribution.

Existing conditions are evaluated in terms of water and sediment yield characteristics and their relationship to current and potential natural channel form. Cascade and step-pool reaches are considered transport segments that are morphologically resilient because they can rapidly convey increased sediment and discharge; pool-riffle reaches are response segments whose channels may incur morphological adjustment in response to increases in discharge or sediment (Montgomery and Buffington, 1997.) The lower reaches of the West Fork and main stem of the St. Maries River are adjusting to riparian and watershed vegetative changes from past harvest activities that limit amounts of large organic material that normally stabilize stream channels; and grazing or other reduction of stabilizing streamside vegetation, especially the deep-rooted shrub component. The tributaries of the West Fork appear to be transporting their sediment and discharge without excess alterations to stream channels. Lateral channel migration is occurring in the lower reaches of the West Fork and St. Maries River, but this is expected in Rosgen “F” & “C” channel types. The rate of adjustments in these stream types is dependent on vegetation type/quantity and soil/alluvium types.

Water Quality and Beneficial Uses (Pollutant Sediment Levels, Stream Temperature).

The Water Quality Limited Stream Segments (WQLS) on the State of Idaho’s 303(d) list are apparently not fully supporting beneficial uses because of pollutants – sediment, temperature, habitat alteration, nutrients and for one reach unknown pollutant(s). It is imperative that no further impairment of these stream reaches occur because of management activities on Federal land through pollutant increases or introduction of new pollutants, and that Federal activities are designed to restore water quality that will support these beneficial uses. There are seventeen road failure hazard sites identified in the project area that are at risk for pollutant sediment delivery.

Environmental Consequences

Hydrologic response to vegetative change is highly variable and dependent on numerous site factors - elevation, aspect, slope, soils, landforms, flow regimes, stream channels, etc. It is important that hydrologic changes from vegetation changes are examined in the context of those factors, and then translated into potential changes to streamflow, flooding, water quality, erosion, and aquatic habitat. Numerous models have been developed which attempt to replicate these complex processes, some from a theoretical basis and others derived from empirical data. It is the intent of the Forest Plan that models be used as a tool to approximate effects, but also used in conjunction with data, research, and professional judgment to refine estimates and make recommendations (IPNF, 1987). A pragmatic, stepwise approach was used to describe potential changes to water and sediment yield, and likely effects on beneficial uses, hydrology, channel conditions, pollutant sediment delivery, and soil productivity.

Alternative A - No Action

Direct and Indirect Effects

No timber harvest would occur in this alternative.

Proper Functioning of Basin Hydrology (Vegetative and Soil Conditions and Water Yield)

Past vegetative treatments, fire and fire suppression have all affected basin hydrology through change of the hydrologic cycle. Change in canopy cover or density affects transpiration, interception, snow accumulation, evaporation from the ground surface (wind velocity and radiation balance), sublimation, and organic material accumulation. Changes in water yield and peakflows may result from change in vegetative structure (MacDonald and Hoffman, 1995).

Because roads within a basin generally increase runoff and decrease subsurface flows, these components of the hydrologic cycle will remain at their current levels. Decreased water yield will occur over time as the vegetation within these watersheds becomes denser and utilizes more soil moisture and the canopy intercepts more precipitation.

Soil productivity will remain constant over the short-term with an improving long-term trend as old roads grow in, and disturbed soils (old roads) rebuild horizons and organic debris rebuilds.

Improved soil conditions will increase infiltration rates.

Roads which currently affect hydrologic function will continue to do so, yet unused roads will become overgrown and rooted, at least partially restoring hydrologic function over the long term.

No road decommissioning will occur to restore hydrologic hill slope functioning and reduce sediment generation. Road failure hazards will be reduced with sporadic and incidental funding for road maintenance, from capital investments, or from supplemental emergency funds. Hazards will not be reduced to the degree or in a timeframe consistent with desired conditions and pollutant sediment delivery will remain a concern. Sediment from diffuse sources (hill slopes) will continue to be low as observed (Field Notes, Project File- SW #44). No new road crossings or restoration of existing crossings will occur. Seventeen-road failure/hazard sites were identified in the project area (Project File, Roads Analysis). Most of these are surface erosion (9), small slumps or fill settling (5), or crossing problems (3). No effect on basin hydrology is anticipated from the existence or repair of these sites because they are not affecting components of the hydrologic cycle. Treatment of these sites will reduce failure hazard and associated risk of pollutant sediment delivery to streams, which could also impact channel conditions. Untreated sites will remain as risks for pollutant sediment delivery to the stream system. Pollutant sediment will be generated during culvert placement, replacement, and removal. This will occur over short periods of hours (Briggs, Project File, Document SW #43) up to 1-2 days. Some suspended pollutant sediment will be delivered to and through fishery segments and show up as temporary turbidity.

Beneficial Use impairment will remain at the current level because no restoration activities will occur. The annual road maintenance program is likely to repair some of the identified road hazard sites.

Stream Channels

No changes to stream channels are expected from Alternative A. Tributary streams (Rosgen B and E channels) are transport reaches that are resilient to most discharge or sediment-supply perturbations because of high transport capacities and generally supply-limited conditions (Montgomery and Buffington, 1997).

The lower reaches of the main stem of The West Fork and the St. Maries River (Rosgen C and F channels) are more responsive to altered discharge and sediment supply (Montgomery and Buffington, 1997, Rosgen, 1996) and they also are adjusting to loss of riparian vegetation. These lower reaches are experiencing lateral migration, some areas of aggradation where obstructions or lower gradients aid in sediment storage and some areas of degradation where gradients or entrenchment is high. Probably the main effect to channel morphology has been the loss of riparian vegetation and the loss of stabilization provided by large woody debris on the lower reaches of the West Fork and St. Maries River. This trend will continue until riparian vegetation becomes reestablished.

The State of Idaho recognizes impaired water quality on the West Fork from sediment and temperature and main stem St. Maries River from nutrients, habitat alteration and sediment. Total Maximum Daily Load determinations are scheduled for 2002. The West Fork tributaries and St. Maries River tributaries in the analysis area, except the Middle Fork St. Maries River, are not identified by the State of Idaho as having impaired beneficial uses. Channel conditions will remain much the same. Bedload, fine sediment loads and discharge will remain at current levels with discharge decreasing over time as vegetative density increases.

Cumulative Effects

Basin hydrologic function will remain at its current level of increased water yield (see WATSED results, Table 3-24). Water yield may increase because of impervious road surfaces and accelerated time of concentration and there may be decreased subsurface flow because of interruption of subsurface flow in road cuts (Macdonald and Hoffman, 1995). Other components of the hydrologic cycle will remain at the current level with the exception of interception which would increase because of vegetative density increases; soil moisture decreasing because of higher utilization; and water yield perhaps decreasing but this could be countered by activities on private lands. Soil productivity will remain at the current level.

No improvement to stream channels or riparian areas will occur as planned in the action alternatives. Stream channels are expected to remain in their present conditions: maintaining their existing trend of response in Rosgen C and F reaches with bank erosion and lateral migration.

Road construction will occur on private land. Utilization of BMPs such as gravelling, slash-filter-windrows, mulching and seeding will decrease sediment generation from proposed construction on Federal land (Burroughs and King, 1989). Private land activities of road building (about 6 miles), timber harvest and grazing will continue at current levels. Activities on private land are regulated by the State of Idaho by administrative rules such as the Forest Practices Act that are designed to protect the environment and decrease sediment generation. Current levels of sediment yield and water yield will remain or slightly increase from these activities. Without full disclosure

of spatial and temporal data associated with planned private activities, quantification of cumulative effects is not possible.

Beneficial Use impairment will remain at the current level because no restoration activities will occur. The annual road maintenance program is likely to repair some of the identified road hazard sites.

The White Pine Progeny Site located in Blair Creek would be reestablished with genetically engineered white pine. This activity would remove the existing sapling sized and smaller grand fir and Douglas-fir and replant with white pine.

All of this work is located near a ridge and sideslope in the headwater area of this watershed. The activity would be handwork and no effect to water quality or beneficial use is expected because only minimum soil disturbance will occur while hand-planting individual stock.

Effects Common to All Action Alternatives

This section will concentrate on and include effects discussion on Activities that are Common to the Action Alternatives

Direct and Indirect Effects

Proper Functioning of Basin Hydrology (Water Yield, Vegetative And Soil Conditions)

No harvest treatments are proposed on landtypes with high mass movement potential. Likewise, no ground skidding is proposed on landtypes with high surface soil erosion hazards. This initial modification helps ensure that the proposed activities do not cumulatively aggravate the existing primary water resource concerns in the project area. Considering the variable site factors which dictate hydrologic response, each treatment unit was analyzed to determine the degree of hydrologic change. Stream channels were rated by response potential (Montgomery and Buffington, 1993, Rosgen, 1996) to changes in flow.

Restoration of riparian vegetation is proposed in all action alternatives through plantings of cottonwood, willow, dogwood, and conifers. Although the effect of this restoration is over the long term, some benefits to channel stability will occur once deep rooted vegetation becomes established in a few years. The short and long term benefits will be most noticeable on the West Fork and main stem St. Maries River.

Basin hydrology maintains and responds to the hydrologic cycle. Alteration of this cycle occurs from vegetative, climatic and geomorphologic changes. The activities proposed in the action alternatives will change the vegetative makeup of the basin through harvest, and hill slope condition (geomorphology) through road construction and decommissioning/storage. Basin hydrology may respond to vegetative changes through different ablation rates (Packer, 1971), change in snowpack or snow-water content and wind passage and velocity (Fowler et al., 1987), yet vegetative change is well within the realm of past conditions from wildfire. The role of roads in basin hydrology is generally that of increasing “flashiness” and runoff (Dunne and Leopold, 1978, MacDonald and Hoffman, 1995). The planned road decommissioning and storage (includes decompaction) in the action alternatives should ameliorate some of the increased flashiness and runoff compared to existing conditions. Returning vegetation to resemble states that reflect

"unmanaged" conditions (see vegetation report) should lead to basin hydrology that would also be more reflective of natural conditions.

Water yield peakflow changes are estimated from the average of three methodologies, Packer (1971), Kappesser (1991) and WATSED. The average resultant increases from the activities proposed in this basin follow: Alt B: 3.0%, Alt C: 0.0%, Alt D: 1.6%, Alt E: 0.0%, Alt F: 2.8%. This is discussed in more detail in the effects from timber harvest activities on page 3-71

Stream Channels

No changes to stream channels are expected in tributary streams (Rosgen B and E channels, Montgomery-Buffington step-pool, cascade and plane-bed channels) because transport reaches are resilient to most discharge or sediment-supply perturbations because of high transport capacities and generally supply-limited conditions (Montgomery and Buffington, 1997). The lower reaches of the main stem of the West Fork and the St. Maries River (Rosgen C and F channels, Montgomery-Buffington pool-riffle channels) are more responsive to altered discharge and sediment supply (Montgomery and Buffington, 1997, Rosgen, 1996) and they also are adjusting to loss of riparian vegetation. These lower reaches are experiencing lateral migration, some areas of aggradation where obstructions or lower gradients aid in sediment storage and some areas of degradation where gradients or entrenchment is high. Probably the main effect on channel morphology has been the loss of riparian vegetation in the West Fork and lower reaches of the St. Maries River. This trend will continue until riparian vegetation becomes reestablished. Response reaches may experience higher levels of lateral migration and bank erosion in areas of aggradation.

Extent of channel response: The relationship described by Schumm (1977), of stream power being proportional to the cube of velocity indicates that small increases in water yield would not increase stream power per unit area consequentially, because channel area increases as stage increases and area greatly increases once streamflow accesses floodplains. And the relationship of channel width being proportionate to the square root of discharge (Leopold et al., 1964, and as reported in Gordon, 1995) also indicates that these small increases in water yield – peakflow will have inconsequential effects. In areas where stream banks are currently eroding (i.e., outside meander bends in Rosgen C reaches or incised areas of Rosgen F channels, see Project File) some additional erosion may take place. Yet, (Leopold et al, 1964, p. 324) found [cross] "Sections show concomitant erosion on the concave bank and deposition on the point bar. The cross sections show that during the time the channel moved laterally a distance equal to one channel width, the concurrent deposition on the point bar kept the channel width about constant. Various sections measured over the 8-year period showed that the net volume of deposition was about equal to erosion. At the point of maximum curvature, erosion exceeded deposition; just downstream from this point deposition exceeds erosion." Schumm (1972) cites research by Everitt (1968) that concluded that one-half of the Little Missouri River's flood plain was reworked during a 69 year period. These latter conclusions indicate that normal progression of rivers is to migrate across their floodplain.

Floodplains and Wetlands

Wetlands are mostly associated with stream channels within the project area or are smaller than ¼ acre and are not mapped. Those associated with stream channels will be protected by Riparian Habitat Conservation Area (RHCA) buffers.

Wetlands buffers will meet standard widths defining interim RHCAs. No effect to wetlands is anticipated from this project. Increasing water yield could be beneficial to current wetlands and actually establish new ones.

Floodplains are adjacent to stream channels and are protected by buffers according to RHCA guidelines. Improvement activities under the riparian planting proposal may improve floodplain conditions – providing for more storage of sediment and attenuating flood peaks. No effect to floodplains is anticipated from the proposed activities.

Road Hazards

One goal is to reduce or eliminate erosion and mass failure hazards on roads: Seventeen-road failure hazard site were identified in the project area (Project File). The intent is to repair some of these sites with road reconstruction work (6 sites) associated with the vegetative treatments. Treatment of the remaining sites is dependent on available maintenance, KV or Capital Investment Program funding, none of which is a certainty. Twelve sites are on roads proposed for decommissioning, two on roads going into long-term storage, and the rest on roads identified for reconstruction/maintenance. Treatment will reduce failure hazard and associated risk of pollutant sediment delivery to streams. Untreated sites will remain hazards however and risks for pollutant sediment delivery will remain high. Pollutant sediment will be generated during culvert placement, replacement, and removal. This will occur over short periods of hours (Briggs, Project File) up to 1-2 days. Some suspended pollutant sediment will be delivered to and through fishery segments and show up as temporary turbidity. Decommissioned road segments will restore subsurface flow continuity, reestablish infiltration, and re-vegetate. This will restore hydrologic function in high road density watersheds, and improve soil productivity over the long-term.

Large Woody Debris Placement

Replace large woody debris elements and structure to approximately 1.2 miles of the West Fork St. Maries R. in Sections 25 & 26, T42N, R1E. Channel conditions will greatly improve with this treatment, provided it coincides with riparian restoration and re-vegetation efforts. The debris will help restore normal step-pool structure, improve aquatic habitat, and stabilize and regulate bedload and sediment routing, which may reduce pollutant sediment. Sustained channel improvement and maintenance is dependent on proper riparian function and normalized rates of natural woody debris recruitment. The material will also disperse flow energies otherwise available for bedload or bank erosion, and attenuate flood waves, helping restore hydrologic function of the channel area. This work will be accomplished by obtaining logs or trees from outside riparian areas, perhaps from nearby timber sales, blowdown patches, etc., transported to the stream, and placed by track-hoe or Spyder-hoe equipment. Some fine pollutant sediment will be entrained and transported during the work and the activity should take place at low flow stage and/or when fishery values would be least impacted. Proposed large woody material placement in the West Fork St. Maries River may temporarily increase sediment in near downstream reaches. This effect will be coincident with the placement work. Long-term improvement to stability will benefit the project area reach and downstream aquatic habitat. Pursue further rehabilitation on private reaches through cooperation with private landowners.

Stabilization of Existing Roads

Rehabilitate unneeded roads through culvert removal, decompaction, re-contouring and obliteration. Unneeded roads will be decommissioned to allow infiltration, subsurface flow continuity, and re-vegetation. This will restore hydrologic function of the sites and more importantly of hillslope processes and small watershed hydrology where many road acres will be rehabilitated. Long-term soil productivity will also improve. Culverts will be removed at stream crossings and the risk of mass failure at these sites eliminated. This will improve channel conditions by removing flow restrictions and decrease potential sources of pollutant sediment from fill failure and the number of potential sediment entry points to the stream system. Some fine pollutant sediment will be entrained in streams during culvert removal or replacement operations.

This will occur over short periods of hours (Briggs, Project File) up to 1-2 days. Some suspended pollutant sediment will be delivered to and through fishery segments. Rehabilitation of these roads is solely dependent on available KV or CIP funding. For a comparison by alternative of the number of stream crossings and road miles rehabilitated see the Effects Summary Table at the end of this report.

Pre-commercial Thinning

Proposed pre-commercial activities are identified by watershed in the following table.

Table 3-25 – Pre-commercial Thinning acres by watershed

Watershed	Acres	Watershed	Acres
Lower St. Maries R.	217	West Fork St. Maries R.	53
Cedar Creek	3	Keeler Cr.	90
Maize Creek	43	Bechtel Creek	16
Wood Creek	32	Long Slim Cr.	149
Hidden Creek	9	Log Cr.	3

No effects to water yield or sediment levels are expected from these activities because acres to be treated are spread across a number of watersheds, vegetative cover will rapidly increase to pre-treatment levels and all activities are non-mechanical (hand work) in both falling and planting. Minimum 50-foot buffers to channels and wet areas are required (see Design Criteria and Features – Soil and Water).

Riparian Planting

Another activity proposed for the Hidden Cedar area includes riparian planting along approximately five miles of Wood Creek, Hidden Creek and West Fork St. Maries River. The approximate 20-30 acres would have cottonwood, conifers, shrubs and possibly sedge planted to increase riparian functionality and provide for future large woody debris incorporation into the stream channel system for stability and habitat improvement. This treatment will provide net benefit to overall hydrologic conditions and the aquatic ecosystem. Some temporary fencing may be utilized to protect the plantings and possible permanent fencing on the lowest reach of Hidden Creek below the highway.

Fish Pond Opportunity

An existing fishing pond is proposed for expansion in the headwaters of the West For St. Maries. This work will be developed in cooperation with Idaho Fish and Game and Potlatch Corp.

The dam would be raised to increase the size and depth of the pond. An old skid road to the south may be utilized as parking facilities. An educational kiosk may be installed. Some minor amounts of sediment may be generated and enter the stream system from this activity, but erosion control measures such as sediment barriers will reduce or eliminate sediment movement.

Water Quality and Beneficial Uses

Stream Temperature

Stream temperature changes are derived from vegetation reductions in the stream-shading zone. INFISH interim RHCA widths were established as design criteria to prevent temperature increases and to provide future shading to reduce temperatures. Since there are no significant reductions in vegetation proposed within these zones (aside from incidental cutting of snags to facilitate safe logging), stream temperatures will not be affected.

Pollutants

Activities common to all action alternatives are not expected to increase pollutant levels, except for a short-term increase in sediment from road decommissioning activities (Project File: Briggs) and woody debris placement. The long-term effect of these activities is to reduce sediment levels and stream temperatures. Impairment of beneficial uses should be reduced (see Summary of Effects, Forest Service, Table 3-31).

Cumulative Effects

Reasonably Foreseeable Activities (These activities are also included in Alt A.)

Garnets: Exploration is proposed in Wood and Hidden Creeks for the feasibility of gemstone extraction. Excavation of test pits or trenches by tracked or rubber tired equipment will occur. Each trench would be reclaimed through backfilling, seeding and installation of sediment barriers where necessary, before moving to the next site. Exploration should avoid disturbance to streambanks, shrubs and tree removal. This will ensure maintaining beneficial uses and protecting water quality. Some mining of garnets is occurring on Bechtel Butte and may continue in the future. This activity is on a ridge top and the disturbance is not affecting water quality or beneficial uses. Some activity may occur in the Cat Spur drainage, which would require site-specific NEPA.

Roads: Routine road maintenance will occur throughout the Hidden Cedar area. Incidental sediment may be generated from this activity, but is not expected to affect water quality because effects are temporary and these activities are intended to prevent erosion and for public safety.

Private land: Road building and harvest activities will likely occur on private lands. These activities may contribute sediment to the stream system. Water yield increases may occur. No quantification is possible of either sediment generation or water yield increases from future activities on private land because no timeframes or mapped locations are provided for future private activities. TMDLs will be applied to private land within the watershed.

2002 Gopher Control Project: Treatment of gophers is proposed for the Hidden Cedar area. Design criteria requires that treatment will not occur within INFISH buffers; in areas where the soil is saturated; or during periods or forecasted periods of heavy precipitation. No effect to water quality or beneficial uses is expected from this treatment because these criteria and the chemical's placement within gopher tunnels, underground, will prevent dispersal of the chemical control agent to the stream system. Also strychnine, the chemical control agent is in very low concentrations – 0.5% and it is poorly soluble in water (US Forest Service, 1994-2002).

Grazing: Current levels of grazing are likely to continue under Forest Service permits and on private land. Effects to soil and water will are reflected in the existing condition.

The District is preparing a Grazing Environmental Assessment, with a signed decision expected in the summer 2002. Monitored grazing sites on Federal land administered by the St Joe Ranger District found that there was about a 5% impact to the soil resource from compaction attributable to cattle grazing. This monitoring was conducted on areas in the Hume Creek drainage where cattle use was very evident from the existence of trails and cow manure. From personal observations during the field seasons of 1999-2001, other areas with permitted grazing do not have the concentrated use evident in Hume Creek and with more dispersed grazing soil impacts are going to be less than that found in Hume Creek. Effects of grazing are identified in the Grazing EA and either of the Action Alternatives is expected to move area streams toward beneficial use support (St. Maries Grazing Allotment EA, p. 73-74, 1999(b)).

Railroad: Ongoing maintenance of the railroad tracks and bridges will occur. Maintenance activities are not expected to affect water quality or beneficial uses. The railroad grade is on private land through acquisition of easements and most of the railroad right of way passes through private land.

Summary

No effect to basin hydrology is expected from activities addressed in the Effects Common to All Action alternatives because most of these activities are resource improvements. All watersheds with previous clearcut harvest on both National Forest and Private lands are in the process of reforesting thus they would steadily add to a decrease in water yield. The only effect anticipated to stream channels is improvements through woody debris placement and riparian plantings. Water quality and beneficial uses should also see improvements through these resource improvement activities. Some sediment entrainment is expected in the very short-term during road obliteration (Briggs, Project File), woody debris placements and maybe with the fish-pond expansion. No consequential aggradation in channels is expected and long-term benefits from these activities are expected to reduce sediment levels (see Effects Tables at end of this section).

Alternatives B, C, D and F

This section concentrates on effects related to timber harvest and the associated road building that occurs at various levels in all alternatives except Alternative E.

Direct and Indirect Effects

Proper Functioning of Basin Hydrology (vegetative and soil conditions and water yield)

Basin hydrology maintains and responds to the hydrologic cycle. Alteration of this cycle occurs from vegetative, climatic and geomorphologic changes. The activities proposed in the action alternatives will change the vegetative makeup of the basin and hill slope condition (geomorphology) through road construction and decommissioning/storage. Basin hydrology will respond to these changes through different ablation rates (Packer, 1971), change in snowpack or snow-water content and wind passage and velocity (Fowler et al., 1987), yet vegetative change is well within the realm of past conditions from wildfire. The role of roads in basin hydrology is generally that of increasing “flashiness” and runoff (Dunne and Leopold, 1978) (MacDonald and Hoffman, 1995). The planned road decommissioning and decompaction (storage) in the action alternatives should ameliorate some of the increased flashiness and runoff compared to existing conditions. Returning vegetation to resemble states that reflect “unmanaged” conditions (see vegetation report) should lead to basin hydrology that would also be more reflective of natural conditions.

The following analysis of water yield does not model road decompaction or recontouring. The effects of commercial vegetation treatments on peak flows were estimated with three different methods, Kappesser (1991), Packer (1971) and WATSED (WATSED includes road construction). The parameters used include size of openings, canopy removal, aspect, slope and elevation.

More detailed information on these methods and results by watershed can be found in the project file (documents SW 18-20,26,31,33,40,47). The following table identifies (averaged) percent water yield by watershed by alternative.

Table 3-26 - Average Estimated Percent (%)Water Yield by Watershed

Watershed	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Blair	1.2	1.2	0.0	0.0	1.2
Lower St. Maries	1.1	1.1	0.14	0.0	1.1
Cedar	12.5	12.5	5.1	0.0	10.3
Maize	2.9	2.9	0.0	0.0	2.9
Wood	0.3	0.3	0.5	0.0	0.4
Hidden	5.9	5.9	4.8	0.0	5.9
Keeler	1.1	1.6	1.9	0.0	1.6
West Fk. St. Maries	3.2	3.2	2.1	0.0	3.2
Bechtel	0.4	0.4	0.0	0.0	0.4

Because parameters are similar but not identical between methods, changes in peak flows differed slightly between calculation method, however, all showed the same trends. In all methods, for Alternatives B, C, D and F, the change in peak flow was ≤6% for all watersheds **except** Cedar Creek, which ranged from 5.1% to 12.5% (Table 3-26) average increase and was high as 19.9% (Table 3-28).

Table 3-27 - Percent Water Yield increase from Proposed Activities for St. Maries River

Method	Alt B	Alt C	Alt D	Alt E	Alt F
Kappesser	2.8%	2.8%	1.4%	0%	2.5%
Packer	5.0%	5.1%	2.4%	0%	4.8%
WATSED	1.7%	1.7%	1.1%	0%	1.7%
Average	3.1%	3.2%	1.6%	0%	3.0%

Predicted increases in water yield for all alternatives are not expected to cause significant channel morphologic change because of the small magnitude of estimated increase (Leopold et. al., 1964, Gordon, 1995) and the presence of transport reaches (Montgomery and Buffington, 1997). The relationship described by Schumm (1977), of stream power being proportional to the cube of velocity indicates that small increases in water yield would not increase stream power per unit area consequentially, because channel area generally increases as stage increases and area greatly increases once streamflow accesses floodplains.

In a report on paired watershed studies, Stednick (1996) suggests that 20% reduction in cover is necessary to detect a measurable increase in annual water yield. See Table 3-17 in the Soil Section (Chapter 3) for levels of harvest by alternative by watershed (percentage and acres harvested). None of the watersheds are proposed for this level of harvest except for Cedar Creek (alternatives B and C). Units were dropped in this watershed in Alternative F.

Table 3-28 - Cedar Creek Water Yield Increases *from Proposed Activities

Method	Alt B	Alt C	Alt D	Alt E	Alt F
Kappesser	9.7%	9.7%	3.6%	0%	6.4%
Packer	19.9%	19.9%	7.8%	0%	16.5%
WATSED	8.0%	8.0%	4.0%	0%	8.0%
Average	12.5%	12.5%	5.1%	0%	10.3%

*over existing conditions

Soil productivity and hydrologic function will improve on 56 acres (Alt B), 56 acres (Alt C), 88 acres (Alt D), 92 acres (Alt E) and 99 acres (Alt F) through decommissioning and storage of roads. These areas will be seeded with native seed mix. Restoration of hydrologic function (infiltration, subsurface flow) on these areas will begin through these treatments and are expected to be complete once native vegetation becomes established (estimated at a year or two).

Stream Channels

The small variances in estimated water yield from vegetation management are not likely to affect the stream channels in most tributaries, nor in a cumulative manner the lower reaches of the West

Fork St. Maries River, because of the order of magnitude increases necessary to affect channels (see discussion under Stream Channels – Effects Common to All Action Alternatives) (Schumm 1977, Leopold et al., 1964, Gordon, 1995).

If water yields are in the higher range (20%- Packer) for Cedar Creek some channel morphological adjustment may occur. WATSED estimates an 8% increase with a return to pre-existing condition within two years (Project File, Doc. SW #31). No areas of instability were noted in reconnaissance surveys of Cedar Creek except small areas where cattle have caused bank damage on portions of the lowest reach (Hallisey, Owen, field notes, Project File, W-5). Wetland meadow areas will not be affected because increased flows will spread over the carex bottom, but the discontinuous reaches of pool-riffle or Rosgen "C"-channel may experience some channel degradation or lateral migration with subsequent aggradation downstream. Rosgen (1996) suggests that channel evolution includes degradation ("F" or "G" channels) moving to pool-riffle ("C" channel) to a hydraulically efficient "E" channel. Channel widening is not likely to occur because of point bar deposition that will maintain channel width (Leopold et al., 1964) and these small increases in water yield, translate to small increases in stream power per unit area. The "E" portion of the channel should not be affected by increased peakflows because they are considered hydraulically efficient channel forms (Rosgen, 1996, p.5-126, 6-13). **With the estimated level at 10-12% (Table 3-28), no effects are likely from this water yield increase (Schumm, 1977, Leopold et al., 1964, Gordon, 1995).**

Levels of sediment generation and delivery (from National Forest administered lands) are expected to decrease in the action alternatives because of road decommissioning and storage. Decreased levels of sediment will allow channels to move toward dynamic equilibrium.

Riparian plantings are expected to provide future large woody material to channels for stability, aquatic habitat and moderating sediment transport rates.

Sediment Yield

The WATSED model estimates sediment yields over estimated natural conditions. Past private activities including road construction and timber harvest on all lands are included in the WATSED results. The values in the Table 3-4 are projected for all activities occurring in the years 2003 and 2004. Recovery figures are for the year 2006, which showed the maximum recovery occurring two years later (2006) and then leveling off in subsequent years. (WATSED values for subsequent years can be found in the Project File- document SW-31). In the table below, negative values show recovery greater than pre-treatment levels.

Alternative C proposed harvest is very similar to Alt B except for 28-acre increase in harvest proposed in Keeler Cr. The level of road construction in Alt C is 9.1 miles less than Alt B. So sediment levels for Alternative C are expected to be much lower than the estimated value for Alternative B. Alternative F is similar to Alternative B but drops 1.7 miles of construction and 125 acres of harvest in Cedar Creek. Alternative F also includes helicopter harvest of Units 50 and 51 (28 acres in Keeler Creek). Keeler and Cedar Creeks are expected to have much lower levels of sediment generation in Alternative F compared to Alternative B.

Table 3-29 - Estimated Sediment Yields (WATSED) (First year or largest increase from activities and recovery by the year 2006.)

Watershed	Alt B	2006	Alt D	2006
Blair Creek	1%	-4%	*	*
Lower St. Maries R.	24%	8%	16%	7%
Cedar Creek	102%	24%	35%	18%
Maize Creek	35%	14%	76%	48%
Wood Creek	9%	5%	28%	17%
Hidden Creek	40%	19%	86%	5%
Keeler Creek	13%	-27%	13%	-2%
West Fork St. Maries R.	39%	14%	12%	6%
Bechtel Creek	2%	-2%	26%	14%
West Fork St Maries River to the confluence with the Middle Fork St Maries River	23%	4%	40%	15%

*not modeled, no treatment proposed

The WATSED model is not a good predictor for sediment generation. WATSED results were compared to actual sediment measurements from Cat Spur Creek (IPNF Monitoring Report, 2000). Cat Spur Creek has private, State and Federal ownership. The model over-predicted actual sediment levels: Over a 9 year period the average modeled value was 1.73 times greater than that of the measured value and ranged from a modeled value of 4.5 times greater than that of the measured value in 1989 to .98 times that of the measured value in 1997. WATSED does not model road decommissioning (pers. comm. Patten (IPNF Forest Hydrologist), 2001) or in channel or streambank erosion. Looking at road decommissioning may better represent changes in the sediment budget.

Road Decommissioning and Sediment Generation

Sediment generation from proposed activities may be estimated using the road miles decommissioned, especially from roads decommissioned on sensitive landtypes. We are storing or decommissioning 3.8 to 4.8 miles (depending on the alternative) on high sensitivity landtypes. (see **Table 3-18**, Soil section). Reducing road mileage will reduce sediment yield in the long term – once vegetation is reestablished – but may increase sediment from the obliteration in the short-term, during culvert removal and re-contouring, but this is expected to be inconsequential compared to overall reductions. The reduction of road mileage, especially on sensitive landtypes, in RHCAs and crossing removals will reduce pollutant sediment yields.

See Chapter 2 of the FEIS for timing of road decommissioning and storage. Many restoration activities have occurred in the past and more are currently planned (Project File, SW-42).

The following table identifies sediment reductions for each alternative from road decommissioning/storage.

Table 3-30 - Percent Decrease in Sediment from Road Decommissioning-St. Maries River

Alternatives	B	C	D	E	F

St. Maries River	9%	21%	36%	3%	26%

Stream Crossing Sediment Risk Reduction

Removal of stream crossings in conjunction with road decommissioning is proposed in all action alternatives. The risk of sediment entry into the stream system from road crossings will be eliminated at these sites. In Alt. B there are 58 crossings removed and about 18,100 tons of sediment risk removed. In Alt. C there are 51 crossings removed and about 18,900 tons of sediment risk removed. In Alt. D there are 69 crossings removed and about 23,300 tons of sediment risk removed. In Alt. F there are 76 crossings removed and about 23,300 tons of sediment risk removed. The preceding sediment values are calculated on net crossing removals. In alternatives above there are new crossings proposed that are subsequently removed, the above numbers are reflective of that (See Project File, document SW-41).

Harvest Units on High Sensitivity Landtypes

The majority of the proposed vegetative treatments are excluded from sensitive landtypes, which will reduce or keep sediment yield values at or very near their current levels.

There are 9-12 acres proposed on high sensitivity landtypes. There are 3.5 acres in Hidden Creek and 8.6 acres in Keeler in Alternatives C and D that are on high sensitivity landtypes and are helicopter/skyline units. There are 3.5 acres in Hidden Creek and 5.5 acres in Keeler on high sensitivity landtypes in Alternatives B and F that are ground/skyline units. No effects are expected from harvesting the units in Alternatives C or D because of helicopter or cable harvesting systems and the RHCA buffers on drainages. In Alternatives B and F, the units in Keeler and Hidden Creeks are on landtype 518. Landtype 518's rating is low for surface erosion hazard and moderate landslide potential. It has high sediment delivery ratings because of the proximity to drainages, which makes it a high sensitivity landtype. Sediment generation is not expected with a low surface erosion hazard rating and application of BMPs. These proposed harvest units are RHCA buffered and this should prevent sediment, if any is generated, from reaching the drainage.

The overall sediment budget from Federal lands is expected to decrease in all action alternatives because of the level of roads being decommissioned and put into long term storage. We are decommissioning more roads than we are constructing so an overall reduction in sediment generation is expected. Calculation of reduction in sediment from road decommissioning is based on Burroughs et al., (1983) using road lengths from the Hidden Cedar Transportation Report.

Emerald Cr. Road Maintenance

In Alternatives B, C, D and F about 1.5 miles of road maintenance are outside the analysis area, within the Emerald Creek watershed. This road is on a ridge top and with application of BMPs no impact from this activity is expected. This activity meets the FS definition for road maintenance.

Water Quality and Beneficial Uses

Changes in water yield are not expected to result in changes to stream channels because the channels will not respond to the inconsequential level of water yield increase in transport reaches and in response reaches stream power is not expected to increase to levels that will cause channel adjustments. No consequential morphological adjustments were noted from flooding in 1996 that was the highest level in the period of record (Project File: St. Maries R. Aerial Photographs and

Interpretation). The predicted minor water yield increases will not cause further beneficial use impairment in the St. Maries River or its tributaries.

Habitat alteration is identified as impairing beneficial uses. Sediment reductions as predicted from road decommissioning in all action alternatives will improve water quality, improve habitat conditions and prevent further impairment of beneficial uses. Incorporation of large woody debris in all action alternatives will improve habitat conditions and further reduce the impairment of the assigned beneficial use.

BMPs will be implemented in all action alternatives to prevent sediment generation or movement from proposed activities (Project File, IPNF White paper, 2002). The overall effectiveness for all BMPs is expected to be high (Lynch and Corbett 1989, Seyedbagheri 1996, Idaho DEQ 2001). Road BMPs' appear to be effective in controlling sediment (rated little or no sediment) on 94% of the 144 miles assessed in Idaho in 2000 (Idaho DEQ, 2001). Only 0.5 miles (0.3%) was rated as a serious sediment delivery problem (Idaho DEQ, 2001).

On all Federal land monitored stream buffers had no harvest activity and 50% of the 11 Federal sites were above the target canopy cover for Stream Protection Zones (Idaho DEQ, 2001). Areas of canopy cover below the target are likely to have been the result of practices prior to the Idaho Forest Practices Act and in some cases may be an unachievable target (Idaho DEQ, 2001).

Stream temperatures are expected to moderate with additional stream shading from proposed riparian plantings, although this is anticipated to take from 5-10 years.

No other pollutant levels are expected to increase from the proposed activities. The risk of accidental and malicious introduction of pollutants should decrease because of the reduction in number of entry points – stream crossings – available (see Forest Service Effects Summary Table).

Cumulative Effects Alternatives B, C, D and F

Proper Functioning of Basin Hydrology

As described above basin hydrology may be affected by vegetative and soil conditions. The cumulative activities in the St. Maries Basin have changed vegetative structure, but it is not much different than achieved by wildfires in the past (see Vegetation Sections, pages 3-14 through 3-16), and Fire: Affected Environment). Vegetative conditions are modeled to reflect changes in water yield from past and proposed activities; WATSED modeling includes private activities.

Basin hydrology maintains and responds to the hydrologic cycle. Alteration of this cycle occurs from vegetative, climatic and geomorphologic changes. The activities proposed in the action alternatives will change the vegetative makeup of the basin through harvest, and hill slope condition (geomorphology) through road construction and decommissioning/storage. Basin hydrology may respond to vegetative changes through different ablation rates (Packer, 1971), change in snowpack or snow-water content and wind passage and velocity (Fowler et al., 1987), yet vegetative change is well within the realm of past conditions from wildfire. The role of roads in basin hydrology is generally that of increasing "flashiness" and runoff (Dunne and Leopold, 1978, MacDonald and Hoffman, 1995). The planned road decommissioning and storage (includes decompaction) in the action alternatives should ameliorate some of the increased flashiness and runoff compared to existing conditions. Returning vegetation to resemble states that reflect

"unmanaged" conditions (see vegetation report) should lead to basin hydrology that would also be more reflective of natural conditions.

Water Yield

Private land activities, within the Hidden Cedar area, including road construction and timber harvest are expected to continue increased water yield compared to reference (untreated) conditions. There is no method or model available to quantify increases from future activities on private land because there is no time frame tied to an amount of activity.

These activities are almost certain to continue at levels similar to the past. The WATSED model estimated a 5% increase prior to Forest Service proposed activities (Cedar Creek drainage). With Forest Service activities it is estimated at 13%. One year following Forest Service activities, it is estimated at 6%. The second year following, it has returned to the 5% level (see Project File, document SW #31). Many of the effects from the activities on private land are speculation at this time. Without full disclosure by private landowners of their anticipated activities (mapped locations) and when they will occur, cumulative effects are speculative and cannot be quantified.

Sediment

Cumulative watershed effects are particularly difficult to predict and identify because individual water and sediment inputs are delivered to the stream system at different points in time and space, and these interact with the water and sediment already in the stream (NCASI, 1999).

Private activities are expected to continue in the Hidden Cedar Area. These include grazing, garnet mining, road construction, timber harvesting, motorcycle racing, off road vehicles and fuels treatment. Private land activities are expected to continue increased sediment yield compared to reference (untreated) conditions. There is no method or model available to quantify increases from future activities on private land without full disclosure from private landowners; (for instance how many miles of road obliteration versus how many miles of road construction) but these activities are almost certain to continue at levels similar to the past. The high sediment yield value for the Cedar Creek watershed (Table 3-28) is reflective of the high level of harvest and roading on private land in the lower half of the watershed. As an example of road management on private lands there are 2.7 miles in Cedar Creek and 3.3 miles in Keeler Creek that were put into long-term storage. In Cedar Creek six stream crossings were removed. In Keeler Creek 18 stream crossings and 2.9 miles of RHCA road were decommissioned. Soil returned to productivity on private land is about 21 acres, although additional private road building may remove this much or more acreage from productivity.

The existing overall sediment budget for the St. Maries River is considered to have caused water quality limited reaches (WQLS), where assigned beneficial uses are not being met (DEQ, 1999). Sedimentary TMDLs are currently under development for the St. Maries Basin and draft levels will be proposed soon (St. Maries Watershed Advisory Group, meeting 3/12/02).

For all action alternatives the amount of sediment generated from the proposed activities in the action alternatives is expected to decrease over current levels because of road decommissioning and storage. There is the elimination of sediment risk by about 18,000-23,300 tons through stream crossing removals. This decrease may take a few years to materialize, but it is the expected

outcome from the proposed activities. See the Cumulative Effects Summary Table at the end of this section for levels of decommissioning and storage.

Stream Channels

Water yield increases from the proposed federal activities are not expected to impact stream channels because the increase in stream power per unit area is basically negligible (Schumm, 1977), and channel widening is not expected (Leopold et al. 1964). Cumulatively, response reaches may be experiencing accelerated lateral migration in the lower St. Maries River and lower West Fork St. Maries River, but little evidence of accelerated lateral migration exists even after the highest discharge in 1996, for the 36 year period of record. Proposed riparian plantings and large woody material placement are expected to improve channel conditions.

Although Schumm's "stream power" (see below) and Leopold's "square root law" (see below) indicate small to no changes to Cedar Creek, some effect to the channel may occur in the lowest reach where small areas of cattle trampling of streambanks occurred. Streambank trampling is discontinuous over about 0.4 miles in the lowest reach (Hallisey, Field Notes, Project File, W-5). The extent of activities on private land is in the lower portion of the drainage where most of the roads are located and the harvest level on private land is about 60-75% (estimate from aerial photography).

Schumm's "Stream Power"

Stream power – the rate of work done by a fluid – is proportional to the cube of velocity. (Schumm, 1977) Although stream power may have a small increase, no consequential increase in stream power per unit area is expected, because channel area generally increases as stage increases and area greatly increases once streamflow accesses floodplains.

Leopold's "Square Root Law."

Channel width increases downstream in proportion to the square root of discharge. The Judge's comment (in the Water Division 1 trial's final decision) that he was therefore, "bold enough to conclude - at least in a footnote - that even substantial changes in flow are likely to produce much smaller changes in the channel" (Gordon 1995 p. 24). This indicates that small increases in water yield have little potential to affect channels.

Some channel adjustment may be occurring in the lower reaches of Cedar Creek, but no instability was noted except some areas of cattle streambank trampling (Hallisey, Field Notes, Project File, SW-5).

Although no increase in sediment is expected from proposed activities (except a short-term spike from road decommisioning), estimated sediment levels from private land (especially in the Middle Fork St. Maries River), may be affecting downstream reaches. In headwater areas increased sediment will not affect transport reaches (Rosgen B and E channel types) because the sediment will be rapidly transported through the system. Downstream response reaches (Montgomery and Buffington pool-riffle and Rosgen F & C channel types) may experience aggradation in the form of pool filling, bar formation and lateral channel migrations above natural conditions (Montgomery and Buffington, 1997). No quantification or threshold values for sediment are in

place for the St. Maries River. The TMDL planned for 2002 will assist in determining levels of sediment that would further impair beneficial uses or not allow for the recovery of beneficial uses.

Water Quality and Beneficial Uses (Pollutant Sediment Levels, Stream Temperature).

Sediment levels are expected to decrease because of the proposed road decommissioning/storage and crossing removals (see values in Forest Service Effects Summary Table and Stream Crossing Sediment Risk Reduction discussion on page in this section). The trend toward attainment of beneficial use support related to sediment should increase from FS activity, but private activities may have sedimentary effects that will offset this benefit.

Stream temperature is not expected to increase because of adequate stream buffers. Eventual decreases are expected from the proposed riparian plantings. If private land activities are meeting the Idaho Forest Practices Act, no increase in stream temperature is expected.

Habitat Alteration is another listed beneficial use impairment. Riparian plantings and large woody material placements are anticipated to improve habitat conditions in the long term. Private land activities may offset any gains from this proposed activity.

Directly or cumulatively, activities are not expected to change nutrient levels unless higher levels of grazing occur or effluent systems on private land increase or become non-functioning.

Alternative E

Direct and Indirect Effects

Proper Functioning of Basin Hydrology (Vegetative And Soil Condition and Water Yields)

No change from the current vegetative condition will occur except for riparian plantings, which will restore riparian areas over the long term and enhance channel stability on the West Fork St. Maries River once deep-rooted shrubs become established. Future recruitment of large woody material for channel stability, fish habitat and sediment storage will also occur from the riparian planting.

Soil productivity will improve on 92 acres through decommissioning and storage of roads. These areas will be seeded with native seed mix that will begin restoration of hydrologic function.

There is no commercial vegetative treatment proposed in Alternative E. No water yield increase would occur.

Stream Channels

Stream channels will remain the same as the existing condition except where reintroduction of large woody debris and riparian plantings are proposed. Riparian planting will improve stream channel stability on Hidden and Wood Creeks and the West Fork St. Maries River. The long-term strategy for improving stream shade and providing future large woody debris to the stream system will occur through the riparian plantings.

Water Quality and Beneficial Uses (Pollutant Sediment Levels, Stream Temperature).

Sediment Budget

The overall sediment budget from Federal lands is expected to decrease in Alternative E because of the level of roads being decommissioned and put into long-term storage. Private activities of timber harvest, road construction and grazing will continue and these activities will contribute sediment to the stream system. Calculation of reduction in sediment from road decommissioning is based on Burroughs et al., (1983) using road lengths from the Hidden Cedar Transportation Report. Road prescriptions for storage and decommissioning would increase by 30.4 miles, reducing sediment by about 37%. The risk of sediment will be further reduced through elimination of 71 stream crossings totaling about 26,300 tons (Project File, document SW 41).

Road Construction

There is no road construction planned, except for access to private land. Road management prescriptions are the same as Alternative D except E removes the Wood Creek riparian road. Alternatives E will remove 7.2 miles of RHCA roads.

In Wood and Hidden Creeks, 5 and 6 stream crossings would be eliminated, respectively. No new road construction on FS lands in Alternative E will isolate an existing road system in the head of Hidden and Little East Fork Emerald Creeks. This road system has existing culverts and would have increased risk of failure at culverts and other locations without proper maintenance. Increased sediment levels would be likely in both Hidden and Little East Fork Emerald Creeks from this lack of maintenance. Temporary increases in sediment levels would also be expected from road obliteration, but once vegetation becomes established sediment levels are expected to decrease considerably compared to the existing condition.

Cumulative Effects

No vegetative treatments will occur. The discussion for cumulative effects of Alt A is applicable here, except that restoration activities will take place. Restoration of roads through decommissioning/storage will reduce sediment by about 37%. The risk of sediment will be further reduced through elimination of 71 stream crossings by about 26,300 tons (see Project File, document SW 41).

Also 10.3 miles of road will be removed from RHCAs.

Ongoing private land activity of road construction (6.5 mi. identified and another 5.6 associated with the access request), timber harvest, grazing recreation, etc., will continue.

Sediment reduction from road decommissioning/storage (37%) and the reduced risk of sediment from stream crossing failures (26,300 tons) will improve water quality and move toward beneficial use support. Private land activities may offset some of the sediment reduction and risk of sediment from the proposed restoration occurring on Federal land. Or private land may begin removing stream crossings and decommissioning roads, which would continue the improvement in water quality – as long as they decommission more roads then they construct.

No increase in water yield will occur from Federal lands and the current levels of increased water yield will continue which are expected in the 5-15% range (see water yield discussion in Summary of Cumulative Effects at the end of this section). In a comparison of aerial photographs no consequential channel changes were noted in the lower St. Maries River even after the highest peakflow of 36 years of record occurred in 1996 (Project File).

Summary of Effects (Forest Service Activities)

A summary of effects on the watershed from proposed federal activities on National Forest land is presented in the table below. The following information is pertinent to Table 3-31: All values are related to effects from activities on Forest Service land jurisdiction. New road construction mileage is from the Transportation Report. Values for sediment increases (from road construction) and sediment reductions (from road decommissioning/storage) are based on research from Burroughs, et al. (1983), and are not definitive but are relative values for comparison between alternatives. Water yield increases are an average using Packer (1971), Kappesser, (1991) and WATSED.

Table 3-31 - Forest Service Activity Effects on the Watershed*Summary Table

Parameters	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
New Road Construction[1]	0.0 mi.	11.4 mi.	2.2 mi.	2.9 mi.	2.2 mi.	8.8 mi.
Percent Sediment increase from road construction (Burroughs)	0%	14.6%	2.8%	3.7%	2.8%	13.3%
Miles of Road Decommissioned or stored[2]	0.0 mi.	27.9 mi.	18.7 mi.	30.4 mi.	30.7 mi.	37.5 mi.
Percent Sediment decrease from roads Decommissioned or Stored[3] (St. Maries River.)	0.0%	9.4%	21.2%	35.5%	36.7%	26.3%
Miles of road in RHCAs post project.	18.8	13.1	13.1	8.6	8.5	8.6
Miles of Road Reduced in RHCAs[4]	0.0 mi.	5.7 mi.	5.7 mi.	10.2 mi.	10.3 mi.	10.2 mi.
Percent Reduction in Roads in RHCAs	0%	30%	30%	46%	46%	46%
New stream crossings (from road construction)	0	9	0	6	0	13
Stream Crossing Removed	0	58	51	69	71	76
Stream Crossing Reductions (%)	0%	39%	36%	47%	50%	49%
Stream Temp. Increase[5]	0	0	0	0	0	0
Other Pollutant Increase[6]	0	0	0	0	0	0
Water Yield Increase West Fork St. Maries River[7]	0.0%	3.3%	3.4%	2.3%	0.0%	2.5%
Water Yield Increase Cedar Cr.[7]	0.0%	12.3%	12.3%	6.8%	0.0%	10.3%
Water Yield Increase for the St. Maries River[7] (Project Area)	0.0%	3.1%	3.2%	1.6%	0.0%	3.0%
Soils returned to productivity from decommission of existing roads[8]		56 ac.	56 ac.	88 ac.	92 ac.	99 ac.

* Watershed as defined in Analysis Area (page 3-x)

[1] New Road construction on NFS administered land only.

[2] Miles of road that change to road management prescriptions C, D and E (see FEIS,Appendix D for definitions). The values for Alternatives B & F appear higher than other alternatives, because

numbers displayed for these Alternatives includes new road construction that is then stored or decommissioned.

[3] Values for reduction in sediment factor in the increases from new FS construction.

[4] Reduction of roads within RHCAs is expected to restore hydrologic function to the rehabilitated areas and in conjunction with riparian plantings; conditions within riparian areas will improve through increased stream shading and future large woody material recruitment.

[5] Stream temperature values are not expected to increase because of RHCA buffers. Temperatures may decrease in the long term because of riparian plantings.

[6] Other pollutant levels are not expected to increase from activities associated with the alternatives, because no chemical additives to the stream system are expected. Pollutant entries into the stream system are possible, at stream crossings or roads close to streams, from accidental occurrences, or purposeful or ignorant injurious introductions.

[7]Water yield increase displayed is the average of Packer & Kappesser (harvest only) and WATSED (harvest and roads).

[8]Soil acres returned to productivity are estimated from the level of road decommissioning and long-term storage. Restoration of hydrologic function will also occur over these same acres once native vegetation becomes established on the recontoured and decompacted surfaces.

Summary of Cumulative Effects (Private And Forest Service)

The following table displays estimated cumulative effects on the St. Maries watershed from the activities proposed on Forest Service land and those occurring and expected to occur on private land within the Hidden Cedar Project Area. Pertinent to the table below are the following statements: 1) Idaho State DEQ regulations that establish TMDLs for the St. Maries watershed may require more road obliteration and stream crossing removals to reduce sediment, however, TMDL's are not to be done until 2002. 2) Because harvesting and road building will continue on private lands all values in the table below with a (+) sign are expected to increase. 3) With the assumption that State BMPs and the Idaho Forest Practices Act are followed on private land, no increase in stream temperature or other pollutants (except sediment) is expected. An example of road management on private lands is the 2.7 miles in Cedar Creek and 3.3 miles in Keeler Creek that were put into long-term storage. This entailed six stream crossings removed in Cedar Creek and 18 stream crossings and 2.9 miles of RHCA road decommissioned in Keeler Creek. Soil returned to productivity on private land is about 21 acres, although additional private road building may remove this much or more acreage from productivity. 4) The effects from increases in sediment and water yield may be increased lateral migration of the West Fork and main St. Maries River in response (Rosgen C and F) classified reaches. Water yield modeling by WATSED ranges from 3% to 15% compared to natural conditions for watersheds in the cumulative effects area and this includes past private land activities. The level of harvest in the Middle Fork St. Maries river was not modeled by WATSED, but activities here are comparable to road and harvest levels within Cedar Creek, which had water yields at 5% above natural prior to FS activities 10-13% as response to FS activities and a lowering to 6% the year following FS activities; or Blair Creek which is modeled at 15% prior and 15% in response to FS Activities and dropping to 14% the year following. This would give an estimated cumulative water yield increase to the Lower St. Maries Watershed of 8% to 18%.

Table 3-32 - Cumulative Effects Estimated Combined FS and Private Activities

Parameter	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
New Road Construction[1]	0.0 mi.	24.2+ mi.	15.0+ mi.	15.7+ mi.	15.0+ mi.	23.1+ mi.
Percent Sediment increase from road construction (Burroughs)	0%	11.3+%	7.0+%	7.3+%	7.0+%	10.5+%
Miles of Road Decommissioned or stored[2]	0.0 mi.	27.9+ mi.	18.7+ mi.	30.4+ mi.	30.7+ mi.	37.5+ mi.
Percent Sediment decrease from roads Decommissioned or Stored[3] (St. Maries River.)	0.0%	-7.1%	4.7+%	18.9+%	20.2+%	9.8+%
Miles of road in RHCA's post project.	58.8	41.7	41.7	37.2	37.1	37.2
Miles of Road Reduced in RHCA's	0.0 mi.	5.7+ mi.	5.7+ mi.	10.2+ mi.	10.3+ mi.	10.2+ mi.
Percent Reduction in Roads in RHCAs	0%	9.7%	9.7%	17.3%	17.5%	17.3%
New stream crossings	8+	17+	8+	14+	8+	21+
Stream Crossing Removed	0+	58+	51+	69+	71+	76+
Stream Crossing Reductions (%)	0%	12.6+%	11.1+%	15.0+%	15.5+%	16.6+%
Stream Temp. Increase	unknown	unknown	unknown	unknown	unknown	unknown
Other Pollutant Increase	unknown	unknown	unknown	unknown	unknown	unknown
Percent Water Yield Increase from Harvest (St. Maries R.)	0.0+%	3.4+%	3.4+%	1.5+%	0.0+%	2.3+%
Percent Water Yield Increase for West Fork St. Maries R.	0.0+%	3.3+%	3.4+%	2.3+%	0.0+%	2.5+%
Water Yield Increase Cedar Cr.	0.0+%	12.3+%	12.3+%	6.8+%	0.0+%	10.3+%
Water Yield Increase for the St. Maries River (Project Area)	0.0+%	3.1+%	3.2+%	1.6+%	0.0+%	3.0+%
Soils returned to productivity from decommission existing roads	0+ ac.	56+ ac.	56+ ac.	88+ ac.	92+ ac.	99+ ac.
Large Woody Material Placement	0 mi.	1-1.5+ mi.	1-1.5+ mi.	1-1.5+ mi.	1-1.5+ mi.	1-1.5+ mi.
Riparian Planting	0 ac.	20-30+ ac.	20-30+ ac.	20-30+ ac.	20-30+ ac.	20-30+ ac.

[1] includes road construction on private land associated with access requests

[2] Miles of road that change to road management prescriptions C, D and E (see Appendix D for definitions).

[3] Sediment reduction includes new FS construction and private road construction. The negative value for Alternative B is an increase in sediment of 7.1%.

Values that have a + sign after the number indicate that there could be an increase from private land activities.

Consistency with Forest Plan and Laws

The Idaho Panhandle National Forests' Forest Plan

Forest Plan Standards are application of Best Management Practices (BMP), meeting the Idaho Forest Practices Act, and maintaining State Standards for pollutants. See Project File of the FEIS for specific BMP's for the Hidden Cedar Project (Applicable BMP's and Soil and Water Conservation Practices, IPNF, White Paper, 2002). The Idaho Forest Practices Act is applied through BMPs and timber sale contract provisions (see Federal Checklist -project file, document #SW49).

Riparian Habitat Conservation Areas (RHCA)

RHCA's are identified for watersheds of the Hidden Cedar area. Landslide-prone areas and streams have buffers applied to them to provide stream shading and prevent sediment entry into the stream system.

Clean Water Act

The Clean Water Act objective is to restore and maintain the physical, chemical and biological integrity of the nation's waters. Buffer strips will protect the physical integrity of the water within the Hidden Cedar area, from temperature modification and sediment routing.

The chemical integrity of the water will not be affected by activities under the alternatives because no toxic pollutants are expected to enter the stream system, except through accidental occurrences. No fueling of equipment will occur within RHCA buffers. The overall sediment budget should decrease under the action alternatives, except cumulatively in Alternative B (Table 3-32), which increases sediment and would not meet the Clean Water Act. Alternatives C, D, E, and F meet the Clean Water Act.

The biological integrity of the water in the Hidden Cedar area will be protected and enhanced from activities proposed in the action alternatives. See the FS Effects Summary Table for number of stream crossing removals and roads decommissioned in RHCAs that will enhance water quality. Riparian plantings are proposed for all action alternatives, which will eventually prevent temperature modification and provide aquatic habitat improvements. Plantings will have the capability to attenuate flood peaks and enhance floodplain development.

Water Quality Limited Segments

Since the St. Maries River is listed on the State 303(d) list to congress of impaired streams and a Total Maximum Daily Load determination is scheduled for 2002, there may be future restrictions or increased mitigation of activities within this drainage. Overall sediment reduction of 9%-37% from Federal lands is expected from implementation of all action alternatives through road decommissioning and storage (see FS Effects Table). The reduction in risk of sediment at stream crossings ranges from 18,000-23,000 tons (Project File). The removal of roads from RHCAs ranges from 5.7-10.3 miles (see Forest Service Effects Summary Table).

There are 3.4-4.8 miles of road decommissioning proposed on high sensitivity landtypes (Soils Section). All of these activities are expected to improve water quality and move toward support of beneficial uses.

Idaho Water Quality Law

The action alternatives will meet Idaho Water Quality Law, with the reasoning stated above for the Clean Water Act. One exception for possible effects to beneficial uses may be the high water yield estimates for Cedar Creek. This drainage may contribute sediment to downstream reaches that may delay attainment of full beneficial use support. Total Maximum Daily Load determinations are scheduled for 2002 and these may limit activities within drainages with Water Quality Limited Segments. Overall for the Hidden Cedar area there is an estimated reduction of sediment from all action alternatives due to road decommissioning and long-term storage.

FISHERIES

Regulatory Framework

There are 6 general standards in the Idaho Panhandle National Forests' Forest Plan (United States Forest Service 1987) plus the additional standards described in the Inland Native Fish Strategy (InFish) which amended the plan in 1995, that are applicable to the fisheries resource. The first 2 standards listed in the IPNF Forest Plan are no longer valid, and have been replaced by InFish. Documentation to support this change can be found in Appendix G of the EIS. INFish requirements include but are not limited to meeting Riparian Habitat Conservation Area (RHCA) and Riparian Management Objective (RMO) requirements, initiating development and implementation of a Road/Transportation Management Plan for the area, and providing and maintaining fish passage in all existing and potential fish-bearing streams.

The National Forest Management Act (NFMA) (1976) requires that the Forest Service manage for a diversity of fish habitat to support viable fish populations. Regulations of NFMA (219.12g) state, "Fish and wildlife habitats will be managed... to maintain and improve habitat of management indicator species." Section 7 of the 1973 Endangered Species Act (ESA) includes direction that Federal agencies 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." Additional regulatory requirements related to fisheries resources (*e.g.* Clean Water Act and Idaho Water Quality Standards, Idaho 303(d) list) are addressed in the Soil and Water Resources Review and are considered under this core topic for fish species and habitat.

Analysis Area

The Hidden Cedar Analysis Area is located in the upper portion of the St. Maries River watershed in Townships 41 through 43 N., Ranges 1 and 2 E. (Boise Meridian) in Clearwater, Latah, and Shoshone Counties, Idaho. The primary named streams included in the analysis area are: the mainstem of the St. Maries River, the West Fork of St. Maries, Bechtel, Blair, Cat Spur (and tributaries), Cedar, Christmas, Hidden, Keeler, Long Slim, Mazie, Swede John, and Wood Creeks. The St. Maries River converges with the St. Joe River to make the St. Joe basin.

The Hidden Cedar project area (32,916 acres) accounts for 11% of the St. Maries River watershed (312,500 acres); the St. Maries watershed is 28% of the St. Joe River basin (1,128,359 acres).

The St. Joe River feeds into the southern portion of Coeur d'Alene Lake, which is also fed to the north by the Coeur d'Alene River. Coeur d'Alene Lake and its tributaries form the upper Spokane River basin, which occurs, within the interior Columbia River basin.

The cumulative effects area for fisheries resources is defined as the St. Maries River watershed from the confluence with Cedar Creek upstream. This area was selected for fisheries resources

because it contains all potential project activities and defines the largest watershed area that allows for the greatest level of resolution for determining a project's contribution to cumulative effects operating at various geographic scales.

A discussion on the Ecosystem Context for fish relative to the Interior Columbia Basin, St. Joe Geographic Assessment Area, and the Hidden Cedar Project Area can be found in the Project Files, Fisheries Report.

Affected Environment

Analysis Methods

Fish Population: Fish species presence and distribution was determined based on a review of historical literature, electro-fishing surveys, snorkel surveys, spawning surveys and incidental sightings during habitat surveys (see project file, Fisheries section, individual drainages). Native bull trout and westslope cutthroat trout have been selected as MIS for the fisheries analysis of this watershed. Rainbow trout are not native to the St. Joe River basin (although they are stocked to supplement the fishable population) and therefore were not selected as MIS for this project.

Current Habitat Condition: The existing conditions of the fisheries resources in the Hidden Cedar area were established by utilizing professional interpretation of information from stream inventories conducted between 1992 and 2001, field reviews, historical records, aerial photographs, an analysis of watershed conditions, published scientific literature, IDFG, USFWS, and comprehensive knowledge of the fisheries resources in the St. Joe River basin (see project file, Fisheries section, individual drainages). The District Fisheries Biologist validated aquatic habitat conditions during field reconnaissance surveys.

Existing conditions were evaluated for primary habitat components believed to be influencing the productive potential of the fisheries resources (*i.e.* MIS fish) within the cumulative effects area. These include water quality (*e.g.* stream temperatures), aquatic habitat quality, cover complexity, and riparian condition. Other selected features (such as substrate composition and channel stability) that can influence the status of fish habitat or fish populations in the Hidden Cedar area were also considered.

The status was determined based on a comparison of the existing condition to the reference condition. The reference condition represents the natural range of conditions. Current condition for each fish bearing stream is assessed to determine how it is functioning. A stream is **functioning appropriately** when it maintains strong and significant native fish populations that are interconnected and promotes recovery of habitat to a status that will provide self-sustaining and self-regulating populations. A watershed is **functioning at risk** when it provides for the persistence of native species but in more isolated populations and may not promote recovery of habitat without active or passive restoration efforts. A watershed is **functioning at unacceptable risk** when native species are absent from historical habitat, or are rare or being maintained at a low population level; although the habitat may maintain the species at this low persistence level, active restoration is needed to begin recovery. This is independent of the percentage of land managed by the Forest Service. Therefore, if a stream is functioning at unacceptable risk, the ability of the Forest Service to alter this determination is dependent on the amount of federal ownership in the

drainage. See Table 3-36 on page 3-97 for a summary of habitat condition for streams in the analysis area.

Limiting Factor Assessment: Potential limiting factors for aquatic ecosystems may be numerous (Everest and Sedell 1984; Orth 1987). Many discussions have been held between biologists from the USFS and Idaho Department of Fish and Game (IDFG) over the past several years concerning factors that limit fish populations in the St. Joe River basin. The IDFG was contacted on April 6, 2000 to discuss fisheries resources in the Hidden Cedar area. Results from field surveys support the professional consensus reached between biologists of the USFS and IDFG that stream habitat degradation and impaired water quality presently plays the most important role in population regulation by influencing carrying capacity and over-wintering survival (Sedell et al. 1988; McFadden 1969). Recent conferencing with the USFWS regarding bull trout has also supported these findings.

Existing Condition

Fish Species

Bull trout and cutthroat trout population status reviews have found considerable reductions in the distribution and abundance throughout their historic range (USDA Forest Service 1996a; Rieman and McIntyre 1993; Apperson *et al.* 1988). In a status review of bull trout on the Idaho Panhandle National Forests, stocks from the St. Joe River system were considered to be at moderate risk of extinction (Cross 1992). Population status reviews of the westslope cutthroat trout in Idaho has determined that populations have declined over their historic distribution. It is estimated that strong westslope populations persist in only 11% of their historical range (Rieman and Apperson 1989) and only 4% of the populations are not threatened with hybridization. Viable populations are believed to exist in only 36% of the original Idaho range (Duff 1996; Rieman and Apperson 1989). Recent surveys in the Hidden Cedar area show that westslope cutthroat trout (as well as sculpin species) continue to persist but bull trout are largely absent. Many details of historical and present fish population dynamics in the Hidden Cedar area are unknown but the persistence of westslope cutthroat trout populations suggests that this area retains some stream characteristics that reflect those under which the species evolved. The primary cause for a decline of bull trout and westslope cutthroat trout is believed to be impaired aquatic habitat conditions (Young 1995; Rieman and McIntyre 1993; Rieman and Apperson 1989).

Bull Trout

Genetic analysis has shown bull trout populations in the St. Joe River system are a unique stock though they are closely linked to the upper Columbia River clad - one of three major groupings throughout the Columbia and Klamath River drainages (Williams, unpublished). Currently, bull trout occupy river habitat in the St. Joe River and occasionally stray up the St. Maries River during spring migration (angler accounts; Apperson et al. 1988). The historic range of bull trout includes the Hidden Cedar area (Fields 1935) but they were last detected and documented in the Hidden Cedar area (in the St. Maries River) during 1987 surveys (Apperson *et al.* 1988).

Westslope Cutthroat Trout

Streams in the Hidden Cedar area provide spawning and rearing habitat for migratory and resident westslope cutthroat trout, albeit at suppressed levels (survey data 1999, Averett and MacPhee 1971) (see Table 3-33).

Torrent Sculpin

Quigley *et al.* (1997) indicates that torrent sculpin are found in the St. Joe River system but its presence has not been established in the Hidden Cedar area. Shorthead sculpin (*Cottus confusus*) have been found in several streams in the St. Maries basin, including the Hidden Cedar area.

The distribution of sculpin species and the key considerations for managing their populations are generally contained within those for native bull trout and westslope cutthroat trout populations (coldwater MIS fish). In addition, management considerations for torrent sculpin are addressed during the analysis for coldwater MIS fish.

Other Fish Species

Population surveys confirmed the presence of native shorthead sculpin (*Cottus confusus*), northern pikeminnow, and introduced brook trout in the Hidden Cedar area. Other fish species native to the St. Joe River basin have access to fish bearing streams and may be present at various times of the year, including mountain whitefish, largescale sucker, longnose dace, and redside shiner.

Fields (1935) reported that stocking of exotic rainbow trout historically occurred in the West Fork St. Maries River during the early part of the century. Fish that are the product of cross hybridization between native cutthroat trout and exotic rainbow trout have been documented in the Hidden Cedar area (Apperson *et al.* 1988). The Idaho Department of Fish and Game continues to stock catchable-size, sterile rainbow trout in the St. Maries River and some of these fish may disperse to streams in the area (Chip Corsi, personal communication). Native bull trout and exotic brook trout hybrids are also potentially present but have not been detected in the analysis area.

Table 3-33 - Fish Distribution Based on Various Survey Methodologies

Stream Name	Survey Method[1]	Bull Trout	Westslope Cutthroat Trout	Brook Trout	Sculpin	Northern Pike Minnow (Squaw Fish)	Unidentified Species
Bechtel	E		X		X	X	
Cat Spur	H		X				
Cedar	H		X			X	
Christmas	H						X
Hidden	S & E		X	X[2]	X		
Keeler[3]	E		X	X			
Kitten	H		X				
Log	H		X				
Long Slim	S & E		X		X		
Swede John	H						X
WF St. Maries[3]	E		X	X			
Wood	E		X	X	X		

[1] S = Snorkel survey, E = Electrofishing survey, H = Habitat Survey (incidental observation)

[2] Brook trout were not located in the upper survey reach. [3] Keeler Creek was electrofished by Idaho Department of Fish and Game, summer 2000 (P. Murphy, personal communication).

Existing Habitat Condition

The following tables and text display the issue indicators or measurable factors for each of the streams within the project area. The numbers listed in Table 3-34 were generated from GIS maps. Kitten and Log Creeks are tributaries to Cat Spur Creek. Drainage acres for Cat Spur include both Kitten and Log.

Table 3-34 - Watershed Conditions and Habitat Access

Stream Name	Drainage Acres	% of drainage NFS	% Sensitive landtypes	Road Density (all roads)	acres past harvest in RHCA	% acres in Rain on Snow zone	Physical Barriers*
Bechtel	1328	95	13	4.7	18	70	UK
Blair	1849	8	19	7.5	2	90	UK
Cat Spur	7675	24	30	4.4	25	95	UK
Cedar	2126	59	10	3.9	2	50	UK
Hidden	1677	97	16	6.8	51	98	Y
Keeler	2665	28	22	6.3	40	99	UK
Kitten	1523	23	27	8.1	3	95	UK
Log	2174	54	22	5.5	20	98	UK
Long Slim	2474	27	18	4.9	27	98	UK
Lower St. Maries	5373	35	11	6.8	135	99	UK
Mazie/Swede John	1407	84	8	5.5	28	85	Y
WF St. Maries	5245	48	7	4.6	93	50	UK
Wood	777	97	11	5.7	53	98	Y

* Y = yes there are physical barriers, UK = unknown if there are physical barriers

The information provided in the following table (Table 3-35) is the professional opinion of the District Fisheries Biologist and District Hydrologist, based on field reviews of the streams (project file). Kitten, Log and Long Slim Creeks were not reviewed recently by the district specialist because there were no Forest Service activities expected in those drainages, therefore they are not included in the following table.

Width to Depth ratio describes the cross-sectional shape of a stream channel. H = high means the channel is wide and shallow, M = moderate, L = means channel is narrow and deep.

Streambank condition describes the stability of the banks. G = Good or >80% of any stream reach has ≥90 % stability, F= fair or 50-80% has ≥90% stability, and P= poor or <50% has ≥ 90% stability.

Floodplain connectivity: G = good, off–channel areas are frequently hydrologically linked to main channel, overbank flows occur and maintain wetland functions, riparian vegetation and succession; M = moderate, reduced linkage of wetland floodplains and riparian areas to main channel; overbank flows are reduced relative to historic frequency as evidenced by moderate degradation of wetland function, riparian vegetation/succession; P = poor, severe reduction of hydrologic connectivity between off-channel, wetland, floodplain area riparian area wetland extent drastically reduced and riparian vegetation/succession altered significantly.

Table 3-35 - Stream Channel Conditions

Stream Name	Width to Depth Ratio	Streambank Condition	Floodplain Connectivity
Bechtel	L-M	F-G	G
Blair	L-M	G	G
Cat Spur	M	F	M
Cedar	M	F	F
Christmas	L	F-G	G
Hidden	L-M	G	G
Keeler	L-M	G	G
Mazie/Swede John	L-M	F-G	G
WF St. Maries	M	P-F	G
Wood	L-M	G	G

The following is a summary of the information pertaining to water quality and habitat elements. Detailed information is located in the project file by watershed.

Bechtel Creek

Bechtel Creek is about 2.5 miles long. The upper 82% of the stream flows through NFS lands, the remainder (18%) at the mouth flows across private lands. The lowest reach of Bechtel Creek has erosion sources due to cattle grazing. Moving upstream the stream channel conditions improve. Banks become more stable, the size of woody debris increases. The majority of the habitat is run. This stream is considered "functioning at risk" due to cattle grazing on private lands and high road densities (Table 3-34).

Blair Creek

Blair Creek is about 4 miles long. The majority of the stream (92%) flows across private ownership. The stream flows across NFS lands near the lower end of the drainage. Based on the size of the stream it is assumed that Blair Creek would provide spawning, rearing and overwintering habitat. Blair Creek appears stable and contains plentiful amounts of woody debris.

Although current conditions within the channel appear to be sufficient to maintain a native fish population, the high road densities (Table 3-34), the number of stream crossings and a road within the riparian zone that parallels the stream, indicate that this stream is "functioning at risk."

Cat Spur Creek

Cat Spur Creek is the largest subdrainage to the West Fork St. Maries in the project area. It is comprised of Cat Spur Creek, Log Creek, Kitten Creek, and several unnamed tributaries. Cat Spur Creek is a low gradient, meadow stream, which meanders through a well-developed floodplain for most of its length. Native westslope cutthroat trout utilize Cat Spur Creek for spawning, rearing, and over-wintering. Cat Spur Creek is identified in the Forest Plan as a high valued stream for fisheries resources.

Runs and pools dominate aquatic habitat. Although Cat Spur Creek provides important habitat for native salmonids within the watershed, the quality of the habitat is impaired. Aquatic habitat in Cat Spur Creek lacks the complexity usually associated with quality habitat. The stream has an

abundance of algae which is likely the result of nutrient inputs from cattle grazing and the amount of direct sunlight reaching the stream.

Sediment input is one factor that continues to degrade the quality of aquatic habitat in Cat Spur Creek. Flood damage to roads in the Cat Spur Creek drainage in 1996 increased sedimentation and exacerbated this process in Cat Spur Creek. The riparian conditions and activities along Cat Spur Creek are also influencing the quality of the aquatic habitat.

Riparian stands of red cedar were cleared from the lower portion of the drainage prior to the 1930's. Cattle grazing along Cat Spur Creek perpetuate this condition today.

Channel stability is compromised in these areas resulting in bank sloughing and sediment production to the stream. The lack of trees in the riparian is also influencing stream shade and LWD recruitment. The scarcity of LWD in the stream is affecting habitat complexity. Road #361, pioneered in the 1930's, extends along the north side of Cat Spur Creek for approximately 1.6 miles of the 5 miles of stream length. This road reduces the productive potential of the riparian area, aids access to riparian areas for grazing, and contributes sediment to Cat Spur Creek.

Cat Spur Creek is considered “functioning at risk” due to the impaired instream habitat conditions, high road densities (Table 3-34) and the influence of cattle grazing.

Cedar Creek

Cedar Creek is about 3.5 miles long and flows through NFS lands at the confluence with the St. Maries River and in the headwaters. Cedar Creek is a slightly entrenched, low gradient stream and has moderate sinuosity. The riparian zone historically had large trees that would have had a greater influence on fish habitat but they were removed by logging. Currently the riparian zone is primarily alder and brush near the mouth and begins to include conifers about ½ mile upstream. Instream habitat is primarily deep runs and glides, with occasional pools formed by woody debris and meanders. Cattle and bulldozers crossing the channel have also influenced the stream. On private land, it appears heavy equipment was used to create a soil dam.

Cedar Creek is considered “functioning at risk” due to the road density (Table 3-34), the effects created by cattle grazing and the low quality of the instream habitat.

Christmas Creek

Christmas Creek is about 1.6 miles long. The middle section, 25%, of Christmas Creek flows through NFS lands, the remainder flows across mixed ownership. There is no defined channel at the confluence with the St. Maries River because the stream flow disperses among marsh habitat across the St. Maries River floodplain. There are two culverts along this stream, one at the main road crossing and the other is on a spur road, which may be partial fish migration barriers due to the distance between resting areas. This stream will not be discussed separately in the analysis of alternatives but will be included in the Lower St. Maries analysis.

Hidden Creek

Hidden Creek is about 3.25 miles long and flows primarily through NFS lands, 93% of the stream length. Hidden Creek is assumed to be used for spawning, rearing and overwintering habitat. The surveyed reach (lowest reach) of Hidden Creek has low habitat diversity, and cover complexity.

There are fewer numbers of pools and less large woody debris than recommended in INFish. The riparian zone is primarily open becoming more timbered moving upstream. Road 498 parallels the stream for the majority of its length. The road is within the RHCA for approximately 2.5 miles and encroaches on the stream itself for about 0.4 miles, (based on GIS mapping). There are four road crossings and one railroad bridge on Hidden Creek.

Hidden Creek is considered "functioning at risk" due to the low quality of instream habitat, a road within the RHCA and high road density (Table 3-34).

Keeler Creek

Keeler Creek is approximately 3.8 miles along. It flows through NFS lands at the confluence with the West Fork and in the headwaters. This comprises approximately 41% of the stream length, the remainder flows across Potlatch Timber Company lands. Keeler Creek is assumed to be used for spawning, rearing and overwintering habitat. The surveyed reach (lowest reach) of Keeler Creek has low habitat diversity, a fair amount of cover which is of poor quality. Large woody debris meets INFish guidelines. Substrate composition is primarily sands, which is not conducive to salmonid spawning. Forest Service road 765 was within the RHCA of Keeler Creek for approximately 2.62 miles, of this 0.2 miles directly encroached upon the stream channel. In 2000, this road was closed, i.e. culverts pulled, but fills still remain in place. The stream continues to pass through 1 culvert near the mouth; this is a concrete culvert, which is partially collapsed. This culvert is located on county road.

Keeler Creek is considered "functioning at risk" due to the low quality of instream habitat, and the high road densities (Table 3-34), with an associated high number (92) of stream crossings.

Kitten Creek

Native westslope cutthroat trout utilize Kitten Creek for spawning, rearing, and over-wintering habitat. There is a lack of quality over-wintering and rearing habitat for native salmonids which is limiting the carry capacity of Kitten Creek. Cover complexity in Kitten Creek is adequate. Riparian roads have a negative impact on reach two.

The condition of aquatic resources in Kitten Creek are unlikely to be influenced by any future Federal actions because National Forest System land only occupies a very small percentage of the sub-basin in the extreme headwater reaches. Kitten Creek is considered "functioning at risk" due to the low of quality instream habitat and the high road density (Table 3-34)

Log Creek

Native westslope cutthroat trout use Log Creek for spawning, rearing, and over-wintering. NFS lands primarily occur in the middle and upper reaches. Surveys of the lowest reach identified low instream habitat diversity and poor pool development. Stream cover and cover complexity are adequate for the habitat conditions. Grazing influences the structure and composition of riparian vegetation along reach 1. The substrate composition is more conducive to successful spawning toward the headwater reaches.

Log Creek is considered "functioning at risk" due to the low quality of instream habitat, the influence of cattle grazing and the high road density (Table 3-34).

Long Slim

Long Slim Creek is about 4.3 miles long and has Forest Service managed lands at its confluence with the West Fork of St. Maries and in the headwaters.

Approximately 34% of the stream is on NFS lands, the remainder is Idaho State Department of Lands or Potlatch Timber Corporation. Long Slim Creek is used by westslope cutthroat trout for spawning, rearing and overwintering. The lower portion of Long Slim Creek, on NFS land, has dense riparian vegetation and has sand to small gravel sized substrate.

Long Slim Creek is considered "functioning at risk" due to low quality habitat and high road densities (Table 3-34).

Mazie Creek

Mazie Creek is about 2 miles long. The upper 56% of the stream flows through NFS lands, the remainder flows across private lands. Mazie Creek is utilized by salmonids but it is uncertain which species. Based on the use of other streams in the area, Mazie Creek is used for spawning, rearing and overwintering. Culverts under Highway 3 are low flow migration barriers. Mazie Creek progresses from a low gradient, sandy/silty meadow type stream in reach one to a stream with sand/gravel substrate and an increasing amount of riparian conifers in reach 3. Instream habitat has very little diversity, a low percentage of pool habitat and low quality pool habitat.

Mazie Creek is considered "functioning at risk" due to low quality habitat, and high road densities (Table 3-34)

Swede John (tributary to Mazie Creek)

Swede John Creek is a small stream about 2.7 miles long, which flows across NFS lands in the upper reaches of the stream, 73% of the stream length. The lower portion of the stream flows through private lands, 27%. Swede John is utilized by salmonids but it is uncertain as to the species. Based on the usage of other streams in the area, the size of the stream and the size of the fish observed, it is assumed that Swede John is used for spawning, and early rearing. The culvert under Highway 3 was determined to provide fish passage. Swede John will not be discussed separately from Mazie Creek in the remainder of the document.

St. Maries River (Mainstem)

The St. Maries River in the project area is about 8.1 miles long. It is primarily a low gradient, meadow stream that meanders through a well developed floodplain for most of its length. It provides spawning, rearing, and over-wintering habitat for native salmonids and other fish and serves as a migration corridor for non-resident fish using river tributaries. Small sections totaling about 27% of the mainstem flow through NFS land. It is listed as a Water Quality Limited Water Body (303(d)list). Pollutants of concern are nutrients, habitat alternation and sediment.

This section of the St Maries River is considered "functioning at unacceptable risk" due to the 303(d) listing, low quality of instream habitat, and high road densities (Table 3-34).

West Fork St. Maries

The West Fork St. Maries River (hereafter called the West Fork) is primarily a low gradient, meadow stream, which meanders through a well-developed floodplain for most of its length. The West Fork has been listed as a Water Quality Limited Water Body (303(d)list). The pollutants of concern are temperature and sediment. The West Fork provides spawning, rearing, and over-wintering habitat for native salmonids (primarily westslope cutthroat trout) and other fish species. This stream also serves as a migration corridor for non-resident fish that utilize river tributaries. Only small sections totaling about 21% of the West Fork flow through National Forest land. The remainder flows the commercial timber company lands, state lands and private ownership. Although the West Fork provides important habitat for native salmonids, the quality of the habitat is impaired. Aquatic habitat lacks the complexity usually associated with quality habitat. Human activity has impacted riparian areas and negatively impacted instream habitat.

The West Fork St. Maries is considered "functioning at unacceptable risk" due to the 303(d) listing, low quality habitat, high road densities, and impacts to the riparian zone.

Wood Creek

Wood Creek is about three miles long and flows primarily through NFS lands, 97%, with only a small portion on Potlatch Timber Corporation and Idaho State lands near the mouth. Wood Creek is assumed to be providing spawning, rearing and overwinter habitat. Instream habitat is providing good habitat although pool development is low. Riparian conditions are currently in a less desirable condition due to human activity. The culvert under Highway 3 is not a migration barrier but the culvert under Forest Service road 341 is a low flow migration barrier due to a vertical jump. Upstream of Highway 3 the channel continues to be an E channel type.

The riparian zone is primarily grasses and forbs. Road 341 parallels the channel for the length of the road. Approximately 90% of the road is within 100' of the channel and approximately 20% is within 25' of the channel.

Wood Creek is considered "functioning at risk" due to the road within the RHCA and the high road density (Table 3-34).

Summary

Table 3-36 - Miles of Stream by Habitat Condition

Stream Name	Functioning	Functioning at Risk	Functioning at Unacceptable Risk
Bechtel		2.5	
Blair		4	
Cat Spur		5	
Cedar		3.5	
Christmas		1.6	
Hidden		3.2	
Keeler		3.8	
Kitten		3	
Log		3.5	
Long Slim		4.3	
Lower St. Maries			8.1
Mazie		2	
Swede John		2.7	
WF St. Maries			9.5
Wood		3	
Total project area length		42.1	17.6

Based on the information provided in Table 3-34 and Table 3-35, as well as the descriptions provided for each individual stream, a condition for each stream was determined (Table 3-36). The definition for the categories in Table 3-36 are described under the section titled Analysis Method, Current Habitat Condition (page 3-87). Stream miles are based on GIS mapping.

Environmental Consequences

Analysis Methodology: Past activity is described under the heading historical influences, in the fisheries report (project file). These past activities contribute to the current condition of the area. Future foreseeable actions utilized in this analysis are listed in the beginning of Chapter 3 (pgs 3-4 through 3-7). The project transportation planner provided information relating to the number of stream crossings on new road construction on NFS land, reasonably future roads on private lands, access request roads on NFS land, and roads on non-NFS lands, which are related to the approval of access requests across NFS lands.

The effects analysis will focus on the anticipated effects (by alternative) on the issues derived from the identification of the limiting factors (Table 3-37). Based on the fact that low carrying capacity and low overwintering survival (improperly functioning habitats) are both limiting fish production in the Hidden Cedar area, the issue is: How many miles of properly functioning fish habitat are there in the project area? The issue indicators are used in the bull trout consultation matrix developed by the U.S. Fish and Wildlife Service and have variable influences on the issue and the limiting factors.

Table 3-37 - Issue Indicators of Influences on Limiting Factors for Fish

Issue Indicator	Measurement Method
Population Characteristics	Population diversity, isolation, persistence ***(see Table 3-31)***
Watershed Condition	Road density, riparian harvest, activity on sensitive landtypes, and activity within the ROS elevation ***(see*** Table 3-34***)***
Water Quality	Temperature, Sediment, Chemical Contaminants/nutrients ***(see drainage descriptions)***
Habitat Access	Physical barriers ***(see*** Table 3-34***)***
Habitat Elements	Substrate embeddedness, large woody debris, pool frequency, large pools, off channel habitat, refugia ***(see drainage descriptions)***
Stream channel conditions	Width to depth ratio, streambank condition, floodplain connectivity ***(see*** Table 3-35***)***
Flow/hydrology	Change in Peak/base flows

For example, overwintering habitat is influenced by stream channel stability. A stream is described as stable if its cross-sectional geometry remains relatively constant over some time scale (Gordon et al 1992). Bisson and Sedell (1982) reported that where stream channels had become destabilized, riffles elongated and in many cases extended through former pool locations resulting in a loss of pool volume and effectiveness of large, stable debris as cover. They suggested that declines in older fish might have resulted due to their dependence upon deeper water habitat.

Overwintering habitat is also influenced by the condition of the riparian zone. Large woody debris is a critical element for aquatic habitat diversity and complexity (Reeves et al. 1993). Overwintering habitat (pools) is often created by large woody debris, which also provides cover and adds complexity to habitats; this increases habitat suitability. Riparian activity influences the potential to recruit large woody debris to streams (Sedell et al. 1988). By altering the recruitment potential for large woody debris, riparian activity can alter the composition, diversity, and structural complexity of aquatic habitat (Bisson et al. 1987, Hicks 1990, Bilby and Ward 1991). Riparian conditions are considered during the analysis of effects on the fishery of the project area.

Other factors frequently discussed for streams will not be analyzed for this project because they would not be influenced by the implementation of an alternative, are not the primary limiting factors for fish production, or can be correlated to the determination of effects for other factors, which are analyzed. The latter is true for the effects analysis of recreational fishing (both economics and experience). The viability of fish populations can be negatively affected by aquatic habitat degradation (Bisson and Sedell 1982). A decline in the fish population reduces the catch rate for recreational anglers. This relationship provides the rationale, which allows a cumulative analysis of effects on the aquatic habitat to determine the potential for effects on the recreational fishing industry.

Summary of Alternative Effects

Table 3-38 and 3-39 are a **summary** of the Forest Service contribution to cumulative effects for the proposed Hidden Cedar project and the overall (all ownerships) cumulative effects. Table

3-38 displays the change to current condition from proposed activities by drainage by alternative.

Table 3-39 gives the status of each stream in miles. It demonstrates the changes to the indicator "miles of properly functioning fish habitat" based on activities proposed.

Table 3-38 - Cumulative Effects on the Fishery (long term)

Stream	Current	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Bechtel, Hidden, Mazie,	Functioning at Risk						
Hidden Cedar Funded		↔	↔	↔	↔	↔	↔
Hidden Cedar other funding		↔	↔	↔	↑	↑	↑
All Ownership Cumlative Effects		↔	↔	↔	↑	↑	↑
Blair, Cat Spur, Keeler, Kitten, Log, Long Slim, Cedar	Functioning at Risk						
Hidden Cedar Funded		↔	↔	↔	↔	↔	↔
Hidden Cedar other funding		↔	↔	↔	↔	↔	↔
All Ownership Cumulative Effects		↔	↔	↔	↔	↔	↔
Lower St. Maries, West Fork	Functioning at Unacceptable Risk						
Hidden Cedar Funded		↔	↔	↔	↔	↔	↔
Hidden Cedar other funding		↔	↔	↔	↔	↔	↔
All Ownership Cumulative Effects		↔	↔	↔	↔	↔	↔
Wood	Functioning at Risk						
Hidden Cedar Funded		↔	↔	↔	↔	↔	↔
Hidden Cedar other funding		↔	↔	↔	↑	↑	↑
All Ownership Cumulative Effects		↔	↔	↔	↑	↑	↑

Definition of terms used in Table 3-38 and 3-39:

- Hidden Cedar Funded (associated with timber sale): timber harvest, road construction, road reconstruction, road obliteration, fuels reduction, gopher baiting. (see Chapter 2-Activities Common to All Alternatives and each alternative description)
- Hidden Cedar Other Funded (appropriated dollars): pre-commercial thinning, in-stream fish structures, obliteration of roads, riparian planting, fish pond (see Chapter 2-Watershed Restoration Work , pages 2-12 – 2-14.
- All Ownership Cumulative Effects: includes activities on non-Forest Service managed lands

Symbols used in Table 3-38 are:

↓ changes the current condition of the stream for the worse

↔ the current condition of the stream (good or bad) does not change

↑ changes the current condition of the stream towards the preferred condition

Table 3-39 - Summary of miles of functioning stream by alternative

Activity	Status	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Hidden Cedar Funded Activities	Functioning appropriately	0	0	0	0	0	0
	Functioning at Risk	42.1	42.1	42.1	42.1	42.1	42.1
	Functioning at unacceptable risk	17.6	17.6	17.6	17.6	17.6	17.6
Hidden Cedar other funding	Functioning appropriately	0	0	0	**13.4[1]**	**13.4[1]**	**13.4[1]**
	Functioning at Risk	42.1	42.1	42.1	**28.7[1]**	**28.7[1]**	**28.7[1]**
	Functioning at unacceptable risk	17.6	17.6	17.6	17.6	17.6	17.6

[1] These numbers show an increase in the trend towards Functioning Appropriately and a reduction in the amount of streams Functioning at Risk.

Effects Common to All Alternatives:

Table 3-40 lists the current and reasonably foreseeable activities, which are common to the no action alternative and the five action alternatives. This table provides a summary of the direct and indirect effects from the individual activities. A detailed description of the effects of these activities is located in the project file. These activities and their effects were taken into consideration during the cumulative effects analysis for the individual drainages.

Table 3-40 - Summary of Effects of Current and Reasonable Foreseeable Actions

Status	Activity	Direct/Indirect Effects	Comments
On Going Federal	Noxious Weeds	No	St. Joe Noxious Weeds EIS, Oct. 1999
	Dutch Cat Timber Sale	No	Indirect Effects of water yield and peak flows not influenced by activities on FS land Dutch Cat EIS, May 1997
	Merry Creek White Pine	No effects	USFWS concurrence letter, 12/7/01
	Power-line clearing and maintenance	Minimal if any	Primarily associated to tree felling
	Outfitter and Guides	No	Regulated by State fishing regulations
On Going Activity on both Federal and Non-Federal	Fire Suppression	Minimal, if any	Documented in the St.Joe River/NF Clearwater Basins BA, July, 1998
	Recreational Uses	yes	Primarily due to influence of roads
	Miscellaneous Gathering of forest products	yes	Primarily due to influence of roads
	Cattle grazing (private)	yes	Due to effects displayed by current practices
	Cattle grazing (USFS permit)	Minimal effects	Currently, grazing activity can be modified through the grazing permit if standards are not being met. Futhermore, and environmental assessment (EA) is underway regarding this activity. Proposals within this EA improve the monitoring effort to determine if standards are met.
	Unregulated Mining	yes	Effects limited in scope
	Operation and maintenance of non-FS or joint transportation	minimal	Water resources report states" it is not expected to be cumulatively significant because effects are temporary"

	systems		
	Biotic Factors (brook trout)	Yes	Influence will not be affected by selection of an action alternative
On-going Non-Federal	Timber management	yes	Related to road construction, and increased water yields, etc.
	Road abandonment	Short term negative, long term benefit	Cedar Creek
	Clarkia community and related business activity	yes	Potential to increase sediment to streams and loss of riparian vegetation
Future Foreseeable FS Activity	Mining - Wood creek	Minimal	Activity required to meet InFish standards and guidelines, and Clean Water Act
	Mining – Cat Spur Creek	Minimal	Activity required to meet InFish standards and guidelines, and Clean Water Act
	Mining – Bechtel Butte	No	No flowing water near
	2002 Pocket Gopher Control Project	**No direct effects due to buffers. Indirect effects possible but unlikely to occur**.	Pocket Gopher Control Project BA, 2002

Effects Common to All Action Alternatives

The following analysis is for Alternatives B, C, D, E and F. It describes the direct and indirect effects from activities that are common to all the action alternatives. A detailed explanation of these conclusions is located in the project file.

Table 3-41 - Summary of Effects Common to All Action Alternatives

Activity	Direct/Indirect	Comments
InFish - bufferstrips	Benefit	Reduces the risk of negative impacts to streams, especially temperature increases, retains future large woody debris, reduces sediment inputs (InFish,1995).
Timber Harvest	Ranges from no effect to negative effects, especially from increased water yields, change to peak flows, etc.	Dependant on the location, prescription, area, timing and harvest method, see individual drainage descriptions.
Road construction	Ranges from minimal short term negative effects to long term negative effects. Increases in sediment from road construction negatively affect instream habitat by decreasing depth and number of pools and physical rearing space, increases subsurface flow, increases channel braiding, increase fine sediment covers spawning gravels,	Dependant on the location, extent and timing of road construction, see individual drainage descriptions. Implementation of InFish guidelines will reduce risk for negative effects (InFish, 1995)
Road Reconstruction	Ranges from short term negative impacts/long term postive impacts to long term negative impacts.	Dependent on the type of reconstruction activity, the location, and extent and timing of activity. Implementation on InFish guidelines and BMPs

Activity	Direct/Indirect	Comments
		will reduce the risk of negative effects.
Road Obliteration	Short term increases in sediment create short term negative impacts, long term benefits from reduced risk of road failure and reduced continuous minor inputs of sediment	Extent of impacts are dependant on the location of the road, the number of culverts to be removed and the rate of revegetation (Johnson 1995)
Access Road Requests	See road construction	See road construction
Gopher Baiting	No direct effects due to buffers. Indirect effects possible but unlikely to occur.	Gopher Baiting BA, 1998
Precommercial Thinning	No effect short term, long term benefit from increasing the rate of growth on remaining trees.	Extent of effects is dependant on location of thinning units. Reference St. Joe River/NF Clearwater Basins BA 1998.
Riparian Planting	Long term benefit by reestablishing coniferous riparian zone	Associated benefits of future woody debris recruitment is best from conifers and cottonwoods.
Large Woody debris placement	Short term sediment input creates short term negative effect, long term benefit from increased diversity	
Fish Pond Construction	Short term sediment input creates short term negative effect, long term benefit by creating a managed fishery which will reduce fishing pressure on native population	

Effects Analysis By Drainage

The following section discusses the direct, indirect and cumulative effects for each alternative by individual stream. A list of the activities considered during analysis for each individual stream is located in the Introduction to Chapter 3.

Bechtel Creek:

Alternative A

Direct and Indirect Effects

There are no Forest Service activities planned under this alternative.

Cumulative Effects

Electrofishing surveys did not locate brook trout upstream of the private lands, and electrofishing surveys were not conducted on the private land. The influence of brook trout on this stream is uncertain because of the lack of information through the private lands. The majority of the on-going activities (both Forest Service and non-Forest Service) have been determined to have no effect or very minimal effect on the fishery of Bechtel Creek. The two exceptions to this are the motorcross course and the grazing activity on private lands. The motorcross course crosses Bechtel Creek twice. This will continue to be a source of sediment to the stream. The grazing along the lower sections of Bechtel Creek was identified, during the stream survey, as a source of stream damage.

Based on the continuation of this activity and the lack of any restoration work it is expected that the trend for the fisheries of this stream is to continue in a *"Functioning at Risk"* condition.

Alternative B and C

These alternatives would implement the same amount of activity therefore the effects will be the same.

Direct and Indirect Effects

As described in Table 3-41, there would be no direct or indirect effects associated to the implementation of pre-commercial thinning projects.

Cumulative Effects

Activities analyzed in Alternative A also occur in these alternatives and the effects described in that alternative are also considered within this alternative. **The Forest Service activity would not have a positive or negative contribution to a cumulative effect on the stream due to the lack of direct and indirect effects.**

The stream will continue to be in a *"Functioning at Risk"* condition due to the activity on private lands and the lack of restoration work.

Alternatives D, E and F

These alternatives would implement the same amount of activity therefore the effects will be the same

Direct and Indirect Effects

As described in Table 3-41, there would be no direct or indirect effects associated to the implementation of pre-commercial thinning projects. The proper storage of 1.6 miles of roads, including the removal of 3 culverts, would have a short term increase in sediment to the streams during the removal of the culverts but there would be a long-term benefit due to the reduction in potential for culvert failure. Revegetation of the road surface would reduce the introduction of fine sediments to the streams. The storage of these roads would occur if funds become available.

Cumulative Effects

Activities that were analyzed in Alternative A will also occur if either of these alternatives is selected therefore the effects described in that alternative are also considered within this alternative.

The Forest Service activity will reduce road densities and decrease the number of culverts, this will be a beneficial contribution to the cumulative effect on the stream. This activity does not have confirmed funding. The activity on private lands near the confluence with the West Fork of the St. Maries River will likely continue to degrade the habitat of that section of stream thus it is unknown whether fish would migrate through that section to arrive at the more secure and higher quality habitat.

Based on this information the stream would continue to *"Function at Risk."*

Blair Creek:

Alternative A

Direct and Indirect Effects

There are no Forest Service activities planned under this alternative.

Cumulative Effects

On-going activities were discussed in Table 3-40, and the majority of these activities were determined to either create no effect or very minimal effect. The exception is the effects of timber harvest and road construction on private lands, and grazing. State, private timber industry or private landowners manage the majority of the land (92%) in the Blair Creek drainage. Grazing is only available on a small portion of the land and would have only minimal influence on stream conditions. Timbered lands cover a large portion of the area, therefore state and private timber harvesting would have a major influence on the stream. The effect of non-federal timber management activity was described in the section titled On-going Non-federal Activity. This activity was determined to have a risk for negative impacts to the aquatic environment.

Based on the above factors, the currently high road density (7.4 mi/mi^2), and the lack of restoration work, it is determined that the trend for the fishery of this stream is to continue in a *"functioning at risk"* status.

Alternative B, C and F

These alternatives propose the same activities except there would be a small amount of road construction (0.4 mile) in Alternative B and F, and none in Alternative C. Because the road construction is such a minor amount, is located near the ridge, does not cross any streams and will be put into a long term storage condition, the effects from the two alternatives are similar.

Direct and Indirect Effects

The effects of gopher baiting was discussed in the section titled Effects Common to All Action Alternatives. There will be no influence from that activity.

The use of bufferstrips would ensure that the timber harvest would have no direct negative effects on the aquatic ecosystem, (see Effects Common to All Action Alternatives). Timber harvest is minimal (39.5 acres or 2% of the drainage), therefore, there would be no change in water yield, timing of flow, or water quality (see Water Section Chapter 3, page 3-73 and 3-73).

The new road constructed for Forest Service activity would create very minimal if any effects on Blair Creek because of its location. The new road that would be constructed if access were granted would have a very minor risk of affecting the Blair Creek fishery. The road access is short and there are no stream crossings, therefore the risk of increased sedimentation is reduced.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if either of these alternatives is selected therefore the effects described for that alternative are also considered within these alternatives.

The granting of access across Forest Service managed lands makes it possible for increased timber harvest and road construction on private lands, (see discussion about effects of on-going non-federal timber management activity). There will be a small amount of additional road construction on private lands but it does not cross any streams, therefore it also produces very minor risk of sediment increases to the stream. The activities proposed on NFS lands are not expected to create a measurable difference within the stream channel. **Therefore the Forest Service activities in this drainage will not contribute negatively to the cumulative effects.**

Considering the above factors in combination with the continued high road density (7.5 miles/mi^2), the high percentage of non-federal lands, and the lack of restoration activity this stream will be maintained in a *"Functioning at Risk"* condition.

Alternatives D and E

Because these alternatives have similar activities in the Blair Creek drainage they are considered together. The effects analysis for alternative D and E are the same as alternative B and C above, ***except*** that there is no timber harvest in alternatives D and E. The overall effects are similar

between the four alternatives because of the low number of acres involved in Alternatives B, C and F.

Forest Service activity will not contribute negative effects to the cumulative condition of Blair Creek. However, considering the above factors in combination with the continued high road density (7.5 miles/mi^2), the high percentage of non-federal lands, and the lack of restoration activity this stream will be maintained in a *"Functioning at Risk"* condition.

Cat Spur Creek:

Alternative A

Direct and Indirect Effects

There are no activities planned on NFS lands under this alternative.

Cumulative Effects

As described in Table 3-41, on-going activities within this drainage will either have no effect or minor effects with a few exceptions, Dutch Cat Timber Sales, private timber harvest and road construction, grazing and the probable presence of brook trout. Dutch Cat will have short-term effects with long term benefits.

Private lands comprise about 76% of the area and there will be at least 1 mile of new construction in the Cat Spur drainage in the foreseeable future. This new road construction will include at least 2 stream crossings on potentially fish bearing streams. The effect of timber management on non-federal lands is described in the section titled non-federal timber management activity and was determined to have a risk for negative effects. Grazing activity has been determined to have the potential for negative effects.

Currently habitat within Cat Spur Creek is impaired. This condition will not change due to the activity proposed on private lands under alternative A. There will be some road obliteration associated to the Dutch Cat Timber Sale which will benefit the stream in the long term but the additional road construction, which will occur on non-federal lands, will somewhat negate that improvement, road densities will remain high (4.4 mi/mi^2). The trend for this stream will continue to be *"functioning at risk."*

Alternative B, C, D, E and F

Proposed activity in the Cat Spur Creek drainage is the same for all action alternatives therefore the effects will be the same.

Direct and Indirect Effects

Discussion of the garnet mining permit is located in Table 3-41. This activity has the potential to create minor negative effects on the stream habitat through the introduction of sediment to the stream. There are no culverts associated to the road construction related to the access request or to the portion of the new road, which is connected to the access request on non-federal lands (0.1 miles). This will prevent any barriers to accessing potential habitat and reduce the potential for

sediment introduction. The road is located near a ridge, which should prevent sediment created on the road from reaching the stream.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if any of these alternatives is selected therefore the effects described for that alternative are also considered within these alternatives.

Currently habitat within Cat Spur Creek is impaired. This condition will not change due to the activity proposed under these alternatives. There will be some road obliteration associated to the Dutch Cat Timber Sale which will benefit the stream in the long term but the additional road construction, which will occur on non-federal lands, will somewhat negate that improvement, road densities will remain high (4.5 mi/mi^2**). The Forest Service activity proposed under these alternatives will not contribute negatively to the cumulative effects in this stream due to lack of direct and indirect effects.** The trend for this stream will continue to be *"functioning at risk."*

Cedar Creek:

Alternative A

Direct and Indirect Effects

There are no Forest Service activities planned under this alternative.

Cumulative Effects

The effect of on-going activities was described in the section titled Effects Common to All Alternatives. These activities were determined to have either no effect or very minor effect, with a few notable exceptions. Exceptions are: grazing, timber management, road construction, and road abandonment on non-federal lands which all have the potential to impact stream environments. Any change to the condition of this stream would be due to the influence of activity on private lands. A road on non-NFS lands will be abandoned which will reduce negative effects on the stream. The potential for negative effects on the stream will, however continue because these lands are managed for timber production, which includes road building and timber harvest.

Although there will be some road abandonment on private land the road densities for the drainage continue to be on the high end of moderate (3.9 miles/mi^2), this in combination with the current condition of the stream will maintain this stream in a *"Functioning at Risk"* condition.

Alternative B:

Direct and Indirect Effects

The effects of the gopher baiting was discussed in the section titled Effects Common to All Action Alternatives. There will be no influence from this activity. The implementation of bufferstrips will prevent timber harvest from having a direct effect on the fishery or aquatic environment. However, the extent of the harvest (8.5% of the drainage in regeneration harvest and 16% of the

drainage in commercial thin harvest) indirectly effects water quality and quantity. Water yields increases were determined to inconsequential, (Water Section, Environmental Consequences).

The construction of 2.84 miles of road will cause a short-term increase in sediment during construction. These effects may only be short-term, but because of the number of miles constructed, it is expected to create some channel morphological adjustment. It is, however, unlikely that channel widening will occur (see Water Section, page 3-72 and 3-73). After harvest activities are completed, the roads will be put into storage, which will reduce the long-term effects of these roads. In addition, existing roads are being converted from barriered roads to roads placed in long-term storage. This may create short term increases in sediment to the stream but in the long term would reduce the potential for sediment inputs from these roads. This alternative includes 1.26 miles of road reconstruction on NFS land outside of the project area. The road is located on the other side of the ridge from the Cedar Creek drainage, within the Emerald Creek drainage. This road reconstruction will have no impact on the Emerald Creek drainage because of the large size of the Emerald Creek drainage, location of the road, and the fact that the road already exists and is being used. Because it is an existing road there should not be any removal of vegetation and should have minimal amount of soil movement.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative is also considered within this alternative.

The Forest Service activity proposed under this alternative will not contribute a consequential effect to the cumulative effects in this stream (as noted above). The on-going activities combined with, the current condition of the stream, and the moderately high road densities (3.7 mi/mi^2), indicate that the stream will remain in a "*functioning at risk*" condition.

<u>Alternative C:</u>

Direct and Indirect Effects

The effects of the gopher baiting, road reconstruction and timber harvest are the same as described in alternative B above.

Some existing roads are being converted from barriered status to a long term storage status. This may create short-term increases in sediment to the stream but in the long-term would reduce the potential for sediment inputs from these roads.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative is also considered within this alternative.

The Forest Service activity proposed under this alternative will not contribute a consequential effect to the cumulative effects in this stream. The on-going activities combined with, the current condition of the stream, and the moderately high road densities (3.7 mi/mi^2), indicate that the stream will remain in a "*functioning at risk*" condition.

Alternative D

Direct and Indirect Effects

The effects from road reconstruction and gopher baiting are the same as alternative b and c, and road management is similar enough to have the same effects as Alternative C. The implementation of bufferstrips will prevent timber harvest from having a direct effect on the fishery or aquatic environment, because the amount of the harvest proposed in this alternative is not expected to have a noticeable effect on the stream channel (see Watershed Report).

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative are also considered within this alternative.

The proposed Forest Service activities should not contribute negatively to the cumulative effects of the drainage. However, based on the effects of on-going activities (private and Forest Service), the current condition of the stream, and the moderately high road densities (3.5 mi/mi^2), it is expected that the stream will continue to be in a *"functioning at risk*" condition.

Alternative E

Direct and Indirect Effects

The effects of the gopher baiting was discussed in the section titled Effects Common to All Action Alternatives. There will be no influence from this activity.

Some roads are being converted from a gated or barriered status to a long-term storage or partially obliterated status. This may create short-term increases in sediment to the stream but in the long term would reduce the potential for sediment inputs from these roads.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative are also considered within this alternative.

The proposed Forest Service activities should not contribute negatively to the cumulative effects of the drainage. However, based on the effects of on-going activities (private and Forest Service), the current condition of the stream, and the moderately high road densities (3.5 mi/mi^2), it is expected that the stream will continue to be in a **"***functioning at risk***"** condition.

Alternative F

Direct and Indirect Effects

The effects of the gopher baiting was discussed in Table 3-41. There will be no influence from this activity.

The implementation of bufferstrips will prevent timber harvest from having a direct effect on the fishery or aquatic environment. Water yields will increase slightly but due to the channel types the increase is not expect to be consequential (see Chapter 3, Water, Environmental Consequences).

The construction of roads will cause a short-term increase in sediment during construction. These roads however are located near the ridge and therefore do not cross any stream channel. Both road segments will be surfaced and after harvest activities are completed, the roads will be put into long term storage, these treatments will reduce the long-term effects of these roads.

There will be 0.95 miles of reconstruction, including surfacing, on road 3557 within the Cedar Creek drainage. This reconstruction will reduce the amount of surface erosion that is currently produced from this road, and therefore is beneficial to the aquatic environment. This road is located near the ridge between the Cedar Creek drainage and the Emerald Creek drainage. Because the road switches back and forth across the ridge between the two drainages, approximately 1.26 miles of road reconstruction on this road (3557) will occur within the Emerald Creek drainage. This road reconstruction will have no negative impacts on the Emerald Creek drainage because of the following: location of the road, the road already exists and is being used, there should be no removal of vegetation, there should be a minimal amount of soil movement, and because of the large size of the Emerald Creek drainage.

There will be 1.3 miles of road converted from gated or barriered to a long term storage or decommissioned condition. This may create short term increases in sediment to the stream but in the long term would reduce the potential for sediment inputs from these roads.

Cumulative Effects

The Forest Service activity proposed under this alternative will not contribute a consequential effect to the cumulative effects in this stream (as noted above). The potential for negative effects are a result of road construction and road obliteration, however; in the long term the road obliteration provides some positive impacts to the drainage.

The on-going activities (grazing and non-federal timber harvest) combined with, the current condition of the stream, and the moderately high road densities (3.5 mi/mi^2), should maintain the stream in a *'Functioning at Risk"* condition.

Hidden Creek

Alternative A

Direct and Indirect Effects

There are no Forest Service activities planned under this alternative.

Cumulative Effects

The effects of on-going activities were described in the section titled "Effects Common to all Alternatives". These activities were determined to have either no effect or very minor effect, for a few activities. These activities included: non-federal timber harvest, road construction and grazing, and the presence of brook trout.

There is very little non-federal land (3%) within the Hidden Creek drainage therefore non-federal timber harvest, and road construction will have little influence on the condition of the stream.

Grazing is occurring and can produce negative effects. Brook trout are present, at least in the lower end of the drainage and therefore do have an effect on the native salmonid population.

The main influences on the condition of Hidden Creek are the presence of brook trout, high road density (6.8 mi/mi^2) and the lack of restoration projects. This results in the continuation of the current condition of **"***functioning at risk***."**

Alternative B:
Direct and Indirect Effects

The effects of the gopher baiting and riparian planting were discussed in the section titled Effects Common to All Action Alternatives. There will be no negative impacts from these activities and there should be long term benefits from the riparian planting.

The implementation of bufferstrips will prevent timber harvest from having a direct effect on the fishery or aquatic environment. The harvest will not cause a significant channel morphologic change (Water section)

The new road constructed in this drainage will include at least 1 stream crossing. The construction of these roads will cause a short-term increase in sediment during construction and installation of the culvert. Although road construction has the potential of generating sediment, the Watershed Report identifies that any increase in sediment, from this alternative, will not affect the channel types that are present in Hidden Creek. Therefore there will be no change to fish habitat. Following the use of the roads, they will be put into storage, reducing the long term effects.

Some existing roads in the drainage are being converted from an open, gated or barriered status to a long-term storage status. This may create short-term increases in sediment to the stream but in the long-term would reduce the potential for sediment inputs from these roads.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative are also considered within this alternative.

The Forest Service activity will not contribute negatively to the cumulative effects within Hidden Creek, however, even with the substantial amount of road storage, road densities will remain high (5.3 mi/mi^2), and combining this with the presence of brook trout will maintain this stream in a **"***functioning at risk***"** condition.

Alternative C

Direct and Indirect Effects

The effects of the gopher baiting, riparian planting, and timber harvest are the same as alternative B. Changes in road prescription are the same as alternative B because they are not different enough to change the effects.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative are also considered within this alternative.

The Forest Service activity will not contribute negatively to the cumulative effects, however, even with the substantial amount of road storage, road densities will remain high (5.3 mi/mi^2), and combining this with the presence of brook trout will maintain this stream in a **"***functioning at risk" condition.*

Alternative D:

Direct and Indirect Effects

The effects of the gopher baiting and riparian planting were discussed in the section titled Effects Common to All Action Alternatives. There will be no influence from these activities.

The implementation of bufferstrips will prevent timber harvest from having a direct effect on the fishery or aquatic environment. The harvest will not cause a significant channel morphologic change (Water page 3-72-73)

Some roads in the drainage are being converted from an open, gated or barriered status to a long-term storage or obliterated status. The main Hidden Creek road (Road 498), located within the RHCA will be obliterated under this alternative. The removal of this road and the storage of the other roads may create short-term increases in sediment to the stream but in the long-term would reduce the potential for sediment inputs from these roads. The removal of the Hidden Creek road will also allow the stream full use of its floodplain and eliminate road induced constrictions. The removal of a culvert under this road will reduce the potential for failure of this culvert, which is storing a large quantity of deposition and will improve fish passage. The funding source for the road storage and obliteration is uncertain.

New road will be constructed for this alternative, and is located near the ridge dividing the Hidden Creek and Emerald Creek drainages. This road will be used as an alternative route to access lands in the Emerald Creek drainage once Road 498 is decommissioned. This road construction will include the crossing of at least 4 streams in the headwaters of the drainage. The road construction will create a short-term increases in sediment to the streams, especially during culvert installation. The location of this new road is considered to have less impact on the aquatic environment of the Hidden Creek drainage than Road 498, which is within the RHCA.

Cumulative Effects

Activities analyzed in Alternative A would also occur if this alternative is selected therefore the effects described for that alternative are also considered within this alternative.

There would be a substantial amount of road storage associated to this alternative however, road densities would remain high (4.9 mi/mi^2), the removal of the road 498 will improve long term conditions for the stream channel. The combination of these factors even with the presence of brook trout will show an improving toward a **"***functioning properly***"** condition.

Alternative E

Direct and Indirect Effects

The effects of the gopher baiting and riparian planting were discussed in the section titled Effects Common to All Action Alternatives. There will be no influence from these activities.

Some roads in the drainage are being converted from an open, gated or barriered status to a long term storage or obliterated status. This includes the main Hidden Creek road (Road 498), located within the RHCA, which will be obliterated. The removal of this road and the storage of the other roads may create short-term increases in sediment to the stream but in the long-term would reduce the potential for sediment inputs from these roads (see Chapter 3, Water Section- Environmental Consequences). The removal of the Hidden Creek road will also allow the stream full use of its floodplain and eliminate road induced constrictions. The funding source for the road storage and obliteration is uncertain. The removal of Road 498, will isolate several roads within the Emerald Creek drainage. These roads would also need to be stored properly and again the funding for this is uncertain.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative are also considered within this alternative.

There would be a substantial amount of road storage associated to this alternative however, road densities would remain high (4.9 mi/mi^2), the removal of the Road 498 will improve long-term conditions for the stream channel. The combination of these factors even with the presence of brook trout, and the minor amount of cattle grazing will show an improving trend toward a **"***functioning properly***"** condition due primarily to the removal of the riparian road.

Alternative F:

Direct and Indirect Effects

The effects of the gopher baiting and riparian planting were discussed Table 3-41. There will be no negative impacts from these activities and there should be long term positive impacts from the riparian planting.

The implementation of InFish bufferstrips will prevent timber harvest from having a direct effect on the fishery or aquatic environment. The harvest will cause a slight increase in water yield but this is not expected to create a consequential effect on the stream channel (Water Resources Report).

There will be four road segments constructed. One segment is a temporary road, which will be decommissioned after use, another segment will be put into long term storage after use. Neither of these roads includes stream crossings. Because of these features these roads should not increase the risk of sediment entering a stream channel. The other two segments are located near the ridge, which divides the Hidden Creek drainage and the Emerald Creek drainage. These roads will be constructed to replace the main Hidden Creek road, which will be decommissioned. The new roads are necessary to maintain access to lands in the Emerald Creek drainage. One of these road

segments (#3901-3343 connection) includes no stream crossings, is short (0.12 miles) and will be barriered following use. This road will not contribute a measurable amount of sediment to any stream channels. The other segment (#3478-3914 connection) includes 4 stream crossings. The installation of these culverts will create a short-term increase in sediment. These stream crossings will not create any barriers to migration, because they are not located on fish bearing streams. This road will be gated following construction. Periodic monitoring (through the annual road maintenance schedule) of these culverts will ensure that they don't create potential for failure. The location of this new road is considered to have less impact on the aquatic environment of the Hidden Creek drainage than Road 498, which is within the RHCA.

Approximately 6.6 miles of road have been identified as candidates for conversion from an open, gated or barriered status to a long-term storage or decommissioned status. The removal and storage of the roads may create short-term increases in sediment to the stream but in the long-term would reduce the potential for sediment inputs from these roads. This activity would reduce roads densities to (5.2 mi/mi^2). The main Hidden Creek road (Road 498), located within the RHCA, will be obliterated under this alternative. In addition to the reduction in a sediment source, the removal of the Hidden Creek road will also allow the stream full use of its floodplain and eliminate road induced constrictions. The removal of a culvert under this road will reduce the potential for failure of this culvert, which is storing a large quantity of deposition and will remove a migration barrier.

Cumulative Effects

The Forest Service activity in this drainage will have short-term increases in sediment due to the storage/decommissioning of road but in the long term this will provide positive impacts to the cumulative condition. The removal of road 498 will improve long-term conditions for the stream channel. The high percentage of Forest Service managed lands within the drainage, combined with the above mentioned factors and even with the presence of brook trout, indicates that the Hidden Creek fisheries would be improving toward a **"***functioning properly***"** condition.

Keeler Creek:

Alternative A:

Direct and Indirect Effects

There are no activities proposed under this alternative.

Cumulative Effects

The effects of on-going Forest Service activities were described in Table 3-41. These activities were determined to have either no effect or very minor effects, the exceptions to this are the timber harvest and road construction activities on private lands, private road abandonment, presence of brook trout and grazing (on-going and future foreseeable). A large percentage of this drainage (72%) is under non-federal management therefore the activity on these lands has a large influence on the condition of the stream habitat and the fishery. It is known that there will be 1.4 miles of new road construction on private lands. This will increase road density to 6.7 mi/mi^2. This new section of road will have at least 8 stream crossings. Road construction can create negative effects on streams (see Effects Common to All Action Alternatives). Because it is known that new road

will be constructed it can be assumed that some level of timber harvest will occur from this road. Timber harvest also has the potential to create negative effects, as does grazing and the presence of Brook trout (see Effects Common to All Alternatives).

Based on the current condition of Keeler Creek and the above information it is determined that the trend for Keeler Creek would continue in a *"functioning at risk"* condition.

Alternative B:

Direct and Indirect Effects

The type and amount of timber harvest, both commercial and pre-commercial, in this alternative would not affect water quality or water quantity (see Water Resources Report).

The new road construction on NFS lands would be put primarily into road management prescription D (1.13 miles) or management prescription C (0.2 miles) following use. There would be one stream crossing likely to intercept subsurface flow, but it will be outsloped and armored rather than receiving a culvert because this road will be eliminated after use. The construction of these roads will create a short-term increase in sediment during the construction phase, and will disrupt runoff patterns. In the long term these roads will re-vegetate and will no longer be a sediment source.

There will be an increase in properly stored roads (2.7 miles) which can cause a short term increase in sediment during the implementation but in the long term it will decrease the potential for sediment reaching the stream.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative are also considered within this alternative. The implementation of road closures on Forest Service managed roads will result in a reduction in road density compared to the current condition, however road densities will remain high, 6 mi/mi^2.

The Forest Service activity will not contribute negatively to the cumulative effects in Keeler Creek. The primary influences in this drainage continue to be the effects from activity on private lands and the presence of brook trout. The trend for this stream is to continue to *"function at risk."*

Alternatives C and D:

These two alternatives have essentially the same amount of activity. The only difference concerns the type of road management prescription, but in both cases the road would not be included in road density calculations because the difference in prescriptions pertains to the extent of the road decompaction.

Direct and Indirect Effects

The type and amount of timber harvest, both commercial and pre-commercial, in these alternatives would not affect water quality or water quantity (see Water Resources Report). Bufferstrips will be applied therefore no direct effects. There will be an increase in properly stored roads (2.7

miles) which can cause a short term increase in sediment during the implementation but in the long term it will decrease the potential for sediment reaching the stream.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative are also considered within this alternative. There are 1.4 miles of road storage that will occur with the timber sale and the remainder, 1.3 miles will occur if funds become available through other sources. The implementation of road closures, both timber sale connected or funded through other funding sources, will result in a reduction in road density compared to the current condition, however road densities will remain high, 6 mi/mi^2.

The Forest Service activity will not contribute negatively to cumulative effects on the stream. The primary influences in this drainage continue to be the effects from activity on private lands and the presence of brook trout. The trend for this stream is to continue to *"function at risk."*

Alternative E

Direct and Indirect Effects

The effect of pre-commercial thinning was discussed in Table 3-41. There will be an increase in properly stored roads (2.7 miles) which can cause a short term increase in sediment during the implementation but in the long term it will decrease the potential for sediment reaching the stream.

Cumulative Effects

Activities analyzed in Alternative A and their effects as described for that alternative are also considered within this alternative. The implementation of road decommissioning on Forest Service managed roads will result in a reduction in road density compared to the current condition, however road densities will remain high, 6 mi/mi^2.

The Forest Service activity will not contribute negatively to the cumulative effects on the stream. The primary influences in this drainage continue to be the effects from activity on private lands and the presence of brook trout. The trend for this stream is to continue to *"function at risk."*

Alternative F:

Direct and Indirect Effects

The implementation of InFish bufferstrips will prevent timber harvest from having a direct effect on the fishery or aquatic environment. The harvest will cause a slight increase in water yield but this will not cause any changes to channel morphology (see Water Resources Report).

There will be an increase in properly stored roads (2.7 miles) which can cause a short term increase in sediment during the implementation but in the long term it will decrease the potential for sediment reaching the stream. One and four tenths miles of this road storage is associated to the timber sale. The removal of culverts from these roads will eliminate all culverts on Forest Service managed roads within the Keeler Creek drainage.

Cumulative Effects

The Forest Service activity will not contribute negatively to cumulative effects on the stream. The primary influences in this drainage continue to be the effects from activity on private lands and the presence of brook trout. Even with the road storage/decommissioning on NFS lands the road density will continue to be high (6 mi/mi2) due to the roads on non-Forest Service managed lands. The trend for this stream is to continue to *"function at risk."*

Kitten Creek:

Alternative A, B, C, D, E, F

There are no activities planned in the Kitten Creek Drainage under any of the alternatives therefore it will not be altered from the current condition. No further analysis will occur.

Log Creek:

Alternative A:

Direct and Indirect Effects

There is no activity proposed under this alternative.

Cumulative Effects

The effects of on-going Forest Service activities were described in Table 3-40. The majority of the activities were determined to have either no effect or very minor effects, the exceptions to this are the timber harvest and road construction activities on private lands, presence of brook trout and grazing (on-going and future foreseeable). These activities have all been determined to create a risk for negative effects. There will continue to be high road densities, numerous stream crossings, and the likely presence of brook trout. The stream will continue to be in a *"functioning at risk condition."*

Alternative B, C, D, E, F

Direct and Indirect Effects

There are no Forest Service planned activities within this drainage under any of the action alternatives and therefore no direct/indirect effects.

Cumulative Effects

Activities analyzed in Alternative A and the effects described for that alternative are also considered within these alternatives.

Private industry will be constructing road within this drainage as a result of granting an **access request** on an existing Forest Service managed road in the West Fork drainage. This new road would have at least 5 stream crossings on private lands. The combination of new road construction, and the lack of road removal increases the road density for this drainage. The road

density is currently high and will become even higher. The construction of this road system also indicates that further timber harvest will be occurring in the drainage on private land.

There are no Forest Service activities planned for this drainage, therefore; the Forest Service is not contributing to cumulative effects. The combination of this high road density, the likelihood of the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected that this drainage will remain in a *"functioning at risk"* condition.

Long Slim:

Alternative A

Direct and Indirect Effects

There is no activity proposed under this alternative.

Cumulative Effects

The effects of on-going activities were described in the section titled "Effects Common to all Alternatives". The majority of the activities were determined to have either no effect or very minor effects; the exceptions to this are the timber harvest and road construction activities on private lands, presence of brook trout and grazing (on-going and future foreseeable). These activities have all been determined to create a risk for negative effects.

Private owners will be constructing road in this alternative. This road construction will increase road density from a current condition of 4.9mi/mi^2 up to a density of 5.4 mi/mi^2. The road construction also indicates that there will likely be timber harvest occurring in the drainage in the near future. The combination of this high road density, the likelihood of the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected that this drainage will remain in a **"***functioning at risk***"** condition.

Alternative B, C, D, E, F:

All action alternatives have the same amount of activity occurring in the Long Slim drainage, therefore the effects will be the same.

Direct and Indirect Effects

The effects of the pre-commercial thinning were described in Table 3-41. There will be no influence from that activity. These alternatives propose to convert 0.6 miles of open road to road management prescription C. The proper storage of this road will reduce the potential for increased sediment introduction to the stream and it will slightly reduce the road density. This road storage is contingent on funding sources other than those associated to a timber sale from this project.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if any of these alternatives is selected therefore the effects described for that alternative are also considered within these

alternatives. The Forest Service activity of putting road into long term storage in this drainage will be beneficial in the long term and it also is beneficial in the short term by limiting the increase in road density, which the road construction on private lands will produce.

The Forest Service activity does not contribute negatively to a cumulative effect on the stream. The combination of this high road density, the likelihood of the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected that this drainage will remain in a *"functioning at risk"* condition.

Mazie Creek:

Alternative A:

Direct and Indirect Effects

There is no activity proposed under this alternative.

Cumulative Effects

The effects of on-going activities were described in Table 3-40. These activities were determined to have either no effect or very minor effect, with the exception of road construction on private lands, grazing and the presence of brook trout. These three activities were determined to have the potential to create negative impacts. The combination of high road density, the likelihood of the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected that this drainage will remain in a *"functioning at risk"* condition.

Alternative B

Direct and Indirect Effects

There will be no direct effects attributable to the proposed timber harvest due to the application of InFish buffers, (see Table 3-41). Indirect effects deal with water and sediment yields and changes to peak flow and timing as a result of the harvest are addressed in the Water Resources Report. That report states that for water yield "the low predicted increases will not cause a significant channel morphologic change," therefore instream fish habitat will remain in its current condition.

Sediment yields are also expected not to be measurable. The new road constructed on NFS lands for this project will create short-term increases in sediment during construction, use and eventually storage of the roads. In the long term the road should not continue to contribute sediment because it will become revegetated. The road, including one stream crossing, which would be granted as access across National NFS lands would be put into either road management prescription A or B. These road management prescriptions eliminate use of the road but the road is still a non-vegetated surface with associated culverts in place. Therefore this access road could be source of increased sediment to the stream, during construction, use and post use.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative are also considered for this alternative. **The**

majority of the proposed activity on NFS lands will not contribute towards negative cumulative effects. The granting of the road access does have the potential of contributing some amount of sediment. Granting the access request will increase the road on FS lands, and on private lands will most likely be used to conduct timber management. However the majority of the land in this drainage is under Forest Service management therefore the activity on private lands has less of an influence on the condition of the stream. Although there are minimal negative effects, the very limited activity (i.e. road decommissioning) planned to improve the current condition eliminates the potential for improvement, therefore the stream will continue to be **"***functioning at risk*."

Alternative C

Direct and Indirect Effects

Direct and indirect effects related to timber harvest are the same as Alternative B. There will be no new road construction associated with Forest Service planned activity. However, road construction for access across National NFS lands would put the road into a road management prescription of A or B. These road management prescriptions eliminate vehicle use of the road but the road is still a non-vegetated surface with associated culverts in place. Therefore this access road will be a source of increased sediment to the stream, during construction, use and post use.

Cumulative Effects

Activities analyzed in Alternative A and the effects described for that alternative are also considered for this alternative. The majority of the proposed activity on NFS lands does not contribute towards negative cumulative effects. The granting of the road access does have the potential of contributing some amount of sediment. Granting the access request will increase the road on FS lands, and on private lands will most likely be used to conduct timber management. However the majority of the land in this drainage is under Forest Service management therefore the activity on private lands has less of an influence on the condition of the stream.

Although there are minimal negative effects, the limited activity planned to improve the current condition eliminates the potential for improvement therefore the stream will continue to be **"functioning at risk."**

Alternative D and E:

These two alternatives have the same activities therefore the effects will be the same.

Direct and Indirect Effects

Pre-commercial thinning and gopher baiting are the only silvicultural activities planned in these alternatives. The effects from these activities were discussed in the section titled "Effects Common to All Action Alternatives." These activities were determined to have no effect on the aquatic environment. The road which would be granted as access across National NFS lands would be put into either road management prescription A or B. These road management prescriptions eliminate use of the road but the road is still a non-vegetated surface with associated culverts in place. Therefore this access road will during construction, use and post use, will continue to be a source of increased sediment to the stream. These alternatives propose almost 4

miles of road storage. The funding for accomplishing this activity is uncertain. Road storage would have short term influences on the aquatic environment, especially during culvert removal, however in the long term this will benefit the drainage by reducing the amount of sediment reaching the streams, restore subsurface flow patterns, and reestablish infiltration.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if these alternatives is selected therefore the effects described for that alternative are also considered for these alternatives. There will be a reduction in road density in both alternatives, which will be a benefit to the aquatic environment. Although the potential for the presence of brook trout still exists, the large reduction in road density (from 5.1 mi/mi^2 down to 3.7 mi/mi^2) indicates that in the long term there should be an improvement to the stream habitat. Therefore the trend for this drainage **is improving**.

Alternative F:

Direct and Indirect Effects

There will be no direct effects attributable to the proposed timber harvest due to the application of InFish buffers, (see Table 3-41). Indirect effects dealing with water and sediment yields, and changes to peak flow and timing as a result of the harvest are addressed in the Water Resources Report. That report states that for water yield "the low predicted increases will not cause a significant channel morphologic change," therefore instream fish habitat will remain in its current condition.

Sediment yields are also expected not to be measurable. The new road constructed on NFS lands for this project will create minor short-term increases in sediment during construction, however there are no stream crossings, the road will be surfaced and following use it will be placed into long-term storage, all of which will prevent sediment increases in the long-term.

The access request road, including one stream crossing, will be surfaced and gated. This road potentially will increase sediment to the channel during construction, but the surfacing and the closure should in the long term reduce any sediment that might be produced.

The project proposes to convert almost 4 miles of open road into properly stored road (2 miles of decommission and 1.8 mile of long term storage). Road storage would have short term negative influences on the aquatic environment from sediment increases, especially during culvert removal, however in the long term this will benefit the drainage by reducing the amount of sediment reaching the streams, restore subsurface flow patterns, and reestablish infiltration. This activity would reduce roads densities to (3.7 mi/mi^2).

The identified migration barrier on Mazie Creek would not be corrected because it is located on a road that is not administered by the Forest Service.

Cumulative Effects

The proposed activity on NFS lands will have a positive effect on the cumulative condition due to the proposed road storage/closures. The granting of the road access does have the potential of contributing some amount of sediment. Granting the access request will increase the road on FS lands, and on private lands and will be used to conduct timber management. However

the majority of the land in this drainage is under Forest Service management therefore the activity on private lands has less of an influence on the condition of the stream. Based on the above factors, even including the likelihood of the presence of Brook trout (effects of brook trout are discussed under Biotic Factors, Table 3-41), it is considered that Mazie Creek would be trending to a "*properly functioning*" condition.

West Fork St. Maries:

Alternative A

Direct and Indirect Effects

There is no activity proposed under this alternative.

Cumulative Effects

The effects of on-going activities were described in the section titled "Effects Common to all Alternatives." These activities were determined to have either no effect or very minor effect, except for timber management and road construction activity on private lands, grazing and the presence of brook trout. These activities were all determined to create the potential for negative effects. There will be new road constructed across private/state lands. This new road construction includes at least 2 stream crossings. The road will not be scarified or revegetated following use. Road density will increase from 4.5 mi/mi^2 to 4.6 mi/mi^2. It is assumed that timber harvest would occur in association with road building.

The combination of high road density, the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected that this drainage will remain in a "*functioning at risk*" condition.

Alternative B and C

These alternatives are similar with the only difference being the 0.1 mile of new road construction in Alternative B. This road construction should not create a major difference in the effects of the alternatives therefore they will be analyzed as if they are the same.

Direct and Indirect Effects

The harvest associated to these alternatives does not create any direct effects due to the implementation of InFish buffers. The harvest should create only minimal increases in water yield and will not have a negative impact on channel conditions (Water Resources Report) and therefore will not impact instream habitat. The new road construction proposed is a combination of roads needed for activity on NFS lands and roads on NFS lands which are needed for non-Forest Service access. The new road construct, 1.4 mi/mi^2 for alternative B and 1.3 mi/mi^2 (access request) for alternative C, will create some increases in sediment, due to the installation of at least 2 culverts. There will also be 8 culverts installed on non-NFS lands that would be a result of the approval of granting the access request. The new road on NFS lands will be returned to a storage condition following use, which will in the long term return the site to more normal influence. The road built for the access request will not be revegetated following use therefore it will continue to be a potential sediment source and will negatively affect runoff patterns. The conversion of gated or barriered roads

into properly stored roads will create a short-term increase in sediment during the storage but in the long term will benefit the drainage by returning the sites to more natural runoff patterns.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if these alternatives is selected therefore the effects described for that alternative are also considered for these alternatives. **The majority of the proposed activity on NFS lands will not contribute towards negative cumulative effects.** The granting of the road access does have the potential of contributing some amount of sediment. Granting the access request will increase the road density on FS lands, and on private lands and will most likely be used to conduct timber management. The proper storage of roads on NFS lands will benefit the drainage by reducing slightly the negative effects of the increase in new road miles.

The combination of high road density, the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected that this drainage will remain in a "*functioning at risk*" condition.

Alternative D

Direct and Indirect Effects

The harvest associated to these alternatives will not create any direct effects due to the implementation of InFish buffers. The harvest should create only minimal increases in water yield and will not have a negative impact on channel conditions (Water – page 3-) and therefore will not impact instream habitat. The road built for the access request will not be revegetated following use therefore it will continue to be a potential sediment source and will negatively affect runoff patterns. The conversion of gated or barriered roads into properly stored roads will create a short term increase in sediment during the storage but in the long term will benefit the drainage by returning the sites to more natural runoff patterns.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if one of these alternatives is selected therefore the effects described for that alternative are also considered for these alternatives. **The proposed activity on NFS lands will not contribute towards negative cumulative effects.** The granting of the road access does have the potential of contributing some amount of sediment. Granting the access request will increase the road density on FS lands, and on private lands and will most likely be used to conduct timber management. The proper storage of roads on NFS lands will benefit the drainage by reducing the negative effects of the increase in new road miles. Road density does increase, changing from 4.5 mi/mi^2 to 4.7 mi/mi^2 , but it would have been greater if road decommissioning did not occur.

The combination of continued high road density, the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected that this drainage will remain in a **"***functioning at risk***"** condition.

Alternative E

Direct and Indirect Effects

The effects of the pre-commercial thinning and gopher baiting were described in the section titled Effects Common to All Action Alternatives. There will be no influence from these activities. The road built for the access request will not be revegetated following use therefore it will continue to be a potential sediment source and will negatively affect runoff patterns. The conversion of gated or barriered roads into properly stored roads will create a short-term increase in sediment during the storage but in the long term will benefit the drainage by returning the sites to more natural runoff patterns.

Cumulative Effects

The activity analyzed for this alternative includes on-going Forest Service activity, activity on non-NFS lands, the influence of brook trout and the proposed activity. The effects of on-going Forest Service activities were described in the section titled "Effects Common to all Alternatives". These activities were determined to have either no effect or very minor effect. **The proposed activity on NFS lands will not contribute towards negative cumulative effects.** The granting of the road access does have the potential of contributing some amount of sediment. Granting the access request will increase the road density on FS lands, and on private lands and will most likely be used to conduct timber management. The proper storage of roads on NFS lands will benefit the drainage by reducing the negative effects of the increase in new road miles. Road density does increase, changing from 4.5 mi/mi^2 to 4.7 mi/mi^2, but it would have been greater if road decommissioning did not occur.

The combination of continued high road density, the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected that this drainage will remain in a **"***functioning at risk***"** condition.

Alternative F:

Direct and Indirect Effects

The harvest associated to these alternatives does not create any direct effects due to the implementation of InFish buffers. The harvest should create only minimal increases in water yield and will not have a negative impact on channel conditions (Water Resources Report) and therefore will not impact instream habitat.

The new road construction proposed for Forest Service activity is a short road (0.1 miles) that does not cross any streams, will be surfaced and after use placed into long term storage. Because of all of these factors this road should not increase the amount of sediment that would be entering any stream channel.

The new access request road construction (1.3 mi), will create some increases in sediment, due to the installation of at least 2 culverts. These roads will be surfaced and gated. These measures should reduce the potential for sediment from reaching the channel, as long as the culverts are periodically checked by the responsible landowner.

The conversion of 3.2 miles of open, gated or barriered roads into properly stored or decommissioned roads will create a short term increase in sediment during the storage but in the long-term will benefit the drainage by reducing the potential for sediment inputs and by returning the sites to more natural runoff patterns.

Cumulative Effects

The proposed activity on NFS lands will have a positive effect towards the cumulative condition due to the road storage/closures. Although the Forest Service would be treating a large percentage of roads, activity on private land is expected to construct an additional 3.4 miles of road. The granting of the road access does have the potential of contributing some amount of sediment. Granting the access request will increase the road density on FS lands, and on private lands and will be used to conduct timber management. There will also be 8 culverts installed on non-NFS lands that would be a result of the approval of granting the access request.

The above information in combination with, the high percentage of non-federal lands, continued high road density, the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected that this drainage will remain in a **"***functioning at risk"* condition.

Wood Creek:

Alternative A:

Direct and Indirect Effects

There is no activity proposed under this alternative.

Cumulative Effects

The effects of on-going activities were described in the section titled "Effects Common to all Alternatives." These activities were determined to have either no effect or very minor effect, except for grazing and the presence of brook trout. These two activities were determined to have the potential for negative impacts. The activities associate to the Stars and Sands EIS were also discussed in the Effects Common to All Alternatives." It was determined that this project, if implemented as proposed would have a negative impact on the fishery.

Not considering the Future activity, the existing high road density (5.4 mi/mi^2) combined with the presence of brook trout in the system and the lack of road restoration will maintain this stream in a *"functioning at risk"* condition.

Alternative B

Direct and Indirect Effects

The effects of the pre-commercial thinning and gopher baiting were described in the section titled Effects Common to All Action Alternatives. There will be no influence from these activities. The commercial harvest will have no effect on the aquatic environment, the activity is very limited, and will utilize InFish Buffers. There will be a short section of new road construction, which will

require 2 stream crossings. This activity will create a short-term increase in sediment during construction. Following use the road will be put into storage, which again will create a short-term increase in sediment but in the long term will return the site to more natural function. The conversion of gated or barriered roads into properly stored roads will create a short-term increase in sediment during the storage but in the long term will benefit the drainage by returning the sites to more natural runoff patterns.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if these alternatives is selected therefore the effects described for that alternative are also considered for these alternatives. The Forest Service activity in this drainage will create short term increases in sediment, which should not cause a change to the current channel conditions. In the long term there will be a decrease in the road density of the drainage from 5.4 mi/mi^2 to 4.5 mi/mi^2.

The reduced density is still high and this in combination with the presence of brook trout in the drainage will maintain this drainage in a "*functioning at risk*" condition.

Alternative C

Direct and Indirect Effects

The effects of the pre-commercial thinning and gopher baiting were described in the section titled Effects Common to All Action Alternatives. There will be no influence from these activities. The commercial harvest will have no effect on the aquatic environment, the activity is very limited, and will utilize InFish Buffers. The conversion of gated or barriered roads into properly stored roads will create a short-term increase in sediment during the storage but in the long term will benefit the drainage by returning the sites to more natural runoff patterns.

Cumulative Effects

Activities analyzed in Alternative A will also occur if this alternative is selected, therefore; the effects described for that alternative are also considered for this alternative. **The Forest Service activity in this drainage will create only short-term minor increases in sediment to the channel from the proper storage of roads. In the long term this will create a decrease in the road density of the drainage from 5.4 mi/mi^2 to 4.5 mi/mi^2.** The reduced density is still high and this in combination with the presence of brook trout in the drainage will maintain this drainage in a "*functioning at risk*" condition.

Alternative D and E:

The same activity is scheduled for both of these alternatives therefore the effects will be the same.

Direct and Indirect Effects

The effects of the pre-commercial thinning and gopher baiting were described in the section titled Effects Common to All Action Alternatives. There will be no influence from these activities. The conversion of open, gated or barriered roads into properly stored roads will create a short term increase in sediment during the storage but in the long term will benefit the drainage by returning the sites to more natural runoff patterns and reduce the potential for sediment inputs.

Cumulative Effects

Activities which were analyzed in Alternative A will also occur if these alternatives is selected therefore the effects described for that alternative are also considered for these alternatives. **The Forest Service activity in this drainage will create only short-term minor increases in sediment to the channel from the proper storage of roads. In the long term this will create a decrease in the road density of the drainage from 5.4 mi/mi^2 to 3.5 mi/mi^2.** Although brook trout will still be present in the drainage and will therefore have a negative effect on the native salmonid population, the reduction in road density will allow the hydrology of the drainage to return to a more natural functioning condition in the long term and thus allow the instream habitat to *improve* over time.

Alternative F:

Direct and Indirect Effects

The effects of the pre-commercial thinning and gopher baiting were described in Table 3-41. There will be no influence from these activities.

The commercial harvest activity is very limited, and will utilize InFish Buffers. This combination will prevent direct or indirect effects on the aquatic environment.

There will be a short section of new road construction, which will require at least 2 stream crossings. This activity will create a short-term increase in sediment during construction. Following use the road will be put into storage and the culverts removed, which again will create a short-term increase in sediment but in the long term will return the site to more natural function.

The conversion of gated or barriered roads into properly stored roads will create a short-term increase in sediment during the storage but in the long term will benefit the drainage by returning the sites to more natural runoff patterns. In the long term there will be a decrease in the road density of the drainage from 5.4 mi/mi^2 to 4.3 mi/mi^2.

A migration barrier on the main Wood Creek road would be corrected which will improve fish passage, and a currently undersized culvert on a side road, which crosses Wood Creek will be removed.

Cumulative Effects

The Forest Service is the primary land manager in this drainage; therefore, it has a strong influence on the trend of this drainage. Based on the current condition of the stream, and the direct and indirect effects expected, **Forest Service activity in this drainage will have a positive influence on the cumulative condition.**

Although the presence of brook trout will still have a negative effect on the aquatic system, the reduction in road density, the correction of culvert problems, the immeasurable impacts from timber harvest activity, will all trend this stream toward “functioning properly.’

Lower St. Maries River:

Alternative A

Direct and Indirect Effects

There is no activity proposed under this alternative.

Cumulative Effects

The effects of on-going activities were described in the section titled "Effects Common to all Alternatives." The majority of these activities were determined to have either no effect or very minor effect, the exceptions to this are the timber harvest and road construction (reasonably foreseeable new road construction will have two stream crossings) activities on private lands, Clarkia and other private businesses, presence of brook trout and grazing (on-going and future foreseeable). These activities have all been determined to create a risk for negative effects.

The Forest Service is not proposing any activity under this alternative therefore there will be no contribution to cumulative effects from Forest Service activity. The St. Maries River is currently listed as an impaired watershed. This in combination with continued high road density, the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected that this drainage will remain in a **"***not functioning properly***"** condition.

Alternative B:

Direct and Indirect Effects

The harvest associated to this alternative will not create any direct effects due to the implementation of InFish buffers. The harvest should create only minimal increases in water yield and will not have a negative impact on channel conditions (Water- page 3-) and therefore will not impact instream habitat. The new road construction will likely alter the hydrology of the drainage, there is one stream crossings proposed on Forest Service managed lands. The new road on NFS lands will be returned to a storage condition following use, which will in the long term return the site to more normal function. The road built for the access request will not be revegetated following use however it is a small section of road which does not cross any streams therefore it should have minor influence on the aquatic environment. The conversion of open, gated or barriered roads into properly stored roads will create a short term increase in sediment during the storage but in the long term will benefit the drainage by returning the sites to more natural runoff patterns.

Cumulative Effects

Activities analyzed in Alternative A will also occur if this alternative is selected therefore the effects described for that alternative are also considered for this alternative. The granting of the road access will not directly impact the stream but the approval allows for further road construction and assumed more timber harvest. Even though there will be road construction on NFS lands and on other ownership lands, the overall road density is decreased due to the proper storage of roads on NFS lands. Density is reduced from 6.8 mi/mi^2 to 5.9 mi/mi^2. The proper

storage of roads on NFS lands will benefit the drainage by reducing slightly the negative effects of the increase in new road miles.

The proposed activity on NFS lands in the Cedar Creek and Hidden Creek drainages combined may contribute towards negative cumulative effects on the lower St. Maries River.

The St. Maries River is currently listed as an impaired watershed. This listing in combination with continued high road density, the presence of brook trout in the system and the assumed continuation of timber harvest on private lands, it is expected this drainage will remain in a **"***functioning at unacceptable risk"* condition.

Alternative C

Direct and Indirect Effects

The harvest associated to these alternatives will not create any direct effects due to the implementation of InFish buffers. The harvest should create only minimal increases in water yield and will not have a negative impact on channel conditions (Soil and Water) and therefore will not impact instream habitat. The new road construction proposed under this alternative is needed for activity on non-NFS lands but will cross NFS lands. This is a minor amount of road, which does not include any stream crossings. The road built for this access request will not be revegetated following use however because it is a small section of road which does not cross any streams it should have minor influence on the aquatic environment. The conversion of open, gated or barriered roads into properly stored roads will create a short term increase in sediment during the storage process but in the long term will benefit the drainage by returning the sites to more natural runoff patterns.

Cumulative Effects

Activities analyzed in Alternative A will also occur if these alternatives is selected therefore the effects described for Alternative A are also considered for these alternatives. The granting of the road access will not directly impact the stream but the approval allows for further road construction and presumably further timber harvest. Even though there will be road construction on NFS lands and on other ownership lands, the overall road density is decreased due to the proper storage of roads on NFS lands. Density is reduced from 6.8 mi/mi^2 to 5.9 mi/mi^2. The proper storage of roads on NFS lands will benefit the drainage by reducing slightly the negative effects of the increase in new road miles.

Even with the road storage, road density continues to be high and thus continues to affect the hydrology of the basin as well as the amount of fine sediment that reaches the stream.

The St. Maries River is currently listed as an impaired watershed. The proposed activity on NFS lands may contribute towards negative cumulative effects due to activity in Cedar and Hidden Creeks. This in combination with continued high road density, the presence of brook trout in the system and the assumed continuation of timber harvest and road construction on private lands, it is expected that this drainage will remain in a **"***functioning at unacceptable risk***"** condition.

Alternatives D and E

The same activity is scheduled for both of these alternatives therefore the effects will be the same.

Direct and Indirect Effects

The effects of the pre-commercial thinning and gopher baiting were described in the section titled Effects Common to All Action Alternatives. There will be no influence from these activities. The conversion of open, gated or barriered roads into properly stored roads will create a short term increase in sediment during the storage process but in the long term will benefit the drainage by returning the sites to more natural runoff patterns and reduce the potential for sediment inputs.

Cumulative Effects

Activities analyzed in Alternative A will also occur if any of these alternatives are selected therefore the effects described for that alternative are considered for these alternatives. The Forest Service activity will create only short-term minor increases in sediment to the channel from proper road storage. In the long-term this will decrease the road density from 6.9 mi/mi^2 to 5.7 mi/mi^2.

The St. Maries River is currently listed as an impaired watershed. **The proposed activity on NFS lands will not contribute towards negative cumulative effects.** This lack of effects from the Forest Service activity will not change the current condition of the channel and combined with continued high road density, the presence of brook trout in the system and the assumed continuation of timber harvest and road construction on private lands, it is expected that this drainage will remain in a **"***functioning at unacceptable risk"* condition.

<u>Alternative F:</u>

Direct and Indirect Effects

Harvest will not create any direct effects due to the implementation of INFish buffers. The harvest should create only minimal increases in water yield and will not have a negative impact on channel conditions (Soil and Water Report) and therefore will not impact instream habitat.

New road construction will be put into long term storage following use. All but 21% (0.32 miles) of the roads will be ripped. The remainder will be surfaced. There will be one culvert installation in the new road construction, which will be removed following use. This road construction and subsequent closure will create some sediment production especially at the stream crossing. In the long term, the roads should create a very small risk for adding sediment to stream channels.

The road built for the access request is a small section of road which does not cross any streams therefore it should have minor influence on the aquatic environment. It will however add a small amount to the road density of the drainage.

The conversion of open, gated or barriered roads into properly stored roads will create a short-term increase in sediment during the storage but in the long term will benefit the drainage by returning the sites to more natural runoff patterns. Density is reduced from 6.8 mi/mi^2 to 5.9 mi/mi^2.

Cumulative Effects

Granting road access will not directly impact the stream but it allows for further road construction and more timber harvest. Even though there will be road construction on NFS and on other lands, road density is decreased by proper road storage on NFS lands, which will benefit the drainage by reducing slightly the negative effects of the increase in new road miles.

The Forest Service activity in this drainage, including the tributaries in the cumulative effects area will not add negatively to the cumulative effects, it will provide some positive influence by reducing the road density, correcting fish passage barriers on Forest Service managed roads, plant riparian areas and add woody debris to the West Fork stream channel. Although there will be improvements due to these activities, based on the current condition, continued high road density, the presence of brook trout in the system, continued grazing and the assumed continuation of timber harvest on private lands, it is expected this drainage will remain in a **"**functioning at unacceptable risk**"** condition.

See Appendix F – Fisheries: Sensitive Species Biological Evaluation for a summary of effects on the sensitive fish species.

Compliance with Standards and Laws

Compliance with IPNF Forest Plan and INFish Guidelines:

Compliance with the IPNF Forest Plan and InFish Guidelines apply to activity implemented or authorized by the Forest Service.

Standard #1 and Standard #2 (as replaced by InFish): This standard would be met in Alternative B and C, D, E, and F.

Standard 3 does not apply to this project because none of the streams identified in that standard are located in this project area.

Standard 4 will be met. New road construction will provide for fish passage and known passage problems on Forest Service roads will be corrected.

Standard 5 was met. The information contained in this report uses fisheries surveys to coordinate activities with other resources. Several projects have been identified in this document that would benefit the fishery when they are implemented.

Standard 6. The intent of this standard is being met due to the extensive review of the stream systems and the implementation of standards described in InFish.

Compliance with NFMA regulations:

All action alternatives will meet NFMA requirements by maintaining and improving habitat of management indicator species.

Compliance with ESA regulations:

None of the alternatives would jeopardize the continued existence of bull trout, the listed species that historically was found in the project area, (Hidden Cedar Biological Assessment dated 4/2002).

Compliance with Executive Orders 11988 and 11990:

None of the alternatives would damage wetlands, and riparian dependent resources, such as the fishery, will be protected through the implementation of Infish bufferstrips.

Compliance with Executive Order 12962:

All alternatives would maintain habitat and thus would not affect the fishery potential, which in turn would not reduce the potential for recreational fishing opportunities. All alternatives include as a part of their proposals the construction of a fishing pond, which would increase recreational fishing opportunities.

WILDLIFE

Regulatory Framework

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

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

Section 7 of the ESA directs federal agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat.

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

The Forest Plan, in compliance with NFMA, establishes Forest wide and Management Area direction, goals, objectives, standards and guidelines for the management and protection of wildlife habitat and species. Forest wide standards that to some degree apply to this project level analysis include:

- Elk - Utilize the “Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho” to evaluate effects on elk habitat.
- MIS - Maintain viable populations distributed throughout the Forest.
- Cavity Habitat - Maintain habitat by implementing the IPNF Snag and Woody Down Timber Guidelines.
- Sensitive Species - Manage habitat of to prevent further declines in populations that could lead to federal listing.
- Old Growth Habitat

  - maintain at least 5% of the forested portion of Old Growth Management Units that have 5% or more existing old growth,

  - roads should be planned to avoid old-growth management stands to maintain unit size criteria.

Management Area direction is described in Chapter I. Direction concerning implementation of the ESA and NFMA can be found in Forest Service Manuals (FSM) and various letters/memos from the Forest Service's Washington Office, Regional Office, and the IPNF Supervisor’s Office.

Geographic Scope

The Hidden Cedar project area was defined early in the planning process and was delineated based on watershed boundaries.

The geographic scope of potential effects on wildlife for this project level analysis was determined based on the spatial distribution of proposed federal actions and the home range of species that may be impacted. The Hidden Cedar wildlife analysis area (Figure 3-1) is approximately 21,575 acres with 11,740 (54%) under Forest Service administration.

For some species, habitat adjacent to the wildlife analysis area has been considered in the analysis. Also, for some species, due to the nature of species occurrence, distribution of capable/suitable habitat, the scope of the alternatives and lack of impacts throughout the wildlife analysis area, the geographic scope of the analysis has been restricted to the area of potential impact. A more specific description of the geographic scope of the analysis is found under each habitat or species/guild section of this document.

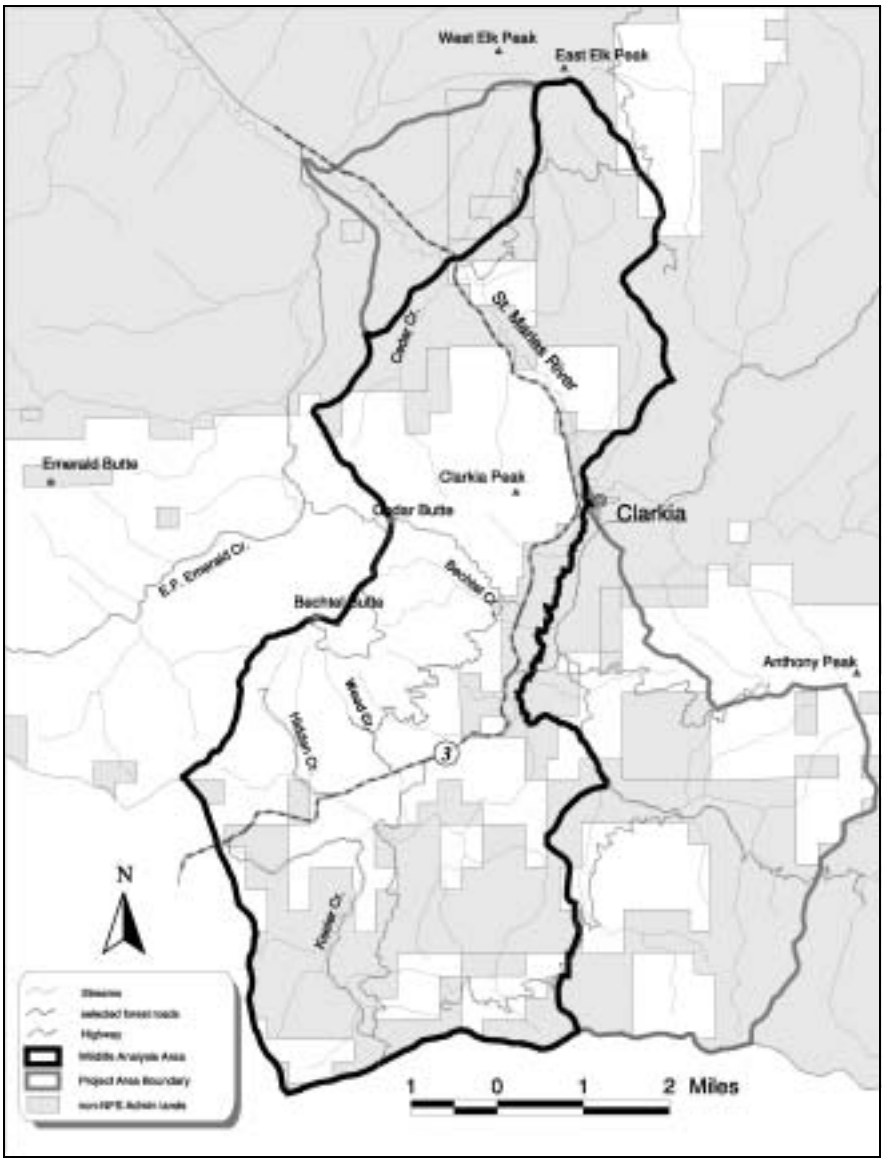

Figure 3-1- Wildlife Analysis Area

Analysis Methods

The appropriate methodology and level of analysis needed to determine potential effects is influenced by a number of variables, including: the potential for impacts, the risk to resources and species, available information, the ability to differentiate between alternatives, and the information necessary for an informed decision. This analysis starts at a course/medium level and proceeds to a finer level of analysis as needed to determine potential effects.

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

- Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin (ICB Assessment)
- Integration of Forest Planning into Ecosystem Management: Toward a Forest Ecosystem Approach: An Assessment for the St. Joe Area (St. Joe Geographic Assessment)
- Available Conservation Assessments and Strategies (final and draft) for wildlife species.
- Additional scientific literature as appropriate.

The analysis also incorporates the concepts in documents such as the *IPNF Standardized Effects Analysis Method for some Sensitive and Management Indicator Species* to help develop and conduct the analysis. The analysis is done at different levels of intensity (i.e. course filter - medium filter - fine filter) as appropriate to address the issues and concerns.

This analysis is organized by habitat and/or species. The main sections are:

- Terrestrial Habitat – including forest structure (i.e. successional stages), old growth, dry site habitat, riparian habitat, access/disturbance, and connectivity.
- Management Indicator Species (MIS)
- Threatened, Endangered, and Sensitive Species (TE&S)

All current and foreseeable actions listed at the beginning of Chapter III are considered in the wildlife analysis. However, those actions vary in their potential for impacts on wildlife and the consequences of potential impacts. The following actions have the potential for a measurable effect on wildlife in the analysis.

- Dutch Cat Timber Sale
- Grazing Permits
- State and Private Actions
- Merry Creek White Pine Progeny Test
- Road building on other lands

Other actions listed may influence impacts but have no measurable effect on wildlife that can be directly attributed to the action. For example, campground operations and outfitter permits may contribute to disturbance levels but are a part of the impacts measured by open road densities; and powerline maintenance may impact vegetation but in terms of effects is essentially maintaining existing open/seedling conditions.

Quantitative modeling approaches to assessing potential effects are not always plausible because of limited information about many species. Available models were used when appropriate based on available information and applicability.

The analysis evaluates habitat in terms of human disturbance and the capability and suitability of vegetation (e.g. structure and composition) for wildlife species or groups of species with similar habitat needs. For the purposes of this analysis, capable habitat is 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 include soils (or parent material, or landtype), slope, aspect, elevation, and habitat type. Suitable habitat is wildlife habitat that currently has both the fixed and variable stand attributes that enable it to produce the habitat requirements for a given species. Variable attributes change over time and may include seral stage, cover type, stand density, tree size, stand age, or stand condition.

Detailed data is available only for National Forest System (NFS) administered lands within the wildlife analysis area. The ownership pattern (i.e. relatively large and relatively contiguous blocks of NFS land surrounded by private) allows for adequate analysis of direct, indirect and cumulative effects for most species with the data from NFS lands only. Where information on non-NFS land is crucial to the analysis of effects (primarily for cumulative effects), data was developed via a combination of visual evaluation, photo interpretation, and extrapolation from data on NFS land.

Acre figures displayed in the wildlife section come from the TSMRS database and the calculations are documented in the project file. All values should be considered approximate due to such factors as rounding of acres and combining/grouping of stands. There are differences between resources (e.g. Vegetation and Watershed) in how effects on the same action/feature are counted. The differences are due to the scale at which the analysis is conducted (e.g. stand vs. within a stand), the level at which effects become noteworthy, and the consequences of the effects on different resources. For example, the shelterwood preparatory prescription does not change forest structure at the stand level (vegetation section), however in this section the small openings created by this type prescription are taken into account.

When needed, cumulative effects from possible impacts on non-NFS lands are evaluated based on past/present practices, management objectives, available information, and assumptions of probable activities. Due to the lack of detailed data, the effects from activities on non-NFS lands are difficult to quantify and qualify. They are therefore measured in more general terms than effects from activities on NFS lands. The assumptions regarding activities on non-NFS land and the possible impacts represent a “worst case scenario” for effects on wildlife species and habitat.

The interaction of disturbance (both human induced and naturally occurring) and forest succession determine the quality and quantity of habitat on a spatial and temporal scale. The existing condition and availability of habitat in the landscape will change regardless of management actions. This change could be sudden and readily apparent (e.g. a stand replacing wildfire) or slow and subtle (e.g. stand aging). As they pertain to this analysis, natural changes are random and unpredictable. Forest succession normally takes place at a rate that is essentially too slow to measure within the temporal scale of this project level analysis. However, because of its long-term effect and the existing condition of stands in the project area (e.g. ages close to but not yet mature) its effects will be discussed.

The fire history and human activities in the Hidden Cedar wildlife analysis area and surrounding landscape have influenced the availability and distribution of wildlife habitat present today, particularly the level of late successional habitat. The amount of late successional habitat is below historic levels for the Hidden Cedar project area and the St. Maries River Drainage. The emphasis

of the proposed action in moving timbered stands closer to historic conditions and avoiding old growth and potential old growth, influences the level and intensity of analysis.

At a landscape scale, land ownership patterns influence the availability of suitable habitat for some species, particularly species with large home ranges. The landscape encompassing the Hidden Cedar wildlife analysis (e.g. the Sherwin Staples LAA) area is predominately non-National Forest System (NFS) land (approximately 63%) and includes lands owned, managed and administered by: private timber companies, state agencies, and private individuals (project file). The dominant influences (e.g. road densities, amount and distribution of forest structures) on the abundance and distribution of many threatened, endangered, sensitive, and socially important/desirable species are the result of past and current management activities on both non-NFS and NFS land. The management objectives on most non-NFS forested lands emphasize timber management and much of the land owned by private individuals is not forested (e.g. open fields). Subsequently, these lands do not contribute to wildlife habitat such as mature/old forest structures or provide it at inherently low levels. Also, management objectives and practices on non-NFS lands tend to limit secure areas away from open/used roads. These conditions then influences the species present in the wildlife analysis area and the methodology and/or need to analyze potential effects.

More specific discussions of analysis methods can be found under the section for each species or group of species.

Species Relevancy Screen

The National Environmental Policy Act directs the agency to focus on a full and fair discussion of significant issues, and identify and eliminate from detailed study the issues that are not significant. Some elements of wildlife habitat require a detailed analysis and discussion to determine potential effects. Other elements may not be impacted; may be impacted at a level that does not influence use, occurrence, or the decision to be made; or can be adequately addressed through design of the project. These elements then do not necessarily require detailed analysis.

TE&S species, MIS, and other wildlife species of interest or concern known to occur on the IPNF were reviewed for their relevancy to the proposed actions and the wildlife analysis area. Relevancy was determined if there is evidence of species occurrence, capable and/or suitable habitat present, or potential for the proposed actions to affect a species or its habitat.

Some species or habitats do not occur in the wildlife analysis area and no further analysis is necessary. Other wildlife species or habitats may occur in the wildlife analysis area, but are not measurably affected because they would not be impacted by proposed actions, the impacts would not influence species use or occurrence, or project design adequately addresses the concerns.

The assessments of the potential for effects made in this screen consider the scope and nature of the activities associated with the proposed action and alternatives, the potential risks for adverse impacts and the ability to determine potential effects based on available information at the time of this phase of the analysis. If the potential for effects cannot be determined with a reasonable degree of confidence in this process then additional analysis will be conducted.

Table 3-42 displays the results of the species relevancy screening process. Further information on species not requiring further analysis and the rationale is discussed following the table.

Table 3-42 - Species Relevance Screen

Species/Habitat	Species or Habitat Present in St. Joe drainage?*	Potential for Measurable Effects in Analysis Area?	Need for Detailed Further Analysis?	Rationale for no further analysis**
Endangered				
Gray wolf***	Y	Y	Y	
Woodland caribou	N	N	N	1
Threatened				
Bald eagle	Y	N	N	2
Grizzly bear	N/I	N	N	1
Canada Lynx	Y	N	N	1&2
Sensitive				
Black-backed woodpecker	Y	Y	Y	
Boreal Toad	Y	Y	Y	
Coeur d'Alene salamander	Y	Y	Y	
Common loon	N/I	N	N	1
Fisher	Y	Y	Y	
Flammulated owl	Y	U	Y	
Harlequin duck	Y	N	N	1
Northern bog lemming	N	N	N	1
Northern goshawk	Y	Y	Y	
Northern leopard frog	U	N	N	1&2
Peregrine Falcon	I	N	N	1&2
Townsend's big-eared bat	Y	N	N	1&2
White-headed woodpecker	N/I	N	N	1&2
Wolverine	Y	Y	Y	
Management Indicator				
Elk	Y	Y	Y	
Moose	Y	Y	N	3
Marten	Y	Y	Y	
Pileated woodpecker	Y	Y	Y	
Other				
Forest land birds	Y	N	N	3
Cavity/Snag habitat	Y	Y	N	2

* Yes, No, Unknown or Incidental (if at all).

**1 Rationale and documentation is provided in the project file for the determination that the species or habitat is not present within the St. Joe/St. Maries River drainages and/or wildlife analysis area.

2 Species or habitat may be present, but due to the scope of the proposed actions - including design criteria - there would not be any effect on habitat or the species (e.g. harvest of trees would not impact habitat for species associated with lakes). Rationale is provided in the project file and in this document.

3 Species does not apply, is not appropriate for the project, or indicators for other habitats/species measure the potential impacts. Rationale is provided in the project file and in this document.

***South of Interstate 90, the gray wolf is classified as nonessential experimental populations; this classification treats wolves as proposed for listing under the ESA.

Rationale For No Further Analysis

Bald Eagles select isolated shoreline areas with larger trees to pursue such activities as nesting, feeding, loafing, etc. Components of nesting habitat include proximity to sufficient food supply, the presence of dominant trees, and line-of-sight to a large body of water - often within 0.25 mile of water (MBEWG 1991).

Species/habitat presence: The lower St. Maries River receives occasional incidental and opportunistic migrating or wintering bald eagle use. District sighting information indicates very limited use during winter and the area is not considered bald eagle wintering habitat (project file).

There are no bald eagle nests in the St. Maries drainage. Based on the above information, bald eagle occurrence in the drainage is considered incidental.

Much of the riparian habitat adjacent to the St. Maries River is in non-NFS ownership. This limits the Forest Service's ability to manage nesting habitat for bald eagles

Rationale for No Further Analysis: There are no large bodies of water in the project area and no bald eagle nesting habitat. Based on the lack of capable habitat and design features of the proposed action and alternatives (e.g. Riparian Habitat Conservation Areas buffers) the potential for effects on bald eagle habitat in areas adjacent to water is negligible. Project activity would have no effect on the bald eagle or capable habitat under any alternative. No further analysis or discussion is warranted.

Canada Lynx occur in mesic coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare. In northern Idaho lynx habitat generally occurs above 4,000 feet in subalpine fir forests or cedar/hemlock habitat types when in association with subalpine fir and spruce habitat types. Habitats that support their primary prey include early successional stages resulting from natural disturbance and timber harvest. Characteristics of foraging habitat include a dense, multi-layered understory that provides cover and browse at ground level and at varying snow depths throughout the winter. Older forests with a substantial understory of conifers or small patches of shrubs and young trees also provide lynx foraging habitat.

The common component of natal den sites appears to be large woody debris. Den sites may be located within older regenerating stands or in mature conifer. For denning habitat to be functional it must be in or adjacent to foraging habitat.

Species/habitat presence: The "Canada Lynx Conservation Assessment and Strategy" (Ruediger et. al. 2000) provides direction for management of lynx on federal lands. As part of the programmatic planning standards, Lynx Analysis Units (LAUs) were delineated (in collaboration with the USFWS) to facilitate project planning. Based on the forest types, potential vegetation, and elevation the Hidden Cedar area was not included in any LAU and is not considered capable of providing sufficient habitat for lynx (project file).

Rationale for No Further Analysis: The geographic location of the project – and the associated lack of capable habitat - precludes the potential for effects on the species. Therefore, activities in the Hidden Cedar Project will have no effect on lynx under any alternative. No further analysis or

discussion is warranted and the project is consistent with the Canada Lynx Conservation Assessment and Strategy.

Northern Leopard Frogs are found in or near water in non-forest habitats. They prefer densely vegetated areas such as wet sedge meadows or cattail marshes. Breeding takes place in lakes, ponds, or springs.

Likely factors contributing to its decline nationally include the loss of breeding habitat (e.g. draining of wetlands) and the possible influence of broad-scale environmental contaminants.

Trampling or vehicle mortality is less of a factor (e.g. than with boreal toads) because leopard frogs are more tied to wetlands, except in those wetlands where livestock grazing occurs unimpeded.

Species/habitat presence & Rationale for No Further Analysis: The wildlife analysis area is well outside of the predicted range for northern leopard frogs in Idaho (Digital Atlas of Idaho). Northern leopard frogs have not been recorded in or adjacent to the wildlife analysis area and the lack of records of occurrence indicates that this species is unlikely to occur at all and so would be unlikely to be affected by this project. Also, Forest Service activities are unlikely to cause impacts to this species if adequate protection is given to wetlands. The project design for this project ensures that wetlands likely to contain breeding habitat for this species would be unaffected by the project.

Peregrine Falcons are seasonal migrants to northern Idaho, nesting in the northern temperate regions while wintering in the US and southward. They nest on cliffs that are typically higher than 100 feet, with overhanging ledges or potholes and a vertical surface that provide protection from predation. Foraging areas associated with nest sites can include wooded areas, marshes, grasslands and open water.

Species/habitat presence and Rationale for No Further Analysis: There are no known historic aeries or capable/suitable nesting habitat in the wildlife analysis area. The species is not known or suspected to occur in the area. Existing habitat capability and suitability; and the nature and scope of the project preclude the potential for effects on habitat or the species. No further analysis and discussion is warranted.

Townsend's Big-eared Bat: Caves and cave-like structures are a critical habitat for this species, both as hibernacula in the winter and as roosts for summer nursery colonies. They occasionally use bridges and old buildings for roosting and in some places have been known to use building attics as nursery sites (Perkins, 1992 p. 9). In northern Idaho, Townsend's big-eared bats primarily roost in abandoned mines. Loss and disturbance of hibernacula and roosting habitat is the limiting factor for Townsend's big-eared bats.

Species/habitat presence and Rationale for No Further Analysis: There are no abandoned mines or caves in the wildlife analysis area that may serve as potential habitat (project file & Minerals section). The species is not known or suspected in the project area. Based on the lack of suitable habitat and occurrence there would be no impact on habitat or the species.

White-headed woodpeckers prefer open canopied stands of mature and older ponderosa pine. They also use mixed ponderosa pine and Douglas-fir stands. In Idaho, nesting white-headed woodpeckers used stands with less than 26% canopy cover or tree density less than 165 trees per acre. Forestry practices including clear-cutting, snag removal and fire suppression have contributed to threats to the species (IDFG, 1995).

Species/habitat presence: The white-headed woodpecker is listed as a sensitive species on the IPNF. There are no known observations of this species on the St. Joe RD. Any occurrences on the IPNF "should probably be considered as vagrants in peripheral range by transient individuals" (D. Svingen, pers. comm. in IDFG, 1995).

***Rationale for No Further Analysis*:** Because of the range and distribution of the species (e.g. nature of occurrence on the IPNF), the geographic location of the project (and habitat capability) precludes the potential for effects on the species. USFS activities on the St. Joe would have no effect on this species. Furthermore, because of habitat similarities with the flammulated owl, the guild of species that includes the white-headed woodpecker will be addressed. Therefore, no analysis specifically for white-headed woodpecker is warranted.

Moose were identified in the Forest Plan as a MIS associated with mature timber stands. Moose eat a variety of plants with shrubs and trees being the most important winter forage. Components of moose habitat include riparian areas and old harvest units or brushfields. The level of human disturbance is considered to be the most limiting habitat component effecting moose in the analysis area.

Species/habitat presence: Moose are known to occur and are relatively common in the wildlife analysis area.

***Rationale for No Further Analysis*:** The parameters used to evaluate effects on elk and other MIS (e.g. road density, security) are applicable and sufficient for addressing potential effects on moose. Therefore, no analysis specifically for moose is warranted.

Forest Land Birds include all the avian species sometimes collectively termed as ‘Neo-tropical migratory birds’, ‘migratory songbirds’ and 'resident songbirds'. This group of birds is an extremely diverse group of species, with divergent habitat associations and potential effects.

Species/Habitat Presence & Rationale for No Further Analysis: Various land birds are known to be present in the wildlife analysis area. Any treatment, including no action, affects some species in this group at the expense of others. Species likely to be affected by activities are represented by other habitat elements and species addressed in this screen and/or analyzed further, including: general forest species (elk), dry site species (flammulated owl), wetlands/riparian habitat (Coeur d'Alene salamander, see also the hydrology and fisheries sections), old growth (flammulated owl, fisher, pileated woodpecker and northern goshawk), and snag dependent species (pileated and black-backed woodpeckers). The potential impacts on this group of species are reflected in the impacts on the various components of terrestrial wildlife habitat (e.g. forest structure/size class, old growth, dry site habitat, and riparian habitat), by potential impacts on representative species (e.g. pileated woodpecker, flammulated owl, black-backed woodpecker, harlequin duck), and by potential impacts on other wildlife species (e.g. elk and boreal toad).

Cavity Habitat: The amount of snags and down woody material present has been identified as a measure of forestland integrity (Quigley et. al. 1996). Snags of varying size, condition, and tree species provide habitat for a variety of wildlife species.

The species totally or largely dependent on cavity habitat include some sensitive (e.g. black-backed woodpecker, flammulated owl) and MIS (e.g. pileated woodpecker).

Species/habitat presence & Rationale for No Further Analysis*:* Existing cavity habitat is a function of past and present disturbances (e.g. fire, insects, disease, and timber harvest), stand initiation, and succession. There is a relatively low amount of seedling/sapling forest structure (i.e. <12% of wildlife analysis area) that has reduced cavity habitat potential due to past activity (project file). Conversely, there is a relatively large amount of large/mature/old and small/medium/immature forest structure (74% of wildlife analysis area) well distributed in the analysis area (project file).

The existing condition of cavity habitat is reduced from 100% of potential but occurs at a level (>74%) that exceeds Forest Plan standards (40-60% of potential) and is not of major concern at this time.

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 that use snags. Recent studies indicate that viable woodpecker populations occurred in areas with about four snags per acre (Bull et al. 1997). Bull et al. (1997) recommends providing snags in every 5 to 25 acre stand to satisfy distribution needs.

In all action alternatives, some snags (i.e. cavity habitat) would be lost. However, the potential impacts on snags and down wood are alleviated by a number of factors. Areas outside of proposed treatment units would continue to provide snags at existing levels in the short term and the number of snags and down woody material in these areas would increase as stands succeed. Areas would be reserved from treatment within Inland Native Fish Strategy buffers. 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 that use snags and down logs (design features, Chapter 2). Snags and snag replacements would be retained in all treatment units at levels recommended by scientific literature based on recent studies (12 per acre in most units). Snag retention objectives exceed Forest Plan standards of 3-4 per acre.

The analysis for terrestrial habitat (i.e. old growth, dry site, and riparian), black-backed woodpecker, flammulated owl, pileated woodpecker, and also forest carnivores will provide analysis of cavity habitat specific to those species.

The project would meet Forest Plan goals and objectives for cavity habitat, and Forest Plan standards would be met or exceeded in all alternatives. No further analysis is needed.

Issue Indicators

Changes in forest vegetation and human disturbance/access could impact existing habitat for wildlife species; and project activities could cause or increase risk of mortality. Based on habitat relationships, indicators of potential impacts on relevant species will be measured. Indicators and

units of measurement for habitat and species are displayed in the following table (Table 3-43). Queries of the timber stand data base (TSMRS) and information from field reviews/surveys were used to identify types of habitat and capable and suitable habitat for wildlife species (project file). The changes in habitat conditions and habitat for species will be disclosed and a discussion of the effects will be displayed. The analysis of effects on species will be tiered to the analysis of effects on the types/components of habitat displayed in the table. To facilitate analysis and to most accurately reflect habitat for some species it was necessary to combine size classes differently dependent on the species being addressed. The most common example of this is including multistoried stands with other size classes (primarily mature or immature) in some species analysis.

Table 3-43 - Issue Indicators for Wildlife

Habitat/Species	Indicator of Effects	Measurement
Terrestrial Habitat		
Size Class	Amount and percent of successional stages present in the area.	Acres and percent of size classes.
Old Growth	Amount, patch size, distribution & Forest Plan Standards	Acres impacted, maintained and future options for management
Dry Site Habitat	Changes in type of habitat	Acres of habitat impacted, maintained and/or improved
Riparian Habitat	Changes in riparian vegetation	Acres/miles impacted or improved
Disturbance/Access	Changes in human access	Road density & changes in road status
Connectivity	Changes in vegetation in travel routes & barriers to movement	Maintenance of vegetation along ridges and riparian areas
Threatened and Endangered Species		
Gray wolf	Changes in disturbance & prey availability	Road density and potential elk use
Sensitive Species		
Fisher (and Marten)	Changes in suitable habitat and security	Acres of suitable habitat and road density
Wolverine	Disturbance of denning habitat and security	Activity near denning and road density
Northern Goshawk	Changes in suitable habitat and nest disturbance	Acres of suitable habitat and activity in nest stands
Black-backed Woodpecker	Changes in suitable habitat	Acres of suitable habitat
Flammulated Owl	Changes in suitable habitat	Acres of suitable habitat
Coeur d'Alene Salamander	Disturbance of microhabitat	Sites disturbed and risk of habitat disturbance
Boreal Toad	Impacts on breeding habitat and direct mortality	Impacts to riparian habitat &risk of mortality
Management Indicator Species		
Pileated Woodpecker	Changes in suitable habitat	Acres of suitable habitat

Habitat/Species	Indicator of Effects	Measurement
Elk	Changes in potential elk use and vulnerability	Potential elk use and acres of security

TERRESTRIAL WILDLIFE HABITAT

This section of the analysis uses a medium/course filter level of analysis to display existing conditions and effects at the scale of the wildlife analysis area. Data displayed in this section will be used in the analysis for wildlife species.

Vegetation/Habitat/Successional Stages

Plant communities at various successional stages provide habitat for wildlife species. Some wildlife species are associated with high levels of dead and downed logs and late successional stages. Others may require or are associated with combinations of young and late successional stages.

The St. Joe Geographic Assessment and the ICB Assessment (at their respective scales) revealed that there has been a decrease in late-seral habitat from historic levels. Many wildlife species that are likely in decline are associated with this type of habitat. Therefore, one of the issues/concerns regarding the proposed action and alternatives is any further decline in the amount of overmature and old growth stands. Such stands are important habitat for maintaining late-seral species in the landscape.

Affected Environment

Table 3-44 - Existing Vegetation by Size Class Group (NFS lands) in Wildlife Analysis Area

Size/Structure	Acres	%
Large/Mature/Old Forest	1,662	14%
Small/Medium/Immature	6,998	60%
Multistory	435	4%
Pole/Young	887	8%
Shrub/Seed/Sap	1,424	12%
Open (field/riparian)	331	3%

Environmental Consequences

All Alternatives

Direct Indirect and Cumulative Effects

For the purposes of this analysis it is necessary to approximate the acres of openings that would be created in the shelterwood treatments. Based on stand conditions and prescription objectives the silviculturist and biologist assigned the following percent to show changes in size class by prescription.

Clear cut with reserves	100%	Shelterwood seed	100%
Commercial thin	0%	Shelterwood removal	100%
Shelterwood	33%	Precommercial thin	0%
Shelterwood preparatory	25%		

In Table 3-45 below, the changes in acres from the existing condition in Alternatives A and E are due to reasonably foreseeable activities. The changes in Alternatives B, C, D, and F are due to proposed timber harvest (and any associated activities e.g. road construction) and reasonably foreseeable activities.

Table 3-45 - Size Class by Alternative

Size/Structure	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
	acres %	acres %	acres %	acres %	acres %	acres %
Large/Mature/Old Forest	1,662 14	1,601 14	1,608 14	1,629 14	1,661 14	1,621 14
Small/Medium/Immature	6,993 60	6,715 57	6,750 58	6,861 58	6,993 60	6,749 58
Multistory	435 4	435 4	435 4	435 4	435 4	435 4
Pole/Young	847 7	863 7	863 7	847 7	847 7	863 7
Shrub/Seed/Sap	1,469 13	1,749 15	1,749 15	1,632 14	1,469 13	1706 15
Open (field/riparian)	331 3	332 3	332 3	332 3	332 3	332 3

The activity that has the greatest impact on size class is the proposed timber harvest. This activity would reduce the amount of forest in the large/mature and small/immature size classes with a corresponding increase in the amount of forest in the seedling size class (in one unit the existing understory of pole size trees would become the size class).

The table below displays the total acres in each size class group that would be treated by proposed harvest (including the current and foreseeable actions listed in front of chapter 3) and the acres that would change size class due to harvest.

Table 3-46 - Acres Proposed for Harvest Treatment by Size Class.

	Alt. A & E		Alt. B		Alt. C		Alt. D		Alt. F	
Forest Structure	treated	changed	treated	changed	treated	changed	treated	changed	treated	changed
Large/Mature/Old	0	0	260	53	282	53	128	31	212	36
Small/Immature	5	5	1091	248	1097	248	458	137	1071	222
Pole	0	0	22	0	22	0	22	0	22	0

In each alternative at least 57 % of the analysis area would succeed naturally from small/immature forest to larger/older size classes over time (this represents 96% of the existing small/immature

size class). This change would be slow and subject to a multitude of variables (e.g. natural fires) that could affect the acres.

In addition to the effects from timber harvest Table 3-46 displays reductions (there is no category to show corresponding increases) from proposed new road construction that would impact existing forest structure. The effects on forest structure from new road construction is as follows: Alternative B - approximately 35 acres of immature forest structure and 7 acres of mature/old forest structure, Alterative D - approximately 1 acre of mature/old forest and less than an acre each of immature and pole structure, Altalternative F - approximately 27 acres of immature forest structure, 5 acres of mature/old forest structure and less than 1 acre of pole structure. Also, the Merry Creek White Pine Progeny Test impacts about 40 acres of existing pole sized structure.

There is no change in size class from the minerals activity included in this analysis. The area of impact from the Bechtel Butte is in the Emerald Creek drainage, Cat Spur activity is under an existing power line (existing open structure), and Wood Creek exploratory activity would not impact size class (project file).

The proposed fish pond would also impact existing mature forest structure by flooding approximately 1-2 acres.

Cumulative Effects

Data displayed in Table 3-45 and Table 3-46 and the discussion pertaining to impacts from proposed road construction depict all past, present and reasonably foreseeable activities on NFS land. In addition, pre-commercial thinning would occur on 615 acres and gopher control would occur on 210 acres. These activities would not change the size class of the treated stands. Succession would continue to proceed and slowly affect the amount of acres in each size class.

A more detailed analysis of potential effects from Pre-commercial thinning and gopher control can be found in the project file.

It is expected that the majority of non-NFS land would be actively managed and therefore no stands would remain in the large/old forest size class for any appreciable length of time before being treated. NFS lands would provide the vast majority of mature/old forest with non-NFS lands being in younger successional stages.

Succession would continue to occur, untreated stands become older and contain larger trees, natural disturbances (e.g. insects, disease, wind throw) would continue to set back succession.

Old Growth

The Forest Plan (page II-5) states that "Approximately 10 percent of the Forest will be maintained in old growth as needed to provide for viable populations of old growth dependent and management indicator species. To obtain the desired distribution, the IPNF will be managed to maintain approximately 5 percent of each old-growth unit as old growth where it exists." As part of a Forest-wide process the District(s) identified stands meeting old growth criteria. Stands were then allocated to old growth management to comply with Forest Plan standards.

Affected Environment

The hidden cedar wildlife analysis area contains all or a portion of 3 old growth management units (OGMU). One of the OGMUs has less than 160 acres of NFS land in the hidden cedar wildlife analysis area. All existing allocated old growth in the wildlife analysis area is in one OGMU that is completely contained within the wildlife analysis area. In the wildlife analysis area, there are 487 acres of allocated old growth, this represents 6% of the NFS land in the OGMU.

All existing old growth in the wildlife analysis area, with the exception of one 14-acre stand, has been allocated to meet Forest Plan standards for maintenance of old growth. The stand not allocated is a narrow stand surrounded by roads and clearcuts that compromise its old growth value and make it undesirable as allocated old growth.

Across the Forest and the St. Joe Ranger District, some OGMUs contain more than 10% allocated old growth and Forest Plan standards for old growth are being met with 11.6% of forested acres allocated (project file).

Fire and topographic diversity in the west (and the St. Maries River drainage) have historically combined to produce a temporally dynamic, naturally fragmented landscape (Dobkin, 1992). Natural patch sizes and differences in structure (e.g. edge) resulting from the interaction of disturbance and succession varied considerably.

Patch sizes ranged from less than an acre to subdrainages and combinations of subdrainages. The resulting landscape was complex, with the vegetation patterns being a function of disturbance frequency and severity, environmental gradients, soil potential, seed source and other factors.

The integrity and effectiveness of old growth stands as habitat is somewhat correlated with patch size and the condition of adjacent stands. For example, when an opening exists or is created next to an old growth stand, the environmental changes created by the opening penetrate into the old growth. The existing old growth (i.e. allocated old growth and non-allocated old growth) occurs in seven patches within the analysis area and range in size from 14 to 170 acres. The stands adjacent to the old growth vary from recent clearcuts through mature forest stands including allocated old growth not in the analysis area).

The following information on patch size is for comparison with desired characteristics in the Forest Plan. Within the analysis area there are 6 patches greater than 25 acres, three of which are greater than 80 acres. No patch is greater than 300 acres. When adjacent old growth outside of the analysis area is included patch sizes increase. One 29-acre patch increases to approximately 270 acres and the 170-acre patch increases to approximately 500 acres.

Environmental Consequences

Common to All Alternatives

Direct and Indirect Effects

There would be no change in existing old growth due to harvest activity. All alternatives were designed to maintain old growth habitat and would allow substantial acres of both existing mature and immature forest habitat in contiguous blocks to naturally succeed (see the previous discussion

regarding impacts on successional stages). Options for an increase in the amount of large/mature/old forest habitat in the future would be maintained in all alternatives (as succession of existing small/medium/immature stands occurs).

There is no Forest Service activity proposed adjacent to existing old growth that would indirectly impact old growth. Thinning is proposed adjacent to the unallocated old growth. However, because of the prescription, the existing road between the proposed thinning and the old growth, and the existing indirect impacts on the old growth stand there would be no further indirect impacts on the old growth value of the stand.

Cumulative Effects

Activities on non-NFS land are expected to retain little, if any, old growth. Because of ownership patterns, harvest activity on non-NFS lands could indirectly impact 5 patches of existing old growth on NFS land. As much as 17,200 feet adjacent to existing old growth could be indirectly impacted. The amount of immature forest on NFS that would succeed naturally would, overtime, increase the quantity and quality of old growth in the analysis area and the OGMUs.

Alternatives A, B, C and E

Direct and Indirect Effects

There would be no direct effect from management activity on existing old growth. Forest Plan standards for old growth retention would continue to be met.

Alternative D and F

Direct and Indirect Effects

Proposed new road construction would directly impact approximately 1 acre of existing allocated old growth and indirectly affect an additional 5 - 6 acres by increasing edge and splitting the existing block (Figure 3-2). The road construction is intended to maintain access to areas/roads that would be lost due to the proposed obliteration of portions of the Hidden Creek road.

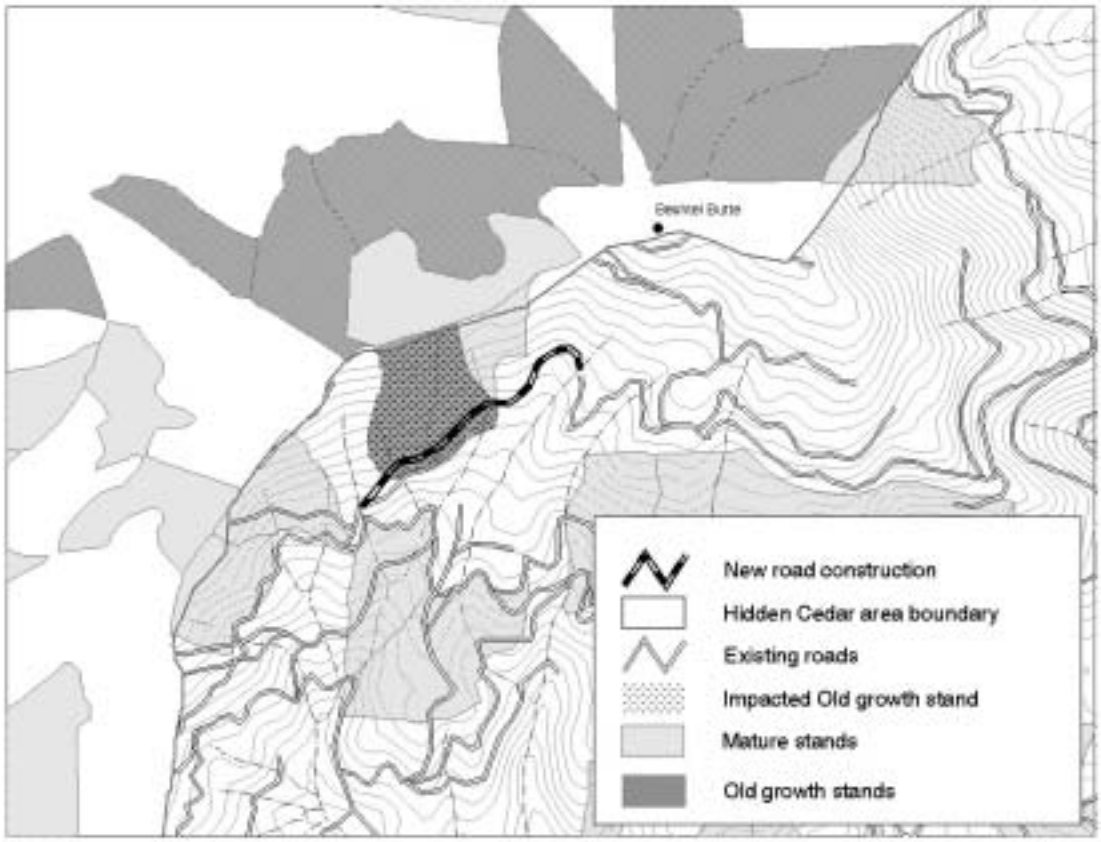

Figure 3-2 - Road Construction in Old Growth (Alternatives D and F)

The affected block (comprised of 2 stands) of old growth in the analysis area is approximately 29 acres of a 270 acre patch of old growth. The northwest tip of the block is adjacent to a 243-acre patch of allocated old growth that is outside of the analysis area.

The block is adjacent to mature and old growth forest on the north and northeast, immature sawtimber on the west, and recent clearcuts on the south and southeast. Approximately 2 acres in the southern portion of the block was burned during the prescribed burning of the clearcut to the south (c. mid-1990s).

The road construction would bisect the existing 29-acre block, creating two blocks (24 acres and 4 acres in size) and approximately 1 acre of road surface and cleared cut/fill slopes. The 4-acre block contains the burned portion of the old growth block. Depending on if and how the affected stands are re-delineated, there would be a 1 or 5 acre reduction in allocated old growth in the OGMU.

The remaining 24-acre block would still be considered suitable for allocation because of its adjacency to mature forest and the existing old growth outside of the analysis area. There would be a reduction in allocated old growth in the OGMU of approximately .06 of a percent. Forest Plan standards for old growth retention would continue to be met.

Dry Site Habitat

The ICB Assessment and St. Joe Geographic Assessment identified that dry site open forests with large trees are in short supply compared to historic conditions.

Affected Environment

In the wildlife analysis area there are 144 acres (1% of NFS land) of dry habitat types (existing forest types include 80 acres of Douglas-fir, 25 acres of larch, and 38 acres not typed) and an additional 62 acres of ponderosa pine on moister habitat types. Ninety-nine acres of the dry habitat type are immature size class or larger/older, and 21 acres of the ponderosa pine are in the immature size class. There are also scattered small areas (less than 10 acres) of ponderosa pine that are minor components of larger stands.

Environmental Consequences

Common to All Alternatives

Direct and Indirect Effects

Opportunities for improvement and expansion of large/mature dry site habitat (the forest type of primary interest is ponderosa pine) were explored. At this time there are no existing dry site stands of ponderosa pine that would benefit from active management to improve/expand this habitat.

Cumulative Effects

Fire suppression under existing policy is not expected to allow fire to perform its historic function of creating/maintaining dry site open forest conditions.

Alternative A, D, and E

Direct and Indirect Effects

There would be no impact on dry habitat in these alternatives.

Alternative B, C, and F

Direct and Indirect Effects

One dry site stand would be treated. The existing forest type is larch. The treatment prescription would create about 4 acres of opening and thin 12 acres to open the stand and improve growth.

Riparian Habitat

The St. Joe Geographic Assessment identified that, compared to historic conditions, changes in riparian zones have occurred (e.g. loss of mature cottonwood).

Affected Environment

The Ecosystem Analysis at the Watershed Scale (project file) identified that much of the riparian vegetation in the Hidden Cedar wildlife analysis area has been impacted by human activities such as timber harvesting (and associated railroad activity), agriculture and cattle grazing.

Environmental Consequences

See the Watershed and Fisheries Sections of this document for a more detailed display and discussion of effects related to road removal in RHCAs.

Alternative A

Direct and Indirect Effects

There would be no impact on riparian habitat associated with this alternative.

Alternatives D and E

Direct and Indirect Effects

These alternatives would remove approximately 0.7 mile of existing road that is encroaching on the riparian habitat in Wood Creek. This (along with the riparian planting) would begin the process of restoring/moving the riparian habitat closer to historic conditions.

Common to All Action Alternatives

Direct and Indirect Effects

Approximately 5 miles (20-30 acres) of the riparian area along Hidden Creek, Wood Creek and the West Fork of the St. Maries River would be planted to trees and/or brush. This would begin the process of restoring/moving the riparian habitat closer to historic conditions.

Common to All Alternatives

Cumulative Effects

Cattle grazing would continue to impact riparian habitat. The ongoing NEPA analysis of effects being considered in the Grazing EA for the St. Maries allotments has determined, based on factors such as lack of species occurrence and minimal impacts on suitable habitat, that the effects on wildlife from cattle grazing are negligible.

The construction of a fish pond would flood 1-2 acres on NFS land and an additional 1-2 acres on non-NFS land.

This activity would create a somewhat permanent wetland and effects would be similar to those of historic beaver activity (i.e. wetland habitat for species of amphibians, reptiles, and other species).

Activity on non-NFS land would continue and may impact riparian habitat. Activity on non-NFS land is subject to compliance with the Idaho Forest Practices Act. These effects are not measurable at this time and beyond the scope of the federal action.

Disturbance/Access

Many wildlife species are sensitive to human disturbance and/or adversely impacted by human access. Potential temporary disturbance of wildlife is inherent in most human activity (e.g. project implementation) and may include alteration of normal use patterns and potential relocation to avoid disturbance (e.g. using alternate forage areas). This type of disturbance is not based on loss or long-term alteration of habitat and would not appreciably affect populations

Most potential adverse impacts from human disturbance are associated primarily with access levels and roads. Effects on wildlife are caused by roads themselves and by the increased contact with humans that they afford. High levels of open roads (or roads and trails used by motorized vehicles) can affect wildlife species by increasing their vulnerability to mortality and displacing them from preferred habitats for one or more seasons. The ICB Assessment identified that those species vulnerable to human disturbance have relatively low amounts of secure habitat. The St. Joe Geographic Assessment also identified security as a concern.

The degree of effects on wildlife from roads is related to the amount and type of use on them. For the purpose of assessing impacts on wildlife from roads on NFS land, only roads that impact wildlife are included in the wildlife analysis. For example, an old road that is re-vegetated to the same composition and size class as the surrounding forest would have no measurable impact on wildlife (but may constitute an impact on other resources). Detailed information regarding the status of roads on other than NFS lands is not readily available. Therefore, the information displayed for roads on all ownerships may include roads that do not impact wildlife.

The ICB Assessment categorized road density levels (expressed as mi/mi^2) of 0.7 to 1.7 as moderate, 1.7 to 4.7 as high and more than 4.7 as extremely high. Road density goals for wildlife vary depending on the species, area under consideration and the objectives and designation assigned to the drainage. For example, there is a high risk to trapping-vulnerability for fisher and marten when road densities are more than 1 mi/mi^2 (Draft - Forest Carnivores in Idaho HCA/S, 1995). The ICB assessment also found a great deal of ambiguity about the amount of road access needed to satisfy public needs.

Data displayed in this section represents conditions in the wildlife analysis area and therefore does not match the figures displayed elsewhere for the larger project area.

Affected Environment

Many of the current and foreseeable actions in the analysis area do/would influence disturbance and access (see Chapter II). However, regardless of the cause for any disturbance or impact on access, the effect is best measured by road miles and densities.

In the wildlife analysis area there are approximately 65 miles of roads on NFS land that, based on field review and an assessment of potential use, may impact wildlife.

For the wildlife analysis this results in a total road density on NFS land in the Hidden Cedar wildlife analysis area of 3.5 mi/mi^2. There are approximately 34 miles of open road that results in an open road density of 1.8 mi/mi^2.

On all lands there are approximately 168 miles of roads of all types (main paved highway to primitive road) and status (open, gated, barriered, brushed-in) in the Hidden Cedar wildlife analysis area. For the wildlife analysis this results in a total road density of 5 mi/mi^2. There are approximately 69 miles of open road that results in an open road density of 2.1 mi/mi^2.

Environmental Consequences

Table 3-47 displays the total road miles, total road densities, open road miles, and open road densities in the wildlife analysis area for each alternative. Road densities are displayed as mi/square mile. The data displayed on NFS land includes only roads that may impact wildlife.

The indirect effects of approving access requests across NFS land are included in the cumulative effects displayed in the table. The reasonably foreseeable minerals activities are not anticipated to affect the miles of road in any alternative.

Table 3-47 - Road Densities and Miles

	Existing	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
NFS lands	**Direct Effects**						
Total road miles	64.9	64.4	62.3	56.1	51.3	50.6	56.8
Total road densities	3.5	3.5	3.4	3	2.8	2.8	3.1
Open road miles	33.8	33.3	30.5	30.5	22.2	22.2	23.2
Open road densities	1.8	1.8	1.7	1.7	1.2	1.2	1.3
All ownership	**Cumulative Effects**						
Total road miles	168.4	173.6	174.6	168.4	163.5	162.8	169
Total road densities	5	5.2	5.2	5	4.9	4.8	5
Open road miles	69.1	68.7	65.7	65.7	57.4	57.4	58.4
Open road densities	2.1	2	1.9	1.9	1.7	1.7	1.7

The following discussions by alternative describe the activities that would lead to the conditions displayed in Table 3-47.

Alternative A

Direct, Indirect, and Cumulative Effects

All effects are associated with Forest Service activities approved in other decisions or activities on non-NFS lands that are independent of any Forest Service decision.

Forest Service activities covered under a signed decision would obliterate .5 miles of existing open road on NFS land. Activity on non-NFS land would build 5.6 miles of road.

Alternative B

Direct, Indirect and Cumulative Effects

This alternative would build a total of 11.4 miles of new road on NFS land in the wildlife analysis area. This includes 9.2 miles to access proposed treatment units and 2.2 miles associated with requests to access non-NFS lands.

The alternative also includes an increase of 14.5 miles of road on non-NFS land (an additional 8.9 miles above the 5.6 miles in the No Action Alternative).

New construction, road rehabilitation, and changes in road management (which reduce the miles of road that may impact wildlife) would combine to increase the total road density on all ownerships in the wildlife analysis area and reduce the open road density.

Alternative C

Direct, Indirect and Cumulative Effects

In association with the access requests the alternative would require the building of 2.2 miles of road on NFS land. The alternative would result in an increase of 14.5 miles of road on non-NFS land (an additional 8.9 miles above the 5.6 miles in the No Action Alternative).

New construction and changes in road management (which reduce the miles of road that may impact wildlife) would combine to maintain the existing total road density on all ownerships in the wildlife analysis area and reduce the open road density.

Alternative D

Direct, Indirect and Cumulative Effects

This alternative would build a total of 2.9 miles of new road on NFS land in the wildlife analysis area. This includes 0.7 miles to maintain access to roads and areas affected by obliteration of existing roads and 2.2 miles from the approval of requests to access non-NFS lands. The alternative also includes an increase of 14.5 miles of road on non-NFS land (an additional 8.9 miles above the 5.6 miles in the No Action Alternative).

New construction and changes in road management (which reduce the miles of road that may impact wildlife) would combine to reduce the total road density on all ownerships in the wildlife analysis area and reduce the open road density.

Alternative E

Direct, Indirect and Cumulative Effects

The alternative includes an increase of 14.5 miles of road on non-NFS land (an additional 8.9 miles above the 5.6 miles in the No Action Alternative). In association with the access requests the alternative would require the building of 2.2 miles of road on NFS land.

New construction and changes in road management (which reduce the miles of road that may impact wildlife) would combine to reduce the total road density on all ownerships in the wildlife analysis area and reduce the open road density.

Alternative F

Direct, Indirect and Cumulative Effects

This alternative would build a total of 8.9 miles of new road on NFS land in the wildlife analysis area. This includes 6 miles to access proposed treatment units, 0.7 miles to maintain access to roads and areas affected by obliteration of existing roads, and 2.2 miles from the approval of requests to access non-NFS lands. The alternative also includes an increase of 14.5 miles of road on non-NFS land (an additional 8.9 miles above the 5.6 miles in the No Action Alternative).

New construction and changes in road management (which reduce the miles of road that may impact wildlife) would combine to maintain the total road density on all ownerships in the wildlife analysis area and reduce the open road density.

Connectivity

Review of historic photos (c.1933) and other sources indicate that (1) relatively wide and open riparian areas adjacent to some streams (e.g. Middle Fork St. Maries) occurred at that time, and (2) fires created large expanses of open forest conditions. These areas continue to influence movement of some wildlife species (e.g. fisher) in the analysis area. The spatial arrangement of existing forest structure, human settlements, land uses (e.g. grazing/pastures and log landings), and roads (especially State Highway 3) affect movement of wildlife and have most likely create impediments to movement for some species. Maintenance of connectivity was one consideration in the development and design of the proposed action and alternatives.

Affected Environment

Past and present actions continue to affect wildlife movement in and through the analysis area.

Areas typically used by wildlife for travel include ridges, riparian areas, and saddles. Prominent ridges that provide potential corridors and connectivity have been mapped (project file-Travel Corridors). Areas that create an impediment to travel for some species have also been identified and mapped (project file-Travel Corridors).

Past harvest (on both NFS and non-NFS land), existing roads (e.g. State Highway 3), and other human activities have reduced the amount of mature/old forest structure in the landscape surrounding the Hidden Cedar wildlife analysis area. This is affecting connectivity/travel corridors for some species.

Environmental Consequences

Common to All Alternatives

Direct and Indirect Effects

Proposed harvest activity would not create permanent barriers to movement. The proposed action and alternatives were designed with an objective of minimizing impacts on traditional areas of wildlife movement (project file). Where feasible proposed new road construction was placed

lower on the hillside to avoid impacts to ridges and saddles. Proposed harvest units were also designed to minimize impacts to ridges and saddles.

In addition, design criteria of the project would further minimize impacts on wildlife travel/movement and would provide for continued use of typical travel ways. All alternatives would maintain areas for travel/movement for potential use by wildlife.

Cumulative Effects

Harvest on non-NFS land would continue to impact the potential for movement in and through the wildlife analysis area. The magnitude and extent of this impact would vary depending on the harvest method and prescription.

It is unlikely that there would be any further changes in permanent impediments to movement. Past, present, and reasonably foreseeable actions would continue to affect wildlife movement in and through the analysis area. Based on existing and foreseeable conditions on NFS lands and anticipated activities on non-NFS lands the area will maintain areas for movement (project file).

Alternative A and E

Direct and Indirect Effects

There would be no impact on the travel corridors on NFS land identified and mapped for analysis.

Alternative B and C

Direct and Indirect Effects

In these alternatives, there are four clearcut units that would partially cross identified travel ways (project file). This likely would affect wildlife movement. Design criteria of the project would minimize impacts and would provide for continued use. Alternative areas for movement by wildlife exist and opportunities for movement/travel would be maintained (project file).

Alternative B

Direct and Indirect Effects

The road construction associated with the proposed thinning harvest in upper Keeler Creek (unit 49) would adversely impact the movement of big game through that area. This would impact a potential travel way identified for this analysis.

Alternative D

Direct and Indirect Effects

In this alternative, two clearcut units would partially cross identified travel ways (project file). Design criteria of the project would minimize impacts and would provide for continued use. Alternative routes of travel exist and opportunities for travel would be maintained (project file).

Alternative F

Direct and Indirect Effects

In this alternative, three clearcut units would partially cross identified travel ways (project file). Design criteria of the project would minimize impacts and would provide for continued use. Alternative routes of travel exist and opportunities for travel would be maintained (project file).

All Alternatives

Cumulative Effects

The consequences of impacts to potential travel in upper Keeler Creek are aggravated by the relatively new road construction and probable pending harvest on non-NFS land to the north of NFS land. This same activity on non-NFS land while contributing to adverse impacts could also render the value of the area for travel through the NFS land somewhat moot by creating conditions that may alter big game movement patterns regardless of activity on NFS land.

Given the relatively limited scope of the proposed actions in these alternatives, design features of all alternatives (Chapter 2, Design Features and Mitigation Common to the Action Alternatives page 2-15) and the conscious desire to minimize impacts through alternative design, it is unlikely that these alternatives would have unacceptable, irreversible and irrevocable adverse impacts on connectivity. Alternative areas for movement by wildlife exist and opportunities for movement/travel would be maintained (project file).

MANAGEMENT INDICATOR SPECIES

Management indicator species (MIS) are species selected to estimate the effects of management activities on wildlife populations. The Forest Plan identified the MIS for the Forests. They include several categories of species including: threatened, endangered and sensitive, commonly hunted or trapped, and species whose population changes are believed to indicate effects of management on other species or biological communities. In this analysis TE&S species have been addressed separately. The later two categories will be addressed in this section. Those species in the Forest Plan applicable to the St. Joe District and project area are displayed in

Table 3-48.

MIS were screened for their relevancy to the wildlife analysis area and proposed action. See the Species Relevancy Screen-Table 3-42 and Rationale for no Further Analysis section above for more discussion regarding MIS analysis needs. More information can be found in the project file.

Table 3-48 - Wildlife MIS for the St. Joe District

Species	Remarks	Existing Habitat /Need for Further Analysis
Goshawk	Associated with late successional forest habitat.	Habitat exists, analysis is documented in sensitive species section.
Marten	Trapped, associated with late successional mesic conifer forest habitat.	Habitat exists, analysis is documented in section with fisher.
Pileated Woodpecker	Primary cavity excavator, dependent on large snags associated with late successional habitat.	Habitat and species present, further analysis will be completed.
Elk	Hunted, important big game species, affected by human disturbance and human use of roads.	Habitat and species present, public issue, further analysis will be completed.
Moose	Hunted, relatively unique big game species, occurs in low numbers throughout the IPNF.	Habitat and species present, elk analysis meets analysis needs, no analysis specifically for moose will be completed.

Marten and potential effects on their habitat are addressed under Sensitive Species along with Fisher and are not addressed further in this section. The goshawk is analyzed as a sensitive species and will not be addressed further in this section. The Species Relevancy Screen determined that there was no benefit to analyzing potential impacts on moose and that further analysis is not warranted.

Old Growth Associated MIS -Pileated Woodpecker

The pileated woodpecker is an old growth indicator because of its strong tie to the availability of large snags. Pileated woodpeckers require tall, large-diameter dead or live defective trees within forested stands for nesting (Warren, 1990). Nest trees average nearly 30 inches, the minimum nest tree diameter is 20 inches. Carpenter ants make up the bulk of their diet. Feeding habitat includes large snags with advanced decay, the moist decaying butts of live trees, logs greater than 10 inches diameter, and natural or cut stumps. Large trees, canopy cover and the number and size of feeding sites (e.g. dead trees greater than 10 inches diameter) are all important features of quality pileated habitat (Aney and McClelland 1990, B. McClelland, 1993). Activities that reduce these habitat features would reduce pileated habitat suitability.

Methodology and Geographic Scope

The analysis of effects on pileated woodpeckers is based on direction in *Old-Growth Habitat and Associated Wildlife Species in the Northern Rocky Mountains* (USDA, 1990) and is tiered to the analysis done for size class and old growth. The geographic scope for direct, indirect, and cumulative effects is the wildlife analysis area.

Specific data in the form needed to fully use the Region 1 Habitat Suitability Index (HSI) models developed for pileated woodpecker is not available (e.g. number of snags by tree diameter, stumps greater than 3 feet tall). Habitat values from the HSI models and TSMRS data were used to identify potentially suitable habitat and assess the potential for effects.

The analysis methodology for determining potential effects on pileated woodpeckers involved mapping old growth and mature forest stands (i.e. suitable nesting habitat) in the wildlife analysis area and delineating hypothetical 1,000-acre home ranges around suitable nesting stands/groups of stands.

Based on relative habitat values and the acres of suitable nesting habitat a home range should have (USDA, 1990), areas with at least 100 acres of contiguous mature/old forest habitat and an additional contiguous 100 acres of immature/large tree habitat were identified as having sufficient suitable nesting habitat.

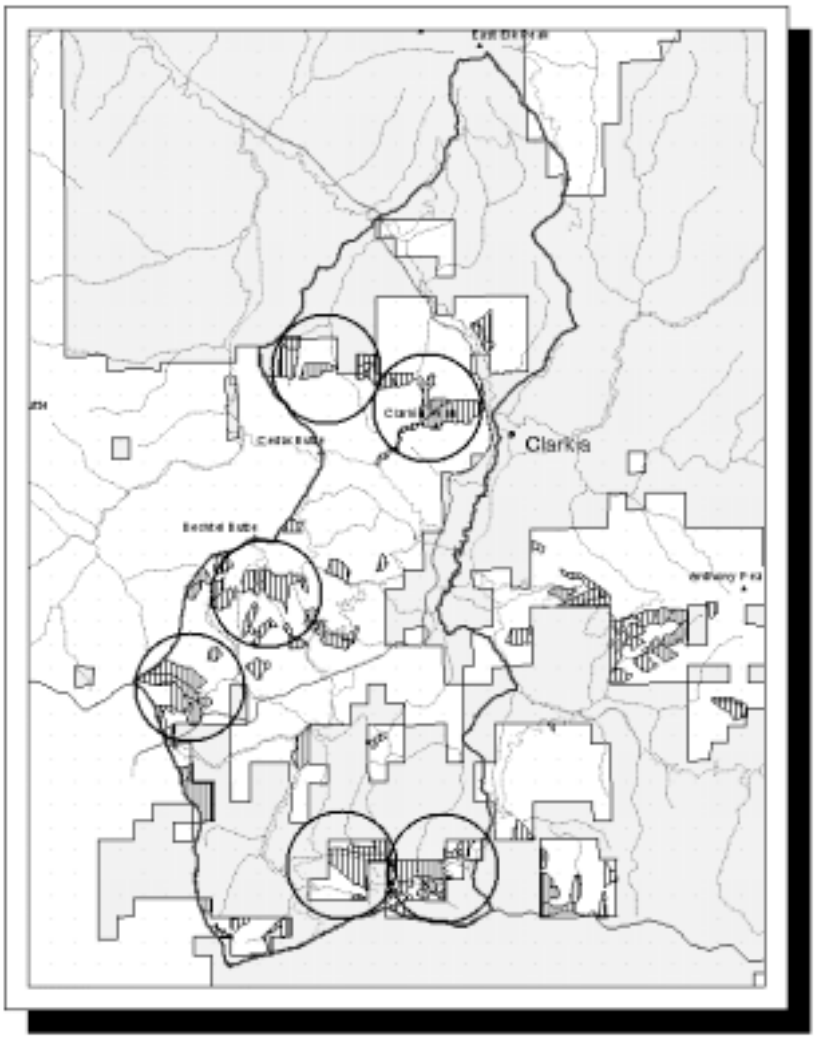

Figure 3-3 - Pileated Woodpecker Home Range

Once home ranges with suitable nest stands were identified, the suitability of surrounding stands in the home range to provide adequate feeding habitat was evaluated. Within each home range at least 500 acres of mature/old forest and/or immature/large tree habitat is needed to provide adequate feeding habitat. Impacts on suitable habitat were then determined for each home range.

Affected Environment

There are 487 acres of allocated old growth in the wildlife analysis area. Forest Plan standards are being met for old growth across the St. Joe Ranger District. Approximately 14 percent (1,677 acres) of the NFS land in the Hidden Cedar wildlife analysis area is large/mature/old forest. These stands (along with stands in the "immature" size class) provide structure and attributes of habitat.

A total of 6 home ranges (A – F, see Figure 3-3) on NFS land were delineated. All 6 of these home ranges contain sufficient feeding habitat. Four home ranges (A – D) provide sufficient feeding habitat on NFS land. The other two home ranges (E and F) provide sufficient feeding habitat only when both NFS and non-NFS lands are included in the calculations.

Environmental Consequences

Common to All Alternatives

Direct and Indirect Effects

No alternative would impact existing old growth (see Old Growth, Environmental Consequences) or suitable habitat on NFS (see following analysis) to an extent that would affect the availability of suitable pileated woodpecker habitat or population.

Cumulative Effects

At least 57 % of NFS lands would succeed naturally from small/immature forest to larger/older size classes over time. This represents 96% of the existing small/immature size class (Table 3-44). These areas would increase (over time (10+ years) the potential suitable habitat and the number of home ranges.

It is expected that the majority of non-NFS land would be actively managed and therefore no stands would remain in the large/old forest size class for any appreciable length of time before being treated. NFS lands would provide the vast majority of mature/old forest with non-NFS lands being in younger successional stages.

Potential harvest on non-NFS land may result in insufficient quantity (and quality) of feeding habitat in the 2 home ranges for which NFS land does not provide sufficient. There is no federal action proposed within these home ranges (project file).

Alternative A and E

Direct and Indirect Effects

There would be no effect on suitable pileated woodpecker nesting habitat or feeding habitat on NFS lands within delineated home ranges (project file).

Alternatives B and C

Direct and Indirect Effects

These alternatives would maintain suitable habitat to support pileated woodpeckers in a minimum of three home ranges - B, C, and D (project file).

Proposed harvest treatment would impact 148 of the 178 acres of mature suitable nesting habitat in Home Range A. This could result in insufficient suitable nesting habitat. However, design features (i.e. snag retention levels), prescriptions (i.e. thinning), and the amount of immature size class maintained reduce the risk of loosing sufficient suitable nesting habitat.

Alternatives D and F

Direct and Indirect Effects

These alternatives would maintain suitable habitat to support pileated woodpeckers in a minimum of four home ranges - A, B, C, and D (project file). These alternatives would reduce the amount of allocated old growth in Home Range C by approximately 1 acre due to road construction.

Proposed harvest treatment would impact 79 of the 178 acres of mature suitable nesting habitat in Home Range A. The acres of mature nesting habitat remaining, design features (i.e. snag retention levels), prescriptions (i.e. thinning), and the amount of immature size class remaining would maintain the suitability of Home Range A.

Elk

Elk are an important big game species within the analysis area. Elk were identified in the Forest Plan as general forest seral species easily affected by management activities. Land management activities, particularly timber harvest and associated roads affect elk habitat quality, potential elk use of habitat, and elk mortality from hunting.

Some parts of the wildlife analysis area are not in either of the elk analysis areas. These areas are predominately non-NFS lands within which NFS lands have limited contributions to elk habitat. In these areas, it is not possible for the Forest Service to provide security or mitigate the impacts on elk from roads.

For the reasons discussed above a detailed analysis of impacts on elk in areas outside of the elk analysis areas is neither practical nor meaningful in evaluating potential effects from Forest Service actions. Therefore, the areas outside of the elk analysis areas will not be analyzed in detail.

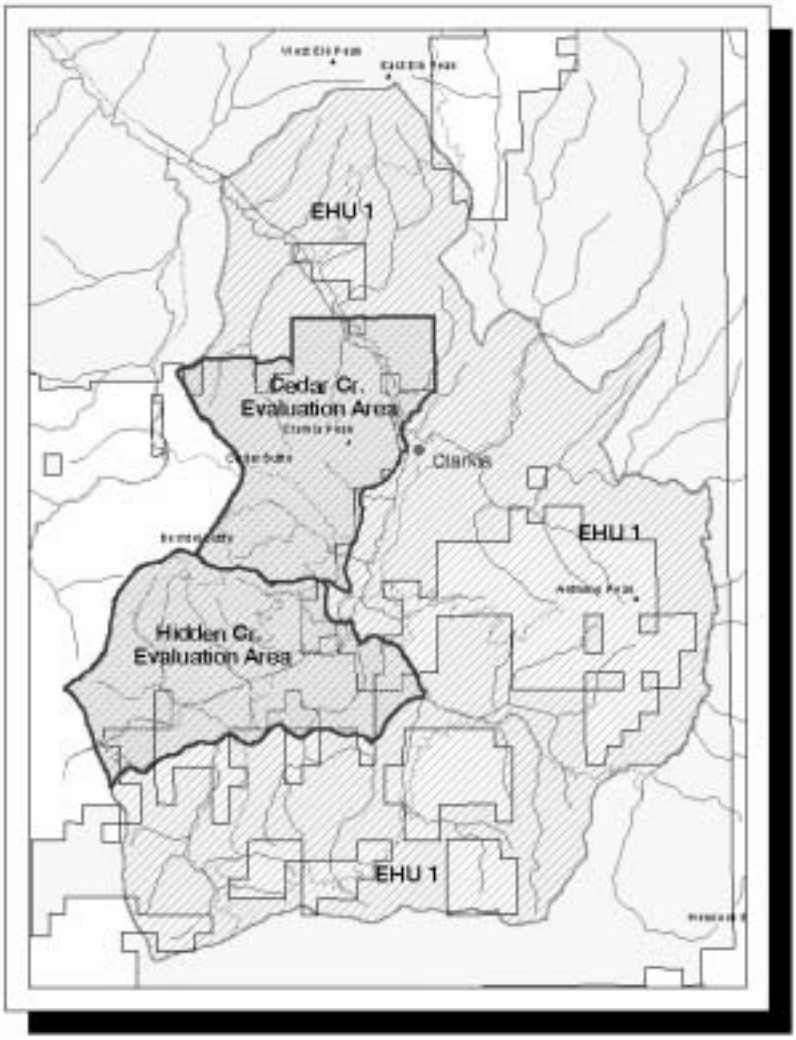

Figure 3-4 - Elk Evaluation Areas

Geographic Scope

The analysis area for elk was determined by considering the proposed actions, land ownership, logical topographic boundaries (i.e. ridges and streams), and existing road systems. To display effects from Forest Service actions and to display the differences between alternatives, the analysis area was broken into two separate evaluation areas based on home range size.

The hidden cedar wildlife analysis area is in Elk Habitat Unit 1, which includes the wildlife analysis area, Keeler Creek, Cat Spur Creek, Dutch Creek, Blair Creek, and Staples Creek. The 2 evaluation areas and EHU 1 will be used as the cumulative effects area.

Methodology

To disclose how the proposed action and alternatives would affect elk and potential elk use of habitat, the *Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho* (Leege, 1984) was used. The procedure evaluates various factors affecting elk habitat quality (e.g. road miles, security acres, cover, forage, and other factors) and assigns a numerical rating. This rating is used to determine elk habitat quality (expressed as a percent of potential elk use or Elk Habitat Potential - EHP).

If all habitat factors were in optimum abundance and distribution, habitat would be rated at 100% of potential. If the procedure calculates the habitat to be at 50% of potential, this indicates that the area can support 50% as many elk as it could if all factors were optimal.

Optimum conditions are rarely met especially if roads are present. The most important factor usually regulating use of habitat by elk is disturbance by people. Most disturbance (and hunting mortality) is related to roads (Leege, 1984).

To establish habitat management potential goals for the Forest, Elk Habitat Units (EHUs) were delineated across the Forest. There are 14 EHUs on the St. Maries portion of the St. Joe Ranger District. To meet the Forest Plan EHP goal of .53 on the St. Maries portion of the St. Joe Ranger District, the District and Idaho Department of Fish and Game in 1993 established an EHP target of .39 for NFS land in EHU 1.

Affected Environment

Past disturbances, forest succession, the existing road systems, and present management of roads combine to affect existing elk habitat quality.

Much of the wildlife analysis area is identified in the Forest Plan as big game winter range (i.e. MA-4). However, the project area is used by elk throughout the year. Goals for wildlife in MA-4 are to provide sufficient forage and cover. Cover, forage, and their availability are not thought to limit big game habitat in the project area. Areas that typically are used by wildlife (including elk) for travel include ridges, riparian areas, and saddles. Areas in the wildlife analysis area that provide suitable conditions for travel have been mapped and considered in the development and design of the proposed action and alternatives (project file).

Analysis of potential elk use related to livestock indicates that the presence of cattle in the project area - at current levels - is not conflicting with elk use on NFS land (project file). Cattle use is primarily confined to existing roads with occasional use of portions of existing clear cuts. There is no forage conflict between elk and livestock. There is no change in livestock proposed under any alternative; and livestock effects on wildlife will not be specifically addressed further.

Table 3-49 - Existing EHP, Security Acres, and Road Miles by Elk Analysis Area.

			Road miles		
Area	**EHP**	**Security**	**Open**	**Gated**	**Barriered**
Cedar Cr.	.47	333 acres	17.6	3	5.2
Hidden Cr.	.43	327 acres	25.2	5.8	0.5
Cedar + Hidden	.45	660 acres	42.8	8.8	5.7

There are a total of approximately 57.3 miles of road affecting potential elk use and security within the elk analysis area. The existing EHP in EHU 1 on NFS land is .38; and the EHP on the St. Maries portion of the District is .62 (project file).

Environmental Consequences

Long-term impacts are displayed for the period following completion of proposed federal actions and cumulative actions (e.g. approximately 5-7 years following the decision). For Alternatives B, C, D, and F effects are also displayed for the time period during implementation when all proposed and cumulative actions would be occurring. Alternative A and E do not have proposed federal actions that would adversely impact big game habitat for any appreciable length of time in any one area (e.g. <1 year), therefore there is no measurable difference during implementation and following implementation.

Data displayed for the period during implementation represents a worst-case scenario. Although design criteria would be implemented that would minimize adverse effects on elk by specifying the timing of activities, the analysis assumes all action would occur at the same time. This is because of the uncertainty in trying to predict the variables that influence sale configuration and timing.

Direct, Indirect and Cumulative Effects are broken out and discussed by alternative. In general, direct effects include effects from the federal actions (e.g. road construction/use on NFS lands), indirect effects include effects that would occur as a result of the decision (e.g. road construction/use on non-NFS land resulting from granting of access requests) and cumulative effects include all past, present and reasonably foreseeable actions on NFS and non-NFS lands in the analysis areas.

Table 3-50 - EHP and Security by Alternative

Area	Alt. A	Alt. B		Alt. C		Alt. D		Alt. E	Alt. F	
Habitat	Long term	During	Long term	During	Long term	During	Long term	Long term	During	Long term
Cedar Cr.										
EHP	.47	.38	.53	.44	.53	.44	.55	.56	.40	.55
% change	0	-19	+12	-7	+12	-7	+17	+19	-15	+17
Security acres	333	0	817	0	817	0	1024	1024	0	1024
Hidden Cr.										
EHP	.41	.34	.39	.36	.40	.33	.55	.55	.34	.51
% change	-6	-20	-10	-16	-8	-24	+28	+28	-20	+18
Security acres	122	0	192	0	192	0	1216	1216	0	810
Cedar/Hidden										
EHP	.44	.35	.45	.39	.45	.38	.53	.55	.37	.53
% change	-2	-22	0	-13	0	-16	+18	+22	-15	+20
Security acres	455	0	1009	0	1009	0	2240	2240	0	1834

Common to All Alternatives

Cumulative Effects

Present and/or reasonably foreseeable actions on non-NFS land (e.g. road construction and harvest) would eliminate 205 acres (part of a larger block adjacent to the analysis area) of existing security in the Hidden Creek elk area and increase the adverse effects on elk habitat due to roads. This would decrease EHP by 6% from the existing condition in the Hidden Cedar area.

Because of the relatively small magnitude of adverse effects there would be no long term effects that would decrease the EHP in EHU1 or cause the EHP to fall below the district goal.

Alternative A

Direct and Indirect Effects

There are no present or reasonably foreseeable federal actions that would measurably affect big game habitat.

Cumulative Effects

In the Hidden Creek elk analysis area the new roads on non-NFS land and the resultant loss of security that is common to all alternatives would reduce big game security to 122 acres and reduce EHP by 6%.

Alternative B

Direct and Indirect Effects

During implementation of the proposed federal actions the use of existing closed/restricted roads for harvest activity on NFS lands would cause a loss of all existing security and reduce EHP by 19% in the Cedar Creek elk area. The use of existing closed/restricted roads for harvest activity on NFS lands and increases in road miles/use (on NFS and non-NFS lands) from the granting of access requests would combine to cause a loss of all existing security and reduce EHP by 14% percent over the no action alternative in the Hidden Creek elk analysis area.

Following completion of all activity and implementation of proposed restoration actions, the EHP would increase by 12% in the Cedar Creek elk analysis area and decrease by an additional 4% over the no action alternative in the Hidden Creek elk area. The decrease in Hidden Creek elk area is due to the increase in road effects on NFS and non-NFS land from the granting of access requests and the loss of 205 acres of security.

Cumulative Effects

The restoration treatment of existing and new roads and changes in road management on NFS land would reduce the miles of road that impact elk and increase the elk security in the Cedar Creek elk area by 345 acres and improve EHP from .47 to .53 (a 12% change).

In the Hidden Creek elk area the combination of the decrease in road miles from restoration work and the increase in road miles (on non-NFS and NFS lands) from the granting of access requests would result in the loss of 205 acres of security and decrease EHP from .43 to .39 (a 10% change).

There would be an increase of 349 acres in security and no change in EHP for the combined Cedar/Hidden elk analysis area.

Alternative C

Direct and Indirect Effects

During implementation of the proposed federal actions the use of existing closed/restricted roads and helicopter use for harvest activity on NFS lands, and increases in road miles/use (on NFS and non-NFS lands) from the granting of access requests would cause a loss of all existing security and reduce EHP by 7% in the Cedar Creek elk area and 10% percent over the no action alternative in the Hidden Creek elk analysis area.

Following completion of activity and implementation of proposed restoration actions, the EHP would increase by 12% in the Cedar Creek elk analysis area and decrease by an additional 4% over the no action alternative in the Hidden Creek elk area.

The decrease in Hidden Creek elk area is due to the increase in road effects on NFS and non-NFS land from the granting of access requests and the loss of 205 acres of security.

Cumulative Effects

The restoration of existing and new roads and changes in road management on NFS land would reduce the miles of road that impact elk and increase elk security in the Cedar Creek elk area by 345 acres and improve EHP from .47 to .53 (a 12% change). In the Hidden Creek elk area the combination of the decrease in road miles from restoration work and the increase in road miles (on non-NFS and NFS lands) from the granting of access requests would result in the loss of 205 acres of security and decrease EHP from .43 to .39 (a 10% change). There would be an increase of 349 acres in security and no change in EHP for the combined Cedar/Hidden elk analysis area.

Alternative D

Direct and Indirect Effects

During implementation of the proposed federal actions the use of existing closed/restricted roads for harvest activity on NFS lands would cause a loss of all existing security and reduce EHP by 7% in the Cedar Creek elk area.

The use of existing closed/restricted roads for harvest activity on NFS lands and increases in road miles/use (on NFS and non-NFS lands) from the granting of access requests would cause a loss of all existing security and reduce EHP by 18% percent over the no action alternative in the Hidden Creek elk analysis area.

Following completion of all activity and implementation of proposed restoration actions, the EHP would increase by 17% in the Cedar Creek elk analysis area and increase by 34% over the no action alternative in the Hidden Creek elk area.

Cumulative Effects

The combination of road restoration and road management changes on NFS land would increase elk security in the Cedar Creek elk area by 691 acres and improve EHP from .47 to .55 (a 17% change).

In the Hidden Creek elk area the combination of the decrease in road miles from restoration work and the increase in road miles (on non-NFS and NFS lands) from the access requests would result in an increase in security acres of 889 acres and increase EHP from .43 to .55 (a 28% change).

There would be an increase of 1580 acres in security and a 22% increase in EHP for the combined Cedar/Hidden elk analysis area.

Alternative E

Direct, Indirect and Cumulative Effects

Implementation of proposed restoration actions would increase security by 661 acres and increase EHP by 19% in the Cedar Creek elk analysis area.

In the Hidden Creek elk area the combination of the decrease in road miles from restoration work and the increase in road miles (on non-NFS and NFS lands) from the access requests would cause an increase in security of 889 acres and increase EHP from .43 to .55 (a 28% change).

There would be an increase of 1580 acres in security and a 22% increase in EHP for the combined Cedar/Hidden elk analysis area.

Alternative F

Direct and Indirect Effects

During implementation of the proposed federal actions the use of existing closed/restricted roads and helicopter use for harvest activity on NFS lands, and increases in road miles/use (on NFS and non-NFS lands) from the granting of access requests would cause a loss of all existing security and reduce EHP by 15% in the Cedar Creek elk area and 14% percent over the no action alternative in the Hidden Creek elk analysis area.

Following completion of all activity and implementation of proposed restoration actions, the EHP would increase by 17% in the Cedar Creek elk analysis area and increase by 24% over the no action alternative in the Hidden Creek elk area.

Cumulative Effects

The combination of road restoration and changes in road management on NFS land would increase the elk security in the Cedar Creek elk area by 691 acres and improve EHP from .47 to .55 (a 17% change).

In the Hidden Creek elk area the combination of the decrease in road miles from restoration work and the increase in road miles (on non-NFS and NFS lands) from access requests would result in an increase in security acres of 483 acres and increase EHP from .43 to .51 (an 18% change).

There would be a 1174 acre increase in security and a 20% increase in EHP for the combined Cedar/Hidden elk analysis area.

THREATENED AND ENDANGERED WILDLIFE SPECIES

The U. S. Fish and Wildlife Service (USFWS) identified five listed or proposed wildlife species that may occur on the Idaho Panhandle National Forests (Species list # 1-9-02-SP-213): Bald Eagle, Gray Wolf, Grizzly Bear, Woodland Caribou and Canada Lynx (project file).

Based on direction provided by the USFWS, the Species List, review of the area, a search of district records, scientific literature, professional knowledge of the area, the EAWS, and a review of information from the Conservation Data Center (CDC) species requiring analysis were identified. See Table 3-42 and Rationale for No Further Analysis section for additional discussion regarding analysis needs of listed species in the wildlife analysis area. The following table displays a synopsis of habitat and existing conditions.

Table 3-51 - Listed Wildlife Species

Common Name	Habitat	Existing Condition in the Assessment Area
Bald Eagle	Nest in large dominant trees near large bodies of water in areas relatively free from disturbance. Perch sites, roost sites and access to prey are essential components of winter habitat.	No large bodies of water are present in the wildlife analysis area. There are no nests or reported sightings in the project assessment area.
Canada Lynx	Mesic conifer forests that provide a prey base of snowshoe hare (generally above 4,000' & in association with subalpine fir and spruce habitat types). Late and early successional stages.	Based on elevation, forest type, and potential vegetation (habitat type) the WL analysis and project area do not contain a sufficient amount of capable habitat to support resident lynx. The area is not in any Lynx Analysis Unit.
Gray Wolf	Large areas with high prey densities and isolation from human activities. Availability of den and rendezvous sites.	There is no evidence of den or rendezvous sites in the assessment area. The geographic location relative to surrounding human disturbances reduces the likelihood of occurrence.
Grizzly Bear	Large areas of undisturbed habitat. Low elevation riparian areas, meadows, snowchutes, shrubfields, grasslands, and open timbered stands.	Project area in the Experimental Population Area of Bitterroot Ecosystem. No documentation of grizzly bears in the Bitterroot Ecosystem. No known or suspected suitable habitat in analysis area.
Woodland Caribou	Mature to old growth forests with dense canopies over a large elevation gradient. High elevation timbered ridges with abundant lichens.	The project area is outside of the woodland caribou recovery area. The species is not known or suspected on the St. Joe Ranger District.

The Hidden Cedar wildlife analysis area does not provide nesting or wintering habitat for the bald eagle - bald eagle occurrence in the drainage is considered incidental (project file).

The Hidden Cedar wildlife analysis area is not within any Lynx Analysis Unit on the district and is not considered capable of providing sufficient habitat for resident lynx. The project is consistent with direction in the Lynx Conservation Assessment and Strategy. There would be no effect on these species and no further analysis is needed or required (see project file).

The grizzly bear and woodland caribou are not present in the project area. However, the project area is in the Experimental Population Area of the Bitterroot Ecosystem (USDI, 2000). If grizzly bears are reintroduced into the Bitterroot Grizzly Bear Recovery Area the Record of Decision (ROD) on Grizzly Bear Recovery in the Bitterroot Ecosystem provides provisions for management of bears that move onto public land in the Experimental Population Area (USDI, 2000). The USFWS does not envision conflicts with any current or anticipated management actions of the U.S. Forest Service (USDI, 2000).

Based on the species not being present, the existing condition of habitat (i.e. low elevation, lack of remoteness), the nature of the proposed activities, the uncertainty of when/if bears may occur in the project area, and the time frames of the decision to be made and any reintroduction effort, there would be no effect on grizzly bear. There would be no effect on grizzly bear or woodland caribou and no further discussion for those species is needed.

Gray Wolf

Historically wolves were distributed throughout most of Idaho in unknown populations. Wolf packs of 4 to 10 animals appear to have ranged widely in the mountains of northern and central Idaho. A decline of native ungulates, control programs designed to eradicate wolves and conflicts with livestock and humans caused the decline of wolf populations in Idaho and led to the absence of a breeding population in Idaho (Hansen, 1986).

High prey densities -particularly big game - and minimal conflict with human interests and uses characterize wolf habitat. Human disturbance as measured by open road densities will be used to disclose potential effects in this analysis. Other important habitat features for wolves include den and rendezvous sites (Hansen, 1986).

Affected Environment

The Hidden Cedar wildlife analysis area falls within the Central Idaho Reintroduction Area where gray wolves are classified as nonessential experimental populations. This classification treats wolves as proposed for listing under the ESA. The reintroduction of wolves in Central Idaho did not envision conflicts with current or anticipated management actions. No changes in land use restrictions (other than the possibility of temporary restrictions near den sites) are required because of the reintroduction.

Existing biophysical habitat does not preclude the presence of wolves in the drainage. However current road densities, human presence, and existing land uses reduce the likelihood of wolves occurring in the area. The area was not identified as a “dispersal corridor” or as a “key area for wolf conservation” (Hansen, 1986).

There are no known wolf dens or rendezvous sites in the wildlife analysis area or the St. Maries drainage. The nearest wolf territory is approximately 8 miles from the project area. Existing road density in the wildlife analysis area is 5.3 mi/mi^2 on all ownerships and 3.4 mi/mi^2 on NFS lands.

The potential elk use value in the Cedar Creek elk analysis area is .47 and in the Hidden Creek elk analysis area it is .43. Potential elk use is a measure of prey availability (see the section on elk later in this document).

Environmental Consequences

Table 3-52 - Density and Prey Availability by Alternative

	Existing	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
NFS lands	**Direct & Indirect Effects**						
Total road density	3.5	3.5	3.4	3	2.8	2.8	3.1
Open road density	1.8	1.8	1.7	1.7	1.2	1.2	1.3
All ownership	**Cumulative Effects**						
Total road density	5	5.2	5.2	5	4.9	4.8	5
Open road density	2.1	2	1.9	1.9	1.7	1.7	1.7
Elk analysis areas	**EHP**						
Weighted Avg.	.45	.44	.45	.45	.53	.55	.53

Common to All Alternatives

Direct and Indirect Effects

There are no known dens or rendezvous sites in the project area; and the likelihood of direct effects on gray wolves is very low. There would be no impact on any known wolf den or rendezvous site (the nearest wolf territory is approximately 8 miles from the project area), no adverse impact on any linkage or connections between habitats, no consequential increase in the likelihood of human wolf conflicts, and a decrease in road densities.

In Alternatives B through E there would be a decrease in EHP due to the indirect effects from the granting of access requests and the road construction on non-NFS lands. These effects are compensated for to varying degrees in the action alternatives by the changes in road management and road obliteration/storage on NFS land. The differences in EHP would not appreciably affect prey availability. For more discussion on EHP see the elk analysis section below.

Cumulative Effects

Historically, gray wolf occurred throughout northern Idaho. An intensive campaign to eradicate wolves led to wolves being essentially gone from the West by the 1930s. Based on the analysis of direct and indirect effects presented in the evaluation, design criteria which would avoid adverse impacts (e.g. maintenance of corridors/linkages), the envisioned impacts on land management from wolf reintroduction, the likelihood and nature of occurrence of wolves, and the relative lack of preference for special habitat exhibited by wolves; the federal actions evaluated in this proposal would not add to any adverse cumulative effects nor contribute to the loss of populations or adversely affect critical or important habitat for gray wolves.

SENSITIVE WILDLIFE SPECIES

Sensitive species are determined by the Regional Forester (FSM 2670.5) and are those species for which population viability is a concern. The National Forest Management Act directs the Forest Service to review programs and activities to ensure that species do not become threatened or endangered as a result of Forest Service actions.

The ICB Assessment found that species that are likely in decline (includes many Sensitive species) are associated with landscape and habitat components that are declining. Forest Plan direction for the Idaho Panhandle National Forests (IPNF) states that habitat of sensitive species will be managed to prevent further declines in populations to prevent federal listing.

There are few quantitative models available which are appropriate for assessing potential effects on sensitive species. This analysis identified capable and suitable habitat based on the latest scientific literature for each species and available data in the TSMRS database. The analysis may identify habitat that is not used and wildlife may use habitat not identified. Impacts on acres of suitable habitat will be measured by alternative and discussed for each species as appropriate.

Sensitive species on the Regional Foresters list were screened for their relevancy to the wildlife analysis area and the proposed action. See the Species Relevance Screen (Table 3-49) and the Rational For No Further Analysis section earlier in this document. Further information can also be found in the project file.

Based on species occurrence, habitat capability and suitability, and the likelihood or risk of potential impacts on habitat and the species, there would be **no impact** on species identified in the Species Relevancy process as needing no further analysis (see Appendix F –Summary of Conclusion of Effects).

Table 3-53 displays the sensitive species that require further analysis, a brief description of their habitat, and comments regarding capable/suitable habitat in the analysis area.

Table 3-53 - Sensitive Wildlife Species and Habitats

Common Name	Habitat	Comments
Fisher	Mature and old growth forests (riparian linkages).	Suitable habitat available within wildlife analysis area. Marten occupy similar habitat.
Wolverine	Areas of adequate food supply in large remote areas.	Limited capable or suitable habitat in wildlife analysis area.
Northern Goshawk	Nest stands - mature to old growth forests	Suitable habitat in wildlife analysis area. Known nest site.
Black-backed woodpecker	Conifer forests, dead/dying trees (especially fire killed).	Suitable habitat in wildlife analysis area.
Flammulated owl	Mature to old growth Douglas-fir and ponderosa pine forests.	Limited capable or suitable habitat within wildlife analysis area.
Coeur d'Alene Salamander	Fractured rock, seeps, waterfall spray zones, & streamsides.	Limited capable or suitable habitat in wildlife analysis area.
	Breed in lakes, ponds, streams	Potential habitat present in wildlife

Common Name	Habitat	Comments
Boreal toad	and persistent water sources.	analysis area.

Fisher and Marten

Fisher and marten occupy similar habitat (Ruggiero et. al., 1994) and potential impacts will be analyzed for both species using the same methodology (the marten is a MIS and not a sensitive species but will be addressed in this section of the document).

Fisher are considered rare through most of Idaho. They prefer late seral stage coniferous and mixed forest habitat. Fisher use riparian habitats as resting sites and extensively for travel. Fisher appear to avoid high elevations (> 4,000 ft.) and non-forested areas (Ruggiero, et. al. 1994). Extensive alteration of forest structure through logging (i.e. reduction in canopy closure, snags, and down woody material) may reduce its habitat value for fisher (Draft - Forest Carnivores in Idaho HCA/S, 1995).

Marten associate closely with late-successional stands of mesic conifers (Ruggiero et al., 1994). In the western United States martens are most abundant in mesic mature to over mature spruce-fir forests where small mammal prey species are most abundant (USDA, 1990). In general, marten prefer forest stands with greater than 40 percent tree canopy closure; and large down logs, stumps, and snags which provide access to prey under the snow and denning sites. Use or selection of riparian zones by marten has been reported in the literature (Ruggiero et al., 1994).

Methodology

The analysis uses management guidelines from *Fisher Biology and Management in the Western United States* (Heinemeyer and Jones, 1994) and *DRAFT, Forest Carnivores in Idaho*, (IDF&G, 1995). The percent of the area in mature/old forest structure (i.e. suitable habitat) will be displayed and compared to the guidelines. Changes from the existing condition relative to guidelines for forest structure will be discussed.

The goal at the scale of this analysis (i.e. the Hidden Cedar wildlife analysis area or "subdrainage") is to maintain functional home ranges (Heinemeyer and Jones, 1994) and a spatial distribution of multiple home ranges that maintain population viability (IDF&G, 1995). However, there are many elements (such as the percentage of private lands and the amount of agricultural lands) that conflict with and limit the "suitability" of fisher/marten habitat in the surrounding landscape and St. Maries River drainage. If the NFS lands were to be managed to meet objectives for high quality subdrainages, it is debatable whether the surrounding subdrainages could/would be managed to provide multiple home ranges that would contribute to population viability. The resolution of this situation is beyond the scope of a project level analysis.

Forest carnivore conservation/management requires an ecosystem management approach at a scale larger than the Hidden Cedar wildlife analysis area or even the IPNF. There is no existing management strategy. It is therefore difficult to put the habitat in the St. Maries drainage and Hidden Cedar wildlife analysis area into a landscape perspective. However, current literature (including existing draft assessments and strategies) can be used to establish existing conditions, identify opportunities for management, discuss tentative objectives for the Hidden Cedar wildlife analysis area, and establish some sideboards for management objectives.

While trapping is a parameter affecting habitat for forest carnivores, the Forest Service has no jurisdiction concerning trapping; and it is beyond the scope of this project analysis. However, road densities affect vulnerability (to trapping) and will be addressed.

Affected Environment

Vegetation/Habitat

Late successional habitat is an essential component of forest carnivore habitat. The physical structure of the forest appears to be more important for fisher and marten then the species composition (Ruggiero et. al., 1994).

Habitat management considerations for fisher and marten emphasize maintaining late successional forest habitat. Mature riparian forest is especially important for denning sites and travel ways for fisher. Based on habitat requirements, the quality, amount and distribution of late successional forest habitat within the drainage is considered the most important factor for fisher and marten.

There are approximately 11,619 acres of capable fisher/marten habitat on NFS land in the Hidden Cedar wildlife analysis area. There are 1,662 acres of mature and older habitat that provide currently suitable fisher/marten habitat.

The existing condition of forested habitat on NFS lands in the Hidden Cedar wildlife analysis area and the guidelines for forest structure by subdrainage are displayed in the following table.

Table 3-54 - Guidelines for Forest Structure

			Subdrainage Guidelines		
Forest Structure	**Existing Condition***		**High Quality**	**Moderate Quality**	**Low Quality**
Mature/older forest	1,662a	14%	65-75%	≥40%	30-40%
Young forest**	7,433a	63%	10-25%	na***	na
Pole/sapling	1,297a	11%	10-25%	na	na
Open/seed	1,345a	11%	na	na	na

* % of NFS capable habitat in the wildlife analysis area

** includes multistory stands

*** not applicable – no guidelines identified

In addition to the 1,662 acres of mature and older habitat, there are approximately 5,164 acres identified as young/immature forest stands that have a number of large trees (20/acre at least 14 inches dbh) and may provide suitable fisher/marten habitat.

Based on these figures, there may be as much as 6,826 acres (59% of NFS capable habitat) of suitable fisher/marten habitat in the wildlife analysis area. However, it is probable that suitable habitat is overestimated because stand specific data on snags and down logs is not available.

Based on the amount of mature and older forest structure, the existing condition of the Hidden Cedar wildlife analysis area is below the criteria needed for a low quality subdrainage. This is due primarily to the fire and harvest history that results in the majority of the stands being classified as immature. See the discussion in the Forest Vegetation section of this chapter. However, when all

stands with more that 20 trees per acres at least 14 inches dbh are considered, the existing condition would meet the criteria of a moderate quality subdrainage.

The above discussion applies only to the NFS administered lands in the wildlife analysis area. It should be noted that the surrounding landscape is primarily non-NFS land that does not provide much, if any mature or older forest habitat.

Impacted riparian zones are also affecting fisher habitat. See the previous section on riparian habitat for further discussion on effects on riparian habitat.

Access/Vulnerability Risk

Trapping-vulnerability risk has been cited as one of the factors affecting forest carnivores in Idaho (IDFG, 1995). Roads are correlated with trapping vulnerability and human disturbance.

Areas with greater than or equal to 1 mi/mi^2 road densities have a high risk to trapping-vulnerability for fisher and marten.

As the effects from roads are associated with access, roads that effectively (either physically or legally) restrict motorized use are not included in the road density.

The existing road density in the Hidden Cedar wildlife analysis area is 5 mi/mi^2 on all lands and 3.5 mi/mi^2 on NFS lands.

Environmental Consequences

Vegetation/Habitat

Table 3-55 - Acres and percent of Forest Structure by Alternative

Forest Structure	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Mature/older forest	1,661a 14%	1,601a 14%	1,608a 14%	1,629a 14%	1,661a 14%	1,620a 14%
Young forest	7,428a 63%	7,150a 61%	7,185a 61%	7,296a 62%	7,428a 63%	7,184a 61%
Pole/sapling	1,297a 11%	1,273a 11%	1,273a 11%	1,257a 11%	1,257a 11%	1,273a 11%
Open/seed	1,351a 12%	1,671a 14%	1,671a 14%	1,554a 13%	1,391a 12%	1,628a 14%

Access/Vulnerability Risk

Table 3-56 - Effects on Road Density (miles/mile^2)

	Existing	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
NFS lands	**Direct and Indirect Effects**						
Total road density	3.5	3.5	3.4	3	2.8	2.8	3.1
Open road density	1.8	1.8		1.7	1.2	1.2	1.3
All ownership	**Cumulative Effects**						
Total road density	5	5.2	5.2	5	4.9	4.8	5
Open road density	2.1	2	1.9	1.9	1.7	1.7	1.7

Common to All Alternatives

Direct and Indirect Effects

Although suitable habitat would be reduced under some alternatives, all alternatives would maintain about 14% of the NFS land in the analysis area as mature/old forest structure and maintain a minimum of 61% (97% of existing) as young forest that would succeed to older forests.

Approximately 5 miles (20-30 acres) of the riparian area along Hidden Creek, Wood Creek and the West Fork of the St. Maries River would be planted to trees and/or brush. This would begin the process of restoring/moving the riparian habitat closer to historic conditions thereby improving habitat for fisher and marten.

The relatively small changes in the amount of mature/older forest structure and young forest structure would not appreciably affect the availability of suitable habitat and there would be no change is the quality of the “subdrainage” (i.e. less than low quality for fisher). There would be a negligible change in the amount and distribution of future suitable habitat as succession continues to move the area towards a moderate or high quality subdrainage.

Construction of a fish pond would reduce mature forest structure by 1-2 acres (a negligible impact on fisher and marten).

Cumulative Effects

In all alternatives, road densities levels result in a high risk to trapping-vulnerability.

Based on existing conditions on non-NFS lands (from field review and aerial photos) and management objectives on non-NFS lands in the St. Maries River drainage, it can be assumed with a reasonable degree of confidence that the St. Maries River drainage is and will remain an area of low integrity for forest carnivores. This condition most likely will exist independent of conditions/management on NFS lands in the St. Maries River drainage and the Hidden Cedar wildlife analysis area.

Common to All Action Alternatives

Direct, Indirect, and Cumulative Effects

All alternatives that propose some Forest Service action (B through F) would reduce road miles and change road/access management. This would reduce both total road densities and open road densities (see Table 3-47); and cause a small improvement in the risk to trapping/ vulnerability.

Alternative A

Direct and Indirect Effects

This alternative would reduce suitable mature forest habitat by 1 acre and the amount of young forest by 5 acres with a corresponding increase in the amount of seedling structure.

Alternative B

Direct and Indirect Effects

This alternative would reduce suitable mature forest habitat by 61 acres, reduce young forest habitat with large trees by 232 acres, and reduce all young forest by 283 acres.

Alternative C

Direct and Indirect Effects

This alternative would reduce suitable mature forest habitat by 54 acres, reduce young forest habitat with large trees by 232 acres, and reduce all young forest by 248 acres.

Alternative D

Direct and Indirect Effects

This alternative would reduce suitable mature forest habitat by 32 acres, reduce young forest habitat with large trees by 132 acres, and reduce all young forest by 137 acres.

Alternatives D and E

Direct and Indirect Effects

These alternatives would remove approximately 0.7 mile of existing road that is encroaching on the riparian habitat in Wood Creek. This (along with the riparian planting) would begin the process of restoring/moving the riparian habitat closer to historic conditions thereby improving habitat for fisher and marten.

Alternative E

Direct and Indirect Effects

Suitable mature forest habitat would be reduced by 1 acre and young forest habitat by 5 acres.

Alternative F

Direct and Indirect Effects

This alternative would reduce suitable mature forest habitat by 42 acres, reduce young forest habitat with large trees by 206 acres, and reduce all young forest by 249 acres.

Wolverine

Wolverines are low density, wide-ranging species that inhabit remote forested areas, ranging over a variety of habitats. Resident female wolverine home ranges in Montana and Idaho range from 11.6 mi^2 to over 300 mi^2. Wolverines tend to use lower elevations in winter and higher elevations in summer when they provide the greatest potential food supply (Hornocker and Hash 1981).

The availability of large mammal (i.e. ungulate) carrion as food is important for the distribution, survival, and reproductive success of wolverines (Ruggiero et. al., 1994). Wolverine presence appears to be associated with low human occurrence/access.

Factors with the potential to threaten local population viability of the species include reduction of "wilderness refugia" (large areas of habitat with limited human access) or natural reserves and food availability (Ruggiero et. al., 1994).

Management objectives for wolverine at the drainage level primarily involve maintaining quality habitat by managing road systems to limit disturbance and reduce risk of displacement during critical wolverine denning periods.

Affected Environment

Wolverine tracks have been reported adjacent to the wildlife analysis area. This sighting most likely represents a transient individual. In a district wide assessment, potential wolverine natal denning habitat was not identified in or adjacent to the wildlife analysis area. The territory size requirements, lack of denning habitat, and existing access in the wildlife analysis area and adjacent drainages preclude other than incidental occurrence within the wildlife analysis area. The existing road density in the wildlife analysis area is 5 mi/mi^2 on all lands and 3.5 mi/mi^2 on NFS lands.

Environmental Consequences

Common to All Alternatives

Direct and Indirect Effects

Due to the lack of habitat, there would be no disturbance of potential denning habitat. Based on existing human access, road density would have little to no beneficial effect on wolverine habitat.

Cumulative Effects

No proposed Forest Service action would add to existing effects on wolverine habitat. High road densities from past and present activities in the wildlife analysis area and the surrounding landscape will continue to limit the suitability of the area as wolverine habitat.

Northern Goshawk

Goshawks use a variety of forest types, structures, and successional stages, but are primarily associated with late successional habitat. For nesting, goshawks utilize mature to old growth stands on gentle to moderately steep slopes. Forest habitat, pole stage or larger, which is open enough to allow unimpeded flight through the understory (less than 750 trees/acre larger than three inches dbh) is considered suitable for foraging.

The analysis of effects on goshawks uses direction in "Old-Growth Habitats and Associated Wildlife Species in the Northern Rocky Mountains" (USDA, 1990) and "Management Recommendations for the Northern Goshawk in the Southwestern United States" (Reynolds et. al. 1992) to determine potential effects. The analysis is tiered to the analysis done for size class (under Terrestrial Wildlife Habitat and Fisher/Marten).

Geographic Scope

Goshawk home ranges are approximately 5,000 to 6,000 acres and are recommended for evaluation of potential goshawk suitability (USDA, 1990 and Reynolds, 1992). For this analysis 2 assessment areas within the WL analysis were delineated based on topographic features and ownership. These assessment areas represent hypothetical goshawk home ranges. For analysis purposes the assessment areas are entirely within the Hidden Cedar wildlife analysis area, actual goshawk home ranges may include areas outside of the analysis area.

Not all of the wildlife analysis area is included in the goshawk assessment areas. Based on size requirements, 2 additional home ranges could be delineated in the wildlife analysis area (i.e. one north of the Cedar Cr. Area and another south of the Hidden Cr. Area – see Figure 3-5). Those areas not included are comprised of predominately non-NFS lands and the NFS lands on their own are incapable of providing sufficient suitable habitat to support the species. Based on a review of aerial photos it is unlikely that the area north of Cedar Creek provides sufficient suitable habitat because of past and present harvest on non-NFS land. Based on relatively recent road construction on non-NFS land and the likelihood of imminent harvest it is unlikely that the area south of the Hidden Cr. area would provide sufficient suitable habitat in the near future.

Because of the anticipated management of non-NFS lands in these areas it is unlikely that they would be able to support goshawks (or other species associated with mature/old forest structure) regardless of the condition of NFS lands. Furthermore, the lack of data on non-NFS land makes it unfeasible to analyze effects on goshawks in these areas. It is assumed that these areas would not contribute to populations of goshawks.

The proposed federal actions outside of the goshawk assessment areas would not affect the ability of those areas to support goshawks and they are not analyzed further.

Management recommendations for each home range include approximately 3 suitable nest areas and 3 replacement areas (in a developmental phase) per home range and a mosaic of vegetation structural stages in both an approximately 420-acre Post-fledging Family Area (PFA) and a 5400-acre foraging area (Reynolds et al. 1992).

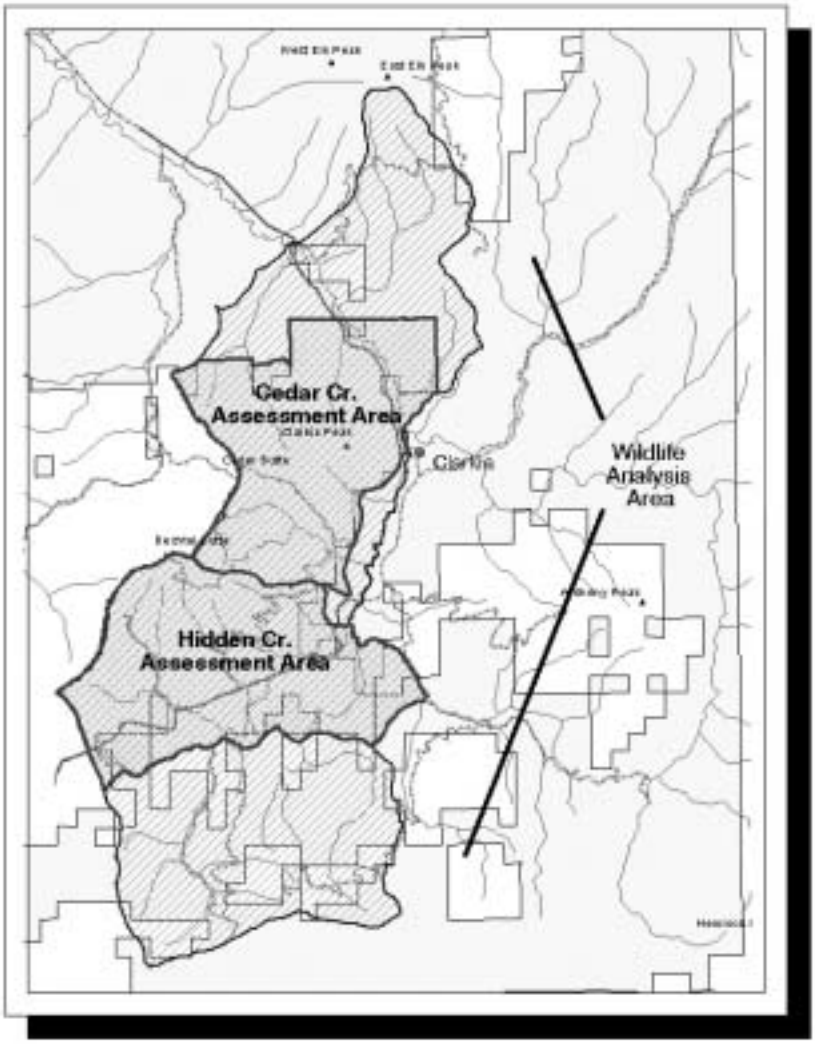

Figure 3-5 - Goshawk Analysis Area

Affected Environment

Table 3-57 - Existing and Desired Conditions for Goshawk

			Forage Area Vegetation Structure							
			Existing acres / %				Desired %			
Area	area acres	ɔot. nes areas*	grass shrub	seed sap	pole	mid old	grass shrub	seed sap	pole	mid old
Cedar Cr.	5,273	20+	348a (7%)	464a (9%)	461a (9%)	4000a (76%)	10%	10%	20%	60%
Hidden Cr.	5,739	20+	297a (5%)	618a (11%)	539a (9%)	4283a (75%)				

*****The exact number of potential nest areas depends on how patches of at least 30 acres in size are counted. These values represent a minimum number based on a conservative approach when assessing nest areas (project file).

Based on literature descriptions and field verification of habitat, there is capable and suitable habitat available within the Hidden Cedar project area. Goshawks are occasionally sighted within the wildlife analysis area. Surveys in the analysis area have confirmed the occurrence and nesting of goshawks. One known nest in the Hidden Cedar wildlife analysis area has been located.

Potential nest areas include: mature/old forest structure and stands classed as immature, but have at least 20 trees per acre greater than 14" dbh. Based on TSMRS data, seedling/sapling forest in the Hidden Creek goshawk analysis area exceeds the recommended 10%.

A PFA around the known nest area was delineated based on approximate size criteria and topographic features. The PFA as delineated contains approximately 105 acres of non-NFS land.

Table 3-58 - Existing and Desired Condition of the Goshawk PFA

	PFA	grass/shrub	seed/sap	pole/young	mid - old
Existing Acres	560	0	33	0	527
Existing % of PFA		0%	6%	0%	94%
Desired % of PFA		10%	10%	20%	60%

Environmental Consequences

The following table summarizes for each goshawk analysis area the desired habitat conditions and how each alternative compares to those conditions.

Table 3-59 - Desired Condition of Goshawk Habitat and the Acres/Percentage Present

Veg. Structure	Desired	Alt. A & E		Alt. B		Alt. C		Alt. D		Alt. F	
Cedar Cr.											
Nest areas	3/3	20+		12+*		12+*		15+*		13+	
	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Grass/shrub	10	348	7	348	7	348	7	348	7	348	7
Seed/sap	10	464	9	550	10	550	10	518	10	524	10
Pole	20	461	9	477	9	477	9	461	9	477	9
Mid/old**	60	4000	76	3881	74	3898	74	3946	75	3914	74
Hidden Cr.											
Nest areas	3/3	20+		11+*		11+*		18+*		+	
	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Grass/shrub	10	297	5	297	5	297	5	297	5	297	5
Seed/sap	10	623	11	724	13	724	13	678	12	724	13
Pole	20	539	9	539	9	539	9	539	9	539	9
Mid/old**	60	4278	75	4166	73	4177	73	4222	74	4165	73

*This represents only nest areas that are not treated, additional areas that are proposed for treatment but that would not necessarily become unsuitable for nesting would also be present.

**Reductions due to new road construction are displayed however there is no coresponding increase in any habitat category.

Common to All Alternatives

Direct and Indirect Effects

All alternatives would maintain middle aged to old forest habitat in excess of 60% in each goshawk analysis area. All alternatives would maintain sufficient nesting habitat well distributed throughout each goshawk analysis area (Table 3-57).

Forest succession has and will continue to take place. This becomes more pertinent in this analysis because using data in the TSMRS data base the amount of seedling/sapling structure in the Hidden Creek goshawk analysis area is above recommended levels. However, there are 126 acres typed as sapling size class in 1992 that have, or will within 5 years, succeed to pole size class. This is not reflected in Table 3-57. Taking into account the change on these 126 acres the amount of seedling/sapling size class would be reduced by 126 acres in each alternative and all alternatives would result in 10% or less in the seedling/sapling size class in the Hidden Creek goshawk analysis area.

Construction of a fish pond would reduce mature forest structure by 1-2 acres. This would have a negligible impact on goshawk habitat.

Cumulative Effects

It is expected that the majority of non-NFS land would be actively managed and therefore no stands would remain in the large/old forest size class for any appreciable length of time before being treated. NFS lands would provide the vast majority of mature/old forest with non-NFS lands being in younger successional stages.

Because of the relatively contiguous distribution of NFS lands in each goshawk analysis area this would not affect the ability of either area to provide sufficient habitat.

At this time there is no known activity reasonably foreseeable on the 105 acres of non-NFS land in the PFA. However, at some time it is realistic to expect that this land would be accessed and harvested in some manner. This would change the distribution of vegetative structure but would maintain 75% in middle aged to old structure. The amount of vegetative structure would remain consistent with management recommendations for middle aged to old forest structure.

Based on the availability of suitable habitat there would be no effect on goshawk populations in either of the goshawk analysis area on NFS land. Activities on non-NFS lands either have or are expected to result in insufficient suitable habitat in the areas outside of the Cedar Cr. or Hidden Cr. areas. The ability of those areas to support goshawks is dependent on the availability of habitat on non-NFS lands. Therefore, proposed activities on NFS lands that are not in the goshawk analysis areas would not affect the ability of those areas to support goshawks.

Cumulative effects on non-NFS lands may affect goshawks in the landscape surrounding the wildlife analysis area.

Alternatives B, C, D, and F

Direct and Indirect Effects

These alternatives would treat 53 acres by commercial thinning within the PFA. This includes 6 acres of mature forest structure that is suitable nesting habitat for goshawks and 47 acres of immature forest structure. This activity would not change the percentages of forest structure in the PFA. The timing of the harvest activity would be restricted to avoid disturbance during the nesting season. The prescriptions call for thinning from below. This treatment is consistent with management recommendations in PFAs (Reynolds et.al., 1992).

Alternatives A and E

Direct and Indirect Effects

These alternatives would increase seed/sap by 5 acres in the Hidden Creek analysis area and would have no impact on the PFA surrounding the known goshawk nest.

Black-backed Woodpecker

Black-backed woodpeckers are specialists in forests that have insect outbreaks from either wildfire or other reasons (Hutto, 1995). They nest in snags or in live trees with heart rot, which are at least 5 inches in diameter. Black-backed woodpeckers feed primarily on wood-boring beetles and specialize on large areas of recently killed, beetle-infested timber. Breeding densities of black-backed woodpeckers vary considerably in response to prey availability. They are specialists in exploiting recent forest fires, especially for the first 3 to 5 years after burning, and rapidly utilize new burns (Hutto, 1995). Historically, mixed severity and stand replacing fires produced new habitat annually, in greater amounts than is presently produced under a fire suppression strategy.

There have been black-backed woodpecker surveys in the St. Maries River drainage and their presence has been confirmed (project file). Based on literature descriptions and field verification of habitat, there is capable and suitable habitat available within the Hidden Cedar Project Area. Distribution of black-backed woodpeckers is presumed to coincide with existing stands of immature to mature old forest structure. In the analysis area they are suspected of occurring at levels comparable with other areas on the Forest and District.

Affected Environment

Black-backed woodpeckers prefer mature and old growth forests and fire or insect damaged stands. The wildlife analysis area contains 1,662 acres of mature and/or old forest that is considered high quality habitat and an additional 7,433 acres of immature (and multistoried) stands considered suitable habitat (project file). In addition there are 22-acres that were salvage harvested and treated by prescribed burning in 1997 that are providing high quality habitat with fire-killed trees. This stand is classed as a seedling stand (i.e. features the planted understory) however, based on visual appraisal the stand has enough residual large fire killed trees to provide preferred habitat for black-backed woodpeckers.

Due to the fire history and past logging in the drainage there is a low level of mature/old forest structure in the St. Maries River drainage; and current fire suppression policy is not conducive to the creation of areas of fire-killed trees. Both of these conditions may be affecting populations of black-backed woodpeckers.

Environmental Consequences

Broadcast burning would have a likelihood of improving habitat for black-backed woodpeckers by providing fire-killed trees. It is reasonable to expect mortality of some trees retained after harvest. The shelterwood units with broadcast burning would have more trees left after harvest than the clearcut units (all units have requirements for leave trees, see design criteria in Chapter II), and therefore have a greater likelihood of providing higher quality habitat than the clearcut units.

Table 3-60 - Acres of size class proposed for harvest treatment.

	Alt. A & E		Alt. B		Alt. C		Alt. D		Alt. F	
	acres treated	% untreated	acres treated	% untreated	acres treated	% untreated	acres treated	% untreated	acres treated	% untreated
Mature/old	0	100	260	84	282	83	128	92	212	87
Immature/multi	5	>99	1091	85	1097	85	458	94	1071	86
Broadcast burning										
Sw acres/cc acres	0		60/104		60/104		21/93		60/104	

Sw – shelterwood; cc – clearcut

Common to All Alternatives

Direct and Indirect Effects

Succession would continue on untreated stands and improve their suitability as black-backed woodpecker habitat. The high quality habitat created by the 1997 underburning will move out of the time period within which it provides high quality habitat (i.e. approximately 2-7 years).

Construction of a fish pond would reduce mature forest structure by 1-2 acres. This would have a negligible impact on black-backed woodpecker habitat.

Even the alternative with the most impact (C) would maintain 83% of preferred habitat and 85% of suitable habitat in its existing condition. In addition all treatment units would retain snags at levels that have been shown to maintain viable populations of cavity dependent species.

A minimum of 83% of existing preferred habitat would be maintained in its present condition (in Alternative C) and 85% of other existing suitable habitat. In addition all proposed treatment units would retain snags at levels intended to maintain viability of cavity dependent species.

Based on the level of suitable habitat maintained and/or improved it is likely that no alternative would adversely impact black-backed woodpecker populations.

Cumulative Effects

Historic wildfire patterns in the drainage would have created stands of fire-killed trees at periodic intervals. It is reasonable to assume that the suppression of fires in the St. Maries drainage and wildlife analysis area has reduced both habitat quantity and quality that would have been present.

It is also reasonable to assume that suppression of nonprescription fires would continue. This would continue to affect the availability of high quality habitat for black-backed woodpeckers.

It is expected that the majority of non-NFS land would be actively managed and therefore no stands would remain in the large/old forest size class for any appreciable length of time before being treated. NFS lands would provide the vast majority of mature/old forest with non-NFS lands being in younger successional stages.

Allocated old growth would be maintained at or near existing levels and untreated stands would continue to age. Retention of snags at levels in the design criteria would maintain some habitat value for black-backed woodpeckers (albeit at a lower level). It is not anticipated that any proposed federal action would contribute to adverse impacts on black-backed woodpecker populations within the project area or at a landscape level.

Flammulated Owl

Flammulated owls are seasonal migrants that occupy home ranges in the northern latitudes during the spring, summer and fall. They are cavity nesters that depend upon naturally occurring or excavated cavities for nesting. Consequently, snags and other defective trees are an important component of their breeding habitat.

These owls are attracted to relatively open, older forests featuring ponderosa pine and Douglas-fir that are correlated with drier habitats. Reynolds and Linkhart (1992) reported that all published North American records of nesting, except one, came from forests in which ponderosa pine was at least present, if not dominant. The flammulated owl's preference for ponderosa pine and/or Douglas-fir can also be linked to prey availability (primarily moths, beetles, crickets). Reynolds and Linkhart noted a stronger correlation between prey availability and ponderosa pine and Douglas-fir, than with other common western conifers.

Affected Environment

There are 144 acres of capable flammulated owl habitat in the wildlife analysis area. There is no suitable habitat at this time. Capable stands are either too young or, in one case, too sparsely stocked (due to natural stand conditions), to provide suitable habitat. Opportunities for improvement and expansion of large/mature dry site habitat (the forest type of primary interest is ponderosa pine) were explored. At this time there are no existing dry site ponderosa pine stands that would benefit from active management

There are no reported occurrences of flammulated owls in the Hidden Cedar wildlife analysis area. The fire history in the drainage has resulted in a low level of mature/old forest structure in the drainage; and current fire suppression policy is not conducive to the creation and maintenance of areas of more open-grown stands of ponderosa pine. At best, the area provides only marginal

habitat for this species. The species is considered not present to very uncommon in the drainage even when compared to other areas on the St. Joe District.

Environmental Consequences

Common to All Alternatives

Cumulative Effects

Fire suppression under existing policy is not expected to allow fire to perform its historic function of creating/maintaining dry site open forest conditions. The area will continue to provide marginal habitat for the flammulated owl.

Alternative A, D, and E

Direct and Indirect Effects

There would be no impact on dry habitat in these alternatives.

Alternative B, C and F

Direct and Indirect Effects

One dry site stand would be treated. The existing forest type of this stand is larch. The treatment prescription is a shelterwood preparatory cut that would create approximately 4 acres of opening and thin 12 acres. This would open the stand, create a more open stand and improve growth. This would be expected to improve the suitability of this stand as habitat for flammulated owls.

Coeur d'Alene Salamander

Coeur d'Alene salamanders are restricted to cool damp aquatic habitats that have thermal and hydric stability. The species has been found in three major types of habitats in northern Idaho: spring seeps, waterfall spray zones and along stream edges between 1,800 to 3,500 feet elevation. Known populations occur in association with sharply fractured rock formations in conjunction with both persistent and intermittent surface water (Cassirer et al, 1994). These conditions are critical for Coeur d'Alene salamanders since they respire through the skin and lose water to the environment through evaporation (Groves 1989).

Affected Environment

There is one known salamander site in the Hidden Cedar wildlife analysis area. In general, the geology of the wildlife analysis area is not conducive to habitat for Coeur d'Alene salamanders (e.g. very little fractured rock associated with springs/seeps and stream sides). Given the number of known sites in the drainage and the capability/suitability of habitat, Coeur d'Alene salamanders are considered relatively uncommon compared to other areas on the St. Joe District.

Environmental Consequences

Common to All Alternatives

Direct and Indirect Effects

There would be no direct or indirect effects on known salamander sites. It is unlikely that any habitat would be impacted by activities. The alternatives differ in their potential adverse impacts from road construction, road decommissioning, timber harvest, etc. However, the risk to the species and habitat is negligible because of the inherent limited presence of capable habitat.

Cumulative Effects

There would be no additional effects on Coeur d'Alene salamanders or suitable habitat from any current or reasonably foreseeable federal action. The current and foreseeable minerals activity would not impact any known site. The same inherent lack of capable habitat that limits the potential for adverse impacts on salamander habitat on NFS land also applies to all lands in the analysis area. Cumulative adverse impacts that would affect populations are unlikely.

Boreal Toad

Boreal toad breeding habitat includes shallow, quiet water in lakes, marshes, bogs, ponds, wet meadows, and other persistent water sources. Young toads are restricted in distribution and movement by available moist habitat, while adults can move several miles and reside in marshes, wet meadows, or forested areas. Toads hibernate in the winter in habitats that maintain a high humidity and above-freezing temperatures. Areas that provide shelter for hibernating toads include rodent burrows, beaver dams and slash piles (Loeffler, 1998).

Reasons for the decline of the boreal toad have not been defined with any degree of certainty. However, habitat alterations from timber harvest, grazing, recreation, and water development would likely not be beneficial to long-term enhancement of boreal toad habitats (Loeffler, 1998). One hypothesis explaining the boreal toad decline concerns mortality caused by disease or some other widespread agent. However, none of these factors have been shown as causative agents for population declines. Since this species depends on wetlands to breed, the reduction of or adverse impacts on wetlands potentially have detrimental effects on boreal toads.

It is important that toads be able to move among their seasonal habitats. The biggest potential barrier to their movement are roads. Steep road cuts 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.

Affected Environment

Boreal toads have been recorded in and adjacent to the analysis area. Ocular evaluation of habitat conditions indicates that potentially suitable breeding habitat is present in the analysis area. This habitat is found primarily in riparian areas adjacent to many streams in the wildlife analysis area.

Based on habitat needs as described in the literature, the mesic nature of much of the forests of the IPNF indicate that toads have many opportunities to find persistent small water sources for breeding, and could successfully disperse through moist forest.

Vehicle traffic on existing open roads and restricted roads arguably constitute some level of risk to toads. This risk is considered to be small, based primarily on a combination of low toad densities, the relative unsuitability of roads as dispersal "habitat", and the relative availability of road surface verses forest habitat.

Environmental Consequences

Habitat alterations from timber harvest and recreation have not been shown as causative agents for population declines (Loeffler, 1998). The primary area of concern for potential impacts to toads would be impacts on breeding habitat. Of secondary concern is the potential for direct mortality of dispersing toads.

Common to All Alternatives

Direct and Indirect Effects

The riparian buffer zones established on creeks in the project area would limit the potential for any substantive adverse impacts to potential breeding habitat. There are no changes in water yield that would result in any measurable adverse impact on potential breeding habitat (see water analysis). These buffers would also protect the majority of timbered stands near water that would be most likely to be used by toads.

This species can breed along roadside ditches and can be found in upland habitat that would not have any special protection. Some mortality may occur to adults and metamorphs in these situations. Increases in vehicle traffic and project related activity (e.g. harvest and road storage) may increase the risk of mortality. The existing risk is low and any changes would remain low and inconsequential based on the same rationale as described in the Affected Environment section (e.g. low densities of toads and roads relative to forested habitat). The road obliteration in some alternatives may tend to decrease the risk of mortality over a long term, however this effect is difficult to measure in any meaningful way and is not expected to be consequential.

Cumulative Effects

The foreseeable construction of a fish pond would create suitable breeding habitat for boreal toads. Activity associated with potential garnet digging may impact breeding habitat. However, recent boreal toad sightings in the Emerald Creek drainage in association with garnet digging indicates that while this activity may affect the habitat and species it has not been shown to eliminate the species from the area. Also, restoration actions provide an opportunity to create/improve habitat. The impacts from proposed federal actions under all alternatives would not contribute appreciably to existing impacts and would not affect population viability. Activities on non-NFS lands are expected to have similar consequences for the same reasons described for federal actions (e.g. low toad and road densities). Any cumulative mortality from any alternative is unlikely; and potential adverse effects would not significantly exceed exiting levels of risks to the species.

Summary of Effects

The preceding Sensitive Wildlife Species section documents the analysis of potential impacts and provides the rationale for the effects determinations. See Appendix F for the determination of effects for each species by alternative.

Consistency with Forest Plan and Laws

All alternatives are consistent with applicable goals, direction, standards, and guidelines from the Forest Plan for the management of wildlife habitat and species populations. All alternatives to varying degrees comply with other direction and recommendations regarding management of the various components of wildlife habitat including the per cent old growth allocated and size of old growth units/patches. All alternatives comply with applicable Conservation Strategies for wildlife species. All alternatives are consistent with the ESA, NFMA and other laws providing direction and requirements for the management of wildlife species and habitat.

PLANT SPECIES AT RISK

Introduction

Activities associated with timber harvest, road construction/reconstruction, controlled burning, watershed rehabilitation, and pre-commercial thinning have the potential to impact Endangered, Threatened, Proposed, and Sensitive (TES) plants. Effects on population viability from disturbance events (natural or human-caused) are hard to quantify with certainty for all TES plant species and species of concern. Specific knowledge of population biology and species ecology is not yet known for several species, particularly the sensitive moonworts and certain orchids. Much of the current knowledge regarding TES plant species is based on observational and even anecdotal information. Literature and monitoring reports for several species, including deerfern (Blake and Ebrahimi, 1992), Constance's bittercress (Lichthardt, 1998), and Idaho barren strawberry (Crawford, 1980), provide a greater understanding of the relationship of habitat disturbance to the integrity of species populations.

The risk of adverse effects on TES plants from activities varies with treatment type, timing and extent of treatment, habitat suitability, and the species. Plant surveys and mitigation measures are designed to protect populations and suitable habitat. Activities with effects that could lead to loss of population viability or trend toward federal listing would have the highest risks associated with them. Other activities may impact individual plants but are not likely to adversely affect population viability and as such are low to moderate risk activities. Small changes in the light regime, moisture levels, or moderate soil disturbance can impact individuals or populations of species dependent on specific successional habitats, soil fungi (mycorrhizae) associations, or canopy closure. Observations and monitoring information indicate that some activities may have little, or even positive effects on some species, such as deerfern (Blake and Ebrahimi, 1992) and Constance's bittercress (Crawford, 1980).

The purpose of this analysis is to determine if alternatives will adversely impact TES plants that may occur in the Hidden Cedar project area, to insure that the alternatives do not contribute to the loss of rare plant population viability, and to insure compliance with Forest Service and other federal policies. Indicators used to measure effects on sensitive plants and suitable habitat include: predicted canopy reduction due to harvest treatments, the extent of ground disturbance, proximity of proposed activities to known occurrences and suitable habitat, and the predicted reduction of fuel loads.

Regulatory Framework

Protection of plant species deemed threatened, endangered, or rare (Forest Service "sensitive") and protection for population viability is determined by Federal legislation, regulations, policy, and direction. This regulatory framework includes the National Environmental Policy Act (1969); the Endangered Species Act (1973), as amended; the National Forest Management Act (1976); Forest Service manual (2672.1 - 2672.43); Idaho Panhandle National Forests, Forest Plan (USDA, 1987); and direction from the Washington Office and Regional Watershed, Wildlife, Fisheries, and Rare Plant program.

Analysis Area

The geographic scope of analysis for rare plant species in this project is the Hidden Cedar Project Area (approximately 15,000 acres of Forest Service ownership, and 32,957 total acres). Geographic scope of potential effects (direct, indirect, and cumulative) is determined by a combination of factors including: geographic location, the scope of the proposed action, resources and species which may be present, consequences and scope of effects, and the ability to measure effects. The scope of the action and potential for adverse effects determine the extent of analysis necessary. This analysis considers short and long-term management as it may affect known or suspected populations of TES plant species as well as their potential habitat.

Analysis Methods

Plant species can be assigned to one or more rare plant guilds, which are groups based on similar habitat requirements and useful for the purpose of analysis (Mousseaux, 1995). For the District, the rare plant guilds are: aquatic, deciduous riparian, peatlands, wet forest, moist forest, dry forest, and sub-alpine. Rock seeps and springs are another habitat that can support certain TES species, but they can occur across all guilds and are not identifiable at a coarse scale. A complete description of all guilds is located in the project file.

Based on current information regarding preferred habitat and successional state for species within the different guilds, the District TSMRS (Timber Stand Management Record System) database indicates the amount of highly suitable rare plant habitat that may be present in the project area. In addition, site-specific information from timber stand examination records, aerial photographs, topographic position, existing habitat and survey information, personal knowledge and professional judgment were used in analysis. Evaluation of known sites for TES and species of concern (SOC) plants was accomplished using District sensitive plant records and Idaho Department of Fish and Game Conservation Data Center (ICDC) Element Occurrence records.

Affected Environment

The sub-basins of northern Idaho contain varied and diverse habitats and plant communities. Of the estimated 1,200 to 1,500 plant species known or thought to occur here, about ten percent are considered rare or uncommon.

Threatened Plant Species

There are no known sites of federally listed plants on the Forest. The USDI Fish and Wildlife Service lists three species as threatened that may occur on the District (USDI, 2002). A threatened species is any that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Water howellia (*Howellia aquatilis*), Spalding's catchfly (*Silene spaldingii*), and Ute ladies'-tresses (*Spiranthes diluvialis*) are suspected on the District, meaning that this species is believed to have potential to occur, but to date has not been found.

Water howellia - a member of the family Campanulaceae, has the potential to occur on the St. Joe Ranger District. According to the Conservation Strategy for *Howellia aquatilis* (USDA,1994), there are currently 110 known occurrences of the species; most occurrences are in Montana and

Washington, with only one known occurrence in Idaho in Latah County. Water howellia occurred historically on the Forest but is believed to have been extirpated.

Water howellia is an annual aquatic species restricted to small, seasonal, pothole ponds or the quiet water of abandoned river oxbows. It occurs at elevations from 10 feet in Washington to 4,420 feet in Montana. The species reproduces only by seed. Germination occurs in October, presuming the plant's habitat has dried sufficiently to expose the seeds to oxygen. Because of this restrictive habitat requirement, population numbers in a given year are directly influenced by the extent of pond drawdown at the end of the previous growing season (USDA, 1994).

Ute ladies'-tresses - a member of the plant family Orchidaceae, has the potential to occur on the St. Joe Ranger District. It is currently known in Colorado, Idaho, Montana, Nebraska, Utah, Washington and Wyoming. In Idaho, it is only known in the Snake River floodplain in the far eastern part of the state. There are no historical or undocumented sightings elsewhere in the state of Idaho (Moseley, 1998).

Ute ladies'-tresses is a perennial, terrestrial species that may undergo periods of prolonged dormancy. "It is a lowland species, typically occurring beside or near moderate gradient medium to large streams and rivers in the transition zone between the mountains and plains. It is not found in steep mountainous parts of the watershed, nor along slow meandering streams out in the flats. The communities where it is found tend to be typical of riparian habitat in the area. …Soil moisture must be at or near the surface throughout the growing season." (USDI, 1998). Floodplains, river meanders, islands, and man-made wetland habitats are typical settings. The communities it is found in are predominantly herbaceous (graminoid) wet meadows, but also include riparian shrublands, riparian deciduous forests, and irrigated pastures (Moseley, 1998).

Spalding's catchfly - a member of the family Caryophyllaceae, is suspected to occur in the IPNF. It is currently known at 52 sites in west-central Idaho, northwestern Montana, eastern Oregon, eastern Washington and British Columbia. The total number of known individuals is around 16,500 (USDI 2001).

Spalding's catchfly is a long-lived perennial species that reproduces only by seed (Lichthardt 1997). Individual plants often exhibit long periods of dormancy (one to three years), and may even experience dormancy within a growing season (Lesica 1997). Its habitat is in dry grasslands and grassland inclusions in ponderosa pine and Douglas-fir forest. Suitable habitat for this species is typically dominated by fescues (*Festuca* species), blue bunch wheat grass (*Pseudoroegneria spicata*) and other bunchgrasses, but also has a high density of forbs. Some sites may have large shrub thickets of *Symphoricapos albus*, *Physocarpus malvaceus*, or *Rosa* spp. Soil types on which it has been found include loam, silty loam, granitic, loamy basaltic and loess (USDI 2000). Soils in its habitat are characterized as deep to moderately deep.

Sensitive Plant Species

Sensitive species, as determined by the Regional Forester (USDA, 1999b), are those for which population viability is a concern. This can be indicated by a current or predicted downward trend in population numbers or suitable habitat, which would reduce the species' existing distribution. Twenty-five of these species are known or thought to occur on the St. Joe Ranger District. One occurrence of Henderson's sedge (*Carex hendersonii*) is known within the project area (ICDC,

2001) from private land. Outside of the project area, but within two miles of the project boundary, there are three populations of the sensitive species deerfern (*Blechnum spicant*) (ICDC, 2001).

Species of Concern

Along with threatened, endangered, and sensitive plants, the Forest also tracks 23 Forest species of concern. These species are considered to be secure at the global, Regional, and state levels, but may be at risk at the Forest planning level. While biological evaluations are not required to address species of concern, they are addressed in effects analysis (per the National Forest Management Act) when viability within the planning unit is an issue. There are two known sites of Lieberg's tauschia (*Tauschia tenuissima*) within the project area. Just outside the project boundary there is one population each of Lieberg's tauschia, phantom orchid (*Eburophyton austiniae*) and Case's fitweed (*Corydalis caseana* spp. *hastata*) (ICDC, 2001).

Results from habitat queries indicate that the only high potential habitat occurring within areas of planned activities is within the moist forest and wet forest guilds (see Habitat Query Results, project file). Of the 52 units considered for timber harvest only units 25 and 39 do not contain high potential habitat. All other units contain moist forest habitat except for unit 46, which is comprised of wet forest habitat (See Harvest Activity Effects on TES Plants Table, project file). High potential dry forest, sub-alpine, deciduous riparian, aquatic, and peatland habitats do not occur within proposed activity areas. A list of wet and moist forest species and their habitats is included in the project file as is a complete list of sensitive species and species of concern.

Of the nearly 33,000 acres within the project area, approximately 12,000 acres on NFS lands are known to be rare plant high potential habitat. Since close to 60% of the project area is not under Forest Service ownership, this number is likely to be much higher. Past and ongoing activities within the project area have led to habitat modification and fragmentation. Grazing has been occurring within the area for many decades. Road construction, timber sales, recreational use, vehicular traffic, grazing, and natural events have all contributed to an encroachment of weeds into the area, primarily along roads, in open meadows and in disturbed areas.

Environmental Consequences

Plant Surveys

Regional direction (Leonard, 1992) states that the need for and extent of field reconnaissance should be commensurate with the risk associated with the project and species involved, and the level of knowledge already in hand. Field surveys will be conducted in all areas slated for project activities that contain high potential suitable habitat. Surveyors will walk through activity areas with the potential to contain TES plants during the growing season of those species likely to be found there. A general survey will be conducted, with more time being spent in special habitats. If any rare plant individuals are found, intensive searches will be conducted within the area. Species presence is assumed for all highly suitable habitats and field surveys either validate or negate presence. Any occurrences that are deemed necessary to ensure species and population viability against a potential trend towards federal listing, are protected. The importance of a population is based on a variety of factors such as size of population, number of known sites, ranking, and sensitivity to disturbance. These practices are assumed to be an effective conservation strategy. Some isolated individuals or occurrences, not deemed critical to population

viability, may be impacted by activities. Occurrences discovered prior to project implementation would have mitigation measures designed by the District Botanist to ensure that species and population viability are maintained (see Design Features in chapter 2).

Field surveys for this project will be located within the project file.

Effects Common to All Action Alternatives

Direct and Indirect Effects

High potential dry forest, sub-alpine, deciduous riparian, aquatic, and peatland habitats do not occur within proposed activity areas. Therefore, there would be no direct or indirect effects on these habitats and their associated rare species.

For Ute's ladies'-tresses and water howellia, there would be no direct or indirect effect, as habitat is not present within proposed activity areas.

The known population of Henderson's sedge within the project area is located on private land and so its continued existence is not guaranteed.

A recreational fish pond may be constructed in high potential moist forest habitat and would be surveyed prior to project implementation. Appropriate mitigation measures (see Design Features in chapter 2) would be adopted should any rare plants be found.

Riparian planting and associated fencing will result in very little ground disturbance and are not expected to adversely affect the population viability of any rare species.

Pre-commercial thinning would generally occur in areas with low probability of providing habitat for TES plants. While it is possible that undetected individuals of *Botrychium* sp. could be impacted, no other TES species is expected to occur in such habitat. Effects to *Botrychium* species would likely be restricted to damage of seasonal, above-ground vegetation. There is no evidence that such removal adversely affects individual plants (Dr. Cindy Johnson-Groh, personal communication, July 2001).

An indirect effect of project activities may be the expansion of noxious weed populations. Such expansions would likely remain confined to areas of disturbance and high light levels. However, the possibility exists that if left unchecked, they could spread into surrounding habitats and ultimately threaten rare plants, should they occur in the area. The Noxious Weed section of this document discusses weed expansion in more detail. Weed treatment and monitoring is likely to occur and would serve to decrease weed populations size. Noxious Weed treatments will be conducted in accordance with the St. Joe Noxious Weed Control FEIS (USDA, 1999). Known TES plant occurrences would be buffered from weed treatments and are not expected to suffer adverse impacts. Noxious weed treatments are expected to improve or maintain the quality of habitat which may ultimately benefit TES plant species. Timber harvest and road building may also indirectly affect rare plant populations by opening up formerly inaccessible or unattractive foraging areas to incursion by livestock. Harvest may result in an increase in forage in newly created openings and roads can provide travel corridors to new areas.

See Appendix F – Plants –Sensitive Species Biological Evaluation for summary of effects.

Timber Harvesting

Timber harvest may directly eliminate individual plants or populations through physical disturbance, and damage or eradicate soil mycorrhizae upon which many plant species depend. Canopy reduction can affect certain TES plants by changing light and moisture regimes. The effects threshold for canopy reduction has not been quantified for most TES plants, but is generally thought to be about 50%; above which effects would be minimal and below which effects would be evident. The higher the percent canopy removed, the greater the risk to TES plants in suitable habitat. The limited data and observations available indicate that many species in the moist and wet forest guilds are intolerant of major canopy removal (Lichthardt, 1998; Greenlee, 1997).

Indirectly, changes in fuel loading, duff levels, moisture regime, and light levels may impact TES plants and their habitat. Site preparation such as underburning or slash treatment associated with post harvest activities could also affect TES plants or habitat. While timber harvest has the potential to adversely affect rare plants it may not always do so. Effects will vary according to species, harvest method and harvest prescription.

Of the prescriptions listed in Table 3-61, the potential effects on rare plant habitat from commercial thinnings, shelterwood preparatory cuts, irregular shelterwood cuts, and group shelterwood cuts would be comparable, varying primarily in the size of their openings. Shelterwood seed cuts and clearcuts would pose the largest threats to rare plant habitats of all the prescription types due to the extreme habitat modifications that would occur. Risks to TES species from shelterwood removal cuts would presumably be small because extensive stand manipulation would have already occurred during the seed cut.

Table 3-61 - Summary of Timber Harvest Prescriptions Characteristics and Guilds Affected

Prescription^	Canopy closure+	Site Prep#	Opening size	Guild affected*
Commercial thinning	45-55%	Yes	< 1 acre	moist forest
Shelterwood preparatory cut	45-55%	Yes	≤ 2 acres	moist forest
Irregular shelterwood cut	45-50%	Yes	≤ 5 acres	moist forest
Group shelterwood cut	45-50%	Yes	3 to 5 acres	moist forest
Shelterwood seed cut	20%	Yes	N/A	moist forest
Shelterwood removal cut	-	Yes	N/A	moist forest
Clearcuts w/ reserves	5%	Yes	N/A	moist and wet forest

+ Canopy closure resulting from the harvest activity. This column shows the range for all alternatives. # Is there a possibility that site preparation such as underburning or slash treatment (after harvest) and planting may occur in openings? * Rare plant habitat guild affected by prescription in all alternatives. ^ Not all prescriptions will take place in all alternatives.

Most timber harvest for the Hidden Cedar project would take place in moist forest habitats, so most effects would be confined to moist forest guild species. Design features for all action alternatives would protect documented occurrences and mitigate for new ones discovered prior to implementation.

<u>Yarding Method for Timber Harvesting</u> (Helicopter, Cable-Skyline, Ground Based)

Helicopter yarding results in little ground disturbance and poses the least risks to TES plants and habitat of the three yarding systems. Cable-Skyline yarding poses intermediate risks and ground based yarding and skidding the highest due to direct physical impacts, soil compaction, and soil displacement.

New Road Construction, Road Reconstruction, and Reconditioning

New road construction, road reconstruction, and reconditioning would take place in all action alternatives. New road construction is a ground disturbance activity that may have adverse effects on TES species in suitable habitat. Road reconstruction and reconditioning occur in existing road prisms which are already disturbed and of very low habitat suitability. Therefore, these activities pose low risk to TES species and habitat. Certain TES plant species have the ability colonize disturbed sites like road cuts from adjacent occupied habitat. However, these occurrences rarely constitute a viable population. Often they are individual plants that are part of, or isolated from, a larger "meta-population" in the vicinity.

Fuels Treatment

Fuels would predominantly be treated using mechanical and hand piling with some underburning, top yarding, and broadcast burning in the clear cuts. Machine piling of slash in suitable habitat can be detrimental due to the direct physical disturbance, and the concentration of heat under the piles.

Hand piling of slash would be a fairly low risk to TES plant species, as long as slash piles were not placed directly on a TES plant occurrence. Low or even mixed severity fire in suitable TES plant habitat can be beneficial to certain TES plants, yet detrimental to others depending upon a variety of factors (see project file).

Watershed Rehabilitation, Including Road Obliteration and Removal/Replacement of Road Channel Crossings

Over 60% of the TES plant species in the St. Joe sub-basin can occur in riparian areas. Full road prism obliteration could affect some TES plants in suitable habitat, especially riparian areas. Direct impacts from equipment can occur above the top of the cut slope, and below the bottom of the existing fill as the slope is returned to a stable position. However, the actual amount of habitat affected along any road prism would be small and present little risk for any TES plant species or habitat. Removal and replacement of channel crossings also takes place in previously disturbed sites. Existing populations in both of these areas are rarely viable populations and often consist of individual plants that are part of, or isolated from, a larger "meta-population" in the local vicinity. The long-term effects of these treatments could be beneficial to TES plants due to improved channel stability and riparian community habitat.

Alternative A - No Action

Direct and Indirect Effects

There are no known direct effects from the No-Action Alternative. Indirectly, there may be an increased risk to TES plants and habitat due to an increase in fuel loads over time. The increase in ignition risk and resulting fires would have an array of effects on TES plant species, ranging from beneficial to detrimental, depending on factors like fire intensity, the ability of the species to

survive the event, and competition in early successional habitat. The ability to analyze these effects for all sensitive plant species is limited given our current knowledge.

A few TES plant species inhabit 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. Species like Idaho barren strawberry, western star flower, and Constance's bittercress are known from more open, mesic forest habitats that may have experienced recent disturbance. Indications are that survival of Constance's bittercress after fire may be dependent on the availability of moist microsites.

Dry, open forest habitats historically have had a higher fire frequency of non-stand replacing fires, than the moist and wet habitats. Species found within these habitats may therefore have higher survival rates following fire activity.

Clustered lady's slipper can be found in drier habitats that historically experience a more frequent fire regime. However, this species is threatened from high intensity wildfire that removes the duff layer. Such fire activity has been documented to extirpate populations of clustered lady's slipper, however individual plants survived areas that experienced low to moderate intensity fire (Greenlee, 1997). It was noted that reproduction for this orchid following these events was reduced.

All the other moist forest, dry forest, and wet forest guild species have populations in mid and later successional habitats, preferring more closed canopy conditions. Some of these species such as moonworts and clustered lady's slipper orchid have factors like obligate soil mycorrhizae relationships that are likely to be affected by increased light (canopy reduction) and moderate to intense (duff replacing) fires. Stand replacing fires were an important part of ecosystem processes in northern Idaho prior to the beginning of suppression efforts in the 1930's. 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, that the ability of rare plants to re-colonize following disturbance has been reduced.

Species like maidenhair spleenwort and chickweed monkeyflower, which are found in seasonally moist moss mats and rock seeps are not likely to be affected by stand replacing fires as their habitat generally is devoid of fuels that can carry a fire.

Cumulative Effects

Under Alternative A, susceptibility of the landscape to high intensity, stand-replacing wildfire may increase due to increased fuel loading. Such fires would have a detrimental effect on most TES species in the moist and wet guilds as few species are adapted to these types of events. However, the time scale of such events is unpredictable. Therefore, for listed species, this alternative would have **no effect**, and for sensitive plant species/guilds this alternative would have **no impact**.

Past activities on federal and other lands, including fire, road construction, and timber harvest have likely affected rare plant populations and habitat. Future activities within the project area are likely to include 6.5 miles of new access road construction on private lands and associated activities. State and private landowners are not required to protect sensitive species.

Given the large amount of high potential habitat on federal land within the project area, especially within the moist forest guild, it is highly likely that other ownerships within the project area will also have such habitats. Therefore, loss of rare species associated with these habitats is likely to occur in the future or to already have occurred.

Within the project area, activities may occur that are associated with garnet digging. All such activities will be analyzed in future environmental documents. However, there are several reasonably foreseeable activities that may occur. Unauthorized digging for garnets currently occurs along a tributary of Cat Spur Creek in T42N R1E Sec 19 and is likely to continue. Recreational digging may be proposed for this area in the future. Wood Creek will likely be tested for garnets in the near future. Testing includes digging 3-15-feet deep trenches in the riparian areas at 50-foot intervals (approximately). All soil removed during trenching would be replaced. The results of the testing may lead to Wood Creek being opened up for recreational digging. This typically results in approximately 100 feet of riparian being hand dug every season. Digging would start at the head of the drainage and work down, and all digging sites would be rehabilitated yearly. The site along Cat Spur Creek and much of the length of Wood Creek are located in high potential rare plant habitat and have the potential to impact rare plants. The Merry Creek white pine progeny site consists of a young stand of timber, which will be cleared, burned, and then replanted with disease resistant strains of trees. The site does not occupy high potential habitat and no impacts to TES species are expected to occur. All proposed and future ground disturbing activities on National Forest lands, except wildfire suppression, will be evaluated through surveys and biological assessments/evaluations as to their impact on TES plant species.

Alternatives B, C, D, F

Direct and Indirect Effects

***Alternative B*:** Alternative B would directly impact approximately 1350 acres of moist forest guild habitat and 18 acres of wet forest guild habitat through harvesting. Harvesting methods will include 130 acres of clearcut with reserves (10%), 40 acres of shelterwood seed cut (3%), 16 acres of shelterwood removal cut (1%), 74 acres of irregular shelterwood cut (5%), 59 acres of group shelterwood cut (4%), and 842 acres of commercial thinning (62%) (see Approximate Acres Impacted by Each Harvest Prescription and Method table in the project file). The single unit within the wet forest guild will be harvested as a clearcut. Over 75% of timber harvest will be done using harvest prescriptions of lesser impact. Units will be harvested by helicopter, cable-skyline, and ground based methods in fairly equal proportions (See Harvest Summary Table in Appendix A).

In addition there will be 11.5 miles of new road construction on NFS land (for access requests and timber harvest), 11 of it through high potential moist forest habitat. A very small portion (.1 mile) of the 11 miles would also include some moderately high probability habitat for *Silene spaldingii*. Road construction in high potential rare plant habitat poses a high risk to TES species due to the amount of ground disturbance involved. Approximately 36 miles of road reconstruction, long-term storage, and decommissioning will also occur, some of which will be on newly constructed roads after harvest activities end. These activities are expected to pose a low risk to rare plant species or habitat because they will be occurring in previously disturbed areas.

All areas scheduled for ground disturbing activities that have a possibility for adverse effects within high potential habitat, will be surveyed for TES species prior to project implementation. While surveys are expected to reveal the presence of most TES populations, the diminutive size and difficulty in detecting the moonworts could result in some populations being overlooked. In such an instance, individuals or populations of moonworts may be lost.

In the event that any TES plant populations are found prior to project implementation, the District Botanist will implement the necessary mitigation measures. As described in the mitigation portion of Chapter 2, population viability would be protected, although some isolated individuals may be impacted by activities.

***Alternative C*:** Alternative C would directly impact approximately 1379 acres of moist forest guild habitat and 18 acres of wet forest guild habitat through harvesting. Harvesting prescription acres are the same as in Alternative B except that 870 acres will be harvested by commercial thinning under this alternative. The single unit within the wet forest guild will be harvested as a clearcut. The majority of units will be harvested by helicopter, with approximately 14% by cable-skyline, and 3% ground based (see Logging Systems Summary, project file). The large increase in helicopter yarding in this alternative compared to Alternative B represents a lower risk to TES species and their habitat.

There will be no new road construction on NFS land under this Alternative Aside from the potential construction of 2.4 miles of road on Forest Service and 11.9 miles on private associated with access requests. Alternative C represents a lower risk to TES species in this regard compared to Alternative B. All 2.4 miles of access requests are located in moist forest high potential habitat. Approximately 27 miles of road reconstruction, long-term storage, and decommissioning will also occur. The difference between Alternative B and C with respect to TES species due to these activities is minimal since risks associated with these activities are low.

Alternative D: Alternative D would impact approximately 586 acres of moist forest guild habitat and 18 acres of wet forest guild habitat through harvesting. Harvest prescriptions include commercial thinning (55%), shelterwood preparatory cut (20%), group shelterwood cut (7%), and clearcut with reserves (18%). The single unit within the wet forest guild will be harvested as a clearcut. The majority of units will be harvested by helicopter, with approximately 24% using cable-skyline, and 4% ground based (see Logging Systems Summary, project file). In addition there will be approximately 3 miles of new road construction (for access requests and timber harvest), nearly all of which will go through high potential moist forest habitat. There will also be 11.9 miles of road constructed for access on private land. Approximately 39 miles of road reconstruction, long-term storage, and decommissioning will also occur.

Alternative F: Alternative F would directly impact approximately 1242 acres of moist forest guild habitat and 18 acres of wet forest guild habitat through harvesting (see Effects of Timber Harvest Activities on TES Plant Guilds by Alternative table in project file). Harvesting methods will include 105 acres of clearcut with reserves (8%), 40 acres of shelterwood seed cut (3%), 16 acres of shelterwood removal cut (1%), 22 acres of irregular shelterwood cut (1%), 59 acres of group shelterwood cut (5%), and 852 acres of commercial thinning (66%) (see Approximate Acres Impacted by Each Harvest Prescription and Method table in the project file). The single unit within the wet forest guild will be harvested as a clearcut. Over 85% of timber harvest in high potential habitat will be done using harvest prescriptions of lesser impact. Nearly half of the units

would be harvested by helicopter, with the remainder split nearly equally between cable-skyline and ground based methods. (See Harvest Summary Table in Appendix A).

In addition there will be 9 miles of new road construction on NFS land (for access requests and timber harvest), 8.5 of it through high potential moist forest habitat. A very small portion (.1 mile) of the 9 miles would also include some moderately high probability habitat for *Silene spaldingii*. Road construction poses a high risk to TES species. Road reconstruction, long-term storage, and decommissioning will also occur, some of which will be on newly constructed roads after harvest activities end. These activities are expected to pose a low risk to rare plant species or habitat.

All areas scheduled for ground disturbing activities that have a possibility for adverse effects within high potential habitat, will be surveyed for TES species prior to project implementation. While surveys are expected to reveal the presence of most TES populations, the diminutive size and difficulty in detecting the moonworts could result in some populations being overlooked.

In the event that any TES plant populations are found prior to project implementation, the District Botanist will implement the necessary mitigation measures. As described in the mitigation portion of Chapter 2, population viability would be protected, although some isolated individuals may be impacted by activities.

Cumulative Effects

The cumulative effects area for TES plants and highly suitable habitat was determined to be the project area. Past activities on federal and other lands, including fire, road construction, and timber harvest have likely affected populations and habitat. Design criteria would be applied to protect TES plant species and viability for any populations discovered prior to project implementation on National Forest System managed lands. The existing population of Henderson's sedge is located on private land and as such no guarantee can be made that it will be protected. State and private lands are not required to protect sensitive species. Current and future activities such as road building, timber harvest, burning, and recreation can be expected to result in habitat modification or plant population loss on these lands.

Activities associated with garnet digging and exploration will occur as outlined in Alternative A.

The cumulative effects on TES plants would be very similar in Alternatives B and C. Both alternatives add to cumulative effects by impacting high potential plant habitat. While some aspects of Alternative C pose lower risks to TES species, the overall risks are not expected to be appreciably lower than Alternative B due to design features, mitigation, and proposed surveys.

The cumulative effects on TES plants in Alternative D would be less than those of Alternatives B, C, or F primarily due to the fact that fewer acres will undergo timber harvest. However, these effects are still expected to be small on NFS land because surveys shall be done and adverse actions mitigated for. Effects on TES species due to actions on private land will be the same under all action alternatives.

Alternatives B and F would have **no effect** on Spalding's catchfly. Potential habitat does exist within the project area, however only a very small amount (< 1 acre) of this potential habitat would be impacted by any project activities. These areas would be thoroughly surveyed prior to any project initiation and if found the area will be avoided or mitigation implemented.

Alternatives C and D would have **no effect** on Spalding's catchfly. Potential habitat does exist within the project area, but is not located in any activity area.

For the moist and wet forest guilds alternatives B, C, D, and F **May impact individuals or habitat but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.** Rationale for this call is based on the fact that surveys are not complete, there is potential habitat for Botrychium, they are difficult to locate, and the moist and wet forest high potential habitat will be modified.

Alternative E

Direct and Indirect Effects

No commercial timber harvest will occur under this alternative. In this respect, effects will be much as outlined in Alternative A, the no action alternative.

The effects of road construction/reconstruction in this alternative are very similar to those in Alternative D. There will be no new road construction on NFS land under this alternative aside from the potential construction of 2.2 miles of road associated with access requests. All 2.2 miles of access requests are located in moist forest high potential habitat and would be surveyed prior to construction. There will be less than two miles of road reconstruction, but long-term storage and decommissioning will occur as in Alternative D.

Cumulative Effects

There will also potentially be approximately 11.9 miles of road construction on private lands within the project area. The cumulative effects would be similar to Alternative A. Effects on TES plants would be low in the short-run but potentially high in the long-run as the possibility of intense wildfire increases (see Fire and Fuels Environmental Consequences for Alts A and E).

For Spalding's catchfly, this alternative would have **no effect**, as habitat is not present in any activity area.

Given that under this Alternative A small area of high potential plant habitat will be impacted by project activities and it is easily surveyed before project implementation, there will be **No impact** on the moist and wet forest guilds in this alternative.

Forest Plan Consistency

The Forest Plan states one management goal as "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 on the Regional Sensitive Species List to prevent further declines in populations which could lead to Federal listing under the Endangered Species Act" (Forest Plan, II-28). The Forest Plan also identifies the need to "Determine the status and distribution of Threatened, Endangered, and Rare (sensitive) plants on the IPNF" (Forest Plan, II-18). All of the proposed alternatives, with 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.

All alternatives would also meet the intent of the Endangered Species Act and the National Forest Management Act.

NOXIOUS WEEDS

Regulatory Framework

Direction regarding the development and coordination of programs for the control of noxious weeds, and evaluation of noxious weeds in the planning process can be found in federal legislation, regulations, and policy.

Executive Order #13112 (February, 1999) directs federal agencies to "…prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause…". The National Forest Management Act (1976) has a goal of providing of a diversity of plant and animal communities and established the disclosure requirements for proposed noxious weed control activities on NFS lands. The Idaho Panhandle National Forests, Forest Plan (1987) and Forest Service Manual (Chapter 2080, as amended, 1995) prioritize weed treatments and state that noxious weeds will be controlled with a integrated pest management approach. In addition, the Idaho Panhandle Forest Plan and the Federal Noxious Weed Act of 1974 as amended requires cooperation with State, local, and other Federal agencies in managing and controlling noxious weeds. The state of Idaho also requires landowners to control weeds on their property under the Noxious Weed Act, Title 22, Chapter 24 Idaho Code.

Analysis Area

The geographic scope of analysis for noxious weeds in this project is the Hidden Cedar Project Area. This is the largest area upon which a meaningful analysis can be done. Weed populations may expand beyond the project area boundary, but this is not expected to occur to any great extent within the time scale of the project. However, should it occur, the threat posed by expansion is minimal because much of the disturbed habitat outside of the project has already been colonized by weeds.

Analysis Methods

Disturbed areas often translate into potential weed habitat. Weed species are adept at colonizing recently disturbed areas particularly if light levels increase. Once established, most species grow and spread quickly and effectively exclude native vegetation from the site. On average, road construction/ reconstruction results in 5.6 disturbed acres per mile (see Emerald EIS support information in project file).

Affected Environment

Noxious weeds are plant species that have been officially designated by federal, state or county officials. The Federal Noxious Weed Act of 1974 defines a noxious weed as "a plant which is of foreign origin, is new to, or is not widely prevalent in the United States, and can directly or indirectly injure crops or other useful plants, livestock or the fish and wildlife resources of the United States, or the public health" (P.L. 93-629). The Idaho Noxious Weed Law definition is any exotic plant species that is established or that may be introduced in the State, which may render land unsuitable for agriculture, forestry, livestock, wildlife, or other beneficial uses and is further

designated as either a State wide or County wide noxious weed (Idaho Code 24 Chapter 22). Both federal and state definitions pertain primarily to competition with commodity land uses, although, weeds also impact non-commodity resources such as water quality, wildlife and natural diversity.

The St. Joe Geographic Assessment (USDA, 1997) indicates that weeds within the project area are likely present in recently disturbed areas and roads. The full extent of weed infestations within the project area is unknown. Inventories completed for the St. Joe Weed EIS (USDA, 1999) indicate populations of spotted knapweed (*Centaurea biebersteinii*), meadow hawkweed (*Hieracium pratense*), sulphur cinquefoil (*Potentilla recta*) and purple loosestrife (*Lythrum salicaria*) within the project area. Houndstongue (*Cynoglossum officinale*) and oxeye daisy (*Leucanthemum vulgare*) have also been noted in more recent visits to the project area. In the Dutch and Anthony drainages spotted knapweed and St. John's wort (*Hypericum perforatum*) are well established on Road #1486. Cat Spur Creek is heavily infested with St. John's wort.

Weeds were treated in the project area manually and through herbicide spraying in 1998 and 1999. Herbicide spraying was conducted in the vicinity of the project area in 2000. Biological control agents have not been previously released in the project area.

Environmental Consequences

Alternative A

Direct and Indirect Effects

Under this alternative, weed populations may decline in some areas as canopy cover increases. Populations would persist longer along the roads due to more frequent disturbances and higher light levels for longer periods than in surrounding forest stands. Here they would provide a seedbank that could spread the species along the road system. Overall, weed numbers will likely increase very gradually due to transport of weed seeds and activities on other ownerships. However, such an expansion is not likely to be noticeable or to become a threat to other natural resources in the area within the time frame of the project.

Cumulative Effects

Cumulative effects are the result of past present and future activities on all ownerships within the area. The cumulative effects discussion under the Action Alternatives is pertinent to Alternative A as well. Current and reasonably foreseeable projects such as the Dutch Cat timber sale, grazing, and garnet digging may result in the creation of new habitat for noxious weeds. However, some of these activities are very small in scale and all have or will have mitigation to control the spread of noxious weeds. Gopher control is not a ground disturbing activity and will have no effect on weed populations.

The St. Joe Noxious Weed Control Project EIS (1999) identifies the grazing allotments (Emerald Cat Spur, Keeler and Merry Creek) as potential treatment areas. Weed control activities within these areas will be scheduled as funding and other priorities allow. Weeds may also be treated in areas not specified in the St. Joe Noxious Weed Control Project EIS (1999) by following the adaptive management strategy outlined within that document. Activities on state and private land in the future are uncertain. Private access requests will likely result in approximately 7.8 miles of new road construction in the area. It is also assumed that timber harvest will occur in the area on

private and state lands. The extent of noxious weed control activities on private land in the area is unknown at this time.

Since approximately 40% of the project area is retained under federal ownership, lack of weed control and prevention measures by others may contribute to weed expansion. Overall, the effect of all activities is expected to result in the gradual increase in weed numbers within the area over time, especially if control methods are not employed.

Effects Common to All Action Alternatives

Direct and Indirect Effects

The direct effect of ground disturbing activities on noxious weeds is to increase the area available for weed colonization. The greatest potential for the establishment of weeds comes from activities that disturb the soil to the greatest extent. In this respect new road construction, road obliteration, skid trails, log landings, and timber harvests have the highest potential to create suitable weed habitat. Road reconstruction, reconditioning, and storage impact already disturbed areas and so would not create new potential habitat. Timber harvest prescriptions and methods differ in the extent to which they might promote noxious weed colonization. In general, the smaller the openings created and the less work done in the remaining stand, the smaller the opportunities for weed colonization. In this respect, commercial thinning (CT), shelterwood preparatory cuts (SW1), group shelterwood cuts (GSH), and irregular shelterwood cuts (SW) would pose the lowest risk of spreading weeds, while shelterwood seed cuts (SW2) and clearcuts (CC) would pose the highest. Ground based yarding may promote the spread of weeds more than any other yarding method due to the greater extent of ground disturbance and use of machinery. Certain design features such as washing logging equipment prior to work on site, keeping skid trails to a minimum, skidding over slash, and seeding certain skid trails would help to minimize these effects. Cable yarding would have an intermediate effect, and helicopter yarding the least effect due to level of ground disturbance of the three methods.

To reduce the availability of colonization sites for weeds, all obliterated roads and landings off of specified roads would be seeded with certified weed-free mixes the year of obliteration**.** Any mulching agents would also be certified noxious weed free. In addition, all off-road logging and construction equipment would be cleaned prior to entering the project area in order to remove noxious weeds.

Indirect effects of project activities could be the possible establishment of new weed populations or the expansion of existing populations. Effects associated with weed population enlargement may include; declines in the palatability or abundance of wildlife and livestock forage, declines in native plant diversity, reductions in the aesthetic value of the landscape, encroachment upon rare plant populations and their habitats, potential reductions in soil stability and subsequent increases in erosion (Lacey, 1989), and an overall decline of ecosystem health. The potential for the spread of existing noxious weeds and the introduction of new species exists for all alternatives.

Established weed populations along right-of-ways and water courses on National Forest lands may provide a source of seeds for infestation of other ownerships (and vice versa). The possibility for weed establishment can be roughly correlated to the amount of ground disturbing activity and increases in light levels that would take place. The potential for weed spread would be less with the No Action Alternative than for the action alternatives, but existing populations would probably

continue to spread due to seed transport by vehicular traffic, cattle, wildlife, and other natural dispersal methods. Major haul roads will be sprayed prior to timber harvest in order to decrease the opportunity for the transport of weeds.

Site preparation and planting will occur in areas where timber harvest has already taken place and are not expected to result in the creation of additional new weed habitat.

Gopher control is not a ground disturbing activity and will have no effect on weed populations.

The construction of a fish pond would result in a small amount of ground disturbance. Design features to minimize the potential for weed spread include: washing of al construction equipment prior to entering the project area, use of certified weed free seed and mulching agents, and the inspection and possible treatment of the disturbed site (FEIS, Chapter 2- Design Criteria and Mitigation). However, increased traffic to the area for recreational use of the pond will increase the chance of the introduction of new weed species from outside the project area.

Riparian planting and associated fencing will not result in the creation of new weed habitat.

Pre-commercial thinning will result in an increase in light levels reaching the forest floor. However, it is not a ground disturbing activity and is not expected to create additional weed habitat

Cumulative Effects

Current infestations of noxious weeds are a result of past and current activities in this area. Other federal projects that would affect this area include the proposed project, Dutch Cat timber sale, grazing, and garnet digging and testing. Any ground disturbing activities associated with these projects may result in the creation of new habitat for noxious weeds. Design criteria exist to limit the spread of weed seed and establishment of new populations, but are not expected to halt such spread completely. Garnet digging and testing is not expected to add to the cumulative effects within the project area. Ground disturbance may occur from hand digging but will be very small in scale. Increases in light levels can play an important role in allowing weed establishment. Testing and digging will not result in an increase in light levels since activities will take place under the existing canopy.

The St. Joe Noxious Weed Control Project EIS (1999) identifies the grazing allotments (Emerald Cat Spur, Keeler and Merry Creek) as potential treatment areas. Weed control activities within these areas will be scheduled as funding and other priorities allow. Weeds may also be treated in areas not specified in the St. Joe Noxious Weed Control Project EIS (1999) by following the adaptive management strategy outlined within that document. Activities on state and private land in the future are uncertain. Private access requests will likely result in several miles of new road construction in the area. It is also assumed that timber harvest will occur in the area on private and state lands. The extent of noxious weed control activities on private land in the area is unknown at this time.

Even under the no action alternative of the Hidden Cedar project, weed populations are expected to remain stable at best. Other federal activities have built in mitigation to control the spread of noxious weeds. However, given that the majority of land in the area is not in federal ownership, lack of weed control and prevention measures by others may contribute to weed expansion. The

overall effect of all activities is expected to result in the gradual increase in weed numbers within the area over time if control methods are not employed. Such increases may not be discernable within the time frame of this project, and will vary depending upon the extent of disturbances.

Alternative B

Direct and Indirect Effects

The proposed project activities would result in a greater potential for weed spread as compared to the no action alternative, due to the degree of ground disturbance (see Table 3-62). Design features and mitigation are expected to minimize this threat. However even with associated weed control methods, weed species may colonize post disturbance areas, although the extent may be small.

Table 3-62 - Approximate Acres Impacted by Each Harvest Prescription and Method

		Approximate Acres			
Alt.	Prescription	Helicopter	Ground Based	Cable	Total
B	Commercial thin	369	235	238	842 (62%)
	Shelterwood preparatory cut	58	51	98	207 (15%)
	Shelterwood seed cut	-	20	20	40 (3%)
	Shelterwood removal cut	-	8	8	16 (1%)
	Irregular shelterwood cut	18	28	28	74 (5%)
	Group shelterwood cut	51	8	-	59 (4%)
	Clearcut w/ reserves	19	48	63	130 (10%)
	Total	514 (38%)	398 (29%)	455 (33%)	1368 (100%)
C	Commercial thin	798	16	56	870 (62%)
	Shelterwood preparatory cut	128	6	73	207 (15%)
	Shelterwood seed cut	-	20	20	40 (3%)
	Shelterwood removal cut	16	-	-	16 (1%)
	Irregular shelterwood cut	39	17	18	74 (5.5%)
	Group shelterwood cut	59	-	-	59 (4%)
	Clearcut w/ reserves	61	19	50	130 (9.5%)
	Total	1101 (79%)	78 (6%)	217 (15%)	1396 (100%)
D	Commercial thin	295	8	30	333 (55%)
	Shelterwood preparatory cut	48	6	64	118 (20%)
	Group shelterwood cut	43	-	-	43 (7%)
	Clearcut w/ reserves	50	14	45	109 (18%)
	Total	436 (72%)	28 (5%)	139 (23%)	
F	Commercial thin	494	178	179	852 (66%)
	Shelterwood preparatory cut	58	51	98	207 (16%)
	Shelterwood seed cut	-	20	20	40 (3%)
	Shelterwood removal cut	-	8	8	16 (1%)
	Irregular shelterwood cut	-	11	11	22 (1%)
	Group shelterwood cut	51	8	-	59 (5%)
	Clearcut w/ reserves	19	36	50	105 (8%)

	Total	622 (48%)	312 (24%)	366 (28%)	1300 (100%)

Alternative C

Direct and Indirect Effects

The amount of timber harvest would be greatest under this alternative. However, only an additional 28 acres of harvest, all of it commercial thinning, would be done as compared to Alternative B. In addition, nearly 80% of timber harvest will be done using helicopter yarding as compared to the nearly equal amounts of helicopter, cable, and ground yarding in Alternative B (see Table 3-62). This would create less ground disturbance compared to that alternative. There is also less road construction and obliteration associated with this alternative than with Alternative B (see Table 3-63). Overall, the degree of ground disturbance under this alternative should be less than that of Alternative B in spite of an increase in thinning acres, given the differences in yarding and reductions in road work.

Alternative D

Direct and Indirect Effects

This alternative includes less clearcutting and less timber harvest overall than either Alternative B or C. The proportions of harvest done by the differing yarding methods are comparable to Alternative C, with approximately 70% of timber harvest being accomplished by helicopter yarding. There is slightly more new road construction and substantially more road obliteration than in Alternatives B and C (see Table 3-63). However, the increase in the amount of these higher risk activities is more than offset by the overall reduction in timber harvest, especially with regards to clearcutting, and should result in less potential new habitat being created than in Alternatives B and C.

Alternative E

Direct and Indirect Effects

No timber harvest will occur under this alternative, but in all other respects, it will be the same as Alternative D. Of all action alternatives, this one may potentially create the least new habitat for noxious weeds (see Table 3-63) and contribute the least to cumulative effects.

Alternative F

Direct and Indirect Effects

Alternative F would result in approximately 15% less acres of timber harvest by clearcut than Alternative B. However, most timber harvest would still be through timber prescriptions other than clearcut or shelterwood seed cut in both alternatives (see Table 3-63) and the total acres of timber harvest are similar between the two alternatives. Alternative F has 18% more acres to be harvested by helicopter and 22% and 20% less to be harvested by ground based and cable yarding respectively than does Alternative B (see Approximate Acres Impacted by Each Harvest Prescription and Method table in the project file). Alternative F proposes 19% less miles of new road constructed and 80% more road obliteration (see Table 3-63). The extent of activities proposed under alternative F would result in a smaller potential for weed spread as compared to Alternative B due to the amount of ground disturbance.

Alternative F has 95 fewer acres of harvest (18 acres of commercial thinning, 52 acres of irregular shelterwood cut, and 25 acres clear cuts with reserves) as compared to Alternative C. Timber harvest will be done by nearly equal amounts of helicopter, cable, and ground yarding in Alternative F as compared to the nearly 80% helicopter harvesting proposed in Alternative C. There is more road construction this alternative than in Alternative C (see Table 3-63). Based on the Hidden Cedar Roads Analysis, approximately 5.6 acres/mile would be disturbed by road construction. This would result approximately 100 additional acres being disturbed by road construction in Alternative F than in alternative C. Some of these road acres would then be put into storage or obliterated. Overall, the degree of ground disturbance under this alternative may be comparable to that of Alternative C given the reductions in timber harvest but increases in road construction.

Alternative F has approximately 696 more acres of timber harvest as compared to Alternative D, of which clear cuts and shelterwood seed cuts make up about 5% (see Table 3-63). Approximately 72% of all timber harvest in alternative D would be done by helicopter and only 5% by ground based yarding, in contrast to the 48% helicopter and 24% ground based yarding in Alternative F.

Alternative F would also have nearly 32% more road construction and nearly 58% more road reconstruction and/or storage than Alternative D. Compared to Alternative D, Alternative F would result in a much greater potential for weed colonization and expansion due to the larger amount of ground disturbance.

The creation of new weed habitats and probability of weed transport would be much smaller in Alternative E compared to Alternative F due to a lack of timber harvesting and lesser road construction.

Table 3-63 - Approximate Acres or Miles of Ground Disturbance on NFS Land

Activity	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
CC and SW2 (acres)	None	170	170	109	None	145
CT, SW, SW1, & GSH (acres)	None	1180	1210	495	None	1155
Road construction (acres)	None	27	4	7	4	22
Road obliteration	None	9	4	45	45	43
Road reconstruction/storage	None	72	56	42	33	72

Consistency with Forest Plan and Laws

According to the Idaho Panhandle Forest Plan (1987) direction, infestations of many noxious weed species, including spotted knapweed, meadow hawkweed, and goatweed are so widespread that control would require major programs that are not possible within expected budget levels (Forest Plan, p. II-7). Forest Plan direction is to "provide moderate control actions to prevent new weed species from becoming established" and to treat noxious weeds with a integrated pest management approach. Alternatives B, C, D, E, and F would meet the intent stated in the Forest Plan for moderate control, through the implementation of design criteria (Chapter 2). Any weed control within the project area shall be done in accordance with the principles of integrated pest management, which is also consistent with the Forest Plan. The No Action alternative would also meet the intent of the Forest Plan by not creating new habitat for the introduction of noxious weeds.

VISUAL QUALITY

Geographic and Temporal Scope of the Analysis

The geographic scope of the scenery analysis (existing condition, direct, indirect and cumulative effects) for the Hidden Cedar project was confined to boundaries of the Project Area. The temporal scope of the analysis was confined to the decade following a decision.

Regulatory Framework

Scenery management direction for the analysis area is contained in the Idaho Panhandle National Forest Land and Resource Management Plan of 1987 (Forest Plan) and is described in the terms of Visual Quality Objectives (VQOs). VQOs were established during the Forest planning process and were mapped by computer. The mapping was based on the area seen from sensitive travel corridors and other features having a high visual sensitivity level. Visual Quality Objectives were assessed upon guidance contained in the Visual Management Handbook, Chapter I of the National Forest Landscape Management Series (USDA Forest Service, 1974). The system was revised and is now known as the Forest Service Scenery Management System. The revised guidelines are contained in Landscape Aesthetics, a Handbook for Scenery Management (USDA, Forest Service publication 701, 1995).

Visual Quality Objectives

Visual Quality Objectives (VQOs) were adopted during the Forest Planning process using the scenery data obtained from the previously described landscape attractiveness and visibility analyses. Adopted VQOs for the IPNF are contained in maps generated during the Forest planning process and are available at the St. Joe Ranger District office in St. Maries.

Visual Quality Objectives consist of five levels that describe scenery management objectives ranging from low scenic integrity to very high scenic integrity. The five levels are: Preservation, Retention, Partial Retention, Modification and Maximum Modification. The levels are directly correlated to VQOs contained in the IPNF Forest Plan.

Analysis Methods

To define the existing condition of the visual resource, the visual character of the landscape is assessed in terms of how it has been altered by human activities. Proposed management activities were reviewed to see how they may change the character. Visual significance was evaluated based upon viewing opportunities form important travel routes in the vicinity. Results were then evaluated as to whether or not they meet Forest plan standards (VQOs).

Affected Environment

Landscape Character

The combination of landforms, water characteristics, vegetation, and cultural elements has resulted in a consistent landscape character over the geographic area (see Landscape Character Definitions

– project file). The landscape of the project area falls into one landscape character class of "Highly modified mature/immature mixed conifer forested landscapes on mountain slope or stream break landforms. "

Variety Classes

The variety classifications are: Class A- Distinctive, Class B- Common, and Class C-Indistinctive.

The entire project area falls into Class B – Common, which is defined as areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide ordinary or common scenic quality. These landscapes have generally positive, yet common attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern and balance. Normally they form the basic matrix within ecological units.

Landscape Visibility

Landscape visibility is defined by two elements:

1. human values as they relate to the relative importance to the public of various themes.
2. relative sensitivity of scenes based on the position of the observer.

The "human value component" is usually described by **concern** levels. The observer position component utilizes varying distance zones.

Concern Levels

The main travel routes which traverse the area and from which the area is viewed are:

Sensitivity Level 1 Travel Routes: State Hwy 3 along the St. Maries River and views from the Cedar Creek Campground.

Sensitivity Level 2 Travel Routes: Bechtel Creek to Bechtel Butte

Sensitivity Level 3 Travel Routes: the remainder of travel routes in the project area.

Site-Specific Forest Plan Visual Quality Objectives

Forest Plan VQO mapping was digitized and placed in a VQO GIS data layer for the project area. A map showing site-specific VQOs for the area can be found in the project file. Table 3-64 summarizes the gross acreages within the project area of each of the five scenery integrity levels previously described.

Table 3-64 - Forest Plan Visual Quality Objectives of the Hidden Cedar Project Area

VQO	Acres	Percent
Preservation	0	0
Retention	4,260	13
Partial Retention	3,636	11
Modification	24,808	75
Maximum Modification	249	1

The VQO mapping also incorporates site-specific information on visibility from differing concern level (sensitivity levels) features, scenic attractiveness classes, and viewing zones.

Environmental Consequences

Land management activities can affect the scenic resource because of contrasts created between natural or natural appearing forested landscapes and those unacceptably modified by management activities. These contrasts consist of changes in line, form, color, and texture of the vegetation and soil. The effects these alterations have are somewhat dependent upon individual values.

The same activities can also alter the landscape character of an area.

Timber Harvest and Fuelbreak Treatments

The ability to control how timber harvest activities appear on the landscape depends on existing topography, logging systems, silvicultural systems employed and slash disposal methods. Silvicultural systems have been identified for implementation within the analysis area see:

Clearcut with Reserves: (CC w/RES): This type of treatment generally does not meet Retention or Partial Retention VQOs when placed in foreground viewing zones. It can meet Partial Retention VQOs in the middleground or background viewing areas if unit boundaries are blended well with surrounding vegetation patterns and topographic features such as natural openings (use similar shapes and avoid straight line boundaries).

Shelterwood Seed Cut (SW2): This type of treatment can meet Partial Retention VQOs in the foreground viewing zone if boundaries are blended with surrounding vegetation patterns and topographic features such as natural openings (by using similar shapes and avoid straight line boundaries).

Commercial Thin (CT): This treatment can meet Retention in all viewing zones if unit boundaries are blended with surrounding vegetation patterns and topographic features such as natural openings (use similar shapes and avoid straight line boundaries).

Shelterwood Preparatory Cut (SW1): The scenic appearance would be similar to that of commercial thinning.

Group Shelterwood (GSH): Such a treatment can meet partial retention or retention VQOs in the middle ground if openings are shaped to mimic surrounding natural openings and opening boundaries are not geometrically (or having straight lines) shaped.

Road Construction/Obliteration

The appearance of road construction depends upon: existing topography, presence/absence of screening vegetation, the contrast between soil and rock colors of undisturbed areas vs. road fills/cuts created by soil disturbance, and the ability to restore or re-vegetate road cuts and/or fill areas. Roads constructed through or along the tops of clearcuts typically stand out when viewed in the foreground or middle ground viewing zones. Given time, re-vegetation of visible road cut and fill slopes, as well as trees growing in the clearcuts or openings, can ameliorate the soil/vegetation contrast situation.

Prescribed Burning

The effects of burning activity slash or understory vegetation such as shrubfields are normally short-term (lasting normally one growing season) if the shapes of units burned are blended with existing topography, natural openings, and surrounding vegetation texture. Straight, geometrically- shaped fireline construction can produce longer lasting effects because of potential soil/vegetation color contrasts (disturbed subsurface vs. surrounding vegetated area). This can be ameliorated over the long -term by re-vegetating disturbed soil. If harvest units are regenerated, and as shrubs grow back in burned shrubfields, most burned areas should be fully re-vegetated within a decade from treatment.

Alternatives A and Alternative E

Direct, Indirect, and Cumulative Effects

The existing condition section of this report describes the existing scenic condition of the project area. If Alternative A or E were implemented there would be no change to the landscape character of the area or the viewsheds of Sensitivity Level 1 or 2 features within the project area.

Alternatives B, C, D, and F

Direct, Indirect, and Cumulative Effects

Forest Plan Visual Quality Objectives (VQOs)

All proposed activities under these alternatives were designed and will be implemented to meet Forest Plan VQOs. All alternatives meet VQOs.

Timber Harvest Activities: all of the proposed timber harvest units that are within High Scenic Levels (Retention) are commercial thinnings (CT) or shelterwood preparatory (SW1) silvicultural prescriptions and meet VQOs.

Road Construction/ Obliteration: No proposed road construction would be within High Scenic Levels. The proposed obliteration of the Wood Creek Road would have a short-term effect for 3 to 5 years while vegetation is growing. This process could be hastened with additional plantings of established plants.

Fuels Reduction: All of the proposed timber harvest units that are within High Scenic Levels were designed to either lop tops or yard tops.

Forest Plan Consistency

All the alternatives, with associated design criteria, meet the Forest Plan standards for visual quality.

FIRE AND FUELS MANAGEMENT

Regulatory Framework

Forest Plan Direction

IPNF forest-wide management direction states "Provide efficient fire protection and fire use to help accomplish land management objectives" (USDA Forest Service, 1987).

Forest Plan fire management standards state that fire protection and use standards are specified by management area. "Cost effective fire protection programs will be developed to implement management direction based on on-site characteristics that affect fire occurrence, fire effects, fire management costs and fire caused changes in values." Management area standards define requirements for fire protection.

Prescribed fire follows Management Area standards to accomplish specific resource objectives, such as to manage wildlife habitat, meet silvicultural objectives as prescribed in the silvicultural prescription or other area objectives. Fire management is a support function integrated with and responsive to the management direction established in the Forest Plan. The use of fire is within predetermined criteria to meet specific management objectives.

Appendix F of the Forest Plan states: Fire is a natural force in the ecosystem of the IPNF. The effects of fires will be detrimental or desirable depending on when and where fires occur and nature of the fires relative to management objectives. Prolonged fire exclusion leads to changes in forest composition and distribution patterns, which can also have detrimental or desirable consequences. Ecological principals relative to fire must be integrated into fire use and protections requirements along with requirements for resource protection and efficiency. Fire use and protection standards included in each management area will:

1. Use prescribed fire where it is the most effective way to achieve ecosystem responses required for management objectives.
2. Reduce the total cost of land management by integrating fire protection and fire use in management direction.

Fire Management Plan

The Fire Management Action Plan (FMP) was developed and guided by Forest Plan standards. The standards state that fire will be used to achieve management goals according to direction in management areas. "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" (USDA Forest Service, 1987 – IPNF Forest Plan, pg II-38).

Forest Service Manual

Forest Service Manual 5130.2 states: "The objective of fire suppression is to safely suppress wildfires at a minimum cost consistent with land and resource management objectives and fire management direction as stated in fire management action plans." Minimum cost considerations usually lead to decisions of aggressive initial attack to keep fires small unless other less aggressive suppression responses to contain or confine wildfire are deemed more cost effective.

Idaho Forestry Act (IFA)-Fire Hazard Reduction Law (FHRL)

Idaho Code Title 38, Chapters 1 and 2 require harvest activities to conform to this act. This act requires the treatment of slash from timber harvest.

Analysis Area

The analysis area for fire management is the Hidden Cedar project area, (Project and Vicinity Map-M-1).

Analysis Methods

The Timber Stand Management Record System (TSMRS) and site visits were used to derive conclusions of fire history within the project area. The project alternatives affect fire management in relation to fire hazard of the harvest, slash fire hazard and fire suppression capability.

General guidelines to slash fuel loadings are available through the photographic series Appraising Slash Fire Hazard in Idaho (Morgan and Shiplett, 1989).

BEHAVE, Fire Behavior Prediction and Fuel Modeling System will be used to predict fire behavior given current, post harvest, and post harvest slash treatment conditions. Fire behavior characteristics such as rate of spread and fire intensity are predicted and utilized to plan and prioritize suppression efforts.

Fuel models that describe current and post harvest slash conditions, developed by the National Forest Fire Laboratory (NFFL) will be used as input for BEHAVE, measured in tons per acre.

Affected Environment

Fire has been the primary natural disturbance process of the Hidden Cedar project area. Fire disturbance regularly occurred and the plant, animal, and physical environments were adapted, modified and sustained by fire. Fire history studies indicate that periodic low intensity and mixed severity fires (25 to 80 years intervals) and lethal stand-replacing fires (50 to 200 years intervals) occurred repeatedly at the timber stand scale over the past 500 years. Stand replacement fires were typically very large, tens of thousands of acres (Quigley and Arbelbide 1997).

Successional development of Hidden Cedar project area habitat types produce high accumulations of natural fuel and typically overproduces biomass beyond the carrying capacity of periodic droughts. Fire was the process primarily responsible for elemental and nutrient recycling (Zack and Morgan 1994). Low intensity fires occurred two to three times more frequently than lethal fires. Low intensity fire occurrence reduced the risk to stand-replacing fire by reducing surface fuels, ladder fuels and reducing drought sensitive tree species representation.

Fire regimes of Hidden Cedar project area have developed higher proportions of lethal fires than was the condition prior to fire suppression. The reduction of low to mixed severity fire occurrence enhances this trend (Zack and Morgan 1994).

Past and current forest management has included a strong wildfire exclusion policy, attempting to regulate a timber supply, increase human safety, and reduce resource losses. Fire suppression

efforts have been largely successful to date in eliminating the frequent low intensity fires. Larger and higher intensity fires have been reduced by aggressive initial attack of small emerging fires. However, fire control cannot continue to be effective because of increasing fuels, the predictable occurrence of lightning and infrequent drought summer conditions. Wildfire suppression statistics of the western United States indicate that large lethal fire occurrence has greatly increased the last 20 years.

The Hidden-Cedar area has had effective fire suppression for the last 60 years. The St. Maries River Basin has not had a large stand replacing fire since the 1930s. District fire records (see project file) show that from 1950-1998 less then 30 lightning fires were suppressed within the Hidden Cedar project area.

These fires were suppressed at small sizes, 17 fires were Class A fires (less than 1/4 acre) and 9 were Class B fires (1/4 to 1 acre). Man-caused fires totaled 12 with 7 Class A and 5 Class B. All of the Class B fires were along the railroad tracks.

Fire suppression cannot be expected to succeed at this rate indefinitely. The dynamic natural vegetation and fuel characteristics increase potential fire intensity levels in the absence of fuel reduction and stand maintenance or disturbance. As fire intensity levels increase, suppression actions become less successful.

There are approximately 33,000 acres in the project area (53% private lands and 47% federal lands). Currently, about 13% of the Federal lands within the project area have been treated over the last ten years. This leaves approximately 7,290 acres of federal lands that have increasing fuels because of past fire suppression. Of the 53% of private lands nearly all of the acres have been logged, mainly regeneration harvest, clear cuts, seed tree, and shelterwood, with associated fuel reduction. This has created substantial effective fuelbreaks devoid of vegetation that could limit large crown fire spread. NFFL Fuel Model 10 is described by having a total average fuel load of approximately 12 tons/acre (Anderson 1982).

Table 3-65 - Existing Fuel Conditions in Hidden Cedar Project Area (NFS land only)

Fire Group	Acres	Ave. Fuel Loading Tons/Acre	Fuel Model
Fire Group 2	338 Acres	1.9 to 16.1	Fuel Model 10
Fire Group 5	95 Acres	2.4 to 16.8	Fuel Model 10
Fire Group 7	557 Acres	1.3 to 14.8	Fuel Model 10
Fire Group 8	13738 Acres	13.1 to 53.6	Fuel Model 10
Fire Group 9	338 Acres	0.7 to 38.6	Fuel Model 10
Unidenitified	444 acres		

(Smith and Fischer, 1997)

Fire Behavior Factors

Fire behavior is primarily affected by three elements - fuels, weather and topography.

The natural dynamic vegetation and fuel conditions of the project area lead eventually to stand replacing fires when periodic environmental conditions occur. Woody fuel accumulation through stand growth, limb pruning, and mortality of short-lived seral species and duff accumulation can result in intense surface fires and crown fire initiation. Other fuel factors promoting crown fire are

low foliar moisture content, continuous aerial extent of closed canopy and low live crown base height or ladder fuels. Seral stand development generally follows a pattern of increasing ladder fuels as shade tolerant tree species grow underneath seral dominants unless low severity fire maintains a single story structure. Ladder fuels reduce the effective live crown base height thereby increasing the potential of crown fire. High stocking density supported by a normally moderate summer moisture regimes can enhance low foliar moisture due to competition during droughty summers. These vegetation characteristics that enhance crown fire potential were all somewhat ameliorated by low to mixed severity fires occurrence under natural conditions. Low to mixed severity fires are successfully eliminated by fire suppression efforts.

Environmental Consequences

Alternative A and E

Direct and Indirect Effects

Continued fire suppression in these alternatives would result in continued fuel buildup, increasing fire behavior characteristics and increased fire suppression difficulties. This would increase the probability of severe wildfire and further departure from historic disturbance patterns. Potentially large severe lethal wildfire is the model of future conditions.

Road access for fire suppression would remain the same as at present.

Cumulative Effects

Alternative A and E would lead to fires with increased fire behavior, and would reduce the likelihood of successful initial attack by ground forces. Conditions that lead to crown fire would continue to get worse under Alternatives A and E and would lead to an increasing risk of large stand-replacing fires.

Of the 13% of acres that have been treated in the past 10 years only 2% would be effective beyond 15 years because of continued fire suppression and increasing fuels under Alternatives A and E.

Activities on State and private lands, such as timber harvesting, prescribed fires, cattle grazing and road construction, have in the past and would continue in the future to lessen the risk of a major crown fire consuming all vegetation with in the area. This is also true of current timber sales (Dutch Cat/Tri county) and their associated activities on NFS lands and also grazing and weed control. Garnet Stars and Sands project would have little affect on fire because it is not manipulating vegetation. Human activities associated with recreation can increase the risk of human cause fires.

Alternatives B, C, D and F

Direct and Indirect Effects

Fuel modification is one way to enhance fire control efforts. Fuel modification treatments by prescribed fire and timber harvest can reduce fuel loads and potential high intensity burns, create fuel breaks and provide safety zones. Without fuel modification the trend toward more severe fire regimes will continue.

Reduction in severe fire disturbances adversely affects many resource conditions. This ecosystem evolved with fire. Timber stand composition and structure development in absence of wildfire or vegetation management reduces stand resiliency to disturbance. Pre-settlement timber stands had a positive correlation between increased fire frequency and resiliency to fire, drought, and insect stresses. Fire was essential in reducing landscape vegetation homogeneity and susceptibility to large-scale disturbance.

Timber harvest and wildfire potential

Timber harvest residues can result in high surface fuel loads, which left untreated, create fire intensities exceeding the limits of direct attack under moderate and severe fire weather. Post-harvest fuel reduction would occur usually within two years, which allows slash to cure. Prescribed burning would be conducted under conditions specified in a burn plan that maximize resource benefit.

These alternatives include fuels reduction in the form of prescribed fire, excavator piling, hand piling and lopping. The prescribed fires are planned as low severity (heat pulse into soil), high intensity spring burns for fire hazard reduction.

The fire prescription includes burning when conditions are conducive to short duration fires and little chance of escape. The effect would be to reduce the fuel buildup. The net effect is changing the fuel model, which characterizes the site according to the amount of available fuel and fire behavior to less intense fire behavior potential.

Fire spread is primarily through the fine herbaceous fuels, either curing or dead (Anderson, 1982)

The proposed harvest and subsequent prescribed burning will trend toward regaining beneficial fire effects and reducing the potential impact and extent of stand-replacing fires. The actions will create a fuel break through the area by canopy removal and reduction, the reduction of surface fuels by burning and establishment of more resilient tree species.

Harvest activity increases fire suppression access and disrupts fuel continuity. Harvest provides a mosaic of less fire-prone fuel complexes. Most effective is regeneration harvests followed with site preparation/hazard reduction burning, and conifer regeneration. Regeneration harvests create a short-term increase (1 to 3 years) in fire hazard until the site preparation and hazard reduction burning is accomplished. Typically regeneration harvests in these habitat types produce up to 30 tons/acres of the fine fuels (less than 3 inches diameter). Burning is generally within two years of harvest slash production. Thereafter, the burned harvest areas result in a long-term effective change in fuel conditions, where the fine fuels are reduced 90% and larger fuels reduced 60% (First Order Fire Effects Model).

Fire behavior potential is reduced on the treated sites compared to untreated harvest areas and many natural fuel conditions. Regeneration harvest would create effective fuelbreaks, affecting both surface fires and crown fires. Typically the overstory is substantially reduced in coverage and unable to sustain crown fire.

Timber harvesting on these sites prevents probable near term increases in natural fuel loads. Timber management activities as proposed in this project would reduce fire behavior comparable to changing NFFEL Fuel Model 10 characteristics to Fuel Models 11, 12, or 13 (an increase in

fuel loading), followed within 1 to 2 years by fuel reduction treatments that represent fire behavior potential of Fuel Model 5 then Fuel Model 8. Differences in the amount of acres in each alternative can be found in Table 3-67.

Table 3-66 - Fire Behavior by Fuel Model

Fuel Model	Rate of Spread (Chains/Hour)	Fireline intensity (BTU/Feet/Sec)	Heat per unit area (BTU/Square Foot)
10	10	220	1207
5	18	127	388
8	2	7	174

Direct effects on wildfire potential are analyzed in relation to the proposed harvest prescriptions and hazard reduction burning. Harvest activities can be a reduction or an increase of fire hazard depending on how harvest residues are treated. The analysis will be on silvicultural treatment areas that propose site preparation/hazard reduction burning or that reduce fuels by lopping, hand piling, burning, and excavator piling.

Quick shrub growth and conifer regeneration reestablishes solar and wind sheltering of surface fuels and contributes high live fuel moistures which all reduce site fire behavior potential. In the moist forest type, grass fuels with higher potential rates of fire spread rarely dominate regeneration harvest areas (Anderson 1982).

Table 3-67 - Summary of Fuels Treatment By Alternative

Fuels Treatment (Acres):	**A**	**B**	**C**	**D**	**E**	**F**
Jacpot/Broadcast Burning	0	188	188	123	0	188
Excavator Piling	0	556	556	24	0	500
Lopping	0	119	119	38	0	144
Hand piling	0	12	19	14	0	19
Total Treated	0	875	882	396	0	851

Research indicates (Scott, 1997) that reductions in crown bulk density by pre-commercial thinning of the overstory reduces potential of active crown fire initiation or spread, especially in combination with low levels of surface fuel. Pre-commercial thinning would occur on 615 acres in each of the action alternatives.

Underburns help maintain more open canopies by removing less fire resistant species. Timber harvest and slash treatment can also be sufficient to reduce crown fire potential. Stand-replacing fires reduce crown fire potential for a period, but potential reburn by high intensity surface fire is later increased because of the heavy fuel created by fire mortality (Scott, 1997).

Clearcut with reserves, Irregular and Group shelterwood and Shelterwood seed cut all incorporate site preparation/hazard reduction burning and excavator piling and burning. They quickly establish an effective fuel break in the natural fuel complex. Not only is potential surface fire intensity reduced on these sites by the hazard reduction burning, but also the large aerial breaks in forest canopy will result in a long duration fuelbreak reducing potential crown fire spread. Seral tree species less prone to fire and drought damage or ladder fuel creation will be planted extending the fire management improvement. The landscape positions of the proposed harvests are

strategically important in that they primarily occupy the midslope "thermal belt, south aspect positions which typically increase potential fire behavior.

Commercial thinning (CT) reduces potential fuel accumulation by promoting large tree growth and stand vigor, and reducing ladder fuels associated with hemlock and true firs through preferential selections in units. The fire resiliency of these stands will improve so long as surface fuels hazard is not created or is mitigated. CT reduces crown bulk density and can reduce potential crown fire initiation and spread when surface fuel hazard is not great. Project design will require lopping, grapple piling broadcast and jackpot burning, and hand piling to mitigate surface fuel hazard risk. (see Appendix A for type of fuels treatment associated with each unit).

Timber harvest will promote future fire use and fire suppression in the project area by affecting live and dead fuels in ways beneficial to fire management. The harvest openings with slash treatment will provide distinct reductions in fire behavior that will provide tactical advantages in managing any kind of fire. Treated areas will act as long-term fuelbreaks providing perimeter control options in fire control or prescribed fire use. Regeneration harvests will provide safety zones of sufficient size, 20 acres or greater, for probable survival by people in the event of stand replacing fire incidents. The thinning and partial cuts will increase possibilities of future prescribed fire application in these areas. The thinnings will pre-treat an area, mimicking low intensity fire effects on structure and composition and lower fuel loadings more appropriate to future stand maintenance or survival of fire. Reducing wildfire risk also reduces the risk of prescribed fire use.

None of the proposed road obliteration will negatively affect access for fighting fires. There are other routes to access the areas.

Cumulative Effects

The cumulative effects of past harvest, fire suppression, and fuels reduction activities on Forest Service and Private lands have been accounted for in the existing condition. The Hidden-Cedar area has had effective fire suppression for the last 60 years. Fire suppression actions are more effective due to the lower fire intensities and associated lower resistance to control in timber harvest areas. Present and reasonably foreseeable activities in the project area (i.e. Grazing, timber harvest on private lands, and road building will lessen fuel loading by removing fuels. The Garnet Stars and Sands project will have no change to effects. The Dutch Cat timber sale will lessen the impacts of fuel (tons/acre) buildup and consequently fire suppression. Human activities (recreational) have the potential to increase the risk of human caused fires.

Consistency with Forest Plan and Laws

Prescribed burning and mechanical treatment of activity fuels proposed in all action alternatives are consistent with direction in the Forest Plan and Idaho Forest Practices Act.

RECREATION

Regulatory Framework

Recreation Goals as identified in the Forest Plan pages II-I-2 include:

1. Provide for the projected use of developed recreation areas. Complete the development of new sites as budget becomes available.
2. Provide for a variety of dispersed recreation opportunities.
3. Provide opportunities for people to be involved in Forest management activities and supply information enabling visitors to better enjoy National Forest lands.

Recreation Objectives identified in the Forest Plan pages II-3 indicate that the Forest will continue to provide a share of outdoor recreation needs in relation to other public and private entities, 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 and increase cooperative trail programs with organizations, clubs, and other public agencies.

The Recreation experience is classified according to the Recreation Opportunity Spectrum (ROS). Lands within and adjacent to the analysis area are a blend of Rural, Roaded Natural, and Roaded Modified where a modified environment predominates with some naturally appearing environment. The Forest Plan defines these (Forest Plan, VI-27):

Roaded Natural: A ROS class located along or near main forest roads and highways where the user will find subtle modification to the natural environment. Improvements are limited to roads, trails, few scattered structures and moderately developed campgrounds. The natural environment still dominates although timber harvest activities may be visible.

Roaded Modified: A ROS sub-class of the Roaded Natural class that is located along less used forest roads where the user will likely encounter large clear cuts and areas where management activities may be present. A few low standard recreation facilities may be provided.

Rural: An ROS class that is characterized by a culturally modified yet attractive environment. This is a roaded area where roads are generally open to recreation use. There will be a high level of interaction between users.

The ROS setting indicators are access, remoteness, size, visual characteristics, site management, visitor management, social encounters and visitor impacts (Project Planning ROS Users Guide Chapter 60, USFS, 1987).

The Hidden Cedar Project area is in Management Areas 1 (MA 1), MA 4, and MA 5. Management area standards for recreation are identified as:

a) MA 1: Manage primarily for roaded modified and roaded natural ROS classes. Maintain a diversity of recreation opportunities. The Emerald Creek Garnet area will be managed to provide a unique recreation rock hound experience in accord with its current management direction (Forest Plan, III-2).

b) MA 4: Manage primarily for roaded modified and roaded natural ROS classes. Motorized use is generally restricted to designated routes. Within critical habitat components motorized recreation use may be restricted to provide needed wildlife security. Maintain a diversity of recreation opportunities. The Emerald Creek Garnet area will be managed to provide a unique recreation rock hound experience and in accord with its current management direction. (Forest Plan, III-17-18)

c) MA 5: Manage toward roaded natural and semi-primitive ROS experience. Motorized use will generally is restricted to designated routes. Within critical habitat components motorized vehicle use may be restricted to provide needed wildlife security. Provide dispersed recreation opportunities consistent with big game winter habitat needs. (Forest Plan, III-23)

Analysis Area

The analysis area for existing conditions and effects is the Project Area.

Analysis Methods

An overview of recreational use was developed through on-the-site visits, information obtained from local residents and from assumptions made from physical evidence (e.g. meat poles in a dispersed campsite = hunting use). The analysis period for the project is 5 years.

Affected Environment

Recreation Opportunity Spectrum

According to the St. Joe District's current ROS inventory (see ROS map, M-19), the project falls within three ROS classifications:

Table 3-68 - Recreation Opportunity Spectrum

ROS	Acres	% of Project Area
Roaded Natural	13,959	41
Roaded Modified	15,109	48
Rural Setting	3,886	11

Camping at Developed Campgrounds

Cedar Creek Campground is in the analysis area. The campground is located adjacent to State Highway 3 along the St. Maries River. The campground was renovated in 1999 – 2000, and will be operated as a fee site in 2001. The site receives moderate to high use in the spring, summer and fall, filling to capacity on holiday weekends. The campground averages 3,000 visitors per year.

Visitor Information Services/Bunkhouse rental

The Clarkia Work Center served over 1,200 people in 2000 with visitor information. In its first year of operation, the Clarkia Bunkhouse cabin rental accommodated 112 people over 155 nights.

Camping at Undeveloped Sites

There are numerous dispersed campsites distributed in the analysis area, including one site on Wood Creek Road, three sites along Cat Spur Road, two sites on the Keeler Cr. Road, two sites on

Bechtel Mt. Road, and two along the Log Creek Road. Use is fairly static along roads in the interior. The primary camping use is in the late summer and fall during huckleberry and hunting season. The privately owned Fossil Bowl has several undeveloped camping sites.

Day Use/Gathering Forest Products

Most of the recreation use within the analysis area is day use as visitors pass through the area on route to other destinations. Day use in the area includes driving for pleasure and sightseeing, fishing, gathering forest products (huckleberries, mushroom, Christmas trees), firewood collecting, and hunting for birds and big game including spring black bear and cougar, and late summer-fall elk, deer and black bear season. Roads frequently used by visitors and residents include Road 504 (Cedar Butte), 361 (Cat Spur) and 765 (Keeler Creek), 3478 (Bechtel Butte), 1450 (Log Creek), 1451 (Staples Creek), 341 (Wood Creek) and 498 (Hidden Creek). Refer to the transportation section for further information about the road system.

Fishing

Area residents and others fish the St. Maries River and its tributaries. Use is light.

Fossil Digging

Digging for fossils occurs at the privately owned Fossil Bowl. The owner estimates that on a yearly average 2,400 persons participate in fossil digging, including school groups and individuals.

Motorized Use for Vehicles under 50 Inches

Within the Hidden Cedar analysis area, there is very light motorcycle and snowmobile use. The level of ATVs (all terrain vehicles) use is low and is often incidental to fall hunting season. It occurs along the open roads with mixed vehicle traffic (where ATVs must be street-legal and operated by persons carrying a valid state driver's license). Some use may occur on roads managed with an A or B road management prescription. Prescription A roads are restricted, usually by a gate. Prescription B roads are similar to prescription A, but the restriction devise is a barrier. Most Prescription A and B roads have no closure order in place and use by vehicles under 50 inches width may occur. The privately owned Fossil Bowl offers a developed motorcycle racetrack, with a yearly average of 5,000 persons participating in motorcycle racing.

Recreation Special Uses

There are presently no designated or reserved outfitter camps within the project area boundaries. One outfitter holds a permit for guiding deer hunting in the western portion of the analysis area.

One person holds a special use permit to guide individuals to the Emerald Creek Garnet Area, which is currently located outside the project area boundaries in 281 Gulch.

Recreational Garnet Digging

There is traffic through the Hidden Cedar project area to the nearby Emerald Creek Garnet Area, located on the East Fork of Emerald Creek (outside the project area boundary) that is open seasonally to the public for recreational digging of gem quality garnets. They are located in 281

Gulch. There are currently no sites open for recreational garnet digging within the Hidden Cedar analysis area. There has been sporadic unauthorized digging within the project area. Refer to the Minerals section for additional information about the garnet resource.

Trails

There are currently no developed trail systems within the analysis area. There are some user-maintained trails. There are no groomed snowmobile or cross-country ski trails within the area. In general, the area receives very light winter use by snowmobiles and cross-country skiers on existing roads. Cross-country skiers have been noted on Hidden Creek and Wood Creek roads.

Environmental Consequences

All Alternatives

Direct and Indirect Effects

Recreation use is expected to increase gradually over time. If a partnership is formed and the proposed fish pond in the Keeler Creek area is constructed, consideration would need to be given to the level of development and signing for rules and information. The physical construction of the pond does not have a direct effect on recreation. Indirectly, sanitation facilities, and funding for installation and continued annual maintenance of the facilities effects the recreation resource. Because only the construction of the pond and parking on the road adjacent to the pond on Potlatch, are considered in this document, the above effects listed as indirect would require further NEPA before implementation.

ROS classifications will remain the same as described in the affected environment.

Alternative A

Direct and Indirect Effects

Recreation use is expected to increase gradually over time. ROS classifications will remain the same as described in the affected environment

Alternatives B, C, D, and F

Direct and Indirect Effects

Overall, open road miles will be reduced by approximately 3 miles in Alternatives B and C, 11.2 miles in Alternatives D, and 10.2 miles in Alternative F. Approximately nine miles of roads with barriers will be added. This will reduce motorized activities such as ATV and motorcycle riding on those roads and may provide for non-motorized activities such as cross-country skiing. There are ample opportunities for motorize vehicle recreation in elsewhere in the project area.

These alternatives may create temporary conflicts between logging and recreation traffic during proposed harvest activities. The logging activities generally occur between June and December. Increased traffic, including logging equipment and support vehicles could be expected. Visitors might experience temporary delays. These roads would be signed to inform visitors of logging activities. Undeveloped camping sites near logging units may be used by contractors with permits

during logging operations for camping and/or for equipment parking. Any dispersed recreation site used for logging or related activities would be restored or rehabilitated following use.

Alternative D and E

Direct and Indirect Effects

Portions of roads in Wood and Hidden Creeks would be removed. Motorized access would be lost in the Mazie and Bechtel drainages west of the Clarkia Work Center. With Wood, Hidden, Mazie and Bechtel drainages approximately 25 miles of road west of State Highway 3 would not be open to motorized vehicle access. Activities such as cross-country skiing, ATV and motorcycle riding, hunting, hiking and berry picking would likely be affected by closures or obliteration, however; there are many other areas available and open to motorized recreation traffic in the project area.

Roads with prescription changes from an A or B prescription to a C, D, or E prescription would no longer be available for motorized use (see- Appendix B Road Data Summaries, FEIS).

Alternative F

Direct and Indirect Effects

Portions of the road in Hidden Creek would be removed. Effects from reduction in motorized access is similar to alternative D. Activities such as cross-country skiing, ATV and motorcycle riding, hunting, hiking and berry picking would likely be affected by closures or obliteration.

Roads with prescription changes from an A or B prescription to a C, D, or E prescription would no longer be available for motorized use.

All Alternatives

Cumulative Effects

The ROS classifications for the area will remain the same as previously described.

Recreational activities are expected to gradually increase over time. Private development of the Fossil Bowl camping area may bring gradual increases in recreational activity in the area.

Under Alternatives D and E, portions of the Wood Creek and Hidden Creek roads are proposed for obliteration. If Wood Creek were identified for a future recreational garnet dig site, road access, development of a parking area, signing for rules and information, sanitation facilities, and funding for installation and maintenance of the facilities would need to be considered (this would be covered in the Garnet Stars and Sands EIS).

Garnet exploration is proposed in Wood Creek for the feasibility of gemstone extraction. Visitors could expect temporary delays from equipment traffic on Wood Creek Road 341.

Because of mineral deposits found in Wood Creek, Wood Creek could be considered as a site for future recreational digging when current areas are depleted.

If a partnership is formed and the proposed fish pond in the Keeler Creek area is planned for construction, consideration would need to be given to road access to the site, development of a

parking area, the level of development, signing for rules and information, sanitation facilities, and funding for installation and continued annual maintenance of the facilities.

Consistency with the Forest Plan and Laws

All of the alternatives would be within Forest Plan Standards for recreation, because a diversity of recreational opportunities will be provided, there in no change in the opportunities for recreational digging in the Emerald Creek Garnet are, and the ROS classes remain the same in the Management Areas (MA-1, MA-4, and MA-5) found in the project area.

RANGE

Regulatory Framework

Direction for the management of the range program on NFS lands is provided in several regulations, policies, and laws including: Idaho Panhandle National Forests Forest Plan (1987) which provides for the protection of current forage levels and the continuation of grazing, and the Forest Service Manual (Chapter 2200, 1990 as amended). Section 2202.1 states the objective of the Range Management Program as being to integrate management of range vegetation with other resource programs. Other goals include: to provide for livestock forage, wildlife food and habitat, outdoor recreation, and other resource values dependent on range vegetation; to contribute to the economic and social well being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood; and consistent with Forest land and resource management plans, to make forage available to qualified livestock operators from lands that are suitable for livestock grazing.

Analysis Area

The geographic scope of analysis for range issues in this project encompasses all of the Emerald Creek, Merry Creek, Keeler Creek, and Cat Spur Creek allotments (approximately 83,396 acres - all ownerships total acres). The Keeler Creek (approximately 10,163 total acres) and Cat Spur Creek (approximately 5,213 acres) allotments are entirely contained within the project area. Only small portions of the Emerald and Merry Creek allotments (2,517 and 1,038 total acres respectively) fall within the Hidden Cedar project area (see Grazing Allotments Map, M-20). Acres were derived from GIS.

Analysis Method

Information was collected from Allotment Management Plans, historic grazing records, permittee files, and the Environmental Assessment for the St. Maries Grazing Allotments (USDA 1999a).

Affected Environment

Vegetation surveys completed in 1998 (located in St. Maries Grazing Allotment EA project file) indicate that the condition of riparian vegetation in the Emerald and Keeler Creek allotments has an upward trend, and that the Cat Spur Creek allotment is stable. These surveys also show that Forest Plan and INFish standards for allowable trampling, level of streambank stability, and streambank vegetation coverage are being met in the Emerald, Keeler, and Cat Spur allotments. Data is not available for the Merry Creek allotment.

Livestock primarily graze within riparian meadows and use adjacent upland areas for shade and cover. Livestock may alter riparian areas by trampling, rubbing, and browsing riparian vegetation. Removing vegetation, trampling and shearing may affect streambanks and fish habitat (Platts, 1991). Monitoring for these effects will be done as described in the St. Maries Grazing Allotment Environmental Assessment (USDA, 1999a).

Emerald Creek

Cattle and sheep grazed in the area of the allotment in the 1920s and 1930s prior to land acquisition by the Forest Service. In 1943 and 1944 sheep were the primary grazers after the Forest Service acquired the land. In 1945 cattle and horse use officially began and has become the only permitted grazing on the allotment. Permitted numbers of stock fluctuated during the early years. Permitted numbers of cattle were 400 cow/calf pairs in 1953 which changed to 368 head in 1968, changed again to 320 head in 1969, and was then reduced in 1972 to 225 head. These numbers were maintained until the Emerald Creek Cooperative Resource Management Area Memorandum of Understanding was signed in 1994. The total number of cow/calf pairs allowed in the allotment was then set at 413, with a total of 41 cow/calf pairs permitted to graze on National Forest lands. Grazing is currently permitted from June 15th to October 15th each year. The majority of grazing occurs in the lower elevations of the East and West Forks of Emerald Creek and on Willow Creek, although some livestock follow existing roads to the Emerald Butte area and the upper portions of the East and West Fork drainages.

Merry Creek

Although grazing occurred, prior to 1982 the Forest Service did not issue grazing permits in this area. In 1982 the Merry Creek Cooperative was formed in order to better coordinate and manage activities within the allotment. Initial forage utilization limits were set at 60%. Monitoring determined that use exceeding 60% utilization was occurring along lower Gold Creek and the BPA powerline and utilization limits were changed to 50% in 1992. Monitoring conducted in the 1990s has shown range condition to be fair to good. Currently, 315 cow/calf pairs graze in the allotment, with a total of 27 permitted to graze on NFS lands. Most of the forage on NFS lands is produced in riparian meadows along the West Fork of the St. Maries River, Gold Center Creek, and Merry Creek.

Cat Spur Creek

From 1940 to 1950 this allotment was part of the Keeler Creek allotment and grazed exclusively by 625 sheep annually. In 1950 Cat Spur Creek was split out into its own allotment and allocated for cattle and horse use. From 1950 to 1957, 14 head of cattle were grazed on the allotment. In 1959 this number increased to 50 head of cattle with 14 being permitted to graze on NFS land. In 1969 more of the allotment came into Forest Service ownership and stocking levels were set at 50 cow/calf pairs with a total of 26 permitted to graze on NFS lands. These stocking rates remain in effect today. Historically primary range within the allotment has been in fair to good condition with an upward trend. Grazing currently occurs between June 6th and October 15th each year.

Keeler Creek

The current Keeler Creek allotment boundary was created after the exclusion of the Cat Spur Creek drainage and the subsequent creation of the Cat Spur Creek allotment in 1950. In general, 625 head of sheep were grazed annually, but numbers were as high as 1,200 in 1958. Keeler Creek was designated as a sheep grazing allotment until 1964 when it changed to cattle and horse grazing. Up to 36 head of cattle were grazed on the allotment until 1973. From 1973 to 1993, 52 head of cattle (25 on National Forest land) were permitted to graze within the allotment.

In 1993 these numbers were reduced to 21cow/calf pairs in the allotment with a total of 10 cow/calf pairs permitted to graze on National Forest lands. Grazing currently occurs between June 15th and October 15th each year.

Environmental Consequences

Table 3-69 - Hidden Cedar Project Activities within Range Allotment Boundaries.

		Approximate Acres or Miles					
Allotmen	Prescription	Alt A	Alt B	Alt C		Alt E	Alt F
Emerald Creek	Commercial thin	-	339	339	90	-	348
	Shelterwood preparatory cut	-	20	20	-	-	20
	Irregular shelterwood cut	-	74	74	-	-	23
	Group shelterwood cut	-	43	43	43	-	43
	Clearcut w/ reserves	-	45	45	35	-	19
	Total Acres	-	521	521	168	-	453
	New Rd.Construction- USFS	-	3	-	-	-	1
	New Rd. Construction- private	-	-	-	-		-
Merry Creek	Commercial thin	-	19	19	-	-	19
	Shelterwood preparatory cut	-	54	54	-	-	54
	Irregular shelterwood cut	-	-	-	-	-	-
	Group shelterwood cut	-	-	-	-	-	-
	Clearcut w/ reserves	-	-	-	-	-	-
	Total Acres	-	73	73		-	73
	New Rd Construction- USFS	-	1	-	-	-	1
	New Rd Construction- private	-	-	-	-	-	-
Keeler Creek	Commercial thin	-	299	327	227	-	317
	Shelterwood preparatory cut	-	105	105	80	-	105
	Irregular shelterwood cut	-	18	18	-	-	18
	Group shelterwood cut	-	15	15	-	-	15
	Clearcut w/ reserves	-	66	66	62	-	66
	Total Acres		503	531	369	-	531
	New Rd Construction- USFS	-	4.25	1.5	2	2	3
	New Rd Construction- private	5	6.75	6.75	6.75	6.75	6.75
Cat Spur	Commercial thin	-	105	105	-	-	105
	Clearcut w/ reserves	-	5	5	-	-	5
	Total Acres		110	110	-	-	
	New Rd Construction- USFS	-	.75	.5	.5	.5	.75
	New Rd Construction- private	1	3	3	3	3	

All Action Alternatives (B, C, D, E, and F)

Direct and Indirect Effects

The creation of a fish pond may occur along the western boundary of the Keeler Creek Allotment. Pond construction is not expected to promote changes in current grazing patterns. Other easily

accessible water sources exist within the area and so cattle are not expected to congregate solely at the pond.

Riparian planting will occur within the Keeler Creek Allotment. Any fencing placed around these plantings should not remove a large area from grazing.

Stands to be precommercial thinned generally have little forage available due to the very dense canopy. Forage may increase post-thinning, due to increases in light levels and cattle may begin to utilize these areas. Grazing will eventually taper off due to decreasing light levels and corresponding decreases in forage abundance once the canopy begins to close again.

Cumulative Effects

Noxious Weed treatments will be conducted in accordance with the St. Joe Noxious Weed Control FEIS (USDA, 1999). Weed treatments are expected to improve or maintain habitat quality by allowing natives and pasture grasses to re-colonize areas previously occupied by weeds.

Alternatives B, C, D, and F

Direct and Indirect Effects

Alternatives B, C, D, and F include proposals to harvest timber which may affect grazing by creating more abundant forage within harvest units. Harvest prescriptions within the allotments are: Commercial thinning, Shelterwood preparatory cuts, Group shelterwood cuts, Irregular shelterwood cuts, and Clearcuts with reserves. After logging, some livestock distribution changes may occur under these alternatives due to the creation of transitory range in openings. All acres harvested and underburned under the action alternatives would provide some transitory range.

Livestock distributions may also change due to new access provided by new roads. All action alternatives have some new road construction associated with them (see Table 3-69). The movement of cattle on to newly created transitory range or to previously unused areas due to new travel corridors could have detrimental to beneficial effects. Such movement may serve to decrease grazing pressure on riparian areas and reduce overall effects of grazing over a larger area. It may also open potentially sensitive areas to grazing that were previously unused. For further discussion of these effects refer to the St. Maries Grazing Allotment EA (USDA, 1999a).

Site preparation and planting will occur in areas where timber harvest has already taken place. If cattle choose to use newly created openings as transitory range, they will be likely to do so regardless of whether or not site preparation has occurred. However, site preparation may result in an increase in the amount of forage created in openings, making such openings more attractive to cattle.

Gopher control will not affect grazing either in scale or distribution. Gopher control activities will not result in any changes in access or available forage.

Alternative A

Direct, Indirect, and Cumulative Effects

There are no known direct or indirect effects from the No Action Alternative. Current stocking levels and grazing practices will continue.

Past and present activities within the allotments include timber harvest, road building, seeding with non-native pasture grasses, mining, and recreational activities. Future events include the likely construction of 6.5 miles of road on private lands within the project area, in association with other activities. This new road construction would primarily take place within the Keeler Creek allotment, and therefore, so would any associated timber harvest. Such activities may open up new areas to grazing. A small amount of road construction would be done in the Cat Spur Creek allotment but would not provide any new access to NFS lands. The new construction is near current primary grazing areas and will not open large new areas to grazing.

Approximately 327 acres of the proposed Forest Service Dutch Cat timber sale occurs within the Cat Spur Creek Allotment. Associated with this timber sale will be approximately one mile of new road construction. This road construction will add short extensions to existing roads and will not open up previously unavailable areas to grazing. Of the timber harvest that will occur, eleven acres will be shelterwood seed cut and the remainder will be either commercial thinning or group shelterwood. All timber harvest, especially the shelterwood seed cut, may provide transitory range and encourage cattle movement to these areas.

Unauthorized digging for garnets currently occurs along a tributary of Cat Spur Creek in T42N R1E Sec 19. Wood Creek will likely be tested for garnets in the near future and may be proposed for recreational digging. Because recreational digging is done by hand, the extent of disturbed ground is kept small. These actions are not likely to affect grazing. Testing is done by digging three to fifteen foot deep trenches in the riparian areas at approximate 50-foot intervals along Wood Creek. Some testing would also occur at Bechtel Butte area. All soil removed during trenching would be replaced. The extent of disturbances related to testing with respects to grazing should be small to nonexistent.

Noxious Weed treatments will be conducted in accordance with the St. Joe Noxious Weed Control FEIS (USDA, 1999). Weed treatments are expected to improve or maintain habitat quality.

Alternative B

Direct, Indirect and Cumulative Effects

Cat Spur Creek

The Cat Spur Creek Allotment is entirely contained within the Hidden Cedar project area. Primary grazing areas occur along Cat Spur, Kitten, and lower Log Creeks. Existing road access to these primary riparian meadows will not change under any alternative. Approximately 105 acres of commercial thinning and 5 acres of clearcut harvest will occur within the allotment (see Table 3-69). Harvest will not occur near the primary grazing areas and so chances are low that it will encourage cattle to drift from these areas into new ones. A short (approximately ¼ mile) road will be constructed at the western edge of the allotment in conjunction with a harvest unit.

Although the likelihood of cattle utilizing this area is low, should it occur, this road could provide cattle with an easy travel corridor to the adjacent Keeler Creek Allotment.

New road construction associated with private access requests will take place fairly close to primary grazing areas and could provide travel corridors for cattle. Any timber harvest associated with this road building could also provide new transitory range.

Past and present activities within the allotments include timber harvest, road building, seeding with non-native pasture grasses, mining, and recreational activities. Approximately 327 acres of the proposed Forest Service Dutch Cat timber sale occurs within this allotment. Associated with this timber sale will be approximately one mile of new road construction. This road construction will add short extensions to existing roads and will not open up previously unavailable areas to grazing. Of the timber harvest that will occur, eleven acres will be shelterwood seed cut and the remainder will be either commercial thinning or group shelterwood.

Unauthorized digging for garnets currently occurs along a tributary of Cat Spur Creek in T42N R1E Sec 19. Prospecting permits, leases, and recreational digging may be proposed for this area in the future. These actions are not likely to affect grazing.

Keeler Creek

The Keeler Creek Allotment is entirely contained within the Hidden Cedar project area. Primary grazing areas exist along lower Hidden, Wood, and Keeler Creeks, and the West Fork of St. Maries River. At this time, grazing only occurs along the eastern portion of the West Fork of the St. Maries River. Road access to these areas will essentially stay the same as in Alternative A. Travel corridors already exist through these areas and new Forest Service road construction will provide alternate access. Road construction associated with private access requests will provide more extensive access into some areas than previously existed. It is likely that timber harvest will occur along these routes in the future, which may provide transitory range and encourage cattle use. Commercial thinnings, shelterwood preparatory cuts, group shelterwood cuts, and irregular shelterwood cuts will all take place adjacent to primary grazing areas in this alternative. Each of these prescription will result in the production of transitory range and may encourage movement of cattle into these units and possibly other units adjoining them.

Past and present activities within the allotments include timber harvest, road building, seeding with non-native pasture grasses, mining, and recreational activities. Wood Creek will likely be tested for garnets in the near future. Testing is done by digging three to fifteen feet deep trenches in the riparian areas at approximate 50-foot intervals along Wood Creek. All soil removed during trenching would be replaced. The results of the testing may lead to Wood Creek being opened up for recreational digging. This typically results in approximately 100 feet of riparian being hand dug every season. Digging would start at the head of the drainage and work down, and all digging sites would be rehabilitated yearly. The extent of these disturbances with respects to grazing should be small to nonexistent.

Merry Creek

The Merry Creek Allotment is comprised of approximately 41,627 acres, of which, 1038 acres are contained within the Hidden Cedar project area. The primary grazing areas within the allotment

are not located within the Hidden Cedar project boundary. However, suitable forage does exist in this section along the St. Maries River at the western edge of the allotment.

Whatever livestock use is occurring in this area is most likely confined to this meadow corridor. However, there is an existing harvest unit within ¼ mile of this corridor, which may provide transitory range. Under this alternative, three units will be harvested, one adjacent to and another within ¼ mile of this existing harvest. The close proximity of these units may encourage cattle to utilize them as transitory range.

However, the quality of this transitory range may be minimal since the harvest prescriptions call for commercial thinning and shelterwood preparatory cuts. Approximately 1 mile of new road construction would occur under this alternative. Most of this new construction would occur within a harvest unit and represent only a short extension of an existing road.

Past and present activities within the allotments include timber harvest, road building, seeding with non-native pasture grasses, mining, and recreational activities. Future activities such as road building, timber harvest, and burning on private and federal land have the potential to affect cattle use by creating new travel corridors, providing new transitory range, and potentially opening up sensitive areas to grazing.

Emerald Creek

The Emerald Creek Allotment is comprised of approximately 26,352 acres, of which, 2,517 acres are contained within the Hidden Cedar project area. Cedar Creek runs through this section of the allotment and provides meadow forage. Heavy use by cattle occurs on the private land in the lower portion of Cedar Creek. Less cattle use occurs on NFS lands in upper Cedar Creek. Currently, roads in this area are gated, in long-term storage or have barriers. This situation will not change under any alternative. Approximately 3 miles of new road would be constructed under this alternative in association with timber harvest in the Cedar Creek area (Table 3-69). All new road construction will be at least ¼ mile from the riparian meadows. Several timber harvest units (commercial thinning and group shelterwood) are adjacent to the riparian meadow and may eventually be used as transitory range. A clearcut unit will exist within ¼ mile of the riparian meadows. Any road construction within these units may serve as travel corridors, enabling cattle to more easily use different areas within the allotment. This may increase cattle access and subsequent usage in upper Cedar Creek and make it difficult for the permittee to retrieve cattle in the fall and to control their movements during the grazing season.

Past and present activities within the allotments include timber harvest, road building, seeding with non-native pasture grasses, mining, and recreational activities. Future activities such as road building, timber harvest, and burning on private and federal land have the potential to affect cattle use by creating new travel corridors, providing new transitory range, and potentially opening up sensitive areas to grazing.

Alternative C

Direct, Indirect, and Cumulative Effects

Cat Spur Creek

Effects on rangeland will be nearly identical to those in Alternative B. The only difference between these two alternatives is that the short road segment of road at the western edge of the allotment will not be constructed in Alternative C. Effects due to access requests, future Forest Service and private activities will be the same as in Alternative B.

Keeler Creek

Effects of Alternative C should be similar to those of Alternative B. There would be no new road construction aside from those associated with access requests. Two additional commercial thinning units will be harvested in this Alternative As compared to Alternative B. These units are near the edge of the allotment, are far removed from the primary grazing areas, and have minimal road access to them. As such they should not provide much additional transitory range. Effects due to access requests, future Forest Service and private activities will be the same as in Alternative B.

Merry Creek

Effects will be much as in Alternative B. The same units will be harvested, however there will be no new road construction associated with these units. Effects from access requests, future Forest Service and private activities will be the same as in Alternative B.

Emerald Creek

Effects of this alternative will be similar to those of Alternative B. However, no new road construction will occur under Alternative C. Without new road construction, cattle may not travel as widely as in Alternative B. Effects due to access requests, future Forest Service and private activities will be the same as in Alternative B.

Alternative D

Direct, Indirect, and Cumulative Effects

Cat Spur Creek

There will be no timber harvest in the allotment under this alternative (see Table 3-69). However, timber harvest will occur along the border of the Keeler and Cat Spur Creek Allotments. Should harvest there result in an increase in usage by cattle, they could drift into the Cat Spur Creek allotment. However, there would be little motivation to do so given the lack of attractive foraging in that area of the allotment. Effects due to access requests, future Forest Service and private activities will be the same as in Alternatives B and C.

Keeler Creek

In this alternative, commercial thinning and shelterwood preparatory cuts will occur adjacent to primary grazing areas and may provide transitory range. There will be fewer such units, and fewer units overall than in Alternatives B and C. Road construction associated with access requests will be the same as in Alternatives B and C. Only one additional road segment will be constructed in the far northern portion of the allotment and should have little effect on grazing patterns. This

segment differs from those to be constructed under Alternative B. Effects from future Forest Service and private activities will be the same as in Alternatives B and C.

Under this alternative, access to primary grazing areas could change dramatically. The upper portion of road #498 along Hidden Creek, the lower portion of road #341 along Wood Creek, and a section of road 765 along Keeler Creek will be obliterated. In addition, road #3340, which provides access into upper Wood Creek will be decommissioned and will not provide motorized access. Such changes will not restrict cattle movement into these drainages. However, the ability of the permittee to easily access these areas will be severely curtailed. Limitations in access will make it more difficult for the permittee to monitor rangeland conditions, move cattle from over-utilized areas, and to achieve timely roundup at the end of the season.

Emerald Creek

Fewer units will be harvested under this alternative than in Alternative B or C. There will be no road construction and only one commercial thinning unit will abut the riparian meadow along Cedar Creek.

It is expected that the quality of transitory range produced within this thinning unit will be poor and should not encourage cattle to drift off of the adjacent riparian meadows. Effects due to future Forest Service and private activities will be the same as in Alternatives B and C.

Merry Creek

There will be no harvest units or new road construction under this Alternative And cattle use is expected to continue as it is does currently. Effects due to future Forest Service and private activities will be the same as in Alternatives B and C.

Alternative E

Direct, Indirect and Cumulative Effects

Cat Spur Creek

Effects of this alternative will be similar to those of Alternative A. Additional road construction for private access requests will occur under this alternative than will take place in Alternative A and effects from this should be similar to those in Alternatives B, C, and D.

Keeler Creek

There will be no commercial timber harvest on NFS lands under this alternative. The effects of road building will be identical to those under Alternative D.

Emerald Creek

There will be no timber harvest on NFS lands or road construction under this Alternative And cattle use is not expected to be different than in Alternative A.

Merry Creek

No commercial timber harvest on NFS lands or road construction will occur under this alternative. In this respect, effects will be much as outlined in Alternative A, the no action alternative. Effects due to access requests, future Forest Service and private activities will be the same as in Alternatives B, C, and D.

Alternative F

Direct, Indirect and Cumulative Effects

Cat Spur Creek

Within the Cat Spur Allotment, effects from Alternative F will be the same as those from Alternative B. The same timber harvest, harvest prescriptions, and road constructions will occur under both alternatives (see Table 3-69).

Effects of Alternative F should be nearly or completely identical to those seen in Alternative B. Alternative F includes two additional thinning units near the southern boundary of the allotment, and will not include road construction in unit 49. Cattle use on the allotment is not expected to be affected by either of these facts given that these activities occur near the edge of the allotment, far removed from primary grazing areas. In addition, grazing currently (and for the foreseeable future) occurs only along the eastern portion of the West Fork of the St. Maries River.

Emerald Creek

Approximately 1 mile of new road would be constructed under this alternative in association with timber harvest in the Cedar Creek area (see Table 3-69). All new road construction will be at least ¼ mile from the riparian meadows. Several timber harvest units are within ¼ mile of the riparian meadow and may eventually be used as transitory range. Road construction and timber harvest may serve to increase access and available forage in upper Cedar Creek. Cattle use of this area may then increase over levels expected in Alternative A.

Merry Creek

Within the Merry Creek Allotment, effects from alternative F will be the same as those from Alternative B. The same timber harvest, harvest prescriptions, and road constructions will occur under both alternatives (see Table 3-69).

Consistency With Forest Plan and Laws

Management directive states that “transitory range in existing allotments may be used where compatible with the objectives of the specific management areas” and that forage production will not be reduced (Forest Plan II-7). The Forest Plan standard states “opportunities for grazing and other uses of public range resources will be managed to serve the welfare of local residents and communities “(Forest Plan II-31). All alternatives would meet the intent of the Forest Plan.

AIR QUALITY

Regulatory Requirements

The IPNF Forest Plan directs that all projects comply with the Clean Air Act (as amended 1990) and the Idaho Smoke Management Plan. In response to these requirements the IPNF is a member of the North Idaho Memorandum of Agreement (Montana/North Idaho Smoke Management Group – 1997) and adheres to the North Idaho Smoke Management Plan. The plan establishes procedures to regulate the amount of smoke produced in designated airsheds in northern Idaho.

Prescribed burning on the IPNF is regulated by the North Idaho Smoke Management Memorandum of Agreement. Under the Clean Air Act, states have the primary responsibility for maintaining air quality standards. The State of Idaho Department of Environmental Quality recognizes the regulations of the North Idaho Smoke Management Plan as the best available control mechanism for air quality management. All spring and fall burning is monitored and controlled through this process. All other burning is regulated directly by the State.

Prescribed burning is allowed only when current and predicted air quality will allow new ignitions for the next day as regulated by the North Idaho/Montana State Airshed Group. Restrictions can be issued to curtail all burning or to reduce burning acres or restrict burning to specified elevations. In practice, a list of all prescribed burning in the St. Joe Ranger District is forwarded to the monitoring unit through the IPNF Dispatch Center. By 8:30 a.m., daily, the District informs the dispatch center of all burning planned for the next day. This information is forwarded to the monitoring unit. By 3:00 p.m. the same day the monitoring unit informs the Forest if any restrictions are to be in effect the following day, and the dispatch center informs the District. This regulation process as well as the temporary nature of smoke accumulation should prevent violations of ambient air standards except possibly temporarily at the actively burning fire sites. The public is restricted from these areas and fire management personnel have safety guidelines and procedures to avoid excessive smoke inhalation.

The conformity provisions Sec. 176(c) of the Clean Air Act prohibits any federal agency from taking any action that causes or contributes to violations of the National Ambient Air Quality Standards (NAAQS). The *de minimus* levels for conformity for PM 10 (particulate matter less than 10 microns in diameter) is 100 tons per year per project.

Analysis Area

The Hidden Cedar project area is in North Idaho Airsheds 12A and 12B (see project file for map). Direct, indirect and cumulative effects are predicted for the project area.

Analysis Methods

Smoke from burning forest vegetation contains many combustion products that are regulated by the National Ambient Air Quality Standards. Particulate matter and carbon monoxide are the major emissions of concern in wood smoke because of the large quantities produced and potential health effects. Elevated particulate matter is generally the cause of violations of ambient air standards in the regional non-attainment areas (see Affected Environment below). Thus, estimated

$PM_{2.5}$ (*particulate matter less than 2.5 microns in diameter*) and PM_{10} particulate emission levels from the various burning activities will be assessed. $PM_{2.5}$ is the portion of smoke that is most easily inhaled into the lungs and it absorbs toxic smoke components. The production of $PM_{2.5}$ will also relate to potential visibility effects. Production of $PM_{2.5}$ corresponds with the amount of fuel consumed. The differences in production are due to burn types and volumes of fuel consumed.

The First Order Fire Effects Model (FOFEM)(Reinhart and others 1997) predicts the amount of $PM_{2.5}$ production from selected fuel models with specified fuel moistures, fuel loadings and expected fire behavior.

The fuel models are determined by the cover type, the dominant species, and the FOFEM includes typical default values for fuel components (duff, litter, live and woody down fuels etc) associated with the cover type unless altered to better represent known conditions. All proposed site preparation/hazard reduction burns for timber harvest areas were analyzed with the default typical values. The proposed prescribed burns were analyzed using expected spring moisture conditions or fall conditions, depending on the fuel reduction activity planned. Drier summer conditions were analyzed for potential wildfire smoke production.

The wildfire scenario assumes that crown fire would occur in this project area. The total potential of wildfire smoke from all activity acres is displayed for Alternative A. This represents the potential smoke production in lieu of any management. The action alternatives will decrease the potential of uncontrolled wildfire and will reduce the total fuel load available to burn if the harvest areas and prescribed fire areas burn from wildfire subsequent to treatment.

Affected Environment

The Clean Air Act designates Class I, II, and III areas for air quality management. There are no Class I or Class III areas within the IPNF, all are designated as Class II. Class II areas can be described as having good air quality with no additional air quality restrictions other than NAAQS. Class I areas are the most pristine areas which receive special visibility protection. The Cabinet Wilderness and the Flathead Indian Reservation are designated Class I areas and lie approximately 80 miles northeast and 80 miles to the north-northeast respectively.

The EPA designates air quality sensitive sites as "non-attainment areas" because of violations of a NAAQS. Airshed 12A and 12B have no non-attainment areas within their combined boundaries. The nearest non-attainment areas are Thompson Falls, 60 miles northeast and Pinehurst, 35 miles to the north. These areas are in violation of the PM_{10} standard during periods of winter inversions. The North Idaho and Montana Smoke Management Plans establishes "impact zones" around the non-attainment areas to include areas where emissions from prescribed burning could significantly impact the non-attainment area. Airshed 12A and 12B does not include any impact zones.

The air quality of the Hidden Cedar Project Area is generally considered good throughout the majority of the year due to good air dispersion. Human caused and natural events inside and outside the project area do occasionally affect air quality. Human influences such as stationary industrial pollution sources, woodstoves, vehicle exhaust and road dust due to a motor-cross track, state highway, and a logging yard in the area are moderate, however regional haze occasionally occurs due to agricultural dust, agricultural field burning, and forest slash burning. Natural events such as dust storms and wildland fires have contributed to reduced air quality at times.

The wind direction in northern Idaho is generally from the southwest to west. Smoke dispersion is to the east and northeast. Long duration low intensity frontal systems commonly occur from late fall to spring aiding atmospheric mixing and improving air quality.

The effects of smoke within this project area and surrounding areas are dependant upon a number of factors such as season, topography, atmospheric conditions and time of day of the burning.

Spring and early summer seasons have the best dispersion and mixing atmospheric conditions. Daytime heating lifts smoke high into the atmosphere and seasonal instability disperses smoke down wind. Daytime heating lifts smoke out of valley inversions, but can be difficult under stable high-pressure systems. Inversions in the fall can potentially create the worst smoke problems of prescribed burning. Fall is the season monitored and regulated by the North Idaho Airshed Group. Cold winter months however are when the air quality can be poorest. Prescribed burning rarely occurs at all during this season and is regulated by the States.

The topographic location of a prescribed fire will either aid smoke dispersion if high on the ridge and exposed to free air wind, or conversely increase the potential of smoke impacts if down in a valley bottom. Smoke produced low on the slope and not lifted up an out of the valley can become subject to nighttime downslope winds trapped by nighttime inversion and contribute to valley smoke pooling until the next daytime heating. Wildfire smoke has naturally been a part of the project area ecosystem. The frequent fire return intervals of the drier ponderosa pine forests to the west and local wildfires surrounding the project area as well as the severe and mixed intensity fire regimes of the project area generated smoke quite often during summers. Wildfire smoke has been reduced in the Hidden Cedar area where fires were kept small and quickly extinguished. The project area atmosphere was often smoky and had a general haze from nearby fires as well as fires elsewhere in the Northern Rocky Mountains. Fire researchers have stated that northern Idaho is perhaps unmatched by other regions for forest conflagrations of similar magnitude, frequency, or degree of destruction (Barrett, 1982). The amount of smoke generated from forest fires has decreased since the 1930s and the advent of effective fire suppression. Prior to this time the northern Rocky Mountains probably had 1,500-2,000 fires burning annually. Before modern fire suppression these fires burned until they naturally went out and many burned for prolonged periods of 60-120 days. Journals from early day explorers and newspaper articles from the late nineteenth century often mention the smoky conditions in western Montana and northern Idaho.

Prescribed fire from both inside and outside the project area has generated smoke during the spring and fall. Agricultural burning restrictions on the Palouse have reduced levels of regional haze.

Environmental Consequences

Table 3-70 estimates particulate emissions from each action alternative and the potential wildfire smoke production for Alternative A and E in lieu of harvest or prescribed fire (see project file - FOFEM Model Summary). For comparison purposes, the acres of a potential wildfire are equal to the number of acres that require burning under Alternative B. The model showed that nearly twice as much PM10 andPM2.5 would be generated in a wildfire as would be generated by Alternatives B, C, or F. Air quality standards are assumed to be met through the regulatory process for planned prescribed fire, however reduced visibility and air quality degradation will occur temporarily during times that burning is conducted.

Table 3-70 - Estimated PM_{10} and $PM_{2.5}$ Emissions

Type Emissions	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Total Tons PM_{10}	703*	248	251	116	703*	248
Total Tons $PM_{2.5}$	599*	211	213	88	599*	211
Total Tons	1302*	459	463	204	1302*	458

* Simulated wildfire.

Alternatives A and E

Direct and Indirect Effects

There would be no immediate adverse effect on air quality. Current management activities in this area contribute little additional pollutants. The primary source of pollution would be from vehicle exhaust, wood smoke and dust from traffic. Air quality would remain good. Watershed restoration activities in Alternative E would not directly contribute to a decline in air quality.

The wildfire scenario of Alternatives A and E would not be regulated and could result in near twice the particulate production per acre and more severe concentrations without fuel treatment and hazard reduction through timber harvest or prescribed fire, during poor dispersion conditions. In the long term, this area is characterized by very large stand replacing fires on average every 100-200 years.

The potential for air quality degradation and reduced visibility may increase with Alternative A and E. Existing and increased tree mortality in the Analysis Area contributes to increased intensities and severities if a wildland fire were to occur. 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 fire size and intensity. Research has found that emissions were greater from current fires, even though they burned fewer acres in total than historically, because consumption of fuel per unit area burned has been greater in the current period (USDA, USDI, 1997).

Cumulative Effects

The proposed noxious weed treatment would have short-term, localized impact on air quality because of the drift of spray particles. Generally the greatest part of this drift would settle within 25 feet of the site, although small amounts could carry greater distances (USDA Forest Service, 1993). The smell of chemicals such as 2,4-D may also persist at a spray site for several days following spraying. Human inhalation environmental exposures of 2, 4-D, would be less than occupational exposures since spray operators, involved with activities on the spray units, are more likely to be subject to spray mist than is a casual visitor. A casual forest visitor would be expected to receive an inhalation exposure of less magnitude than that of a backpack sprayer (USDA Forest Service, 1984).

All other activities (present and reasonably foreseeable) will have no measurable effect on air quality in the project area. Pollution from woodstoves, vehicle exhaust and road dust due to a motor-cross track, state highway, and a logging yard in the area are moderate.

Smoke from wildfires from outside the project area would add some accumulations to the air quality within the project area during the summer months.

Table 3-71 - Approximate Fuel Treatment Acres

Treatment	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Broadcast/Jackpot Burning	0	188	188	123	0	188
Grapple Pile*	0	556	556	221	0	500
Lopping	0	119	119	38	0	144
Hand piling	0	12	19	14	0	19
Total Harvest Acres	0	1368	1396	603		1300
Total Treatment Acres*	0	875	882	396	0	851

* Includes 65 acres of landing piles.

Alternatives B, C, D and F

Direct and Indirect Effects

Broadcast burning is done when there is no overstory trees to preserve such as when harvest was clearcut or when brushfield burning. Generally a higher intensity convection column can be developed providing efficient combustion of fuels and a high elevation lift for smoke mixing. A strong smoke column will lessen the impact to the airshed by good dispersion. Good combustion efficiency produces less smoke than smoldering fires.

The objective of underburning is to treat the fuel but not kill the overstory trees remaining. Underburning is then generally carried out at a lower intensity or slower than broadcast burning. These factors may not allow good dispersion locally. Underburning is usually conducted under wetter conditions resulting in less fuel consumption than dryer conditions of broadcast burning.

Piles will be constructed of landing area slash, when whole tree yarding is prescribed and grapple pile units. Piles burn with a high efficiency and can be scheduled in late fall when unstable atmospheric conditions and good dispersion exist. Escaped fire potential is also reduced by moist environmental conditions chosen for burning in the fall.

The smoke emissions from prescribed burning activities could adversely affect air quality. In addition, dust may increase from road construction, maintenance, and stabilization as well as project associated vehicular traffic. Dust is generally a very temporary and local problem. Road dust is primarily a minor local nuisance settling near the source. Dust is also generated at differing times than prescribed fire activity and not considered a significant cumulative impact.

The amount of smoke generated from post settlement prescribed fire will be reduced through the current scheduling of slash burning when atmospheric conditions are favorable as to burning during poor air quality and atmospheric conditions. Restrictions on agricultural burning in the Palouse have reduced previous levels of regional haze.

Results of the FOFEM emissions modeling determined annual $PM_{2.5}$ and PM_{10} standards are shown in Table 3-70. In Alternatives B, C, and F it ranges from 252 to 404 total tons of emissions. However, all the proposed prescribed burning would be over a five year time period and conducted only when atmospheric conditions are judged favorable. Given this five year time frame for fuel activities, the annual expected air emissions would be roughly between 50 and 80

tons per project per year, which is well within the 100 tons mentioned above in regulatory requirements. The proposed burns would result in less smoke produced per acre than wildfire and reduce the wildfire risk on those acres treated. Alternatives B, C, D and F have prescribed burning that would occur in both fall (pile burning) and the spring (site preparation/hazard reduction). When possible, scheduling prescribed fires for spring like conditions reduces emissions by as much as 54%, and where possible burning slash in clean piles rather than broadcast burns reduces emissions by 25-50% (Radke and Ward 1991).

Proposed activities may temporarily affect air quality at Clarkia, Idaho and visitors using the developed and undeveloped campgrounds along the St. Maries River corridor, because they are down canyon from the project area. Effects will be from the down canyon winds at night, bringing smoke into the area until daytime lifting of the smoke occurs.

Diurnal temperature inversions within the drainage may allow pooling of smoke to affect these sites. The project area itself gets the majority of public use from bear hunters in the spring and big game hunters in the fall.

Smoke produced from prescribed fire will be dispersed generally to the northwest by prevailing winds over unpopulated forest lands. The smoke that reaches populated areas to the northwest will be lifted high in elevation to clear the 6,000 foot Bitterroot Mountains divide and not likely to be of any concentrations except to contribute to general haze.

Cumulative Effects

The monitoring of air pollutants during prescribed burning seasons is used to eliminate burning during times when such activities would result in violations of the State standards, including unacceptable impacts to non-attainment areas. The Forest Service voluntarily ceases burning operations to avoid violations of State standards. The monitoring of air pollutants during prescribed burning periods has not recorded any violations of the State standards to date.

Broadcast and jackpot burning of activity-created fuels would occur primarily in early spring when demand for airspace has been historically low, piles (from grapple pile, hand pile and lopping) will be burned late fall early winter. Smoke and particulate matter flows to the northeast and dissipates rapidly during good to excellent dispersion days.

Prescribed fire from both inside and outside the project area has generated smoke during the spring and fall months. Agricultural burning restrictions on the Palouse have reduced levels of regional haze.

Pollution from woodstoves, vehicle exhaust and road dust due to a motor-cross track, state highway, and a logging yard in the area are moderate.

Wildfires from outside, as well as those from inside the project area generate smoke during the summer months. Wildfire smoke has been reduced in the Hidden Cedar area where fires were kept small and quickly extinguished.

Noxious weed spraying would have a short-term localized effect in the area of spraying. The area will be sprayed for noxious weeds as planned in the St. Joe Noxious Weed Control Environmental Impact Statement. The impact from spraying would be very minimal to the air quality in the project area. The proposed weed treatment would have short-term, localized impact on air quality

because of the drift of spray particles. Generally the greatest part of this drift would settle within 25 feet of the site, although small amounts could carry greater distances (USDA Forest Service 1993). The smell of chemicals such as 2,4-D may also persist at a spray site for several days following spraying. Human inhalation environmental exposures would be less than occupational exposures since spray operators, involved with activities on the spray units, are more likely to be subject to spray mist than is a casual visitor. A forest visitor should be expected to receive an inhalation exposure orders of magnitude less than that of a backpack sprayer (USDA Forest Service 1984).

Consistency with the Forest Plan and Laws

All alternatives will be monitored and controlled by airshed regulations to avoid violation of air quality standards, in compliance with the North Idaho Smoke Management Plan, as directed in the Idaho Panhandle Forest Plan.

Requirements of the North Idaho/Montana State Airshed Group (notification of planned burning one day in advance) allows the Idaho Department of Environmental Quality to place restrictions on or prevent burning if it determines that air quality standards can not be met, which meets the Clean Air Act.

Since the annual production of $PM_{2.5}$ and PM_{10} for the Hidden Cedar project is less than 100 tons, non conformity determination is required to meet the Clean Air Act.

MINERALS

Regulatory Framework

Minerals land management goals as identified in the Forest Plan are to provide opportunities for mineral exploration and development in compliance with laws and regulations. The Management Areas where minerals of interest lie are Management Areas 1, 4 and 5. There are no specific standards identified for these management areas; however, all of these management areas are compatible with potential minerals development.

Analysis Area and Methods

The analysis area for minerals is the Project Area as defined in Chapter 1. The minerals overview was developed by reviewing files and on-site visits. The analysis period is 5 years.

Affected Environment

There has been limited mining activity in the Hidden Cedar Project Area due to the underlying mica schist geology in several drainages (Wood, Hidden and Cat Spur Creeks) and Bechtel Butte. There are industrial quality garnet sands and/or gem quality faceting and star garnets known to be in these areas. These minerals are on NFS land that have been "acquired" under the authority of the Weeks Law of 1911. Acquired lands are open to prospecting and development only through prospecting permits and leases authorized by various minerals leasing laws.

Over the years, there has been unauthorized public digging (i.e. without permits of any kind) in the search for garnet gemstones on Bechtel Butte and within Cat Spur and Wood Creeks.

Collecting of garnets for recreational purposes has been a traditional use in the adjacent Emerald Creek drainage since the 1950s. The Forest Service currently operates a public recreational digging area in 281 Gulch of the Emerald Creek drainage. This public digging area is becoming depleted. Part of the Purpose and Need of the Garnet Stars and Sands project DEIS, is to propose testing for other potential public digging areas. Wood Creek (in the Hidden Cedar Project Area) is one of those areas proposed to be tested for its potential for large garnets. There are currently no sites open for recreational digging within the Hidden Cedar Project Area.

There have been recent (last 5 years) prospecting permits for garnet gemstones on Bechtel Butte and in a tributary of Cat Spur Creek. Currently, there is a pending Preference Rights Lease Application for Bechtel Butte. A decision for this lease will be made in the next two years (Garnet Stars and Sands FEIS and Record of Decision). These potential activities are listed under Planned Agency Actions at the beginning of this chapter.

Environmental Consequences

Alternative A

Direct, Indirect Effects

The No Action Alternative would have no direct or indirect effects on the minerals resource.

Cumulative Effects

No cumulative effects would occur from the alternative for this project to the minerals resource. Unauthorized digging for gemstones would likely continue to occur under all alternatives. A decision on Garnet Stars and Sands to include Wood Creek in leasing areas would lead to removal of minerals from the project areas.

Alternatives B, C, D, E, and F

Direct and Indirect Effects

The proposed alternatives include vegetation management, road building and road removal. All of the action alternatives may create temporary conflicts between land management activity – related traffic and traffic associated with mining. There would be no direct or indirect effects on the minerals resource from implementation of Alternatives B, C, or F.

For Alternatives D and E, a portion of the Wood Creek Road would be decommissioned. Implementation of either Alternative D or E will hinder access (i.e. require building another road or trail to access the area) to Wood Creek, if this area were to be proposed for any mining development.

Cumulative Effects

No cumulative effects would occur from the alternatives for this project to the minerals resource. Unauthorized digging for gemstones would likely continue to occur under all alternatives. A decision on Garnet Stars and Sands to include Wood Creek in leasing areas would lead to removal of minerals from the project areas.

Consistency with the Forest Plan and Laws

All of the alternatives would be within Forest Plan Standards for minerals, i.e. they would not preclude minerals development.

HERITAGE RESOURCES

Regulatory Framework

In accordance with the National Historic Preservation Act of 1966, as amended, this documents the procedures used to identify and evaluate heritage resources in the project area. The Forest Plan requires systematic cultural resource inventory prior to ground-disturbing activities and preservation of significant cultural resources in place whenever possible. The Forest Plan also requires consultation with the State Historic Preservation Officer to determine significance of the site; this is done during site inventories. Also, consultation with Native American groups is required when sites of religious significance are involved.

Analysis Area and Methods

The analysis area for heritage resources is the Project Area as defined in Chapter 1. The project area has been systematically surveyed for heritage resources. These surveys and known sites have been documented and recorded in many inventory reports. In addition to field surveys, historic records, maps and photos were reviewed for confirmation of known sites and to possibly identify new sites. Site information is exempt from mandatory disclosure pursuant to the Freedom of Information Act, 5 USC 552(b)(5). Additional surveys for any newly discovered sites would be documented in accordance with established Forest procedures. There has been adequate inventory coverage on all potential impact areas within the Project Area.

Affected Environment

Most of the National Forest portion of the project area is on what is called “acquired lands,” which means there were other landowners prior to the land being acquired for the National Forest. With most of the project area being within one mile of a major river and travelway, there has been a great deal of development and many activities. Euroamerican settlement increased with the construction of the railroad between St. Maries and Bovill in the early 1900s. Land management involved settlement, agriculture, logging, tree planting, fire protection, building roads and trails, range allotments for cattle and sheep and blister rust control. The community of Clarkia became an important center and “jump – off” point.

Most sites identified within the project area date to the historic period and are related to turn of the century settlement, railroad construction, logging, and Forest Service (fire protection, Civilian Conservation Corp camps and blister rust control) activities. There are no known prehistoric sites.

Environmental Consequences

Alternative A

Direct, Indirect and Cumulative Effects

There are no direct, indirect or cumulative effects expected with the No Action Alternative.

Alternatives B, C, D, E, and F

Direct, Indirect and Cumulative Effects

The proposed action alternatives include vegetation management, road building and road removal - all ground-disturbing activities that can affect heritage resources. Site-avoidance is the preferred method for conservation of these resources, which has been planned for all alternatives. No specific heritage sites would be impacted. The potential does exist for finding additional sites during project implementation. If additional sites are discovered, the sites would be inventoried and then protected if found to be of cultural significance. The decision to avoid, protect or mitigate impacts on these sites would be in accordance with the National Historic Preservation Act. In addition, the timber sale contract provision for protection of heritage resources would be included in each timber sale contract to ensure protection of heritage sites located during project implementation. With site-avoidance being the method to preserve heritage resources, the action alternatives are basically the same as Alternative A in terms of effects on the heritage resource. There are no expected direct, indirect or cumulative effects on the heritage resources with implementation of the action alternatives.

Consistency with the Forest Plan and Laws

Systematic inventory and reports are complete for this project area and Native American groups have been given the opportunity to comment. The area of potential effect included areas of previous projects that were inventoried for heritage resources. In accordance with the Programmatic Agreement among the United States Department of Agriculture, Forest Service, Northern Region (Idaho), The Advisory Council on Historic Preservation and, the Idaho State Historic Preservation Officer regarding Cultural Resources Management on National Forests in the State of Idaho and the related Site Investigation Strategy 2001 of the Idaho Panhandle National Forests no further inventories were carried out. All alternatives comply with the National Historic Preservation Act and the IPNF Forest Plan.

FINANCES

Regulatory Framework

The IPNF 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 Forest Plan EIS was community stability (Forest Plan FEIS, pg. 1-8). Forest Service policy sets a minimum level of financial analysis for timber sale planning (see Forest Service Handbook 2409.18 section 32).

Analysis Area

This analysis deals only with project level financial attributes of the proposed activities in each alternative. The analysis was used to determine the economic feasibility of proposed timber sales.

Analysis Methods

Different revenues and costs are associated with the management activities under each action alternative. To arrive at the expected stumpages a computer program "Timber Sale Planning and Appraisal System" was used to determine the potential stumpage (i.e. gross bid values) of timber harvested. The program runs the same regression equation that is contained in the Transactions Evidence (TE) appraisal model, used for appraising actual timber sales. The TE appraisal method predicts the value of timber (referred to as 'stumpage') through 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. The market is not as robust as it has been, in some areas, lumber prices have reached a low that hasn't been seen since 1992.

Fuel reduction/site preparation and planting costs were used from recent timber sale contracts (including overhead). Other costs such as road construction, road reconstruction, road maintenance and grass-seeding, came from the Idaho Panhandle average costs from the 1998 TSPIRS report (USDA R1. 1998), included in the appraisal program. The project file contains detailed documentation of cost estimates ("Finances").

Costs for road construction and reconstruction, reforestation, mitigation and other direct costs are deducted from the expected stumpage value. The costs of upgrading existing arterial roads (main travel/haul routes) to further reduce long-term risks to the watersheds, are included in the reconstruction costs.

The necessity of all proposed sale activity work (such as type and/or/extent of fuel treatments, road work, etc.) that would be required of the purchaser was continually reviewed. Within the harvesting alternatives, watershed improvement work that sale purchasers could perform was identified, such as upgrading culverts and/or removing culverts and closing roads. Due to higher government overhead, purchasers can accomplish work more economically.

Non-commodity values were not included in this analysis because these resources are evaluated under the specific resource section. Title 40, Code of Federal Regulations for NEPA (40 CFR 1502.23) indicated 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.

Table 3-72 - Financial Issues Indicators

Issue Indicator	Measurement Method
Net Value	Total Net Stumpage Value and Net Value per MBF

Table 3-73 - Additional Features used in Financial Analysis

Feature	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Net Volume (Thousand board feet)	0	13,285	13,533	6,743	0	12,327
Yarding systems used (percent of volume)						
Tractor		25	9	4		20
Skyline		42	21	24		44
Helicopter		33	70	72		36
Average Diameter of Harvested Trees (inches)	NA	13.6	13.7	13.2	NA	13.6

Affected Environment

Stumpage prices are noticeably down across the Untied States at present, largely due to lack of demand and imports of inexpensive, often subsidized timber from other countries.

Environmental Consequences

Some of the projects planned Alternatives B, C, D and F would be completed in conjunction with the timber sale. This work includes necessary regeneration (site preparation/fuel reduction, planting and follow-up monitoring for planting success) and road construction, reconstruction and decommissioning or storage that can be associated with the timber sale contracts. Legally, timber sale contracts can only be required to complete work that is associated with the timber sale. As an example, road decommissioning can be required on a road that is used during timber harvesting, but segments of the same road that extend beyond the harvest unit can not be included in the sale contract. This work must be funded in some other manner. These activities can be found in Table 3-74 and Table 3-75 below.

Where appropriate, the Forest Service can transfer money received from the value of the sale into "trust fund" accounts that can be used for sale area betterment. This type of funding in not guaranteed, since the value of timber and the cost of contractually required work is determined at the time of sale.

The following table provides a summary of predicted values of contractually required work and trees to be harvested for each alternative, along with government expenses associated with the timber sale contract(s).

Table 3-74 - Timber Sale Economic Efficiency by Alternative

	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Total MMBF	0	13.3	13.5	6.7	0	12.3
Stumpage Value (net)	**0**	**$2,263,970**	**$1,560,351**	**$799,226**	**$0**	**$1,922,126**
Average Net $/MBF	0	$166.93	$113.12	$119.28	$0	$154.94
Regeneration	0	$110,631	$110,631	$72,796	$0	$90,995
TS Road Construction FS	$0	$237,000	$0	$46,900	$0	$212,300
TS Road Consruction Cost Share	$0	$73,900	$73,900	$73,900	$0	$73,900
TS Road Reconstruction FS	$0	$86,800	$86,800	$102,200	$0	$113,000
TS Road Reconstruction Cost Share	$0	$64,800	$64,800	$58,200	$0	$64,800
Temp Roads	$0	$76,200	$0	$0	$0	$40,900
TS Road Decommissioning	$0	$81,250	$27,200	$32,000	$0	$85,150
NET Project Value (Stumpage - regeneration and road work)	**$0**	**$1,533,389**	**$1,197,020**	**$413,230**	**$0**	**$1,241,081**

Table 3-75 - Miles of Road Decommissioning and Storage by Funding Source

	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Funded by Timber Sale	0.0	13.5	4.8	5.3	0.0	14.3
Funded by Cost Share	0.0	0.3	0.3	0.3	0.3	0.3
Funded by Other Sources2	0.0	16.1	15.6	32.2	38.1	29.1
Total Miles	0.0	29.9	20.7	37.7	38.4	43.7

Table 3-76 - Projects Funded by Other than TS

Projects Funded Other that TS	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Road Construction Cost Share	$0	$68,750	$68,750	$68,750	$142,650	$68,750
Road Reconstruction Cost Share	$0	$24,600	$24,600	$24,600	$52,500	$24,600
Road Storage Cost Share	$0	$1,300	$1,300	$1,300	$1,300	$1,300
Road Decommissioning and Storage FS	$0	$88,300	$85,800	$258,750	$292,750	$234,450
Woody Debris Placement	$0	$14,000	$14,000	$14,000	$14,000	$14,000
Riparian Planting	$0	$30,000	$30,000	$30,000	$30,000	$30,000
Total Other Funding	**$0**	**$132,300**	**$129,800**	**$302,750**	**$336,750**	**$278,450**

More detail on how costs were developed can be found in the economic and transportation sections of the project files.

The cost of the fish pond development is unknown. The cost to the government for this activity is dependent on the final plan, and the amount of the cost paid by other agencies such as the Idaho Fish and Game and private donations.

Alternatives A and E

Direct and Indirect Effects

2 “Other Sources” include trust funds generated from the timber sale, money appropriated annually by Congress or paid by cooperative agreement or donation.

Since no timber harvesting would occur under these alternatives, there would be no effect on the efficiency of timber harvest proposals. Not managing the timber resource in this area may result in a loss of mature timber (of commercial size) to disease and insects, and would result in the loss of productivity over the long term. This directly relates to expected future revenues.

Both Alternatives A and E incurred planning costs, even if no timber cutting occurs. These alternatives would have a net loss to the government.

Costs incurred with watershed restoration (road obliteration, fish habitat improvement, riparian planting), vegetation restoration (precommercial thinning) (see Table 3-76) and fish pond development in Alternative E would have to be appropriated from Congress or existing trust funds from previous timber sales where appropriate. There is no certainty that this type of work would be funded. These funds are distributed based on priority at a national, regional and forest-wide basis, and this project would not be expected to compete well with other projects for funding.

Watershed restoration work in Alternative E would create some employment opportunities locally and regionally.

Cumulative Effects

Past, present and reasonably foreseeable activities on National Forest System and other lands within the project area are not going to have an effect on the economic issues for these alternatives.

Alternatives B, C, D and F

Direct and Indirect Effects

Net stumpage is figured using the value of timber removed (based on size, species and volume), yarding method used and hauling distances. Logging, hauling, and contractual work (clean up, fire line construction, fuel treatment, grass-seeding, and road construction, reconstruction and obliteration) costs are deducted from the value of the timber. Regeneration costs include planting, monitoring for success and overhead.

These alternatives would create some employment opportunities for local and regional residents for timber sale and watershed restoration work.

As in Alternative E, some activities proposed in these alternatives (road obliteration, fish habitat improvement, riparian planting, precommercial thinning and fish pond development) cannot be funded with the sale of timber (see Table 3-76). The difference between these alternatives and Alternative E is that some of the road decommissioning and storage would be completed by the timber sales, and appropriated money would not have to be used.

Table 3-77 - Road Funding Percents

	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Decommissioning and Storage Funded by Timber Sale*	0%	45%	23%	14%	0%	33%

*based on information in Table 3-75.

Below Cost Sales

Timber sales in Alternatives B, C, D and F appear to be positive (see Table 3-74), which indicates that revenue generated is expected to exceed contractual and other required fuel treatment, regeneration, road construction, and road decommissioning work included in the timber sale contracts. This indicates that sales proposed in these alternatives are reasonably expected to sell.

When Forest Service planning and administration costs are subtracted from the net value of the sales (see Table 3-78), all alternatives except Alternative B appears below cost (cost associated with the sales exceed the value of the timber).

Table 3-78 - Total Sale Values

	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
NET Value (see Table 3-74)	$0	$1,533,389	$1,197,020	$413,230	$0	$1,241,081
Planning*	$577,000	$577,000	$577,000	$577,000	$577,000	$577,000
Sale Prep and Admin.	$0	$738,416	$749,520	$371,984	$0	$684,562
NET Value	-$577,000	$217,973	-$129,500	-$535,754	-$577,000	-$20,480

* Including stand exam, transportation planning, analysis and documentation. Costs from TSPIRS.

Cumulative Effects

This analysis determined the economical efficiency of the timber sales. Past, present and reasonably foreseeable activities would not affect the economical efficiency of the proposed timber harvests.

Consistency with Forest Plan

The Forest Plan does not give any specific direction for finances. Providing timber is consistent with the plan.

Disclosures

Potential Conflicts with Plans and Policies of Other Jurisdictions

There would be no conflicts with Federal, State or local policies, plans or regulations. Compliance with such laws and regulations are discussed in Chapter II and where appropriate in applicable resource effects discussions in Chapter 3

Probable Environmental Effects That Cannot Be Avoided

Implementation of any action alternative would inevitably result in some adverse environmental effects. The severity of the effects can be minimized by adhering to the features of the alternatives such as the Best Management Practices, project – specific mitigation as discussed in Chapter 2. If management activities occur, however, some effects cannot be avoided. Even the no action alternative has effects. Effects relating to Alternative A (no action alternative) are disclosed in each resource section.

Air Quality

Temporary seasonal effects on air quality are unavoidable under any of the action alternatives. Prescribed fire is an integral part of slash disposal, and site preparation for reforestation. These activities would be scheduled when air dispersion is good.

Wildlife/Fish

All the action alternatives would have an effect on cover/forage relationships in the project area and security. During management activities, some wildlife species may be displaced. Activities in the action alternatives would displace some sediment, which would end up in streams. Best management practices, site-specific design criteria and the use of stream buffers reduces the effects to a minimal level.

Noxious Weeds

Any activity has a risk of introducing and spreading weeds. Vehicle use and travel associated with timber harvest, road construction and other activities will increase the risk of spread. Mitigation measures such as washing vehicles will help reduce but would not eliminate the risk of weed spread from proposed activities.

Relationship Between Short-Term Use and Long-Term Productivity

Short-term uses are those that generally occur annually. Long-term productivity refers to the ability of the land to produce a continuous supply of a resource.

Water Quality/Fisheries

The duration of the effects of timber management, road building, and road removal on the water resource or fishery is highly variable and dependent on land and vegetation types. Stream channel conditions may be altered as a consequence of short-term direct and indirect effects of

management activities. The long-term benefits of these activities would reduce the potential volume of sediment entering the stream channel over time and improve habitat conditions for fisheries.

Removal of roads in riparian areas has the short-term effect of removing streamside vegetation associated with road fill and an increase of sediment, but the long-term benefit is to provide for a more natural channel. Habitat complexity and large wood recruitment into streams would improve over time as the obliterated roads regenerate to riparian vegetation and forested cover.

Wildlife

Key habitat requirements for wildlife species include feeding habitat or foraging areas interspersed with nesting, or denning and thermal and hiding cover. As successional changes take place and reforestation occurs, they would again provide cover. The appropriate scheduling of timber harvest can provide and sustain a mosaic of cover and feeding habitat. Security drops with the building of roads short term, however, decommissioning of roads constructed and other roads in the area helps maintain adequate security for wildlife.

Vegetation

Managed stands produce a higher volume of wood fiber through time than unmanaged stands. Regeneration of desired fast-growing species, planting of genetically improved trees, stocking control to reduce competition and improve growth of individuals trees, and intermediate treatments to maintain the health and vigor of stands are silvicultural means of maintaining the long-term yield of forest stands.

Depending on the level of timber harvesting and the site preparation method that follows, reductions in organic matter could reduce long-term site productivity. Silvicultural prescriptions include measures designed to maintain varying levels of organic matter. Reforestation of harvest areas could change plant succession, stand development, and species composition.

Air Quality

The temporary impacts of smoke from prescribed debris burning and road dust from vehicles would have minor, short-term effects on visual quality and recreation use. The short-term impacts are traded for by minimizing the risks from wildfire and long-term, increased site productivity. The short-term impact of prescribed burning is required to decrease the wildfire risk on these sites. Wildfires generally provide significantly more air pollution. Silvicultural treatments and prescribed burning will increase long-term site productivity.

Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources refers to the loss of production or use of a non-renewable resource due to a land use decision that, once executed, cannot be changed. An irretrievable commitment of resources applies to losses of production or use of renewable resources for a time.

Soil productivity

Best Management Practices would be used to avoid soil productivity losses from timber harvesting and associated road construction. Road construction would constitute an irreversible effect on soil

productivity since roaded templates can only be restored to a non-roaded condition after a long period of time or after ripping and revegetation. The soil mixing and disturbance that would be associated with road construction would lower soil productivity. While plant and tree growth on these sites would occur over the short term, full productivity recovery would take decades to hundreds of years.

There would be minor nutrient displacement as a result of burning piles for fire hazard reduction and from wood removed from the site. Harvest a tree bole as a log indirectly affects potassium levels in the soils. Effects of removing logs from low potassium soils in not entirely understood. The loss could be termed an irreversible loss due to non-renewability of the resource. Mitigation measures that call for retaining much of the fines and small stem material to overwinter on site would limit the potassium removal.

Wildlife

The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover. However, the timeframe for this to occur may be as long as several decades.

Specifically Required Disclosures

Environmental Justice Act

In February 1994, President Clinton signed and executive order on Environmental Justice, requiring federal agencies to conduct activities related to human health and environment in a manner that does not discriminate or have the effect of discriminating against low-income and minority populations.

Although low-income and minority populations may live in the vicinity, there would be no overall differences between alternatives in effects on low income populations, minorities, Native American Indians, women, or the civil liberties of any American citizen. Effects of various levels of timber harvest and watershed restoration work are concentrated on National Forest System lands. All contracts offered by the Forest Service contain Equal Employment Opportunity requirements.

See the project file for a breakdown of minority groups from the most recent census and the preliminary report Social Assessment for the Idaho Panhandle National Forest (December 31, 2001).

Effects on Floodplains and Wetlands:

Most wetlands in the project area are associated with floodplains and are protected as RHCA's. Wetlands may occur in the form of seeps, springs, and small bogs; however, the exact locations of all these have not been identified prior to unit layout. These seeps, springs and small bogs are not evident through aerial photography and are probably less than ¼ acre in size. These areas would be protected by adhering to Idaho Panhandle National Forest Plan guidelines as amended by INFish, Best Management Practices and Section 404 of the Clean Water act. See the Water and Fisheries sections of Chapter 3 for more specifics.

Effects of Alternatives on Threatened and Endangered Species

Threatened and endangered wildlife, fish, and plant species may be affected by the proposed activities in the project area. A biological assessment will be prepared and submitted to the US fish and Wildlife Service for concurrence according to the Endangered Species Act to insure protection of these species.

Energy Requirements and Conservation Potential of Alternatives

The energy required to implement the alternatives in terms of petroleum products would be insignificant when viewed in light of the production costs and effects of the national and worldwide petroleum reserves.

Incomplete or Unavailable Information

There is less than complete knowledge about many of the relationships and conditions of wildlife, fish, forests, jobs, and communities. The ecology, inventory and management of a large forest area is complex and developing science. The biology of wildlife species prompts questions about population dynamics and habitat relationships. The interaction of resource supply, the economy, and communities is the subject matter of an inexact science. However, the basic data and central relationships are sufficiently well established in the respective sciences for the deciding official to make a reasoned choice between the alternatives, and to adequately assess and disclose the possible adverse environmental consequences. New or improved information would be very likely to reverse or nullify these understood relationships.

The most recent research by the Intermountain Forest Tree Nutrition Cooperative was used to develop mitigation measures (See chapter II) to protect soils and site productivity. The measures represent current state-of-the-art recommendations.

CHAPTER 4 - RESPONSE TO COMMENTS

The Draft Environmental Impact Statement was made available for public review beginning June 1, 2001. The official comment period ended July 16, 2001. Comment letters were received from 3 groups or agencies. Each comment was given a number: 1-1 corresponds with the first comment in letter number 1. Copies of the letters are included at the end of this chapter.

Letter	Commentor
1	Kootenai Environmental Alliance and Idaho Sporting Congress
2	Environmental Protection Agency
3	The Lands Council, Ecology Center, Alliance for the Wild Rockies, Friends of the Clearwater and Upper Columbia River Sierra Club

Comments and Responses

1-1 Comment:

The FEIS should supply information regarding:

The number or acres clearcut after 1962;

The FEIS should indicate there are 204 acres of the Dutch Cat timber sale adjacent to the Hidden Cedar analysis area;

Acres of logging in the Tri County timber sale that are within or adjacent to the Hidden Cedar analysis area and how many of those acres are regeneration harvest.

Response:

The harvest history by stand, for this analysis area was obtained from the timber stand management records system (TSMRS). A copy of this summary is in the project file. The total regeneration harvest on NFS lands within this area since 1962 is approximately 2,810 acres. These activities consist of 2,236 acres of clearcut, 547 acres of seed tree and 27 acres of shelterwood seed tree cut.

The Dutch Cat Timber Sale harvest acres adjacent to the project area has been added to the FEIS.

Units 16, 17, 18, 19, 23, and 24 of the Tri-County Timber Sale are **adjacent** to the Hidden Cedar Analysis area. They total 105 acres of which 68 acres are regeneration harvest. There is no timber harvest associated with the Tri County Sale **within** the analysis area. On page 3-13 of the DEIS the Vegetation section says Unit 23 is within the analysis area, this has been corrected in the FEIS.

1-2 Comment:

DEIS does not describe the substantial percentage of logging activity on the non-Forest Service lands in and adjacent to the Hidden Cedar analysis area. There is no clear definition in the DEIS of what is meant by "substantial" and "intensive" logging activities on both private and State lands within and adjacent to the Hidden Cedar analysis area.

No data that indicates how many acres on State lands, Crown Pacific and Potlatch lands have been clearcut since 1960.

Response:

The DEIS states that through review of aerial photos and other information, it is believed a

substantial percentage of non forest service land has had commercial harvest (FEIS, pg. 3-13). Page 3-12 of the DEIS states that "more intensive timber management contracts were not prevalent until the early 60's." And goes on to say approximately 35% of the Forest Service jurisdiction lands in the analysis area have had commercial timber harvest since 1962 of which approximately 52% is regeneration harvest. Intensive timber management on NFS lands, related to activities since approximately 1962, are those activities that were intended to trend a stand toward, or create, a particular desired condition within the stand. The harvest activities on NFS lands prior to 1962 were dominated by removal of specialty products such as posts, poles, cedar products and scattered high value products. Additionally, salvage of dead and dying trees suitable for lumber products was also common. That would define "intensive" relatively speaking on Forest Service lands. On 12/21/99 the Forest Service met with Potlatch to request information on timber harvest, road building and any other activities they had planned on their lands within the analysis area. Potlatch was reluctant to provide information and attached a cost of $150.00/for a paper copy and $500.000 for a digital copy per orthophoto quad to show their planned timber harvest. We indicated that if they did not provide the information, we would make assumptions about their management and existing condition based on past practices, recent field visits and 1996 aerial photography (project file). This information is adequate to assess effects and have an informed decision.

To better define "substantial" percentage of Non Forest Service lands has received…" it was estimated that 50% or more of the non-NFS lands had received some sort of timber harvest. This estimate was developed through estimates from aerial photos and general field observations during area reconnaissance of the analysis area.

1-3 Comment:

The incomplete or unavailable information regarding logging on state and private lands is significant. The FEIS must address the NEPA requirements described in 40 CFR 1508.22 (b).

The FEIS must supply accurate scientific analysis and expert agency comments that indicate how effects to water and fisheries on the National Forest lands in the analysis area from logging at least 603 acres, and up to 1,368 acres are accurately analyzed when there is a significant amount of incomplete and/or unavailable information concerning logging activities on State and private lands.

Response:

See answer to comment 1-2 above. There is less than complete knowledge about many of the relationships and conditions of wildlife, fish, forest, jobs, and communities. The ecology, inventory, and management of a large forested area is a complex and developing science. The basic data and central relationships are sufficiently well established in the respective sciences for the deciding official to make a reasoned choice between alternatives, and to adequately assess and disclose the possible adverse environmental consequences. New or improved information would be unlikely to reverse or nullify these understood relationships. We have information on Forest Practices Act applications for the project area that has been added to Chapter 3 of the FEIS and used in the cumulative effects analysis by the resources. These show current and future foreseeable harvest proposals by the State, private corporations and private individuals. The FEIS will address 40 CFR 1508.22 (b) at the end of chapter 3 in the Disclosures section.

The predicted effects to the fisheries from non-federal timber management is described on pg 3-90 of the DEIS. Tables 3-35 through 3-47, Row: titled Private/State, timber harvest, identifies the

drainages where non-federal timber harvest could potentially occur and was therefore taken into consideration during the analysis of cumulative effects. Effects to the water resource are modeled using WATSED. How private land was interpreted for WATSED is in the project file. These interpretations utilized satellite imagery.

1-4 Comment:

There is no mention on pages 3-228 or 3-229 regarding the Dutch Cat timber sale and the Dutch Cat II timber sale. The Dutch Cat timber sale had a minimum acceptable total sale value of $2,361,011.28. This timber sale did not sell and the revised Dutch Cat II had a minimum acceptable total sale value of $1,222,091.86. This is a reduction of over $1,138,919.00 from the original minimum acceptable total sale value for Dutch Cat. The species to be cut and the volume to be cut for Dutch Cat II were the same as Dutch Cat. The FEIS must supply accurate information that will indicate the expected net revenues that will be available from one or more Hidden Cedar timber sales if the total stumpage values would have to be reduced by $1,000,000 or more in order to sell the net volume.

Response:

The Dutch Cat II timber sale was re-appraised after the appraisal model was updated to reflect market conditions at the time. If the timber market were to decline, the economic feasibility of the timber sale would have to be re-evaluated. See response to comment 1-5 below.

1-5 Comment:

The FEIS needs to supply expert agency comments that will indicate if all planned activities such as; fuels reduction/site prep, reforestation, road decommissioning, road reconstruction, mitigation work, and monitoring, will be fully funded if a minimum acceptable total sale value of less than $2,000,000 is necessary in order to sell 13.6 pr 13.9 MMBF of timber.

Response:

Fuels reduction, site preparation, reforestation, and road reconstruction are associated with the timber sale contract and will be fully funded when the sale sells. These costs are not affected by the bid price, but instead are included as required work or payments to the Forest Service. Mitigation is nearly always financed this way. Road decommissioning is required work whenever legally possible, so in many circumstances, it would also be “financed” directly by the timber sale. Road decommissioning not covered by the timber sale is indicated in the Fish and Watershed sections of the EIS and would be funded through KV trust fund collections or included in the annual budget as project work. The monitoring work described in the EIS is forest level and is not funded through the timber sale, unless it is associated with KV activities, such as reforestation.

1-6 Comment:

The FEIS must also supply expert agency comments regarding Alternative D and the funds available for planned activities if the stumpage value would have to be reduced by $300,000 or more in order to sell the seven mmbf timber sale.

Response:

See response to comment 1-4.

1-7 Comment:

The Final EIS also needs to indicate if the Forest Service's FY 1998 TSPIRS Report for Region 1 was used as part of the economic analysis described in the DEIS.

Response:

Yes, the 1998 TSPIRS report was used in the TSPAS model for analysis. The DEIS erroneously stated the date as 2000. This has been corrected in the FEIS. There has not been an updated TSPIRS report since 1998.

1-8 Comment:

The FEIS should supply data that would indicate how many acres were reforested with DF after 1962 on the national Forest lands described on page 3-12. If reforestation information regarding the planting of DF is incomplete or unavailable for specific years, the FEIS should supply data for the years in which data is available regarding acres of DF that were planted in the analysis area (including Tri County and Dutch Cat).

Response:

Reforestation activities on NFS lands, whether using natural regeneration or planting, are designed to provide a mix of tree species suitable for the sites. When regenerating stands through planting, we develop a reforestation prescription, which incorporates early seral species for the particular site - generally white pine, western larch, lodgepole pine, ponderosa pine (where appropriate), as major components in the planting mix. This mix will; however, incorporate other species including Douglas-fir, Engelmann spruce, cedar and other appropriate species native to the site to be planted. Stand composition on regenerated sites not only results from the planting mix, but also includes natural regeneration which contributes to total stocking and stand composition. Within this analysis area, the natural regeneration contributing to regenerated stands is generally grand fir, cedar, western hemlock, Engelmann spruce and Douglas-fir. Pending the site and available seed sources, white pine and western larch may also come in naturally but usually at relatively low numbers. White pine and western larch generally contribute 45% to 60% of the planting mix (pending the particular site characteristics and conditions). The remaining 40-55% of the planting mix will be made up of other species appropriate to the site.

1-9 Comment:

The FEIS should indicate if it is anticipated that planting DF will occur on lands other than National Forests lands.

Response:

Indications from industry and state representatives are that management of species composition on these lands are similar to those proposed by the Forest Service. One can anticipate that Douglas-fir would be planted where it is appropriate to achieve goals for a particular site.

1-10 Comment:

It is not clear if any of the roads that are to be put into long-term storage have one or more undersized culverts that will remain after the road are in long-term storage. It is also not clear if undersized culverts will be removed or replaced with larger culverts in the roads that would be decommissioned.

Response:

Page 3-51 of the Soil and Water Section mentions that culverts will be removed at stream crossings. In Appendix C – Road definitions, Prescription C = " minimum activities for decommissioning roads include… culvert removal"; Prescription D = re-establish natural drainage patterns although not stated outright involves culvert removal. All culverts will be removed in the decommissioning of roads under prescriptions C and D.

1-11 Comment:

The FEIS should indicate the sizes of any culverts planned to be removed and the sizes of any new culverts that would replace any undersized culverts.

Response:

On page 3-60 and 3-128 of the DEIS it indicates that INFish standards and guidelines will be applied to meet Riparian Management Objectives. Standard RF-4 of INFish requires culverts to be sized to accommodate a 100-year flood.

1-12 Comment:

Also "Te (sic) estimated reduction in sediment would be 330 lbs/cubic foot of runoff" appears incomplete.

Response:

The sentence is complete; should read "The estimated reduction…" and have a period at the end. This has been corrected in the FEIS.

1-13 Comment:

The sentence at the bottom of page 3-45 is incomplete.

Response:

The complete sentence should read: Since no quantitative criteria exist for sediment, the estimated reduction in **sediment from road decommissioning may or may not lead to attainment of full beneficial support**. It has been corrected in the FEIS.

1-14 Comment:

The FEIS must indicate whether there has been past road failures or road slumps within the Hidden Cedar Project Area. If there is incomplete or unavailable information regarding road failures or road slumps on State lands or private lands, the Final EIS must indicate this information is incomplete or unknown. If there is also incomplete or unavailable information regarding culverts and incidents of past culvert failures on State and private lands, the FEIS needs to indicate this information is incomplete or unavailable. If it is anticipated that there will be future culvert

failures on State and private lands within the Hidden Cedar analysis, the FEIS should describe the locations where the culvert failure may occur.

If there is incomplete or unavailable information and analysis regarding expected culvert failures on State and private lands, the FEIS needs to indicate this analysis and information is incomplete or unavailable.

Response:

A complete history of all road failures or slumps and culvert failures within the analysis area is unavailable. A varying degree of information is available for individual National Forest System Roads and can be found in the project files. The hydrologist and transportation engineer compiled a list of existing slump and failures and potential problem sites. This information was also used to assess roads for decommissioning at Road Management Prescription C, D, or E levels. The existing condition described in the EIS reflects effects of past failures and slumps through the assessment of channel conditions and channel classification.

State and Private landowners are expected to comply with the Idaho Forest Practices Act (FPA).

1-15 Comment:

The cumulative effects analysis in the DEIS does not explain why the 13 streams and portions of the River have been significantly degraded when Federal and State laws required the prevention of any degradation to fisheries habitat and water bodies.

Response:

Page 3-64 of the DEIS describes the historical influences which have occurred within the project area. Many of which occurred around the turn of the century (pg 3-225, DEIS). These activities occurred before the adoption of State and federal laws protecting water and fish have had a strong influence on the current condition of the streams (i.e. Removal of riparian conifers, construction of the railroad in the riparian zone).

1-16 Comment:

The FEIS must supply accurate scientific analysis and high quality information that would explain the reasons for the serious and significantly degraded fisheries conditions that exist in the Hidden Cedar analysis area in spite of the 1972 CWA and Idaho FPA that has been Idaho Code since 1974.

Response:

See above response to comment 1-14.

1-17 Comment:

It is indicated on page 2-12 that cable-logging operations may require falling trees within the INFish buffer zones. The FEIS should indicate which action alternative would affect the most area within the INFS buffer zones.

Response:

No activity is planned in the INFish buffer zones (RHCAs) in the action alternatives. INFish guidelines as they pertain to RHCAs will be followed. The Soil and Water Design Criteria for all

action alternatives on pg 2-12 indicates there are exceptions (Standard TM-1 allows harvest in RHCAs for catastrophic events and silvicultural prescriptions to attain RMOs). TM-1 does not apply to the project. However, in the INFISH EA, Decision Notice and FONSI (1995) pg. A-12, under General Riparian Area Management Standard RA-2 it indicates that trees may be felled within RHCA when they pose a safety risk. Keep felled trees on site when needed to meet woody debris objectives. This is the correct reference and has been corrected in the FEIS.

1-18 Comment:

The FEIS needs to supply information that will indicate if previous placements of large woody debris were destroyed or removed from section 25 or 26 due to high flows or bedload movement.

Response:

Page 2-8 of the DEIS, Large Woody Debris Placement, identifies the project as "**replace** large woody debris….in the West Fork of the St. Maries River." Large woody debris (LWD) was never been "**placed**" in the West Fork of the St. Maries river in sections 25 and 26 by the Forest Service. The wording replace refers to the assumption that LWD was likely present in the stream historically due to the presence of suitable soils and a coniferous riparian zone. The LWD was likely removed in the past during railroad construction and other activities.

1-19 Comment:

The FEIS also needs to explain what structures were removed from section 25 and 26 that should be replaced. If there have been additional instances in other streams or creeks within the analysis area where log structures or woody debris were installed and have been damaged or destroyed, the Final EIS needs to indicate if the log structures or woody debris were damaged or destroyed due to high flows.

Response:

See response to comment 1-18 above regarding LWD in sections 25 and 26.

1-20 Comment:

The FEIS must supply accurate high quality analysis regarding the impacts to fisheries that would occur on the National Forest lands if 5.4 miles of new road construction does take place on Potlatch Corporation lands and State of Idaho lands.

Response:

Page 3-94, DEIS describes expected effects of the construction of new road on non-federal lands. Tables 3-36, 3-37, 3-40, 3-42, 3-43, 3-44, 3-45, and 3-47 identify the drainages and miles of road construction on non-federal lands. This road construction was taken into account during the cumulative effects analysis of those drainages.

1-21 Comment:

The FEIS must also indicate whether the ANILCA Act supersedes the requirements of the CWA.

Response:

ANILCA calls for access authorization to be conditioned to assure that the use and occupancy of **federal lands** for access is exercised in a manner that complies with all applicable laws and

regulations, which would include the clean water act (CWA). One law does not supercede the requirements of another law.

1-22 Comment:

The FEIS must supply data for the total amount of sediment that is expected to be reduced on National Forest lands in the Hidden Cedar area associated with the planned logging and road construction, along with the total amount of sediment that is currently being released from State of Idaho lands and private lands in the Hidden Cedar analysis area.

Response:

DEIS, Table 3-27 shows sediment reduction from proposed road decommissioning on NFS lands in Alternatives B, C, and D (these reductions take into account road construction as noted at the bottom of the table). The DEIS on page 3-58 identifies sediment reduction for Alternative E. The FEIS has added two Summary Tables (Forest Service Actions and Cumulative Effects) at the end of the Water Resource section of chapter 3, which display the reduction of sediment by alternative.

1-23 Comment:

If current sediment totals are not known and the projected amount of additional sediment that will be released from new logging and road construction on Potlatch and State lands is not known, the FEIS must indicate whether the statement on page 3-59 is factually correct for the entire analysis area.

Response:

For all action alternatives, an estimated reduction in sediment will occur from road decommissioning. This is correct based on activities on Federal land. See DEIS pages 3-56 and 3-58.

1-24 Comment:

The FEIS must indicate the date of the most recent validation of the WATSED model on the St. Joe District and indicate which watershed(s) were used as part of the validation and calibration process.

Response:

The Catspur watershed was calibrated with WATSED results most recently in water year 2000. (IPNF Monitoring Report, 2000). The model over predicted actual sediment levels by 173% of the average value over a 9 year period. %. This updated information has been added to the FEIS.

1-25 Comment:

The FEIS needs to supply analysis that will explain how WATSED calculates a recovery year of 2006 when it is expected there would be active logging operations through the years 2005 and 2006 on both National Forests lands and State and private lands.

Response:

WATSED and 2006 recovery: For the model all proposed activities were identified as occurring in the year 2003 which represents a worse case scenario (see project file, WATSED).

1-26 Comment:

The final EIS needs to include this data (logging, acres of regeneration logging from State of Idaho land and Potlatch Corp lands it used in WATSED), unless it is already included in the project files.

Response:

This data and how it was collected is located in the project files, WATSED section.

1-27 Comment:

Correct the Gordon 1995 citation – lit cited says 1992.

Response:

This has been corrected in the FEIS.

1-28 Comment:

The FEIS needs to explain what further impairment to the West Fork is possible since page 3-86 shows that 9.5 miles are already considered as functioning at Unacceptable Risk.

Response:

Fisheries environmental consequences section, DEIS pages 3-87 through 3-96 describes the effects of activities that are common to all alternatives and could apply to any drainage in the analysis area. Table 3-45, page 118 summarizes the effects of the activities that are occurring or proposed to occur in the West Fork drainage by alternative. A narrative follows Table 3-45 on pages 3-119 through 3-121 and describes the effects (direct, indirect and cumulative) by alternative.

1-29 Comment:

The FEIS should include data that would show the % change in water yields that would be required to cause significant channel changes in each of the watershed listed in Table 3-25.

Response:

There are a myriad of conditions that are responsible for channel stability – including (but not limited to) vegetation amount and type, soil and alluvial material shear strength, antecedent soil moisture, duration (if any) of increased peak flows, floodplain accessibility, current level of bank erosion and whether the channel is aggrading or degrading. Because of the many conditions, the percent increase in water yield cannot be quantified as the causative agent for significant channel changes. See Leopold's "square root law" and Schumm;s "stream power rule" for orders of magnitude of velocity required to increase channel width or act on the channel. The above explanation has been added to the FEIS.

1-30 Comment:

Table 3-12 cited near the bottom of page 3-53 does not appear to be the correct Table.

Response:

The Table referred to is Table 3-24. This has been corrected in the FEIS.

1-31 Comment:

The FEIS should clarify if the 80% (of area as sensitive snowpack and rain-on-snow zone) is only NFS land or the entire analysis area.

Response:

This refers to 80% of the ANALYSIS AREA. This has been clarified in the FEIS.

1-32 Comment:

It is not clear if Table 2-15 includes lands that have historically had openings, and lands that were acquired in the early and mid 1930s. The FEIS should include information that would show how many ECA are directly related to logging that has taken place after 1960.

Response:

ECA values are from the WATSED model and include private land activities. The WATSED model determines ECA by utilizing the TSMRS database which has records back to the 50's.

1-33 Comment:

The FEIS should include information that would indicate the timber sales that have taken place after 1987 in the Hidden Cedar area that have Monitoring data and written Evaluations that analyzed and interpreted the Monitoring data.

Response:

The IPNF annually conduct reviews of BMP implementation and effectiveness and timber sales. The results of this and other monitoring are summarized in an Annual Monitoring and Evaluation Report. This report provides information about how well the management direction of the Forest is being carried out, and measures the accomplishment of anticipated outputs, activities and effects. The existing condition of the project area includes past harvest activities. Analysis takes into account the effects of past harvest. The project file has those past harvest activities listed and is from the timber stand data base.

1-34 Comment:

The FEIS should clarify the size of the project area (37,000 acres in the summary vs 32,916 acres on page 3-60).

Response:

The 37,000 acres mentioned in the summary is referring to the Sherwin-Staples Landscape Assessment Area. The Hidden Cedar project area is within this LAA, however due to the high percentage of private land on the north end of the LAA, this was not included in the Hidden Cedar analysis area (33,916 acres). Note that each resource discusses the geographic area utilized in their analysis.

2-1 Comment:

The Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters calls on Federal Land Managers to develop a Water Quality Restoration Plan (WQRP) before carrying out activities in a watershed that has impaired streams

listed pursuant to Section 303(d) of the CWA … We would like to see the 303(d) Protocol discussed in the EIS.

The EIS should explain the purpose and intent of the 303(d) Protocol, what it calls for land mangers to do, and how or if the 303(d) Protocol will be applied on the Hidden Cedar Project.

Response:

The 303(d) protocol requiring a WQRP is currently not applicable in Region 1 of the Forest Service, because it is not Region 1 policy. The development of TMDLs for watershed within the analysis area will act as water quality restoration plans and these are scheduled for development in 2002.

2-2 Comment:

Explain the significance in reduction of suitable forest habitat on fish and marten. The EIS provides the acres of suitable habitat lost but does not explain what it means in terms of viability of these species in the entire analysis area.

Response:

A brief explanation of the consequences/effects on fisher and marten from the proposed action and alternatives was discussed in the DEIS under Cumulative Effects (p. 3-165). However, after consideration of this comment and review of the DEIS, we agree that further discussion would be helpful. Therefore, additional discussion explaining the consequences of effects on fisher and marten has been included in the FEIS.

2-3 Comment:

The EIS needs to discuss how this situation (smoke management, air quality, and sensitive areas) will be monitored and any contingency plans should PM concentrations reach a threshold of concern or an action level of some kind.

Response:

The DEIS states on page 3-216 that burning is allowed only when current and predicted air quality will allow for new ignitions. The process the District follows is we send our PM-10 and PM-2.5 projections to the North Idaho Smoke Air Shed Group one day prior to ignitions. These projections along with PM-10 and 2.5 projections by State and Private Forestry groups determine whether permission will be granted. This has been added to the FEIS.

The method used to predict smoke concentrations is conservative and gives a potential maximum concentration prediction for the given parameters.

On page 3-216 of the DEIS also goes on to say that restrictions can be issued to curtail all burning or to reduce burning acres or restrict burning to specified elevations.

2-4 Comment:

The EIS should identify an action level or how one will be determined before the burn takes place. An action level would be a signal to issue public health advisories and/or to curtail the burning. The EIS should also discuss how communities will be informed of upcoming burns.

Response:

A notice to the local newspaper will appear prior to the burning season explaining why, when and where the burning will be conducted. As stated above in response to comment 2-3, monitoring is conducted through reporting our PM-10 and PM2.5 projections for the next day to the North Idaho Smoke Air Shed Group. Prescribed burning will not be conduced if any element in the burn plan is out of prescriptions (i.e. Maximum temperatures, minimum relative humidity, high winds, etc.)

2-5 Comment:

Explain the KV funding process. Explain the certainty of KV funding being available to reduce the impacts of existing roads. That is, explain the likelihood of sufficient KV funds to address all of the proposed ecosystem restoration activities proposed in the Purpose and Need statement.

Response:

KV funds (Knutson-Vandenburg) are a trust fund established by Congress to fund reforestation and other post timber sale projects. Money from timber sales are collected and put into a fund for reforestation. An authorized KV plan collects money that can be used for other projects such as watershed restoration, **provided** the timber sale generates enough money after funding purchaser required activities such as fuels reduction and road maintenance. Extra money is divided into three trust funds: KV fund, Brush Disposal Fund (BDF), and. Salvage Sale Fund (SSF). Market conditions will dictate the value of the sales. Generally, reforestation and associated activities are given the highest priority. Watershed improvement in the form of reducing road impacts is usually the next highest priority.

Funding of activities not included in the timber sale is through appropriated funds in the budget. Activities with uncertain funding have been identified in the Fish and Watershed sections of the EIS and effects analysis completed with both possibilities. Requirements for activities that are necessary to mitigate effects of the harvesting or road construction are guaranteed by the timber sale contract.

3-1 Comment:

One of the major problems with the DEIS is the use of non-NEPA and non-decision documents as a programmatic decision document, like a forest plan. In this case, the Natural Resource Agenda, the St. Joe Geographic Assessment and the Hidden Cedars Project Area Ecosystem Analysis at the Watershed Scale are used to justify site-specific actions….and to establish new management direction for the Forest by developing desired conditions not found in the Idaho Panhandle Forest Plan.

Response:

The Natural Resource Agenda and the St. Joe Geographic Assessment were used in completing the Ecosystem Analysis at a Watershed scale (EAWS). The EAWS identifies existing, historic, and desired future conditions in an area. It is not used to justify site-specific actions or new direction.

The Forest Plan is one of the main components for the desired future conditions identified in the EAWS. The EAWS assembles, organizes and interprets information needed to **guide** future **decisions**. The St. Joe GA findings are not resource decisions (decisions to take any particular action on the land) and therefore do not trigger the analysis and disclosure procedures specified in the National Environmental Policy Act. The findings in the GA provide a context and framework for how to best carry out present management direction (i.e. IPNF Forest Plan). The GA is an interactive process that allow for new information and ideas to be developed and incorporated at any future point.

3-2 Comment:

Furthermore, the analysis in the Geographic Assessment or EAWS cannot preclude meaningful alternatives through a narrow definition of the purpose and need nor can alternatives be dismissed because they do not meet the project objectives.

Response:

See above answer to comment 3-1.

3-3 Comment:

Rational to eliminate the "Conventional Logging Systems Only, No helicopter" alternative" [is flawed since]…there is minimal difference from this alternative to that of Alternative B.

Response:

In Alternative B, 32% of the units will be harvested by helicopter. One third of the units will be harvested with this method and that is a recognizable difference from the conventional systems only alternative that was eliminated for resource reasons. Conventional logging only would also build approximately 25 miles of road, which is considerably more miles of road construction than Alternative B's 11.4 miles of road construction.

3-4 Comment:

The premise that the forest conditions differ significantly from your arbitrarily defined "historical condition" is not supported by information in the DEIS.

Response:

The DEIS displays current and historic conditions related to Forest composition and structure in Table 3-3 on page 3-8 and in Table 3-4 on page 3-11. Comparing the current conditions with the historic conditions demonstrates a change in both forest composition and structure.

3-5 Comment:

We request the FS also review Tiedmann et al. (2000) in order to improve the analysis of the proposed prescribed fire.

Response:

Literature cited for the Fires section is referenced in Chapter 3, pages 3-196 through 3-201 in the DEIS, and at the end of the document. The analysis uses current information available to conduct a sound analysis. Fire and Vegetation resources reviewed Tiedemann et.al.(2000). Tiedemann et al. (2000) addresses prescribed fire on a large scale and as a primary tool for vegetative manipulation.

The Hidden Cedar project is using prescribed fire to reduce hazard fuels and create fuel breaks on harvest units post harvest, so Tiedemann does not apply to the analysis for fire/fuels.

3-6 Comment:

There is no site-specific data on the historical range of conditions, nor is there site-specific data on the present conditions to show it does not sufficiently meet "desires future conditions."

Response:

See response to comment 3-4 above.

3-7 Comment:

We were unable to find a definition of "historical range of variability" in the DEIS. What is "historic?" How did you get the data?

What range of time is being used to determine HRV and is it long enough to be accurate? What proof is there to refute scientific findings that these historic conditions were only a few frames and not representative of an ecology perspective that should be from two to three thousand years in length (see Walder 1995 and Johnson et al. 1994)?

Response:

Historic Range of Variability was not referenced in this analysis, and thus no definition was included. A definition of this term can be found in the Upper Columbia River Basin Draft Environmental Impact Statement (Vol. 1, Chapter 5, page 41).

Sources of historic and current conditions and discussion of analysis methods are found in the DEIS pages 3-5 through 3-12.

3-8 Comment:

…what evidence refutes scientific research that stand replacing fires occurred in ponderosa pine types (Arno et. Al 1995)? What evidence refutes the role of climate in changes in ponderosa pine types and the science that shows ponderosa pine types may not always exhibit equilibrium? (Arno et al. 1995, Shinneman and Baker 1997, Veblen et al 2000).

Response:

The Hidden Cedar project is not dealing with ponderosa pine vegetation types. The wildlife section discusses "dry site habitat" related to species that prefer these habitats. The wildlife analysis refers to 144 acres of dry site habitat of which there is some ponderosa pine (68 acres), however, this ponderosa pine is found in a moister **habitat type**. The analysis is not dealing with ponderosa pine habitat types, because they are not found in the project area.

3-9 Comment:

Why is there so little discussion of the beneficial role of stand-replacement fire?

Response:

The beneficial role of stand replacement fire was not fully discussed because of the risks associated with stand replacement fire (threat to firefighters and public). Hidden Cedar is an area of mixed ownership (state, private). Because of this, full fire suppression is the only approved response.

3-10 Comment:

What evidence is there that stand-replacement fire is normal for moist forest types?

Response:

Discussion of fire as it relates to the moist forest types of northern Idaho is on DEIS page 3-12.

Stand replacing fires are and were normal for habitat type group 2, which is moist forest composed of western red cedar and western hemlock.

Stand replacing fires occurred every 177 to 363 years. (Smith and Fischer, 1997).

3-11 Comment:

Stand-replacing fires favor larch as they do better in open sites yet the DEIS tries to avoid these types of fires while at the same time trying to encourage larch.

Response:

Regeneration of western larch is favored by substantial site preparation and reduction of competition during establishment. Stand replacing fires are only one of the disturbances that can provide adequate conditions for establishment of western larch. Once established, western larch need to maintain their dominance in the stand to achieve large size and develop into mature old trees. Due to western larch intolerance to shade, competition from other trees needs to be minimized for larch to maintain this dominance. This can be achieved through various types of disturbances; including frequent low intensity fires, thinning and other stand density reducing disturbances. This is discussed in the DEIS pages 3-13 through 3-14, Forest Composition.

Discussion of fire management and suppression is found in the DEIS on pages 3-196 through 3-201 of the Fire/Fuels Management sections.

3-12 Comment:

What evidence is there that these forests are like those in the Southwest? …Why is the agency using a model that may better fit the Southwest for so-called ponderosa pine stands in the northern Rockies?

Response:

There is no reference to the Southwest or models from the Southwest in the Vegetation or Fire Sections of the EIS.

3-13 Comment:

If the premises in the DEIS were correct—that logging is needed to favor intolerant seral species – then intolerant species should already dominate in the analysis area.

Response:

See Forest Composition and Forest Structure discussions on pages 3-7 through 3-16 of the DEIS.

3-14 Comment:

Has the agency considered evidence that forest conditions are more reflective of climate change then fire suppression?

Response:

Climate is referred to on page 3-6 of the Vegetation section. A biophysical Classification, Habitat Groups and Descriptions (USDA, 1996) was used in the analysis and it is based on temperature and moisture environments.

3-15 Comment:

The DEIS does not analyze the possibility of a prescribed fire burning out of control.

Response:

Because of the time of the year in which prescribed fire is conducted, the probability of a prescribed fire burning out of control is minimal. Written prescriptions must be planned and approved for each unit prior to ignition. These prescriptions use fire behavior models to determine burn parameters.

3-16 Comment:

Where in the DEIS is the relationship between spring burning and natural fires seasons discussed.

Response:

A relationship between spring burning and natural fires is not discussed in the DEIS. Prescribed burn prescriptions (for fuels reduction) during natural fire seasons is not attainable, because dry hot weather conditions cause too great a risk to safety of firefighters and public.

3-17 Comment:

The DEIS does not provide any evidence these grand experiments will succeed or that logging and thinning replicate natural fires.

Response:

The proposed treatments within the DEIS are intended to create favorable stand conditions to encourage stand development towards desirable conditions. See DEIS discussion on pages 3-17 through 3-22.

3-18 Comment:

The DEIS…says on one hand that logging and thinning will reduce fire severity but that the extensive logging in the past, which also included slash burning and many clearcuts, does not affect the current fire regime.

Response:

On page 3-198 of the DEIS it states, " of the 53% of private lands nearly all of the acres have been logged, mainly regeneration harvest, clear cuts, seed tree, and shelterwood, with associated fuel reduction. This has created substantial effective fuelbreaks devoid of vegetation that could limit large crown fire spread.

3-19 Comment:

The effects discussions…fail to discuss the beneficial impacts and natural role of natural fire. They also fail to analyze the negative impacts on unnatural spring burning, fails to adequately analyze the direct, indirect and cumulative impacts of the project on vegetative cover and fire regimes.

Response:

See DEIS, pages 3-14 through 3-15 (effects of the no action alternative) for a discussion on natural fire and its effects on species composition. The effects on forest composition are discussed in reference to the absence of fire (including natural), fire suppression activities relative to shade tolerant species and historically how fire shaped composition of stands. Also see pgs 3-8 through 3-9 of the DEIS (affected environment -Forest composition) and relation to fire suppression and natural fire.

3-20 Comment:

The Dutch Cat EA did not anticipate nor disclose the degree to which more logging activities (i.e., Hidden Cedar project) will occur in areas where both analysis areas overlap. Since the Dutch Cat EA is now invalid, it would be unlawful to proceed with the Dutch Cat timber sale(s) since the cumulative effects of both actions have yet to be adequately analyzed in any NEPA document.

Response:

When the Dutch Cat Environmental Assessment Decision Notice (DN) was issued (5/30/97), it was not known that harvest activities would be proposed in the Sherwin-Staples Landscape Assessment area (of which Hidden Cedar Project is within). In Dutch Cat EA, the best available information was used to develop scenarios that predicted future actions that may be expected to occur. The Hidden Cedar analysis considers the effects of Dutch Cat as it relates to the project area and any new information gathered during sale preparation. When a decision is made on Hidden Cedar, the cumulative effects of both activities will have been analyzed and considered.

3-21 Comment:

The DEIS does not disclose the costs of this activity (gopher control), ecologically nor economically.

Response:

The cost of gopher control is included in the cost of regeneration (reforestation) activities, based on past average need for this treatment. The resources in Chapter 3 discuss the effects of this activity on each resource.

3-22 Comment:

…restoration ..projects must be designed with forethought and based upon empirical evidence that they will have the desired effect.

Response:

The DEIS on page 3-51 discusses large woody debris placement. It also describes conditions needed to show improvement in channel conditions.

3-23 Comment:

The DEIS fails to reconcile its reliance on Thomas (1979) with the fact that its own scientists regard Thomas (1979) to be out-of-date and inadequate for maintaining viable populations [of] snag dependent and cavity nesting species.

Response:

The DEIS does not rely on Thomas (1979) for maintaining viable populations of snag dependent and cavity nesting species. The discussion regarding cavity habitat (and snags) is found on pages 3-136 and 3-137. Scientific literature referenced here includes Quigley et al. (1996) and Bull et al. (1997). The Design Features in the DEIS (p. 2-10) include guidelines for snag retention based on the Northern Region Snag Management Protocol (Jan. 2000).

3-24 Comment:

The DEIS fails to demonstrate compliance with even the inadequate snag and cavity nesting Standards as laid out in Forest Plan Appendix X. Viability of snag dependent and cavity nesting species cannot be assured…Nowhere does the DEIS describe project area snag habitat in terms of the amount inside the geographic area forest Plan Appendix X designates for assessment.

Response:

A brief explanation of the rationale for not analyzing cavity habitat further was discussed in the DEIS on pages 3-136 and 3-137. Additionally, the Design Features in the DEIS (pg. 2-10) include guidelines for snag retention based on the Northern Region Snag Management Protocol (Jan. 2000). These guidelines clearly exceed the standards from the Forest Plan. However, after consideration of this comment and review of the DEIS, we agree that the existing condition in the analysis area is not displayed as clearly as it could be and that further discussion may be helpful. Therefore, additional data and discussion regarding cavity habitat has been included in the FEIS.

3-25 Comment:

We are not aware of any NEPA process used to support the use of the Northern Region Snag Management Protocol (2-10).

Response:

Use of the Protocol (and other scientific literature) does not require NEPA.

3-26 Comment:

We are also not aware of any monitoring results from your past snag and replacement "prescriptions" that assure success in this endeavor…although the Forest Plan Appendix X Wildlife Standards 3 requires post-project monitoring, there is no information in the DEIS that discloses the results of such monitoring.

Response:

There is no standard in the Appendix X of the Forest Plan that requires post project monitoring. However, monitoring of recent timber sales has occurred and the project file includes monitoring information concerning snag retention. Data indicates that snag retention objectives are being met on the units. Forest Plan monitoring is beyond the scope of this project level NEPA analysis

3-27 Comment:

The DEIS does not commit to any steps that would be adequate to locate existing goshawk nests before they would be disturbed by logging activities.

Response:

The DEIS (p. 2-10) states that the existing known nest and any nest found before or during implementation would be protected. It further states that activity timing restrictions may be removed if it is determined that the nest is inactive or unsuccessful. Since finding the nest in 2000, the nest site and surrounding area has subsequently been surveyed in 2001 and is planned for surveying in 2002. After consideration of this comment and review of the DEIS, language has been added to the FEIS that clearly states the requirement to survey the known nest site and surrounding area prior to unit layout and implementation of the sale.

3-28 Comment:

The FS should perform all necessary and scientifically adequate sensitive plant surveys, locate existing populations, and present conservation strategies in the EIS so the public can understand and comment on any measures to protect populations and maintain viability.

Response:

As was stated in the EIS, high potential rare plant habitat within the project area was delineated through queries of the district's TSMRS database, aerial photo interpretation, historical records and personal knowledge. Field surveys will be conducted in these high potential areas prior to project activities. Qualified surveyors will conduct field surveys at the appropriate time of year for species identification. A general survey will be conducted, with more time being spent in special habitats. If any rare plant individuals are found, intensive searches will be conducted within the area. Species presence is assumed for all highly suitable habitats and field surveys either validate or negate presence. Mitigation measures are discussed in Chapter 2. Any occurrences that are deemed necessary to ensure species and population viability against a potential trend towards federal listing, will be protected. Measures to protect population viability and habitat for all known and newly discovered occurrences could include: altering or dropping proposed units from activity, modifying the proposed activity, and implementing buffers around plants.

3-29 Comment:

The FS must include the results of all necessary surveys for heritage and historic sites in the EIS.

Response:

The results of surveys are documented in a report. Site information that is in the reports is exempt from mandatory disclosure pursuant to the Freedom of Information Act, 5 USC 552 (b) (5). This is all done in accordance with the National Historic Preservation Act of 1966. See DEIS, pg 3-225 Regulatory Framework and Analysis Area sections.

3-30 Comment:

What exceptions in INFISH (2-12) will be used to log inside standards INFISH buffers of streams and other wet areas?

Response:

There is no logging planned within INFISH buffers. Exceptions to INFish noted on page 2-12 do not apply here. See response to comment 1-1 for explanation.

3-31 Comment:

Do you have mapping of "areas of recent or historic landslides and slumping (2-12)?"

Response:

A map in the project file shows areas of past mass movement.

3-32 Comment:

The DEIS does not indicate how the low-potassium status of the soils will be taken into account in design of the "treatments."

Response:

See page 2-13, Soil and Water Design Criteria of the DEIS. This will be expanded in the FEIS, based on site specific sampling in the area.

3-33 Comment:

The DEIS falls far short of providing the required analysis of the cumulative impacts of livestock grazing activities on soil productivity, wildlife habitat, water quality, and fish habitat.

Response:

Fisheries: DEIS pages 3-63 through 3-65; 3-75 through 3-77 and 3-81 through 3-84 describe the effects of livestock grazing on the existing condition. DEIS page 3-89 describes the anticipated effects of livestock grazing. DEIS, tables 3-35 through 3-47 identify by drainage where grazing occurs and this is taken into consideration in the cumulative effects section for each drainage.

Soil and Water: A field inspection was conducted in September 2000 with Suzanne Digiacomo (botanist, Mike Treadway (Forest Range Specialist) and John Macy (South Zone hydrologist). Riparian pastures on Hume, Charlie, East Emerald, Keeler, and Catpsur creeks were looked at. Grazing intensity on FS lands is light overall and with a few areas of moderate use where cattle concentrate. The condition of the range was good with adequate vegetative stubble heights, bare soil only on trails and little evidence of streambank damage or concentrated use areas**.** Documentation of this visit has been added to the FEIS and was taken into account in the cumulative impacts from grazing on soil productivity and water quality**.**

Wildlife: The analysis of potential impacts on wildlife includes the cumulative impacts from livestock grazing when relevant. In the DEIS the effects from grazing on various components of wildlife habitat are discussed at the following locations: riparian habitat on pg. 3-144, connectivity on pg. 3-147, elk on pg. 3-154, fisher on pg. 3-164 (refers the reader to the riparian section). The project file contains more documentation of the analysis of grazing and the impacts on wildlife.

3-34 Comment:

The DEIS does not explain if habitat conditions of the National Forest land in the project area are adequate to contribute to or demonstrate compliance with IPNF Forest Plan Wildlife Standards 7a.

Response:

The DEIS (p. 3-132) discusses fire history, human activities and ownership patterns and their influence on habitat conditions and species occurrence. The Species Relevancy Screen eliminates from further analysis those species for which habitat conditions are inadequate to support the species. In the T&E section (p. 3-159) species for which there is insufficient capable or suitable habitat are identified. In the Sensitive Species section (e.g. Table 3-60 on pages. 3-161 and 3-162) species with limited capable or suitable habitat are identified. A discussion specifically concerning habitat conditions and the low suitability of habitat conditions for fisher and marten can be found on pages 3-162 through 3-163. Further discussion of habitat conditions for sensitive species with limited capable or suitable habitat can be found under the section for each species (i.e. wolverine – p. 3-167, flammulated owl – p. 3-173 and 174, Coeur d'Alene salamander – p. 3-174 and 3-175).

3-35 Comment:

The IPNF has failed to implement conservation strategies, as system-wide directives such as the Forest Service Manual require.

Response:

Conservation strategies are handled at the Forest level and are beyond the scope of the project level.

3-36 Comment:

The DEIS does not disclose whether or not the IPNF is meeting Forest Plan old growth standard 10(b), 10 (e), 10(f).

Response:

The DEIS on page 3-141 states that "Forest Plan standards for old growth are being met." This includes those specific standards mentioned in this comment. Meeting the standards is based on compliance with Forest direction regarding old growth allocation on the St. Joe District. The project file contains documentation of compliance with the Forest Plan (on the Forest and District). The DEIS (p. 3-141) discloses the existing conditions in terms of the standards mentioned in this comment (i.e. percent allocated and patch size).

3-37 Comment:

The DEIS does not adequately discuss the impacts of removing these important components of the MIS pileated woodpecker's habitat (snags at least 30" dbh and snags at least 20" dbh).

Response:

The DEIS has the analysis for old growth on pages 3-141 through 3-143 and pileated woodpecker on pages 3-150 through 3-153. The association of pileated woodpeckers with old growth habitat is acknowledged, and that large/mature/old forest stands **along with stands in the immature size class** provide structure used by pileated woodpeckers. The analysis for pileated woodpecker shows effects from loss of all suitable habitat (including changes in forest structure), not just allocated old growth.

3-38 Comment:

FP monitoring item F-1 requires the annual monitoring of "population trends of indicator species"…which the IPNF has failed to do.

Response:

The analysis in the DEIS is based on the availability (amount and distribution) of suitable habitat. Forest Plan monitoring is beyond the scope of this project level NEPA analysis.

3-39 Comment:

The EIS must disclose the methodology for maintaining viable populations of old growth species, since it lacks population monitoring information, is unable to meet forestwide and OGMU Forest Plan old growth standards, and has inaccurate old growth inventory information.

Response:

The analysis of potential effects on old growth associated species is based on the availability (amount and distribution) of suitable habitat. The DEIS displays the potential effects on old growth associated species. Population monitoring is beyond the scope of this project level analysis.

3-40 Comment:

The DEIS does not disclose whether or not all areas, whether planned for logging or not, have been compared to the Forest's old growth inventory.

Response:

The analysis of potential effects on old growth is documented in the DEIS (p. 3-141 to 3-143). Comparison of all treated stands to old growth criteria is not required to meet Forest Plan standards nor needed for an informed decision. See also the response to Comment 3-36.

3-41 Comment:

The IPNF must amend its Forest plan before allowing the project activities in lynx habitat.

Response:

The DEIS documents that the project area does not provide sufficient capable lynx habitat and that there would be no effect on lynx (p. 3-133, 3-158 and 3-159). Additional documentation can be found in the project file. No Forest Plan amendment is needed.

3-42 Comment:

The basis upon which the conclusion that the areas to be logged are not lynx habitat is not given…The DEIS also avoids the road access and winter travel issues as well.

Response:

The DEIS in Table 3-58 and the narrative following the table (p. 3-158 and 3-159) provide the basis and states that "Based on elevation, forest type, and potential vegetation (habitat type) the WL analysis and project area contains insufficient capable habitat to support the species and is not in any Lynx Analysis Unit". Therefore, there is no need to address the road access and winter travel issues. Additional documentation can be found in the project file.

3-43 Comment:

The analysis used methodology – a database query-that is not adequate for delineation of lynx habitat components and thus lacks scientific integrity. This same problem exists for analyses of other MIS and Sensitive species, including the fisher, the northern goshawk and others.

Response:

The methodology for the wildlife analysis is documented in the DEIS (pgs 3-130 through 3-132) and further documented under each habitat/species where needed. The analysis methodology (including data) is appropriate for the scope of the project, the risk to resources/species and the decision to be made.

3-44 Comment:

The DEIS does not demonstrate that the project, and the analysis for the project, is in compliance with the Lynx Conservation Assessment and Strategy.

Response:

The DEIS states (p. 3-159) that there would be no effect on lynx. However, after consideration of the concerns regarding the analysis for lynx expressed in this and the previous three comments, additional explanation regarding lynx and the lack of potential effects has been added to the FEIS.

3-45 Comment:

The DEIS fails to disclose that Townsend's big-eared bats use large dead trees for roosting and thus would suffer habitat depletion by the removal of big trees.

Response:

The analysis for Townsend's big-eared bat is documented in the DEIS (p. 3-135) and in the project file. Townsend's big-eared bats are strongly correlated with the availability of caves or cave like roosting habitat (Pierson et. al. 1999). While observed use of trees in California (by 2 bats) has raised the possibility that this typically cavern-dwelling species may make use of large hollows in trees, this information does not contradict the lack of habitat and effects in the project area based on the absence of cave-like roosting habitat.

3-46 Comment:

White-headed woodpecker was listed as Sensitive and the FS must therefore disclose impacts in the EIS or in a Biological Evaluation.

Response:

The DEIS (p. 3-135 and 3-136) documents the consideration of the potential for effects on the white-headed woodpecker and further documentation is included in the project file. Additional analysis of dry site habitat and the flammulated owl (a species with similar habitat requirements) is found in the DEIS (p. 3-143 and 3-173 to 3-174). The biological evaluations determination of effects is documented in the DEIS - Appendix F.

3-47 Comment:

… we are unaware of the IPNF having ever established what the range of this bird (white-headed woodpecker) is across the Forest. Please disclose that information, if the IPNF has it.

Response:

The DEIS (p. 3-135 & 3-136) states that any occurrences of white-headed woodpeckers on the IPNF "should probably be considered as vagrants in peripheral range by transient individuals". See also the response to comment #47.

3-48 Comment:

Lofrroth (1997) in a study in British Columbia, found that wolverines use habitats as diverse as tundra and old-growth forest. Wolverines are also known to use mid-to-low elevation Douglas-fir forest in winter (USDA 1993). The DEIS fails to explain why this scientific information should be discounted for the purposed of the Hidden Cedar project.

Response:

The analysis for wolverine is documented in the DEIS (p. 3-166 to 3-167) and in the project file. Use of "…lower elevations in the winter…" is acknowledged and use of the habitats mentioned in this comment is not discounted. However, there is no information that contradicts the determination that territory size requirements, lack of denning habitat, and existing access (i.e. lack of remoteness) is limiting wolverine occurrence/use in the analysis area.

3-49 Comment:

The FS also failed to disclose and analyze the uncertain and precarious population status of fishers, as described in the ICBEMP forest carnivores report…The EIS must include this important information in the analysis.

Response:

The analysis for fisher is documented in the DEIS (p. 3-162 through 3-166) and in the project file. In the DEIS the fisher is acknowledged as a sensitive species that by definition is a "species for which population viability is a concern" (p. 3-161).

3-50 Comment:

The DEIS does not state why 5 to 6 thousand acres is used for the goshawk analysis. Please state why your home range figure is more accurate (than Austin, 1993).

Response:

The analysis for the goshawk is documented in the DEIS (p. 3-167 – 3-171) and in the project file. The DEIS (p. 3-168) states "Goshawk home ranges are approximately 5,000 to 6,000 acres and are recommended for evaluation of potential goshawk suitability (USDA, 1990 and Reynolds, 1992)." The home ranges used in this analysis come from recommendations deemed most applicable for the Northern Region (i.e. USDA, 1990).

3-51 Comment:

The DEIS does not discuss the impacts of the expected loss of canopy in logged areas, whereas canopy cover is an important parameter of goshawk habitat quality.

Response:

Table 3-66 in the DEIS (p. 3-170) displays the changes in goshawk habitat. As explained by the * at the bottom of the table, nest areas with treatment (i.e. reduction in canopy cover) are dropped as suitable nest areas. It also discloses how the various vegetation treatments affect size class changes (p. 3-139) – the goshawk analysis is tiered to the analysis of successional stages/forest structure.

3-52 Comment:

Does the FS propose to bring all the existing roads in the project area up to BMP Standards? If not, the EIS must disclose the impacts of the ongoing watershed and soil problems these out-of-standard roads are causing.

Response:

No, the Forest Service will not bring all existing roads up to BMP standards. In the DEIS on page 3-36, Regulatory Framework, it states that BMPs will be applied to all management activities to meet water quality standards and maintain long-term soil productivity. All new construction and reconstruction will utilize BMPs. The impact of existing roads in the analysis area is modeled in WATSED (details in the project file) and described in Chapter 3 effects analysis for water and soil.

Problems on existing roads were identified in the analysis area. A list of these roads can be found in the project file (project file, Watershed Road Analysis). Problems on these identified roads will be remedied through reconstruction or decommissioning.

3-53 Comment:

The DEIS is also deficient in not including and alternative that addresses <u>all</u> watershed restoration needs in these watersheds on national forest land problems, instead focusing mainly on the roads that are to be used for log hauling and therefore can be included in a timber sale contract.

Response:

Alternatives D and E look at watershed restoration needs identified by the IDT on Forest Service lands and roads where the Forest Service has jurisdiction. Many of the roads identified for watershed restoration are **not** those used for hauling of timber harvest materials. The FEIS spells out road restoration work covered by appropriated dollars in Chapter 2.

3-54 Comment:

The analysis of logging alternatives fails to disclose some important direct and indirect impacts of logging. Damage to trees during logging exacerbates root rots and other active tree pathogens as well as insect attacks.

Response:

Disclosure of expected effect by alternative, including root disease and insects is discussed in the DEIS, pages 3-14 through 3-22.

3-55 Comment:

And the DEIS downplays the increased risk of fire that logging activities cause.

Response:

Disclosure of fire risk or potential is discussed in the DEIS under Environmental Consequences in Fire/Fuel Management, pages 3-199 through 3-201.

3-56 Comment:

The DEIS does not provide enough information to tell if the FS would be in compliance with the new roads policy.

Response:

The roads policy through CFRs 212, 261 and 295 and FSM 7700 and FSM 1920 outline a science based analysis to inform road management decisions by identifying needed and un-needed roads, unneeded roads to decommission, reconstruction and maintenance needs and making the road system less costly or environmentally friendly to maintain. The DEIS identifies in the alternatives the NFSR roads that are needed and those not needed that can be decommissioned and reduced maintenance levels. These are reflected in the management prescriptions of open/A, B, C, maintenance levels. On page 3-26 of the transportation section the Roadless Analysis Process (RAP) is mentioned and the project file is referenced.

3-57 Comment:

The DEIS …fails to disclose the impacts of such development – the significance of these past risky actions (past harvest and roads on sensitive landtypes).

Response:

Roads and harvest activities were included in the WATSED modeling. The DEIS on page 3-40 references the project file for calculations on past activities.

3-58 Comment:

The DEIS states (3-40), "The current level of detrimentally impacted acres for the soil resource is 14.89% of activity areas. This is within the Regional Standards of 15%." Can you please disclose the precise cite where your application of the Regional Standard-seemingly misapplied in this case-is specified?

Response:

USDA Forest Service, 2000 – Forest Service Manual 2500, R1 Supplement 2500-99-1. This is referenced in the Regulatory Framework of Soils in Chapter 3 (see DEIS III-40 and Project File).

3-59 Comment:

The DEIS indicates at page 3-42 that access request roads would be built on "high mass movement potential landtypes." We believe that you should have better alternative for such access, including helicopter access for the logging. What success, based upon past monitoring, can you rely upon to assume that the mitigation and design specifications on such landtypes will result in "no increase in mass movement"?

Response:

This refers to activities on private land. The GIS coverage used for analysis has ***all*** new road construction proposed on both private and federal land. There is new construction occurring on private lands that is not associated with the access requests (see EIS, pg 3-3 Road Building on non-National Forest lands). The 1150' and 370' is construction occurring on private lands and not those private lands associated with the access requests.

Mass Movement Potential: Road construction would occur on **PRIVATE** land on 1150 feet in the Lower St. Maries River subwatershed and 370 feet in the Catspur Creek subwatershed on high mass movement potential landtypes. Road design for these areas should not concentrate water or increase soil-water enough to reduce shear strength and initiate earth movement. This will be accomplished through road outsloping and other drainage design features. This will be clarified in the FEIS.

3-60 Comment:

We are not aware of any monitoring to indicate that decompaction effectively eliminates detrimental soil conditions, or that use of "low ground pressure equipment" (3-43) will completely prevent more adverse impacts on soils.

Response:

Please see the 2000 Monitoring Report pages 52- 54.

3-61 Comment:

Please disclose how the IPNF is acting in compliance with Executive Order 13186, (migratory birds), both with the project and forest-wide.

Response:

The Executive Order on the conservation of migratory birds is directed at agencies and departments and is being addressed above the Forest level. The IPNF (and the project) is complying with existing direction and will comply with future direction regarding migratory birds.

3-62 Comment:

The DEIS does not provide sufficient bases for scientific support for the assumption that white-headed woodpeckers, Townsend's big-eared bats, Canada Lynx and northern leopard frogs do not reside in the project area.

Response:

The basis and scientific support for these determinations are documented in the DEIS and in the project file. The rationale/basis for white-headed woodpeckers can be found in the DEIS on pages 3-135 and 3-146, Townsend's big-eared bat on page 3-135, lynx on pages 3-158 and 3-159, northern leopard frog on page 3-135. Additional information can be found in the project file. See also the responses to comments 3-42 through 3-44 and 3-46 through 3-48.

3-63 Comment:

The DEIS fails to adequately consider the impacts of the proposed project on wildlife habitat connectivity and the functionality of the area as a biologic corridor.

Response:

The analysis for connectivity is documented in the DEIS (p. 3-147 – 3-149) and in the project file. When relevant, connectivity is also addressed under the analysis for species – elk travel on page 3-154 and fisher/marten on pages 3-163 and 3-165. The design features in the DEIS also include measures that address connectivity (pages 2-10 and 2-11).

3-64 Comment:

As fragmentation and disruption of biological corridors may threaten population viability, the lack of appropriate analysis in this regard represents a failure to ensure population viability as required by NFMA.

Response:

See the response to comment 62. Fragmentation is addressed in the DEIS under old growth on pages 3-141 through 3-143 and under connectivity on pages 3-147 through 3-149.

3-65 Comment:

(Population viability) analysis should thoroughly assess the population structure within and beyond the project area.

Response:

An analysis of population structure and metapopulations is beyond the scope of this project level NEPA analysis. Regarding population viability, see DEIS, pg 3-129, Regulatory Framework which states that the Forest Plan is in compliance with NFMA. NFMA requires the Forest Service to maintain viable populations. Also see DEIS page 3-176, Consistency with Forest Plan and Laws. On pages 3-130 – 131 of the DEIS under Analysis Methods: it indicates that the use of capable and suitable habitat is used in evaluating the impacts or effects to species. Appendix F – Summary of Conclusion of Effects for Sensitive Species Biological Evaluation (wildlife) indicates whether or not the project will impact individuals or habitat and contribute to a trend towards listing or loss of viability to the species or population.

3-66 Comment:

The DEIS does not provide any basis for concluding that cumulatively, the proposed new habitat degradation from the Hidden Cedar project will not result in significantly reduced hunting opportunities, and significant failures to meet state goals and objectives and Forest Plan requirements for big game.

Response:

The DEIS documents the analysis for elk on pages 3-153 – 3-158. The analysis for disturbance/access is documented on pages 3-144 – 3-147. The DEIS specifically addresses cumulative effects on elk on pages 3-156 – 3-158.

3-67 Comment:

There is not enough information in the DEIS to determine if VQOs are met.

Response:

VQOs – on page 3-195 of the DEIS it is indicated that VQO standards are being met. Harvest units silvicultural prescriptions were used that would meet VQOs (pg 3-195 under Timber Harvest Activities. In Chapter 2 on page 2-17 there is site-specific mitigation to maintain visual quality.

3-68 Comment:

Tables used to summarize impact on fisheries and streams, such as 3-35, etc. suffer from the lack of any meaningful explanation of the terms and units.

Response:

Tables 3-35 through 3-47 identify all the ongoing and proposed activities on federal and non-federal lands that were taken into consideration during the analysis of cumulative effects for the individual drainages. Explanations of the terms and units were added in the FEIS.

3-69 Comment:

The DEIS fails to disclose the sediment yield due to simply increasing use of the roads due to logging and administrative traffic.

Response:

To mitigate effects from traffic, timber haul routes are either graveled or have some dust abatement treatment applied to the surfacing which may show a decrease in sediment from the road surface (personal communication with Civil Engineering Technicians on South Zone). See DEIS, page 2-12 Road- Sediment Control, under Design Features and Mitigation Common to the Action Alternatives.

3-70 Comment:

Same as comment 2-1.

3-71 Comment:

The DEIS fails to demonstrate the project will be in compliance with Forest Plan fry emergence Standard.

There is no reference in DEIS to validation monitoring, that compares the existing situation with predicted values in IPNF Plan.

Response:

DEIS page 3-67 discusses the fry emergence standard and the reason that the standard is not applicable to the streams in the project area. Full reference is in the FEIS, Appendix G. Validation monitoring would not apply.

3-72 Comment:

There is no reference in the DEIS to any quantitative monitoring to support the conclusions that the BMPs employed will be effective in protecting the beneficial uses of the affected streams and provide conformance with the Forest Plan monitoring requirements.

Response:

The effectiveness of BMPs is documented in Seyedbagheri (1996). This has been added to the list of citations. Also Forest Plan Monitoring Reports are another reference used for analysis. The DEIS has two reports (1996 and 1998 IPNF Monitoring Report) listed in the citations at the end of the DEIS. The IPNF Forest Plan Monitoring Report – 2000 has been added to the list of citations. These citations that were used for analysis will be referenced in the soil and water section on page 3-58 under Forest Plan Consistency. BMPs and their development include feedback from many sources. Effectiveness of BMPs are looked at during timber sale reviews.

3-73 Comment:

The DEIS's assumption that the combination of the planned watershed restoration in combination with the logging and additional road construction will result in a net benefit to the watersheds also qualifies for quantitative effectiveness monitoring.

Response:

See discussion on pg 3-45 of the EIS under Consistency with Forest Plan and Laws. The State of Idaho DEQ will establish quantitative criteria for sediment during TMDL development. TMDLs for streams in this area are not scheduled until 2002. TMDLs will likely require monitoring. See answer to comment 3-71 regarding monitoring.

3-74 Comment:

Same as comment 2-5.

3-75 Comment:

As far as we are aware, the IPNF has not identified all key and special emphasis watersheds – only the "priority" watersheds identified soon after INFISH was adopted by Forest Plan amendment.

Response:

Project file document "**Key and Priority Watershed Task Team Report"** dated July 15, 1999 identifies key and special emphasis watersheds.

3-76 Comment:

We have also not seen an "improved monitoring strategy" put forth by the IPNF.

Response:

The IPNF set up the TRACKS system to look at project implementation monitoring. This applies to all projects after 10/1/99. Also the IPNF set up Corporate Monitoring Data to be displayed in all projects (see chapter 2, pgs 2-23 through 2-26). Information from the core data tables of each project is also reported in the Forest Plan Monitoring Report.

3-77 Comment:

The actual direct and indirect effects to the streams systems cannot be assessed, unless the current stream rates, and bed loads, suspended loads, and siltation loads are measured…There must also be estimated changes to stream rates and sediment loads for each alternative and proposed tree extraction method.

Response:

See the effects analysis on DEIS pages 3-44 (Table 3-21); 3-45, 3-54 (Table 3-24), 3-55 (Table 25) and 3-56 (Table 3-28), and 3-57 and 3-58. Estimated water yield and sediment changes are discussed on these pages.

3-78 Comment:

With 20% of Hidden Creek surveyed, how do you determine the impact to the stream system with this low of a number.

Response:

The existing condition for Hidden Creek is described on pages 3-78 and 3-79. Although only 20% is surveyed, the section surveyed is the channel type most susceptible to influences of human activity.

3-79 Comment:

The DEIS fails to provide a claimed "need" to provide access…..

Response:

Page 1-4 of the DEIS states as one of the components of the Purpose and Need:

"**E. Provide Access.** Since the project area contains lands owned by private individuals, private corporations, and the State of Idaho, coordination of road design, operations and maintenance should occur to provide reasonable access."

The purpose is to provide "reasonable access" for existing cost share agreements, and this can be found in Forest Plan direction, FS policy, regulations, and laws. In the No Action alternative, there is a discussion on no road construction (page 3-30).

3-80 Comment:

The DEIS does not analyze a full range of alternatives, because it does not include all watershed restoration and other means of access or denying access.

Response:

Alternative E is all watershed restoration. It has no timber harvest. Alternative A (no action) does not provide access across Forest Service land to private inholdings and has no timber harvest.

3-81 Comment:

The FS needs to clearly state the planned engineering of the roads that will have the ability to reduce the impact roads have on our national forests.

Response:

All new and temporary NFS roads will be put into road management prescriptions C, D, or E. All alternatives shift miles of open and road prescription A and B roads to prescription C, D, or E. On page 2-12, Design Features for all action alternatives (ROADS), states reconstruction = "could be rebuilt to its approved traffic service level or improved to increase safety, operational efficiency or resource protection." Additional discussion reflects that for this document some road maintenance activities (new 7705 definitions) are included as reconstruction.

3-82 Comment:

If roads that have been naturally closed through revegetation, why would there be considerations of reopening them? (This is relative to the design criteria for pre-commercial thinning).

Response:

This design feature is specific to the proposed pre-commercial thinning. This activity would be implemented prior to any proposed road obliteration/storage. The intent of the design feature is to determine if the "natural closure" is the desired condition and if opening it (for pre-commercial thinning) is consistent with other resource objectives for a particular road. One thing that bears mentioning is that a 'naturally closed' road may not be in the desired condition. For example, there may be culverts that constitute an unacceptable risk to the watershed/fisheries resource.

3-83 Comment:

What will be the likely noxious weed scenario in the project area in five years? In ten years? In 20 years? In 50 years?

Response:

The extent of weed infestations short-term vs. long-term is difficult to quantify. This varies by weed species, levels of activity and disturbance, policy changes and degree of weed abatement by adjoining landowners along with federal staffing, and funding. It is unknown as to when weed species first appeared in the project area, however, the Invaders Database (Rice, 2000) does provide a record of when they were first recorded in Latah and Shoshone Co. (this information has been added to the FEIS – existing condition). In the short term, project activities are expected to pose the greatest risk in the potential to **introduce new invaders** but **not in the enlargement of existing weed populations**. Initial populations are usually easy to eradicate if caught quickly. So the extent to which the proposed activity will contribute to the **expansion** of weed populations and the ability of the Forest Service to contain or reduce their extent is unknown. Effectiveness monitoring established with the St. Joe Noxious Weed Control EIS will allow us to gauge the effectiveness of our control efforts so that we can tailor our treatments for the best results.

3-84 Comment:

The Hidden Cedar DEIS cannot be tiered to another project-specific EIS. A full analysis of direct, indirect, and cumulative effects of noxious weed control actions must be disclosed in the DEIS.

Response:

The St. Joe Noxious Weed Control EIS is a broad document. While it does include specific sites for noxious weed control, treatment of these sites is not mandatory. The EIS merely provides a framework and a way of prioritizing them should they be conducted. Several of these sites are large, up to 15,000 acres in size. The EIS also provides for an adaptive management strategy that allows weed treatment to be done on previously undelineated sites, provided certain conditions are met. Taken in total the St. Joe Noxious Wed Control EIS exists as a way to direct the noxious weed program on the St. Joe Ranger District. Therefore, it is a broad spectrum EIS that can be tiered to.

3-85 Comment:

Nowhere in the DEIS does the FS offer such information. How will the owner enjoy the land? How many acres will be harvested?

Response:

In the project file – Access request documentation – is information on what the landowner is planning on doing on their land.

3-86 Comment:

The DEIS fails to document that State of Idaho and potlatch tried and exhausted all other legal recourses and methods (to access their land).

Response:

In terms of cost share and developing joint transportation systems, they are not required to exhaust all other possibilities. The roads that are access requests fall into cost-share and joint transportation systems (Forest Plan II-10, II-35).

3-87 Comment:

The FEIS must supply accurate high quality analysis regarding the impacts to fisheries that would occur on the National Forest lands if 5.4 miles of new road construction does take place on Potlatch Corporation lands and State of Idaho lands. The FEIS must also indicate whether the ANILCA Act supersedes the requirements of the CWA.

Response:

See response to comments 1-20 and 1-21.

3-88 Comment:

Same as comment 1-1.

3-89 Comment:

In regards to meeting FP standards for MA's 4, 5, and 16, does the harvest acreage per prescription when added to other past timber harvesting project exceed the IPNF FP Standards set forth for each decade for each MA?

Response:

This is not a Forest Plan Standard. These are FORPLAN projections.

DEIS, pg 3-23 indicates that the all action alternatives are consistent with timber management guidelines in the Forest Plan pgs II-2, II-8 and II-32 and comply with Appendix A, that provides direction for silvicultural practices.

DEIS, pg 3-186 indicates that all proposed alternatives would meet the intent of the Forest Plan.

3-90 Comment:

Are allocated road construction, reconstruction, reforestation, fish habitat improvements, and VQOs standards being met? If so, where are they indicated?

Response:

Construction/reconstruction – In the transportation section (pg 3-25) is a reference to Chapter 2 and Forest Plan standards. On pg 2-12 of the DEIS are the design criteria used in this project to meet Forest Plan standards.

Reforestation -Page 3-23 states that standards are being met and Chapter 2 (pg 2-6) lists activities common to action alternatives that will take place to make sure reforestation standards will be met.

Fish habitat – on page 3-128 indicates compliance with Forest Plan standards, and design criteria in Chapter 2 (pg 2-13) are used to meet standards.

VQOs – on page 3-195 of the DEIS it is indicated that VQO standards are being met. Harvest units silvicultural prescriptions were used that would meet VQO's (pg 3-195 under Timber Harvest Activities. In Chapter 2 on page 2-17 there is site specific mitigation to maintain visual quality.

3-91 Comment:

The DEIS completely disregarded anything to do with what it considers to be unquantifiable economic and cost considerations, in violation of the requirement that an EIS /should at least indicate those consideration…"

Response:

The regulatory requirements for the financial analysis are disclosed in the DEIS and FEIS.

3-92 Comment:

To meet the letter and intent of NFMA, the FS must analyze the market and non-market benefits of unlogged forests in the project area.

Response:

As stated in the Finance section of the EIS, the value of unlogged forest is measured in the other resource sections of the EIS.

3-93 Comment:

The DEIS infers that this timber sale will be above cost and capable of generating trust fund dollars for other projects. This is partially because costs such as analysis of the environmental effects of logging, administration of the timber sale, and mitigation of damage from past logging and road building are not included. The General Accounting Office investigated this practice and concluded that these costs are logging related and therefore must be included in the economic analysis.

Response:

As stated in the EIS, the financial analysis is used to determine the economic feasibility of the timber sale, not to determine the overall cost of every aspect of the project from beginning to end. Costs of analysis and administration of the timber sale do not affect the salability of the timber. Costs of mitigation of past logging and road building that affect the value of the timber sale are included in the analysis.

3-94 Comment:

In failing to disclose an accurate cost/benefit analysis based upon current market conditions, the DEIS provides extremely misleading economic information to the public…

Response:

The financial analysis provides information as to the likelihood that the timber sales would sell and that the costs of planned activities would be adequately financed given the depressed market conditions at the time the analysis was done.

3-95 Comment:

The Garnet Stars and Sands Mineral exploration will have an obvious long-term effect on this area. We would like to see how these two projects would have a cumulative effect on the area's stream systems.

Response:

See DEIS page 3-52 in the soil and water section for cumulative effects. As stated on pg 3-2 at the beginning of Chapter 3 of the EIS, mitigation and design criteria will be developed to minimize environmental disturbance. The above mentioned project must incorporate the endangered species act, clean water act and other regulations. .

3-96 Comment:

Why did the FS leave out further explanation of this project and its relation to the Hidden Cedar project?

Response:

On page 1-4, Chapter 1, heading Scope of the Project is the first mention of the Garnet Stars and Sands Mineral explorations. In Chapter 3, page 3-2 is a detailed description of the project. Because the project is in the very beginning stages, we took the best guess as to the proposed activities. IDT members used a worst case scenario in their effects analysis, because it is not known how many of the proposed activities will actually take place.

3-97 Comment:

We request that you again read that January 25, 2000 letter, note any disparities or omissions between those issues and concerns and the DEIS's analyses, and address them before making a final decision.

Response:

The January 25th letter is not site specific to the Hidden Cedar Project area. Many of the concerns are appropriately addressed at the Forest Plan scale. The interdisciplinary team is familiar with your letter and the issues raised and have addressed them at the appropriate scale and level of detail as it fits with the Hidden Cedar proposal.

APPENDIX A - VEGETATION TREATMENT SUMMARY

Alternative B - Vegetation Treatment Summary

GB=ground base; C-S = cable/skyline; H = helicopter

Unit	Acre	MA	Drainage	Silvicultural and FuelsTreatment Description	Existing % Crown Closure	Estimated % Retained Crown Closure	Logging Method
1	39.5	1	Blair Creek Merry Creek	Shelterwood seed cut; retaining a Basal Area of approx. 25-30 sq.ft./ac. *Broadcast burn*	75	20	C-S/GB
2	29.0	4	W.Fork St. Maries St. Maries River (4)	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. There will be a 100' "no treat" buffer between highway and east end of unit. *Broadcast burn*	70	45-50	C-S
3	33.3	4	St. Maries River (4)	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. Openings will be restricted to ≤ 1 acre in size. *Grapple pile and Hand pile*	75	45-50	C-S/GB
4	20.5	4	St. Maries River (4)	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. Openings will be restricted to ≤ 1 acre in size. *Grapple pile*	70-75	45-50	C-S/GB
5	19.4	4	St. Maries River (4)	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac. *Grapple pile and Hand pile*	65	45-50	C-S/GB
6	15.9	4	St. Maries River (4)	Shelterwood Removal Cut; retaining a Basal Area of approx. 35-40 sq.ft./ac., or approx. 35-45 overstory trees/ac. *Lopping*	75	35-40	C-S/GB
7	19.0	1	Cedar Creek	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. *Grapple pile*	75-80	50	C-S/GB
8	22.3	1	Cedar Creek Kitten Cr. (< 1%)	Irregular shelterwood cut; generally CT but will have variable BA retention and openings of up to 1.5-2 tree lengths in size in disease centers. *Grapple pile and lopping*	75-80	45-50	C-S/GB
9	51.2	4	Cedar Creek	Irregular shelterwood cut; generally CT but will have variable BA retention (average of 140 sq.ft./ac.) and openings of 3-5 ac. in size in root rot & other disease centers. *Grapple pile*	70-80	50	C-S/GB
10	32.7	4	Cedar Creek	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of 3-5 acres in size, and remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. B *Grapple pile & broadcast burn*	75-85	45	H
11	10.4	4	Cedar creek	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of 3-5 acres in size, and remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. BA. *Grapple pile & Broadcast burn*	75-85	45-50	H
12	10.3	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 100 sq.ft./ac. *Grapple pile*	70-75	45-50	H
13	35.6	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac. *Grapple pile*	65-70	45-50	H
14	14.8	4	Cedar creek	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac. *Grapple pile*	80-85	45-50	C-S/H
15	29.4	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac. *Grapple pile*	85-90	50-55	C-S/GB
16	109.6	1	Cedar creek Kitten Creek (<1%)	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac. *Grapple pile and Lopping*	85-90	50-55	C-S/GB
17	120.4	1	Cedar Creek Kitten Creek (<1%)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac. *Grapple pile and Lopping*	75-80	50-55	C-S/GB
18	37.0	1	St. Maries River (4)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac. *Grapple pile and Lopping*	75-80	50-55	C-S/GB
19	18.5	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx.120 sq.ft./ac. *Grapple pile*	70-75	50-55	C-S/GB
20	13.6	4	Cedar Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area. *Broadcast burn*	65-70	5	H
21	5.8	4	Cedar Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area. *Broadcast bunr*	65-70	5	H
22	15.3	4	Cedar creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area. *Broadcast burn*	80-85	5	C-S/GB
23	10.7	4	Cedar Creek St. Maries R.4 (<1%)	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area. *Grapple pile*	80	5	C-S/GB
24	11.4	1	W.Fork St. Maries	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area. *Broadcast burn*	70-75	5	C-S

Unit	Acre	MA	Drainage	Silvicultural and FuelsTreatment Description	Existing % Crown Closure	Estimated % Retained Crown Closure	Logging Method
25	15.8	1	W.Fork St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 100-120 sq.ft./ac. *Lopping*	65	50	H
26	21.9	1	W.Fork St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. :*Lopping & Hand pile*	75-80	45-50	H
27	19.2	1	W. Fork St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. Openings restricted to ≤ 1.5 acres in size. *Grapple pile*	75-80	50	C-S/GB
28	28.1	4	W. Fork St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1 acre in size *Lopping*	80-85	50	C-S
29	10.5	1 & 4	W. Fork St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1.5 acre in size *Hand pile*	80	50	H
30	130.7	1 & 4	West Fk St. Maries 50%) Mazie Creek (50%)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./acre and feathering 2 tree lengths width along north and west boundary. *Grapple pile*	70-75	50-55	GB/C-S/H
31	15.2	1	W. Fork St. Maries Mazie Creek	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac. *Grapple pile*	70	50-55	GB/C-S
32	10.9	1	Mazie Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area *Broadcast burn*	65	5	GB/C-S
33	9.4	4	Hidden Creek	Shelterwood Preparatory Cut; retaining a Basal area of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1 acre in size *Jackpot burn*	80-85	50-55	C-S/GB
34	18.3	4	Hidden Creek	Commercial Thinning; retaining a Basal Area of approx. 90-100 w/ ave. spacing of 20-21 ft, openings restricted to ≤ 1 acres and feathering 100' strip along southern boundary. *Grapple pile*	70-75	50-55	C-S/GB
35	15.4	4	Hidden Creek Wood Cr	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of ≤ 3 acres in size AND feather edges for 50' to soften edge appearance; remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. BA *Jackpot burn*	65-70	45	H/GB
36	9.9	4	Wood Cr	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac. *Grapple pile*	70-75	50-55	GB/C-S
37	20.6	4	Hdden Cr Wood Cr	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac. *Grapple pile*	80-85	50-55	H
38	38.4	4	Hidden Cr	Commercial Thinning; retaining a Basal Area of approx. 110-120 sq.ft./ac., openings restricted to ≤ 1 acre in size, feather approx. 100 ' along southern boundary. *Grapple pile*	75	50	GB/C-S
39	22.2	4	Hidden cr	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac. :*Lopping*	75-80	50-55	H
40	6.1	4	W. Fork St. Maries	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./acr., openings restricted to ≤ 2 acres in size, irregular density. *Grapple pile*	80-85	50	H
41	46.6	4	Hidden Creek (50%) West Fk St. Maries (50%)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., irregular density, 200' no treat buffer along southern edge next to highway, 50-75 foot feathering along no treat buffer. *Grapple pile and Hand pile*	80	50-55	H
42	5.7	4	Hidden cr	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac., 200' no treat buffer along southern & eastern edge next to highway, 50-75 foot feathering along the no treat buffer. *Grapple pile*	85-90	50-55	H
43	11.7	4	Hidden Cr	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac. *Grapple pile*	80	45-50	H
44	22.6	4	Hidden Cr W. Fork St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac., 200' no treat area along highway at northwest bdy. and 50-75' feathering along this unit edge. *Grapple pile*	75	50-55	H
45	9.0	4	W. Fork St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., 50-75' feathering along the northern boundary. *Grapple pile*	75-80	50-55	H/C-S
46	17.5	4	Hidden Cr	Clearcut w/reserves; removing approx. 90-95% of current basal area. *Broadcast burn*	65-70	5	C-S
47	30.8	4	Hidden Cr	Clearcut w/reserves; removing approx. 90-95% of current basal area. *Broadcast burn*	75	5	C-S/GB
48	13.8	4	W. Fork St. Maries	Clearcut w/reserves; removing approx. 90-95% of current basal area. *Broadcast burn*	75-80	5	GB
49	73.9	1	Keeler Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac. *Grapple pile*	80	50	C-S/GB
52	15.7	1	W. Fork St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., variable density. Openings restricted to ≤ 1 acre in size. *Grapple pile*	70-75	45	C-S/GB

Note: 1) Existing and estimated retained crown closure is **weighted values** for unit Overall. 2) Fuels reduction method is in *italics. Acres for each unit is in the PROJECT FILE-Fuels.* 3) Includes pre-commercial thinning, see page A-8

Alternative C - Vegetation Treatment Summary

GB=ground base; C-S = cable/skyline; H = helicopter

Unit	Acre	MA	Drainage	Treatment Description And Summary	Existing % Crown Closure	Estimated % Retained Crown Closure	Logging Method
1	39.5	1	Blair Creek, Merry Creek	Shelterwood seed cut; retaining a Basal Area of approx. 25-30 sq.ft./ac.	75	20	GB/C-S
2	29.0	4	West Fk. St. Maries St. Maries River (4)	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. There will be a 100' "no treat" buffer between highway and east end of unit.	70	45-50	C-S
3	33.3	4	St. Maries River (4)	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. Openings will be restricted to ≤ 1 acre in size.	75	45-50	H
4	20.5	4	St. Maries River (4)	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. Openings will be restricted to ≤ 1 acre in size.	70-75	45-50	H
5	19.4	4	St. Maries River (4)	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac.	65	45-50	H/S
6	15.9	4	St. Maries River (4)	Shelterwood Removal Cut; retaining a Basal Area of approx. 35-40 sq.ft./ac., or approx. 35-45 overstory trees/ac.	75	35-40	H
7	19.0	1	Cedar Creek	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac.	75-80	50	H/C-S/GB
8	22.3	1	Cedar Creek Kitten Cr. (< 1%)	Irregular shelterwood cut; generally CT but will have variable BA retention and openings of up to 1.5-2 tree lengths in size in disease centers.	75-80	45-50	H
9	51.2	4	Cedar Creek	Irregular shelterwood cut; generally CT but will have variable BA retention (average of 140 sq.ft./ac.) and openings of 3-5 ac. in size in root rot & other disease centers.	70-80	50	H
10	32.7	4	Cedar Creek	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of 3-5 acres in size, and remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. BA	75-85	45	H
11	10.4	4	Cedar creek	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of 3-5 acres in size, and remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. BA.	75-85	45-50	H
12	10.3	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 100 sq.ft./ac.	70-75	45-50	H
13	35.6	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	65-70	45-50	H
14	14.8	4	Cedar creek	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac.	80-85	45-50	C-S/ H
15	29.4	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	85-90	50-55	H /C-S
16	109.6	1	Cedar creek Kitten Creek (<1%)	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac.	85-90	50-55	H
17	120.4	1	Cedar Creek Kitten Creek (<1%)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	75-80	50-55	H
18	37.0	1	ST. Maries River (4)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	75-80	50-55	H /C-S/GB
19	18.5	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac.	70-75	50-55	H
20	13.6	4	Cedar Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	65-70	5	H
21	5.8	4	Cedar Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	65-70	5	H
22	15.3	4	Cedar creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	80-85	5	H
23	10.7	4	Cedar Creek St. Maries R.4 (<1%)	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	80	5	H
24	11.4	1	West Fk. St. Maries	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	70-75	5	C-S
25	15.8	1	West Fk. St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 100-120 sq.ft./ac.	65	50	H
26	21.9	1	West Fk. St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac.	75-80	45-50	H
27	19.2	1	West Fk. St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. Openings restricted to ≤ 1.5 acres in size.	75-80	50	C-S/GB
28	28.1	4	West Fk. St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1 acre in size	80-85	50	C-S

Unit	Acre	MA	Drainage	Treatment Description And Summary	Existing % Crown Closure	Estimated % Retained Crown Closure	Logging Method
29	10.5	1 & 4	West Fk. St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1.5 acres in size.	80	50	H
30	130.7	1 & 4	West Fk. St. Maries River (50%) Mazie Creek (50%)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./acre and feathering 2 tree lengths width along north and west boundary.	70-75	50-55	H
31	15.2	1	West Fk. St. Maries Mazie Creek	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac.	70	50-55	H
32	10.9	1	Mazie Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area	65	5	H
33	9.4	4	Hidden Creek	Shelterwood Preparatory Cut; retaining a Basal area of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1 acre in size	80-85	50-55	H
34	18.3	4	Hidden Creek	Commercial Thinning; retaining a Basal Area of approx. 90-100 w/ ave. spacing of 20-21 ft, openings restricted to ≤ 1 acres and feathering 100' strip along southern boundary.	70-75	50-55	H
35	15.4	4	Hidden Creek Wood Cr	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of ≤ 3 acres in size AND feather edges to soften edge appearance; remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. BA	65-70	45	H/GB
36	9.9	4	Wood Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	70-75	50-55	GB/H
37	20.6	4	Hidden Creek Wood Creek	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac.	80-85	50-55	H
38	38.4	4	Hidden Creek	Commercial Thinning; retaining a Basal Area of approx. 110-120 sq.ft./ac., openings restricted to ≤ 1 acre in size, feather approx. 100 ' along southern boundary.	75	50	H
39	22.2	4	Hidden cr	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac.	75-80	50-55	H
40	6.1	4	West Fk. St. Maries	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./acr., openings restricted to ≤ 2 acres in size, irregular density.	80-85	50	H
41	46.6	4	Hidden Creek (50%) West Fk. St. Maries (50%)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., irregular density, 200' no treat buffer along southern edge next to highway, 50-75 foot feathering along no treat buffer.	80	50-55	H
42	5.7	4	Hidden Creek	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac., 200' no treat buffer along southern & eastern edge next to highway, 50-75 foot feathering along the no treat buffer.	85-90	50-55	H
43	11.7	4	Hidden Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	80	45-50	H
44	22.6	4	Hidden Creek West Fk. St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac., 200' no treat area along highway at northwest bdy. and 50-75' feathering along this unit edge.	75	50-55	H
45	9.0	4	West Fk. St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., 50-75' feathering along the northern boundary.	75-80	50-55	H/C-S
46	17.5	4	Hidden Creek	Clearcut w/reserves; removing approx. 90-95% of current basal area.	65-70	5	C-S
47	30.8	4	Hidden Creek	Clearcut w/reserves; removing approx. 90-95% of current basal area.	75	5	H/C-S
48	13.8	4	West Fk. St. Maries	Clearcut w/reserves; removing approx. 90-95% of current basal area.	75-80	5	GB
49	73.9	1	Keeler Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	80	50	H
50	11.5	1	Keeler Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq,ft,/ac *Handpile.*	80-85	50-55	H
51	16.4	1	Keeler Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac. *Handpile*	85	50-55	H
52	15.7	1	West Fk. St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., variable density. Openings restricted to ≤ 1 acre in size.	70-75	45	C-S/GB

Note: 1) Existing and estimated retained crown closure are **weighted values** for unit overall. 2) Fuels reduction methods same as B for all units. Methods for units 50 and 51 are indicated above 3) Includes pre-commercial thinning see page A-8.

Alternative D - Vegetation Treatment Summary

GB=ground base; C-S = cable/skyline; H = helicopter

Unit	Acre	MA	Drainage	Treatment Description And Summary	Existing % Crown Closure	Estimated % Retained Crown Closure	Logging Method
2	29.0	4	West Fk St. Maries St. Maries River (4)	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. There will be a 100' "no treat" buffer between highway and east end of unit.	70	45-50	C-S
10	32.7	4	Cedar Creek	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of 3-5 acres in size, and remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. BA	75-85	45	H
11	10.4	4	Cedar Creek	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of 3-5 acres in size, and remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. BA.	75-85	45-50	H
12	10.3	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 100 sq.ft./ac.	70-75	45-50	H
13	35.6	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	65-70	45-50	H
14	14.8	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac.	80-85	45-50	C-S/H
15	29.4	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	85-90	50-55	H / C-S
20	13.6	4	Cedar Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	65-70	5	H
21	5.8	4	Cedar Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	65-70	5	H
22	15.3	4	Cedar Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	80-85	5	H
24	11.4	1	West Fk St. Maries	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	70-75	5	C-S
26	21.9	1	West Fk St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac.	75-80	45-50	H
27	19.2	1	West Fk St. Maries	Shelterwood Prep Cut; retaining a BA of approx. 120-140 sq.ft./ac. Openings restricted to ≤ 1.5 acres.	75-80	50	C-S/GB
28	28.1	4	West Fk St. Maries	Shelterwood Prep Cut; retaining a BA of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1 acre.	80-85	50	C-S
29	10.5	1 & 4	West Fk St. Maries	Shelterwood Prep Cut; retaining a BA of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1.5 acre.	80	50	H
33	9.4	4	Hidden Creek	Shelterwood Prep Cut; retaining a BA of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1 acre.	80-85	50-55	H
39	22.2	4	Hidden Creek	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac.	75-80	50-55	H
40	6.1	4	West Fk St. Maries	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./acr., openings restricted to ≤ 2 acres in size, irregular density.	80-85	50	H
41	46.6	4	Hidden Creek (50%) West Fk St. Maries (50%)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., irregular density, 200' no treat buffer along southern edge next to highway, 50-75 foot feathering along no treat buffer.	80	50-55	H
42	5.7	4	Hidden Creek	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac., 200' no treat buffer along southern & eastern edge next to highway, 50-75 foot feathering along the no treat buffer.	85-90	50-55	H
43	11.7	4	Hidden Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	80	45-50	H
44	22.6	4	Hidden Creek West Fk St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac., 200' no treat area along highway at northwest bdy. and 50-75' feathering along this unit edge.	75	50-55	H
45	9.0	4	West Fk St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., 50-75' feathering along the northern boundary.	75-80	50-55	H/C-S
46	17.5	4	Hidden Creek	Clearcut w/reserves; removing approx. 90-95% of current basal area.	65-70	5	C-S
47	30.8	4	Hidden Creek	Clearcut w/reserves; removing approx. 90-95% of current basal area.	75	5	H / C-S
48	13.8	4	West Fk St. Maries	Clearcut w/reserves; removing approx. 90-95% of current basal area.	75-80	5	H
49	73.9	1	Keeler Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	80	50	H
50	11.5	1	Keeler Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq,ft,/ac.	80-85	50-55	H
51	16.4	1	Keeler Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	85	50-55	H
52	15.7	1	West Fk St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., variable density. Openings restricted to ≤ 1 acre in size.	70-75	45	C-S/GB

Note: 1) Existing and estimated retained crown closure are **weighted values** for unit overall. 2) fuels reduction treatments are the same as listed for units in alternatives B and C. 3) Includes pre-commercial thinning, see page A-8.

Alternative F - Vegetation Treatment Summary

GB=ground base; C-S = cable/skyline; H = helicopter

Unit	Acre	MA	Drainage	Treatment Description And Summary	Existing % Crown Closure	Estimated % Retained Crown Closure	Logging Method
1	39.5	1	Blair Creek Merry Creek	Shelterwood seed cut; retaining a Basal Area of approx. 25-30 sq.ft./ac.	75	20	C-S/GB
2	29.0	4	W.Fork St. Maries St. Maries River (4)	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. There will be a 100' "no treat" buffer between highway and east end of unit.	70	45-50	C-S
3	33.3	4	St. Maries River (4)	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. Openings will be restricted to ≤ 1 acre in size.	75	45-50	C-S/GB
4	20.5	4	St. Maries River (4)	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. Openings will be restricted to ≤ 1 acre in size.	70-75	45-50	C-S/GB
5	19.4	4	St. Maries River (4)	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac.	65	45-50	C-S/GB
6	15.9	4	St. Maries River (4)	Shelterwood Removal Cut; retaining a Basal Area of approx. 35-40 sq.ft./ac., or approx. 35-45 overstory trees/ac.	75	35-40	C-S/GB
7	19.0	1	Cedar Creek	Shelterwood preparatory cut; retaining a Basal Area of approx. 120-140 sq.ft./ac.	75-80	50	C-S/GB
8	22.3	1	Cedar Creek Kitten Cr. (< 1%)	Irregular shelterwood cut; generally CT but will have variable BA retention and openings of up to 1.5-2 tree lengths in size in disease centers.	75-80	45-50	C-S/GB
10	32.7	4	Cedar Creek	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of 3-5 acres in size, and remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. BA	75-85	45	H
11	10.4	4	Cedar creek	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of 3-5 acres in size, and remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. BA.	75-85	45-50	H
12	10.3	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 100 sq.ft./ac.	70-75	45-50	H
13	35.6	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	65-70	45-50	H
14	14.8	4	Cedar creek	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac.	80-85	45-50	C-S/H
15	29.4	4	Cedar Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	85-90	50-55	H
16	109.6	1	Cedar creek Kitten Creek (<1%)	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac.	85-90	50-55	C-S/GB
17	120.4	1	Cedar Creek Kitten Creek (<1%)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	75-80	50-55	C-S/GB
18	37.0	1	St. Maries River (4)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	75-80	50-55	C-S/GB
20	13.6	4	Cedar Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	65-70	5	H
21	5.8	4	Cedar Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	65-70	5	H
24	11.4	1	W.Fork St. Maries	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area.	70-75	5	C-S
25	15.8	1	W.Fork St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 100-120 sq.ft./ac.	65	50	H
26	21.9	1	W.Fork St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac.	75-80	45-50	H
27	19.2	1	W. Fork St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. Openings restricted to ≤ 1.5 acres in size.	75-80	50	C-S/GB
28	28.1	4	W. Fork St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1 acre in size	80-85	50	C-S
29	10.5	1 & 4	W. Fork St. Maries	Shelterwood Preparatory Cut; retaining a Basal Area of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1.5 acre in size	80	50	H
30	130.7	1 & 4	West Fk St. Maries 50%) Mazie Creek (50%)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./acre and feathering 2 tree lengths width along north and west boundary.	70-75	50-55	GB/C-S/H
31	15.2	1	W. Fork St. Maries Mazie Creek	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac.	70	50-55	GB/C-S

Unit	Acre	MA	Drainage	Treatment Description And Summary	Existing % Crown Closure	Estimated % Retained Crown Closure	Logging Method
32	10.9	1	Mazie Creek	Clearcut w/reserves; removing approx. 90-95% of existing Basal Area	65	5	GB/C-S
33	9.4	4	Hidden Creek	Shelterwood Preparatory Cut; retaining a Basal area of approx. 120-140 sq.ft./ac. and openings restricted to ≤ 1 acre in size	80-85	50-55	C-S/GB
34	18.3	4	Hidden Creek	Commercial Thinning; retaining a Basal Area of approx. 90-100 w/ ave. spacing of 20-21 ft, openings restricted to ≤ 1 acres and feathering 100' strip along southern boundary.	70-75	50-55	C-S/GB
35	15.4	4	Hidden Creek Wood Cr	Group Shelterwood Harvest; approx. 1/3 to ½ of stand would be in openings of ≤ 3 acres in size AND feather edges for 50' to soften edge appearance; remainder of stand would be CT retaining approx. 120-140 sq.ft./ac. BA	65-70	45	H/GB
36	9.9	4	Wood Cr	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	70-75	50-55	GB/C-S
37	20.6	4	Hdden Cr Wood Cr	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac.	80-85	50-55	H
38	38.4	4	Hidden Cr	Commercial Thinning; retaining a Basal Area of approx. 110-120 sq.ft./ac., openings restricted to ≤ 1 acre in size, feather approx. 100 ' along southern boundary.	75	50	GB/C-S
39	22.2	4	Hidden cr	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac.	75-80	50-55	H
40	6.1	4	W. Fork St. Maries	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./acr., openings restricted to ≤ 2 acres in size, irregular density.	80-85	50	H
41	46.6	4	Hidden Creek (50%) West Fk St. Maries (50%)	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., irregular density, 200' no treat buffer along southern edge next to highway, 50-75 foot feathering along no treat buffer.	80	50-55	H
42	5.7	4	Hidden Cr	Commercial Thinning; retaining a Basal Area of approx. 140 sq.ft./ac., 200' no treat buffer along southern & eastern edge next to highway, 50-75 foot feathering along the no treat buffer.	85-90	50-55	H
43	11.7	4	Hidden Cr	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	80	45-50	H
44	22.6	4	Hidden Cr W. Fork St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120 sq.ft./ac., 200' no treat area along highway at northwest bdy. and 50-75' feathering along this unit edge.	75	50-55	H
45	9.0	4	W. Fork St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., 50-75' feathering along the northern boundary.	75-80	50-55	H/C-S
46	17.5	4	Hidden Cr	Clearcut w/reserves; removing approx. 90-95% of current basal area.	65-70	5	C-S
47	30.8	4	Hidden Cr	Clearcut w/reserves; removing approx. 90-95% of current basal area.	75	5	C-S/GB
48	13.8	4	W. Fork St. Maries	Clearcut w/reserves; removing approx. 90-95% of current basal area.	75-80	5	GB
49	73.9	1	Keeler Creek	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac.	80	50	C-S/GB
50	11.5	1	Keeler Creek	Commercial Thinning, retaining a Basla Area of aprox. 120- 140 sq.ft./ac.	80-85	50-55	H
51	16.4	1	Keeler Creek	Commercial Thinning, retaining a Basla Area of aprox. 120- 140 sq.ft./ac	85	50-55	H
52	15.7	1	W. Fork St. Maries	Commercial Thinning; retaining a Basal Area of approx. 120-140 sq.ft./ac., variable density. Openings restricted to ≤ 1 acre in size.	70-75	45	C-S/GB

Note: 1) Existing and estimated retained crown closure are **weighted values** for unit overall. 2) fuels reduction treatments are the same as listed for units in alternatives B and C above.. 3) Includes pre-commercial thinning, see page A-8.

All Action Alternatives – Alternatives B, C, D and E

Pre-commercial Thinning

Unit	Acres	Drainage
A	29	St. Maries River 4
B	83	“
C	77	“
D	15	“
E	8	Bechtel
F	18	Bechtel/W. Fork St. Maries
G	31	W. Fork St. Maries
H	7	Bechtel/W. Fork St. Maries
I	15	Wood
J	16	Wood
K	14	Mazie
L	13	Mazie
M	16	Mazie
N	9	Hidden
O	12	W. Fork St. Maries
P	24	Keeler
Q	45	Keeler

Unit	Acres	Drainage
R	7	Long Slim Creek
S	6	Long Slim
T	24	Long Slim
U	17	Long Slim
V	6	Long Slim
W	15	Long Slim
X	5	Long Slim
Y	11	Long Slim
Z	2	Long Slim
AA	6	Long Slim
BB	9	Long Slim
CC	3	“ w/ 2% in Log drainage
DD	19	“
EE	10	“
FF	22	“
GG	21	Keeler Creek
Total	615	

APPENDIX B - ROAD DATA SUMMARIES

Common to All Action Alts

Miles of Road within the Project Area Project Area Size: 51.5 sq miles

	Road Management Prescription					action alts		Alt A	
	Open	A Gate	B Barrier	C LTS	D & E Recontour	subtotal jurisdiction	rd density (mi/mi^2)	subtotal jurisdiction	jurisdiction change
BPA	5.3	0.2	0.8	1.5		7.8	0.2	12.7	-4.9
Cost Share	31.1	4.0	0.1	0.8		36.0	0.7	28.0	8.0
New Cost share		1.8	0.1	0.3		2.2	0.0	0.0	2.2
Private	18.2	56.6	45.7	27.8	0.1	148.4	2.9	150.5	-2.1
New Private		2.8	2.1	0.6		5.6	0.1	0.0	5.6
Public	19.0					19.0	0.4	19.0	0.0
SUBTOTAL	**73.6**	**65.5**	**48.8**	**31.0**	**0.1**	**219.0**	**4.3**		
mi/sq mi in project area	1.4	1.3	0.9	0.6	0.0				
subtotal rd mgt Alt A	74.0	60.2	46.6	29.5	0.1	210.4			
road mgt net change	-0.4	5.3	2.2	1.5	0.0	8.6			

National Forest System Lands in the Project Area 24.1 sq miles (46.8%)

	Road Management Prescription					action alts		Alt A	
	Open	A Gate	B Barrier	C LTS	D & E Recontour	subtotal jurisdiction	rd density (mi/mi^2)	subtotal jurisdiction	jurisdiction change
BPA	1.2	0.2	0.2	0.9		2.5	0.1	6.2	-3.7
Cost Share	16.5	0.8		0.5		17.8	0.7	13.0	4.8
New Cost Share		1.2	0.1	0.3		1.5	0.1	0.0	1.5
Private	0.3	0.3		0.2		0.8	0.0	0.8	0.0
New Private		0.6	0.2	0.1		0.8	0.0	0.0	0.8
Public	8.5					8.5	0.4	8.5	0.0
SUBTOTAL	**26.4**	**2.9**	**0.5**	**2.0**	**0.0**	**31.9**	**1.3**		
mi/sq mi on NFS land	1.1	0.1	0.0	0.1	0.0				
subtotal rd mgt Alt A	26.9	0.5	1.2	1.0	0.0	29.6			
road mgt net change	-0.5	2.4	-0.7	1.0	0.0	2.3			

Private Ownership in the Project Area 27.4 sq miles (53.2%)

	Road Management Prescriptions							Alt A	Total
	Open	A	B	C	D & E	total	rd density	total	change
		Gate	Barrier	LTS	Recontour	miles	mi/sq mi	miles	
miles on private land	47.7	64.0	48.3	30.0	0.1	190.0	6.9	184.5	5.5
mi/sq mi on pvt	1.7	2.3	1.8	1.1	0.0				
per cent of pvt on pvt	25%	34%	25%	16%	0%				
Alt A	47.7	61.2	46.5	29.1	0.1				
net change on private	0.0	2.8	1.8	0.9	0.0				

BPA miles (pvt & NFS) includes Clearwater Power access; Cost Share includes some BPA access

Alternative B

Miles of Road within the Project Area 51.5 sq miles

	Road Management Prescription (miles)							
	Open	A Gate	B Barrier	C LTS	D & E Recontour	subtotal (miles)	Rd Density mi/sq mi	% in proj area
NFSystem Road	17.6	11.0	3.3	13.6	0.7	46.2	0.9	15%
New NF System				6.2		6.2	0.1	2%
unclassified & temp				30.7	10.3	41.0	0.8	13%
New Temporary				0.8	2.2	3.0	0.1	1%
SUBTOTAL	**17.6**	**11.0**	**3.3**	**51.2**	**13.2**	**96.3**	**1.9**	**31%**
mi/sq mi	0.3	0.2	0.1	1.0	0.3			
%	6%	3%	1%	16%	4%			
Alt A subtotal rd mgt	20.0	16.5	14.5	28.0	9.1	88.1		
Change in Rd. Mgt Alt. A to Alt. B	**-2.4**	**-5.5**	**-11.2**	**23.2**	**4.0**	**8.1**		

Miles of Road on National Forest Land within the Project Area (24.1 sq miles = 46.8% of total)

	Road Management Prescription (miles)								
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Subtotal (miles)	rd density (mi/mi^2)	% on NF	% of Proj. Area
NFSystem Road	17.1	9.6	3.3	13.3	0.7	44.0	1.8	35%	14%
New NF System				6.2		6.2	0.3	5%	2%
unclassified & temp				30.0	10.3	40.3	1.7	32%	13%
New Temporary				0.8	2.2	3.0	0.1	2%	1%
SUBTOTAL	**17.1**	**9.6**	**3.3**	**50.3**	**13.1**	**93.5**	**3.9**	**75%**	**30%**
mi/sq mi on NFS land	0.7	0.4	0.1	2.1	0.5				
Alt A subtotal rd mgt	19.5	14.8	14.4	27.5	9.1	85.3			
Change in Rd Mgt. Alt. A to Alt. B	**-2.4**	**-5.2**	**-11.1**	**22.8**	**4.0**	**8.1**			

Project Area and NFS land Summary

	Road Management Prescriptions							
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density (mi/sq mi)	%
Alt B % of PA miles	29%	24%	17%	26%	4%			
project area alt B	91.1	76.5	52.1	82.3	13.2	315.3	6.1	
project area alt A	94.1	76.5	61.1	57.5	9.2	298.4	5.8	
net change A to B	-2.9	0.0	-9.0	24.8	4.0	16.9		
miles on NFS land Alt B	43.5	12.5	3.9	52.3	13.1	125.3	5.2	40%
miles on NFS land Alt A	46.4	15.3	14.6	28.5	9.1	113.9	4.7	38%
Change in Rd Mgt. Alt. A to Alt. B	**-2.9**	**-2.8**	**-10.8**	**23.9**	**4.0**	**11.5**		

Jurisdiction Project Area

	Alt B	Alt B % of PA	A to B Change	Alt A	Alt B mi/sq mi
Public	19.0	6%	0.0	19.0	0.4
Private	154.0	49%	3.5	150.5	3.0
BPA & Cost Share	46.0	15%	5.3	40.7	0.9
Non Coop NFSR	52.4	17%	6.0	46.4	1.0
Total Classified Miles	271.4	86%	14.8	256.6	5.3
unclassified & temporary	44.0	14%	2.2	41.8	0.9
Total Miles	**315.4**	**100%**	**17.0**	**298.4**	**6.1**

Alternative C

Miles of Road within the Project Area (51.5 sq miles)

	Road Management Prescriptions							
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density (mi/sq mi)	%
NFSystem Road	17.6	11.0	3.3	13.6	0.7	**46.2**	0.9	15%
New NF System				0.0		**0.0**	0.0	0%
unclassified & temp				30.7	10.3	**41.0**	0.8	13%
New Temporary				0.0	0.0	**0.0**	0.0	0%
Alt C subtotal	**17.6**	**11.0**	**3.3**	**44.3**	**11.0**	**87.2**	**1.7**	**28%**
mi/sq mi in project area	0.3	0.2	0.1	0.9	0.2			
Alt A subtotal rd mgt	20.0	16.5	14.5	28.0	9.1	88.1		
rd mgt change A to C	**-2.4**	**-5.5**	**-11.2**	**16.3**	**1.9**	**-1.0**		

Miles of Road on National Forest Land within the Project Area24.1 sq miles (46.8%)

	Road Management Prescriptions								
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density	% on NF	% of proj
NFSystem Road	17.1	9.6	3.3	13.3	0.7	**44.0**	1.8	35%	14%
New NF System				0.0		**0.0**	0.0	0%	0%
unclassified & temp				30.0	10.3	**40.3**	1.7	32%	13%
New Temporary				0.0	0.0	**0.0**	0.0	0%	0%
Alt C subtotal rd mgt	**17.1**	**9.6**	**3.3**	**43.4**	**11.0**	**84.3**	**3.5**	**67%**	**27%**
mi/sq mi on NFS land	0.7	0.4	0.1	1.8	0.5				
Alt A subtotal rd mgt	19.5	14.8	14.4	27.5	9.1	85.3			
rd mgt change A to C	**-2.4**	**-5.2**	**-11.1**	**15.9**	**1.9**	**-1.0**			

Alternative C Project Area and NFS land Summary

	Road Management Prescriptions							
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density (mi/sq mi)	%
Alt C % of PA miles	29%	24%	17%	24%	4%			
project area alt C	91.1	76.5	52.1	75.3	11.1	306.2	5.9	
project area alt A	94.1	76.5	61.1	57.5	9.2	298.4	5.8	
net change A to C	**-2.9**	**0.0**	**-9.0**	**17.8**	**1.9**	**7.8**		
miles on NFS land alt C	43.5	12.5	3.9	45.4	11.0	116.2	4.8	37%
miles on NFS land alt A	46.4	15.3	14.6	28.5	9.1	113.9	4.7	38%
net change A to C	**-2.9**	**-2.8**	**-10.8**	**16.9**	**1.9**	**2.3**		

Alternative C Jurisdiction Project Area

	Alt C	Alt C % of PA	**A to C Change**	Alt A	Alt C mi/sq mi
Public	19.0	6%	**0.0**	19.0	0.4
Private	154.0	50%	**3.5**	150.5	3.0
BPA & Cost Share	46.0	15%	**5.3**	40.7	0.9
Non Coop NFSR	46.2	15%	**-0.2**	46.4	0.9
Total Classified Miles	265.2	87%	**8.6**	256.6	5.2
unclassified & temporary	41.0	13%	**-0.8**	41.8	0.8
Total Miles	**306.2**	**100%**	**7.8**	**298.4**	**5.9**

Alternative D

Miles of Road within the Project Area 51.5 sq miles

	Road Management Prescriptions							
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density (mi/sq mi)	%
NFSystem Road	9.3	8.2	3.2	19.2	0.7	**40.6**	0.8	13%
New NF System		0.7				**0.7**	0.0	0%
unclassified & temp				18.3	28.3	**46.6**	0.9	15%
New Temporary						**0.0**	0.0	0%
Alt D subtotal rd mgt	**9.3**	**8.9**	**3.2**	**37.5**	**28.9**	**87.8**	**1.7**	**28%**
mi/sq mi in project area	0.2	0.2	0.1	0.7	0.6			
Alt A subtotal rd mgt	20.0	16.5	14.5	28.0	9.1	88.1		
rd mgt change A to D	**-10.7**	**-7.6**	**-11.4**	**9.5**	**19.8**	**-0.3**		

Miles of Road on National Forest Land within the Project Area 24.1 sq miles (46.8%)

	Road Management Prescriptions								
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density	% on NF	% of proj
NFSystem Road	8.8	6.8	3.2	19.0	0.7	38.5	1.6	33%	13%
New NF System		0.7				0.7	0.0	1%	0%
unclassified & temp				17.8	27.0	44.8	1.9	38%	15%
New Temporary						0.0	0.0	0%	0%
Alt D subtotal rd mgt	**8.8**	**7.5**	**3.2**	**36.8**	**27.7**	**84.0**	**3.5**	**67%**	**27%**
mi/sq mi on NFS land	0.4	0.3	0.1	1.5	1.1				
Alt A subtotal rd mgt	19.5	14.8	14.4	27.5	9.1	85.3			
rd mgt change A to D	**-10.7**	**-7.3**	**-11.2**	**9.3**	**18.6**	**-1.3**			

Project Area & NFS land Summary

	Road Management Prescriptions							
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density (mi/sq mi)	%
Alt D % of PA miles	26%	24%	16%	22%	9%			
project area alt D	82.9	74.4	52.0	68.6	29.0	306.8	6.0	
project area alt A	94.1	76.5	61.1	57.5	9.2	298.4	5.8	
net change A to D	**-11.2**	**-2.1**	**-9.1**	**11.1**	**19.8**	**8.5**		
miles on NFS land alt D	35.2	10.4	3.7	38.8	28.7	116.9	4.8	37%
miles on NFS land alt A	46.4	15.3	14.6	28.5	9.1	113.9	4.7	38%
net change A to D	**-11.2**	**-4.9**	**-10.9**	**10.4**	**19.6**	**3.0**		

Jurisdiction Project Area

	Alt D	Alt D % of PA	**A to D Change**	Alt A	Alt D mi/sq mi
Public	19.0	6%	**0.0**	19.0	0.4
Private	154.0	50%	**3.5**	150.5	3.0
BPA & Cost Share	46.0	15%	**5.3**	40.7	0.9
Non Coop NFSR	41.2	13%	**-5.2**	46.4	0.8
Total Classified Miles	260.2	85%	**3.6**	256.6	5.1
unclassified & temporary	46.6	15%	**4.8**	41.8	0.9
Total Miles	**306.8**	**100%**	**8.4**	**298.4**	**6.0**

Alternative E

Miles of Road within the Project Area (51.5 sq miles)

	Road Management Prescriptions							
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density (mi/sq mi)	%
NFSystem Road	9.3	7.7	2.9	19.2	0.7	**39.8**	0.8	13%
New NF System						**0.0**	0.0	0%
unclassified & temp				19.1	28.3	**47.4**	0.9	15%
New Temporary						**0.0**	0.0	0%
Alt E subtotal rd mgt	**9.3**	**7.7**	**2.9**	**38.3**	**28.9**	**87.2**	**1.7**	**28%**
mi/sq mi in project area	0.2	0.1	0.1	0.7	0.6			
Alt A subtotal rd mgt	20.0	16.5	14.5	28.0	9.1	88.1		
rd mgt change A to E	**-10.7**	**-8.8**	**-11.7**	**10.3**	**19.8**	**-1.0**		

Miles of Road on National Forest Land within the Project Area 24.1 sq miles (46.8%)

	Road Management Prescriptions								
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density	% on NF	% of proj
NFSystem Road	8.8	6.3	2.9	19.0	0.7	**37.7**	1.6	32%	12%
New NF System						**0.0**	0.0	0%	0%
unclassified & temp				18.6	27.0	**45.6**	1.9	39%	15%
New Temporary						**0.0**	0.0	0%	0%
Alt E subtotal rd mgt	**8.8**	**6.3**	**2.9**	**37.6**	**27.7**	**83.3**	**3.5**	**66%**	**26%**
mi/sq mi on NFS land	0.4	0.3	0.1	1.6	1.1				
Alt A subtotal rd mgt	19.5	14.8	14.4	27.5	9.1	85.3			
rd mgt change A to E	**-10.7**	**-8.5**	**-11.5**	**10.1**	**18.6**	**-2.0**			

Project Area & NFS land Summary

	Road Management Prescriptions							
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density (mi/sq mi)	%
Alt E % of PA miles	0.3	0.2	0.2	0.2	0.1			
project area alt E	82.9	73.2	51.7	69.4	29.0	306.2	5.9	
project area alt A	94.1	76.5	61.1	57.5	9.2	298.4	5.8	
net change A to E	**-11.2**	**-3.3**	**-9.4**	**11.9**	**19.8**	**7.8**		
miles on NFS land alt E	35.2	9.2	3.4	39.6	28.7	116.2	4.8	37%
miles on NFS land alt A	46.4	15.3	14.6	28.5	9.1	113.9	4.7	38%
net change A to E	**-11.2**	**-6.1**	**-11.2**	**11.2**	**19.6**	**2.3**		

Jurisdiction Project Area

	Alt E	Alt E % of PA	A to E Change	Alt A	Alt E mi/sq mi
Public	19.0	0.1	0.0	19.0	0.4
Private	154.0	0.5	3.5	150.5	3.0
BPA & Cost Share	46.0	0.2	5.3	40.7	0.9
Non Coop NFSR	39.8	0.1	-6.6	46.4	0.8
Total Classified Miles	258.8	0.8	2.2	256.6	5.0
unclassified & temporary	47.4	0.2	5.6	41.8	0.9
Total Miles	**306.2**	**1.0**	**7.8**	**298.4**	**5.9**

Alternative F

Miles of Road within the Project Area (51.5 sq miles)

	Road Management Prescriptions							
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density (mi/sq mi)	%
NFSystem Road	10.26	8.20	3.18	19.20	1.24	42.08	0.8	13%
New NF System		0.55	0.12	4.05		4.72	0.1	2%
unclassified & temp				18.34	26.73	45.07	0.9	14%
New Temporary				1.01	1.05	2.06	0.0	1%
Alt F subtotal rd mgt	**10.26**	**8.75**	**3.30**	**42.60**	**29.02**	**93.93**	**1.8**	**30%**
mi/sq mi in project area	0.2	0.2	0.1	0.8	0.6			
Alt A subtotal rd mgt	19.99	16.46	14.54	28.02	9.13	88.14		
rd mgt change A to F	**-9.73**	**-7.71**	**-11.24**	**14.58**	**19.89**	**5.79**		

Miles of Road on National Forest Land within the Project Area 24.1 sq miles (46.8%)

	Road Management Prescriptions								
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density	% on NF	% of proj
NFSystem Road	9.76	6.83	3.18	19.00	1.19	39.96	1.7	32%	13%
New NF System		0.55	0.12	4.05		4.72	0.2	4%	2%
unclassified & temp				17.83	26.55	44.38	1.8	36%	14%
New Temporary				1.01	1.05	2.06	0.1	2%	1%
Alt F subtotal rd mgt	**9.76**	**7.38**	**3.30**	**41.89**	**28.79**	**91.12**	**3.8**	**74%**	**29%**
mi/sq mi on NFS land	0.4	0.3	0.1	1.7	1.2				
Alt A subtotal rd mgt	19.49	14.84	14.4	27.49	9.11	85.33			
rd mgt change A to F	**-9.73**	**-7.46**	**-11.10**	**14.40**	**19.68**	**5.79**			

Project Area & NFS land Summary

	Road Management Prescriptions							
	Open	A Gate	B Barrier	C LTS	D & E Recontour	Total miles	rd density (mi/sq mi)	%
Alt F % of PA miles	27%	24%	17%	24%	9%			
project area alt F	83.84	74.29	52.08	73.64	29.10	312.95	6.1	
project area alt A	94.06	76.51	61.09	57.50	9.21	298.37	5.8	
net change A to F	-10.2	-2.2	-9.0	16.1	19.9	14.58		
miles on NFS land alt F	36.19	10.30	3.82	43.89	28.79	122.99	5.1	39%
miles on NFS land alt A	46.38	15.29	14.63	28.45	9.11	113.86	4.7	36%
net change A to F	-10.2	-5.0	-10.8	15.4	19.7	9.13		

Jurisdiction Project Area

	Alt F	Alt F % of PA	A to F Change	Alt A	Alt F mi/sq mi
Public	19.0	6%	0.0	19.0	0.4
Private	154.0	49%	3.5	150.5	3.0
BPA & Cost Share	46.0	15%	5.3	40.7	0.9
Non Coop NFSR	47.2	15%	0.8	46.4	0.9
Total Classified Miles	266.2	85%	9.6	256.6	5.2
unclassified & temporary	46.7	15%	4.9	41.8	0.9
Total Miles	**312.9**	**100%**	**14.5**	**298.4**	**6.1**

APPENDIX C – ROAD DEFINITIONS

Road. A motor vehicle travel-way over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified or temporary.

Classified road. Roads wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long-term motor vehicle access, including state roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service.

Road Classifications in Current Use

Functional Class	Traffic Service Level	Maintenance Level
Arterial: Provides service to large land areas. Connects with other arterials or public highways. Collector: Serves smaller land areas than arterials. Connects arterials to local roads or terminal facilities. Local: Single purpose road. Connects terminal facilities with collectors or arterials.	A: Free flowing, mixed traffic; stable, smooth surface; provides safe service to all traffic. B: Congested during heavy traffic, slower speeds and periodic dust; accommodates any legal-size load or vehicle. C: Interrupted traffic flow, limited passing facilities, may not accommodate some vehicles. Low design speeds. Unstable surface under certain traffic or weather. D: Traffic flow is slow and may be blocked by activities. Two-way traffic is difficult, may require backing. Rough and irregular surface. Accommodates high clearance vehicles. Single purpose facility.	Level 1: Closed more than 1 year. Level 2: High-clearance vehicles. Level: Passenger vehicles—surface not smooth. Level 4: Passenger vehicles–smooth surface. Level 5: Passenger vehicles–dust free; possibly paved.

Public road. Any road or street under the jurisdiction of, and maintained by, a public authority and open to public travel (23 U.S.C. 101(a)).

Private road. A road under private ownership authorized by an easement to a private party, or a road that provides access pursuant to a reserved or private right.

National Forest System road. A classified forest road under the jurisdiction of the Forest Service. The term "National Forest System roads" **(NFSR)** is synonymous with the term "forest development roads" as used in 23 U.S.C. 205.

Unclassified road. Roads on NFS lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon termination of the authorization (36 CFR 212.1).

Temporary road. Roads authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be a part of the forest transportation system and not necessary for long-term resource management.

New road construction. Activity that results in the addition of forest classified or temporary road miles (36 CFR 212,1)

Road decommissioning. Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1), (FSM 7703).

Road maintenance. The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective (FSM 7712.3).

Road reconstruction. Activity that results in improvement or realignment of an existing classified road as defined below:

Road improvement. Activity that results in an increase of an existing road's traffic service level, expansion of its capacity, or a change in its original design function.

Road realignment. Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway (36 CFR 212.1).

Road Management Objectives are to:

- Establish the specific intended purpose of a road based on management needs as determined through land and resource management planning;
- Contain operation and maintenance criteria for existing roads; and

Road Management Prescriptions:

Open Road Management. Unrestricted classified roads available for public use, generally maintained at level 3-5, but could include some level 2 roads whose condition may limit vehicle use.

Road Management A. Classified roads for administrative and contractual use, generally maintained in a passable condition at level 2. Traffic is usually controlled with a gate.

Road Management B. Classified roads for administrative and contractual use, generally maintained at level 1, meeting the minimum requirements for an inactive road as defined by the Idaho Forest Practices Act (Title 38, Ch 13, Idaho Code, Rule 040 (04, d)). Traffic is usually controlled with a static physical barrier to eliminate over 50" vehicle use. Road condition or restrictions may limit under 50" motor vehicle use.

Road Management C. Classified roads put into long-term storage or unclassified, temporary or private roads decommissioned to meet the minimum requirements for abandoned road as defined by Idaho Forest Practices Act (Title 38, Ch 13, Idaho Code, Rule 040 (04, e)). The intent is to put classified roads in a condition eliminating motor vehicle use and maintenance in non-use periods.

Minimum activities for decommissioned roads include surface de-compaction, culvert removal, re-establishment of stream channels and re-vegetation within the road corridor.

Road Management D. Unclassified, temporary or private roads decommissioned using re-contouring or partial pullback of fill material. The intent is to eliminate use as a road, stabilize slopes, re-store site productivity, and re-establish natural water infiltration and drainage patterns.

Road Management E. Unclassified, temporary or private roads decommissioned to restore slopes and drainages to near pre-road conditions.

APPENDIX D - ACCESS MANAGEMENT PLAN

Map Index	Rd #	Location	Action To Take	Timing	Reason For Action	Alt
1	504a	@ Jct. w/504	Lock existing gate open	@ start of harvest operations	Harvest	B, C, D, F
			Gate will be locked shut on weekends and evenings	During harvest operations	Big game security, water and soil concerns	
2	498	Gate @ milepost 2.8	Open existing gate.	Start of harvest operations	Harvest	B, C, D, F
			Gate will be locked shut on weekends and evening	During harvest operations	Big game security, water and soil concerns	
3	3380	@ Jct. w/State Hwy3	Open existing gate.	Start of harvest operations	Harvest	B, C, D, F
			Lock shut on weekends and evenings.	During harvest operations	Big game security, water and soil concerns	
4	3557	@ Jct. w/447	Open existing gate	Start of harvest operations	Harvest	B, C, D, F
			Locks shut on weekends and evenings.	During harvest operations	Big game security, water and soil concerns	
5	3335	@ rd from Clarkia workcenter	Open existing gate.	Start of harvest operations	Harvest	B, C, D, F
			Locks shut on weekends and evenings.	During harvest operations	Big game security, water and soil concerns	
6	3327j	@ Jct. w/3327G	Open existing gate	@ start of harvest operations	Harvest	B, C, D, F
			Lock shut on weekends and evenings.	During harvest operations	Big game security, water and soil concerns	
7	New road	Off rd. 765 going to units 30,31,32	Install gate (coordinate with Idaho Dept. of State Lands)	@ start road construction	Big game security, water and soil concerns	B, C, D, F
			Lock shut on weekends and evenings.	During harvest operations	Big game security, water and soil concerns	
			Lock existing gate shut (coordinate with Idaho Dept. of State Lands)	After harvest operations are complete.	Big game security, water and soil concerns	
8	New road	@ off road 361C to units 27,28	Install gate (Coordinate with State)	@ start of road construction	Big game security, water and soil concerns	B, C, D, F
			Lock gate shut	After harvest operations complete	Big game security, water and soil concerns	

Map Index Numbers are identified on Maps – M-6, M-8, M-10, and M-15

APPENDIX E - MONITORING PLAN

Item #	Resource	Objective	Timing	Methodology	Responsible
1	Watershed	Implementation and effectiveness of applicable Best Management Practices (BMP's)	Ongoing, during and a post harvest visit.	This will be accomplished by completing BMP inspection reports for the timber sale(s) and associated road work.	Hydrologist/Sale Administration/Engineering
2	Fisheries/ Water-shed	Implementation of Riparian Habitat Conservation Areas (RHCAs)	Prior to advertisement of timber sale(s).	Monitor application of RHCAs, as noted in Chapter 2.	Fisheries biologist/hydrologist
3	Watershed/ fisheries	Determine status of riparian plantings	1st, 2nd, & 3rd year following initial planting.	Walk through survey, ocular to determine survival of plants.	Hydrologist
4	Silviculture /Fire	Determine whether silvicultural objectives were accomplished. Assess site preparation and tree planting needs.	Post harvest and prior to any site preparation or fuels treatment	Review treatment areas. Evaluate silvicultural objectives in light of accomplishments and, if necessary, modify the original prescription. Check for special fuels treatment needs (e.g. excavator piling, no treatment, or different timing of Rx burn) and special planting needs (e.g. excavator scalp, moving of slash, or different stock type needed)	Fuels Management Specialist/District Silviculturist
5	Silviculture	Determine status of regeneration harvest units.	First, third and, if necessary, 5th year, following initial planting.	Monitor stocking and status of regeneration (planted) using walk-through and standard plot exams following R1 procedures.	District Reforestation Specialist
6	Wildlife	Determine status and assess response to project activity of known goshawk territory	Prior to, during, and two years post project activity.	Yearly – ocular evaluation of nest status; and or surveys of post-fledgling areas (PFA). Document timing of project activity within ¼ mile of PFA	Wildlife Biologist

APPENDIX F – BIOLOGICAL EVALUATION SUMMARY

SENSITIVE SPECIES BIOLOGICAL EVALUATION

SUMMARY OF CONCLUSION OF EFFECTS*

FISH

Project Name: Hidden -Cedar

Species	ALT A	ALT B	ALT C	ALT D	ALT E	ALT F
1. Westslope Cutthroat Trout	MIIH	MIIH	MIIH	MIIH	MIIH	MIIH
2.Torrent Sculpin	MIIH	MIIH	MIIH	MIIH	MIIH	MIIH
3.						
4.						

Conditions: Road decommissioning and proper storage will occur throughout the project area.

Recommendations:

Prepared by: /s/ Lisa Hawdon Date: April 3, 2002

Zone Fisheries Biologist

NI = No Impact

MIIH = May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Loss Of Viability To The Population Or Species

WIFV** = Will Impact Individuals Or Habitat With A Consequence That The Action May Contribute To A Trend Towards Federal Listing Or Cause A Loss Of Viability To The Population Or Species

BI = Beneficial Impact

* The rationale for the conclusion of effects is contained in the Fisheries section of Chapter 3 in the Hidden Cedar Project FEIS. Other pertinent information for the evaluation of effects on sensitive species (e.g. description of activity) is contained in the FEIS.

** Considered a trigger for a significant action in NEPA

Form 2 (R-1/4/6-2670-95)

SENSITIVE SPECIES BIOLOGICAL EVALUATION

SUMMARY OF CONCLUSION OF EFFECTS*

Wildlife

Project Name: Hidden Cedar

Species	ALT A	ALT B	ALT C	ALT D	ALT E	ALT F
Black-backed Woodpecker	NI	MIIH	MIIH	MIIH	MIIH	MIIH
Boreal Toad	NI	MIIH	MIIH	MIIH	MIIH	MIIH
Coeur d'Alene Salamander	NI	MIIH	MIIH	MIIH	MIIH	MIIH
Common Loon	NI	NI	NI	NI	NI	NI
Fisher	NI	MIIH	MIIH	MIIH	MIIH	MIIH
Flammulated Owl	NI	NI	NI	NI	NI	NI
Harlequin Duck	NI	NI	NI	NI	NI	NI
Northern bog lemming	NI	NI	NI	NI	NI	NI
Northern Goshawk	NI	MIIH	MIIH	MIIH	MIIH	MIIH
Northern Leopard Frog	NI	NI	NI	NI	NI	NI
Perigrine Falcon	NI	NI	NI	NI	NI	NI
Townsend's Big-Eared Bat	NI	NI	NI	NI	NI	NI
White-headed woodpecker	NI	NI	NI	NI	NI	NI
Wolverine	NI	NI	NI	NI	NI	NI

Conditions: None

Recommendations: The district biologist should be notified if any sensitive species are observed during pre-sale and sale activity.

Prepared by: /s/ Charles R. Stock Date: April 2, 2002

Wildlife Biologist

NI = No Impact

MIIH = May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Loss Of Viability To The Population Or Species

WIFV** =Will Impact Individuals Or Habitat With A Consequence That The Action May Contribute To A Trend Towards Federal Listing Or Cause A Loss Of Viability To The Population Or Species

BI = Beneficial Impact

* The rationale for the conclusion of effects is contained in the Wildlife section of Chapter 3 in the Hidden Cedar Project FEIS. Other pertinent information for the evaluation of effects on sensitive species (e.g. description of activity) is contained in the FEIS.

** Considered a trigger for a significant action in NEPA

SENSITIVE SPECIES BIOLOGICAL EVALUATION

SUMMARY OF CONCLUSION OF EFFECTS*

Sensitive Plants

Project Name: Hidden Cedar

Habitat Guild	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Wet Forest	NI	MIIH	MIIH	MIIH	MIIH	MIIH
Moist Forest	NI	MIIH	MIIH	MIIH	MIIH	MIIH
Dry Forest	NI	NI	NI	NI	NI	NI
Deciduous Riparian	NI	NI	NI	NI	NI	NI
Subalpine	NI	NI	NI	NI	NI	NI
Aquatic	NI	NI	NI	NI	NI	NI
Peatland	NI	NI	NI	NI	NI	NI

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BI = Beneficial Impact

Recommendations: New listed, proposed, or sensitive plant occurrences identified during project implementation should be reported to the Botany Coordinator for evaluation. Any occurrence deemed essential to population or species viability would be protected by project design.

Prepared by: /s/ Suzanne DiGiacomo Date: April 9, 2002

Botanist

* Note: The rationale for the conclusion of effects is contained Plants Species at Risk section of Chapter 3 in the Hidden Cedar Project FEIS. Other pertinent information for the evaluation of effects on sensitive species (e.g. description of activity) is contained in the FEIS.

** Considered a trigger for a significant action in NEPA

APPENDIX G – Fisheries Forest Plan Standard

1. **Fry Emergence (Fish Standard 1 and 2):**

The IPNF Forest Plan contains standards for fry emergence that are no longer valid since the Inland Native Fish Strategy was developed. This section explains why.

The objectives for fisheries in the Forest Plan state that the forest "will be managed to maintain and improve fish habitat capacities in order to achieve cooperative goals with the State Fish and Game Department and to comply with state water quality standards. Sediment arising from land management activities will be managed so that in forest fisheries streams the objective is to maintain 80 percent fry emergence success as measured from pristine condition" (II-7). The first two standards for fish use similar language (II-29). The Fishery/Watershed Analysis to determine effects of land management activities on fry emergence is described in Appendix I (I-1, 2).

Appendix I requires that if, during the environmental assessment process, cumulative effects of the proposed and past activities on stream sedimentation are projected to result in greater than 20% reduction in fry emergence, then additional detailed analysis will be undertaken. The analysis is then used to determine the significance of the project on water resources. If the project is judged to have a "significantly negative effect" on water resources, it will be reviewed by the State for conformance with water quality standards prior to the final decision.

At the time the Forest Plan was written, models determining fry emergence (e.g., Stowell *et al.* 1983) were popular. These empirical models were later found to have limited application and were unreliable outside of where they were developed (J. Kershner, personal communication). In addition, the use of fry emergence survival (regardless of the threshold) as a surrogate for viability came into question, primarily for two reasons:

- First, fry emergence is highly variable. This can be due to changing natural conditions (e.g., floods, temperature regimes, geology) or human-induced causes (e.g., increased sediment input, chemical spills). Both agents are at work in most cases so it is difficult to determine what proportion of egg-to-fry mortality is due to each cause. As a result the underlying relationship between sediment in redds and survival is difficult to predict (Chapman 1988).
- Second, and more important, egg-to-fry mortality is usually density-independent (i.e., a percentage of fry will survive regardless of the number of eggs). This means that in most cases there are enough fry to inhabit all available habitat within a stream. Therefore fry-to-smolt (sub-adult) survival, where density dependent mortality plays a significant role, is a more effective and appropriate predictor of population viability than egg-to-fry survival (for a review of these concepts see Hilborn and Walters 1992). Currently the indicator used as a surrogate of fry-to-smolt survival is stream habitat characteristics.

The 1989 Forest Plan Evaluation and Monitoring Report documents the change away from use of the fry emergence standard (Item G-1, pages C-1 and C-2). The findings

were that it was not a good monitoring tool to report stream health. G-1 was combined with item G-3, which includes a comprehensive array of fisheries and hydrology parameters.

The Inland Native Fish Strategy (INFS; USDA 1995) amended the Forest Plans "…except where existing Plan direction would provide more protection" for inland native fish habitat (page 4). All INFS standards and guidelines are intended to either make progress toward Riparian Management Objectives (which describe "good" fish habitat within the context of what is capable of the watershed) or to ensure that activities will not retard the natural rate of recovery of RMOs in a watershed (USDA 1995, A6-A16). In addition, the strategy states that actions that reduce habitat quality, whether existing conditions are better or worse than objective values, are not consistent with INFS direction (USDA 1995, A-3).

INFS supersedes the original IPNF Forest Plan direction because it offers far more protection to inland native fish habitat for the following reasons:

- INFS directs the establishment of Riparian Habitat Conservation Areas (RHCAs) and only allows activities within RHCAs that maintain or improve, and do not retard, the attainment of the RMOs. The original Forest Plan direction actually permitted degradation of water resources at the discretion of the line officer, and allowed "significant" degradation after review by the State.
- Activities that reduce habitat quality to any extent are contrary to INFS direction, regardless of whether RMOs have been attained. The original Forest Plan direction allowed for apparent degradation of fish habitat by permitting up to a 20 percent reduction of potential fry emergence.

In *The Lands Council v. Vaught* the U. S. District Court for the Eastern District of Washington, in its reading of the plain language of the INFS documents and giving deference to the Forest Service's expertise in interpreting its Forest Plans, concluded that INFS does supersede the Forest Plan in all areas where RHCA guidelines and standards apply (i.e., where delivery of sediment to streams is the identified threat that proposed project activities pose to fish habitat). The Forest Plan standards remain in effect in all other areas.

In conclusion, this project complies with original Forest Plan direction because, although fry emergence was not computed, a detailed analysis of the effects to fish habitat and water resources was developed as required in Appendix I; and the project has been determined to be fully consistent with the INFS Forest Plan amendment and state water quality standards for supporting beneficial uses (see Watershed discussion).

GLOSSARY

A

ACCESS MANAGEMENT OBJECTIVES. Objectives that describe the extent and form of access needed to accomplish the management area direction, including how access to and within National Forest lands will be provided, whether by foot, horse, motorized vehicle, or aircraft; over water, roads, or trails; or through the air. (FSH 7709.55 section 06).

ACTIVITY AREA. Area within the project area where activities are proposed.

ACTIVITY FUELS. See Slash

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

AGE CLASSES. A distinct group of trees, or portion of growing stock recognized on the basis of age (i.e., seedling, pole, mature.)

AGGRADATION. When more sediment enters a reach than leaves it, there is a buildup of sediment. This is called aggradation.

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.

ALTERNATIVE. A mix of management prescriptions applied to specific land areas to achieve a set of goals and objectives. Each alternative represents a different way of achieving a set of similar management objectives. Sometimes the term "action alternative" is used when it is desirable to recognize that there is a "no action" alternative under which the proposed activity would not take place.

ANALYSIS AREA. The geographic area defining the scope of analysis for a particular resource. This area may be larger than the project area when effects have potential to extend beyond the boundaries of the proposed action.

APPEAL. A request by any party dissatisfied with a decision of a forest officer to have that decision reviewed at a higher organizational level within the Forest Service and, where appropriate, by the Secretary.

B

BANKFULL. The level water reaches in the stream that is at or near the lowest terrace.

BASIC INDUSTRY. These are fundamental manufacturing industries which serve as the basis of the economy. They do not include the service side. These are business and government activities that produce raw materials, products made from those materials, and which transport those materials or products.

BEST MANAGEMENT PRACTICES. A set of practices in the Forest Plan which, when applied during implementation of a project, ensures that water related beneficial uses are protected and that State water quality standards are met.

BIG GAME. Those species of large mammals normally managed as a sport hunting resource.

BIOLOGICAL ASSESSMENT. Information (document) prepared by or under the direction of the Federal agency concerning listed and proposed threatened and endangered species and proposed critical habitat that may be present in the action area and the evaluation of potential effects of the action on such species and habitats.

BIOLOGICAL EVALUATION. A documented Forest Service review of programs or activities in sufficient detail to determine how an action or proposed action may affect any sensitive species.

BLIND DRAIN. A drainage structure installed in the subgrade of a road which intercepts, collects, and redirects subsurface water.

BLOWDOWN. See windthrow.

BOARD FOOT (BF). A unit of measurement equal to an unfinished board one foot square by one inch thick. Timber volumes are often expressed in terms of thousands of board feet.

BOGS. Perennially saturated areas that usually have wetland and riparian plants surrounding them.

BOLE. The trunk or main stem of the above ground part of a tree.

BROADCAST BURN. See prescribed burning.

C

CANOPY. The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth. Layers of canopy may be called stories.

CANOPY CLOSURE. The progressive reduction of space between tree crowns as they spread laterally; a measure of the percent of potential open space occupied by the collective tree crowns in a stand.

CAVE. A natural underground chamber that is open to the surface.

CAVITY. The hollow, excavated in snags by birds; used for roosting and reproduction by many birds and mammals.

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

CAVITY NESTERS. Wildlife species that nest in cavities.

CLEARCUT HARVEST. A regeneration method under which the entire mature stand is cut. Some snags and potential snags may be left to benefit snag-dependent wildlife species.

CLEARCUT WITH RESERVES. A variation of the clearcutting method where reserve trees are left for all or part of a stand rotation and serve a specific function that is consistent with management objectives.

CLOSED CANOPY. The condition that exists when the canopy created by trees or shrubs or both is dense enough to exclude most of the direct sunlight from the forest floor.

CODE OF FEDERAL REGULATIONS (CFR). The official, legal tabulation or regulations directing Federal Government activities.

COMMUNITY. A group of one or more populations of plants and animals in a common spatial arrangement; an ecological term used in a broad sense to include groups of various sizes and degrees of integration.

COMPARTMENTS. A geographic area delineated by a watershed drainage for management planning purposes.

CONIFER. Any of a group of needle and cone bearing evergreen trees.

CONNECTORS. Strips or patches of vegetation used by wildlife to move between habitats.

CORE SAMPLE. Stream bed material removed from the stream for analysis.

CORRIDORS. Areas of vegetation (may be linear or patch-like) available to wildlife to facilitate movement between habitats. Corridors may vary in size by species need. For big-game, forested areas of at least 600 feet in width is generally acceptable.

COVER. Vegetation used by wildlife for protection from predators, breeding and rearing of young (hiding cover), or to ameliorate conditions of weather (thermal cover).

COVER/FORAGE RATIO. The ratio, in percent, of the amount of area in cover conditions to that in forage conditions.

COVER TYPE. See forest cover type

CROWN FIRE. A fire burning into the crowns of the vegetation, generally associated with an intense understory fire.

CULTURAL RESOURCES. The physical remains of human activity (artifacts, ruins, burial mounds, petroglyphs, etc.) having scientific, prehistoric, or social values.

CUMULATIVE EFFECT. The impact on the environment which results from the incremental impact of the action when added to other actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time.

D

DEADFALL. Previously dead trees that have fallen.

DEBRIS. The scattered remains of some things broken or destroyed; ruins; rubble; fragments.

DECADENT. Deteriorating; when used in reference to stand condition there are inferences of the loss of trees from the overstory and of the presence of disease, or indications of loss of vigor in dominant trees so that the mean annual increment is negative.

DECISION AREA. The geographic area defining the scope of this document and the alternatives proposed by it.

DEGRADATION. This occurs when a stream has excess energy and more sediment leaves a reach than enters it. This is associated with channel scouring.

DENNING SITE. A place of shelter for an animal; also where an animal gives birth and raises young.

DETRIMENTAL SOIL DISTURBANCE. The condition where established threshold values for soil properties exceed and result in significant change. (FSH 2509.18, section 2.05, 9).

DESIGN CRITERIA. The requirements derived from management area direction such as safety requirements and traffic characteristics that govern the selection of elements and standards for a road or section of a road. (FSM 7721.05. Also see FSH 7709.56, section 4.05)

DESIGN STANDARDS. The definitive lengths, widths, and depths of individual elements, such as a 12-foot traveled way, 2-foot shoulders, 3/4:1 cut slopes, 3-foot curve widening, and 6 inches of crushed aggregate, that define a road template. (FSM 7721.05 and FSH 7709.56, section 4.05)

DESIRED FUTURE CONDITION. A portrayal of the land or resource conditions which are expected to result if goals and objectives are fully achieved.

DISPERSED RECREATION. Outdoor recreation in which visitors are diffused over relatively large areas. Where facilities or developments are provided, they are more for access and protection of the environment than for the comfort or convenience of the people.

DISPLACEMENT AREA. An area of suitable habitat reserved for use by a local population of a wildlife species while that population is displaced from, or caused to vacate, its former habitat by disturbance from human activities.

DISTURBANCE. Any event which affects the successional development of a plant community (examples: fire, insect attack, windthrow, timber harvest).

DIVERSITY. The relative distribution and abundance of different plant and animal communities and species within an area.

DOWN WOODY COMPONENT. A component of forest habitats used by wildlife for feeding, denning, and shelter. (See Old Growth Habitat.)

DRAINAGE EFFICIENCY. The net runoff for a given amount of precipitation in a drainage.

DUFF. An organic surface soil layer, below the litter layer, in which the original form of plant and animal matter cannot be identified with the unaided eye.

E

ECOLOGICAL NICHE. The set of habitat conditions that are favorable for the growth and reproduction of a given species.

ECOSYSTEM. The complete system formed by the interaction of a group of organisms and their environment. In this context of activities on National Forest lands, humans are considered a part of the ecosystem.

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, or 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. Plant or animal species occurring only in a restricted geographic area.

ENVIRONMENT. The aggregate of physical, biological, economic, and social factors affecting organisms in an area.

ENVIRONMENTAL ANALYSIS. An analysis of alternative actions and their predictable environmental effects, including physical, biological, economic, and social consequences and their interactions; short- and long-term effects; direct, indirect, and cumulative effects.

ENVIRONMENTAL ASSESSMENT (EA). A concise public document which serves to: (a) Briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a Finding of No Significant Impact; (b) Aid an agency's compliance with NEPA when no EIS is necessary; (c) Facilitate preparation of an EIS when necessary.

ENVIRONMENTAL IMPACT STATEMENT (EIS). A detailed statement prepared by the responsible official in which a major Federal action which significantly affects the quality of the human environment is described, alternatives to the proposed action provided, and effects analyzed.

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

EPIDEMIC. The populations of plants, animals, and diseases that buildup, often rapidly, to highly abnormal and generally injurious levels .

EQUIVALENT CLEARCUT AREA (ECA). Equivalent Clearcut Area is an indicator of basin condition and is calculated from the total amount of crown removal that has occurred from harvesting, road building, and other activities based on the current state of vegetative recovery.

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

EVEN-AGED MANAGEMENT. Deliberate planned actions that result in stands of trees of essentially the same age, growing together. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands.

EXTIRPATION . Complete loss.

F

FEDERAL REGISTER. A daily publication which reports Presidential and Federal Agency documents.

FLOODPLAIN. The lowland and relatively flat areas adjoining inland and coastal waters, including, at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year.

FIRE PERIMETER. The outer edge limits of a fire-burned area.

FIRE REGIME. The combination of fire frequency characteristics, predictability, intensity, seasonality and extent in an ecosystem.

FIRE TOLERANT. A plant which has properties or charistics which enable it to survive fire.

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

FORAGE AREAS. Vegetated areas with less than 60 percent combined canopy closure of tree and tall shrub (greater than 7 feet in height).

FOREST COVER TYPE. A descriptive classification of forestland based on the present vegetative species composition and/or locality (ie: lodgepole pine, mixed conifer). Most stands are given a classification (stratum label), based on aerial photo interpretation, that includes the forest cover type, the size class, density class, and stand development phase. For example: a stand with the stratum label of LP2W would be considered a lodgepole pine cover type (LP) that is of a pole/small sawtimber size class (2) and is well stocked with coniferous trees (W).

FOREST HEALTH. An ecological perspective that looks at the resiliency of an ecosystem and its ability to be sustainable.

FOREST LAND. Land at least 10 percent occupied by forest trees or formerly having had such tree cover and not currently developed for nonforest use.

FROST HEAVING. Occurs when moist or saturated soils are frozen, causing seedlings which are not yet deeply rooted to be ejected from the soil. This occurs mostly in low elevation areas that have frost before there is a cover of snow.

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

FUEL LOADING. The amount of available fuels, usually expressed in tons per acre.

FUELBED. The arrangement of available fuels, continuity and amount.

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

G

GAP. An opening in the stand or canopy caused by some disturbance.

GENETIC INTROGRESSION . The entry or introduction of genetic material from one gene complex to another.

GRADIENT. The rise or fall of a ground surface expressed in degrees of slope.

H

HABITAT. The sum total of environmental conditions of a specific place occupied by a wildlife species or a population of such species.

HABITAT COMPONENT. A simple part, or a relatively complex entity regarded as a part, or an area or type of environment in which an organism or biological population normally lives or occurs.

HABITAT DIVERSITY. The variation in types, sizes, and shapes of landscape elements or vegetation types.

HABITAT EFFECTIVENESS. The ability of an area to support a species (individual or population) based on a potential of 100%.

HABITAT TYPE. An aggregation of all land areas potentially capable of producing similar plant communities at climax. Within the analysis area the following habitat types are present: western redcedar/queencup beadlily (531), western hemlock/queencup beadlily (571), western hemlock/menziesia (579), subalpine fir/queencup beadlily (620), subalpine fir/menziesia (670), subalpine fir/beargrass (690), subalpine fir/beargrass, grouse whortleberry (692), subalpine fir/grouse whortleberry, pinegrass (731), subalpine fir/alder (740).

HABITAT TYPE GROUP. A category of habitat types with similar ecological amplitudes and environmental conditions. Combined with information on stand conditions, habitat type groups can be used to develop silvicultural stand treatment priorities during the IDT process.

HARDWOODS. A conventional term for the wood of broadleaf trees. In the decision area these trees are generally confined to areas near water.

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 RISK. Individual or groups of trees that are live (green) but have the physical characteristics favorable to insect infestation. Trees in this category are subject to mortality and loss of economic value.

HOST TREE. A tree in which other organisms, parasites, or insects live for part of their life cycle.

I

INDICATOR SPECIES. See management indicator species.

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

INFISH. (Inland Native Fish Strategy) On July 31, 1995, the Decision Notice for Inland Native Fish Strategy Environmental Assessment (INFISH) was signed. This strategy was developed to provide interim (approximately 18 months) direction to protect habitat and populations of native resident fish and supersedes the Idaho Panhandle Riparian Guidelines previously used.

INSTREAM FLOWS. The minimum water volume (cubic feet/second) in each stream necessary to meet seasonal streamflow requirements for maintaining aquatic ecosystems, visual quality, recreational opportunities and other uses.

INTERAGENCY GUIDELINES. A document which was originally developed in the Yellowstone grizzly bear ecosystem and later applied to all grizzly habitat through congressional mandate. Previously known as the "Yellowstone Guidelines" , it identifies important, specific management measures regarding the conduct of multiple use activities in grizzly bear habitat and parameters for identifying the sensitivity of grizzly bear habitat to human activities.

INTERDISCIPLINARY TEAM (IDT). A group of resource professionals with different expertise that collaborate to develop and evaluate resource management decisions.

INTERMEDIATE HARVEST. Any harvest in an even-age stand rotation which retains the major stand components and does not regenerate the stand.

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.

INVENTORIED ROADLESS AREAS. Areas identified in a set of inventoried roadless area maps, contained in *Forest Service Roadless Area Conservation, Draft Environmental Impact Statement, Volume 2,* dated May 2000, which are held at the National headquarters office of the Forest Service, or any update or revision of those maps (FSM 1920.5).

IRREVERSIBLE. A term that describes the loss of future options. Applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity that are renewable only over long periods of time.

IRRETRIEVABLE. A term that applies to the loss of production, harvest, or use of natural resources. For example, some or all of the timber production from an area is lost irretrievably while an area is serving as a winter sports site. The production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume timber production.

L

LADDER FUELS. Small trees and understory shrubs that allow fire to burn up into the canopy of larger trees.

LANDSCAPE. The aspect of the land that is characteristic of a particular region or area.

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.

LARGE WOODY MATERIAL. (Also large woody debris; LWD)- Branches and/or tree trunks located within a stream channel, originating from trees growing in or near the channel. Such material is considered "large" if it is of sufficient size that it remains at least partially submerged during all but major flood events. These materials are important in stream systems because they serve a variety of functions related to channel hydraulics and morphology. Functions would include flow energy reduction due to friction and turbulence on downstream side of debris, and sediment storage on upstream side of materials. LWD is delivered to stream channels by decay and/or windfall of trees in close proximity to stream channels.

LETHAL FIRES A descriptor of fire response and effect in forested ecosystems of high-severity or sever fire that burns through the overstory and understory which consumes large woody surface fuels and may consume entire duff layer. Stand is essentially destroyed and will be replaced as stand is set back to initiation stage.

LIMITING FACTOR. The environmental influence through which the toleration limit of an organism is first reached, which acts, therefore, as the immediate restriction in one or more of its functions or activities or in its geographic distribution.

LODGEPOLE PINE. See explanation under timber type.

M

MANAGEMENT AREA. 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 INDICATOR SPECIES (MIS). A species of wildlife, fish, or plant whose health and vigor are believed to accurately reflect the health and vigor of other species having similar habitat and protection needs to those of the selected indicator species.

MASS EROSION (also called mass wasting) Downslope movement of a unit of soil. Mass erosion includes landslides, debris flows, debris avalanches, debris torrents, slumps and soil creeping.

MATURE. On lands allocated for timber harvest, mature is defined as trees or stands that have reached rotation age, generally around 100 years. In the context of wildlife - Mature forest habitat with characteristics needed to provide habitat for species such as pine marten and pileated woodpecker (generally occurs around age 100).

MID-SERAL. A middle transitory stage in forest succession.

MITIGATION. Actions to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice.

MIXED CONIFER. See explanation under timber type.

MIXED LETHAL FIRES A descriptor of fire response and effect in forested ecosystems of moderate fire, burns in surface fuels but may involve a tree understory. It consumes litter, upper duff, understory plants and foliage on understory trees. Individual and groups of overstory trees may torch out if fuel ladders exist. Enough of the stand's overstory survives to provide for the major portion of the regeneration that results.

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.

MONOCULTURE. A pure stand of a single species.

MOSAIC. The intermingling of plant communities and their successional stages in such a manner as to give the impression of an interwoven design.

MOUNTAIN PINE BEETLE. The common name for the bark beetle (Dendroctonous ponderosae, Hopkins) which is an insect pest that has caused more tree mortality in the intermountain west than any other

MULTI-STORY. A forest stand or plant community having more than two main canopy layers or "stories".

N

NATIONAL FOREST SYSTEM ROAD. A CLASSIFIED FOREST ROAD UNDER THE JURISDICTION OF THE FOREST SERVICE. THE TERM “NATIONAL FOREST SYSTEM ROADS” IS SYNONYMOUS WITH THE TERM “FOREST DEVELOPMENT ROADS” AS USED IN 23 U.S.C. 205. (FSM 7705).

NEPA PROCESS. An interdisciplinary process, mandated by the National Environmental Policy Act, which concentrates decisionmaking around issues, concerns, alternatives and the effects of alternatives on the environment.

NO ACTION ALTERNATIVE. The No Action alternative is required by regulations implementing the National Environmental Policy Act (NEPA) (40 CFR 1502.14). The no action alternative provides a baseline for estimating the effects of other alternatives. Where a project activity is being evaluated, the no action alternative is defined as one where no action or activity would take place.

NONGAME SPECIES. All wild animals not subject to sport hunting, trapping or fishing regulations.

NON-LETHAL FIRES A descriptor of fire response and effect in forested ecosystems of low-severity or cool fire. Has minimal impact on the site. It burns in surface fuels consuming only the litter, herbaceous fuels, and foliage and small twigs on woody undergrowth. Little heat travels downward through the duff. None of the large (commercial size) trees are killed.

NONSTOCKED. A stand of trees or aggregation of stands that have a stocking level below the minimum specified for meeting the prescribed management objectives.

NOXIOUS WEEDS. Rapidly spreading plants which can cause a variety of major ecological impacts to both agricultural and wild lands.

NUTRIENT. An element found in the soil that is needed for plant growth.

O

OBLITERATION. The reclamation and/or restoration of land to resource production from that of a transportation facility. This may include, but is not limited to, one or more of the following: ripping, seeding, pulling culverts, or recontouring. The term "obliteration" is often used in place of "road decommissioning" as defined in 36 CFR 212.1.

OLD GROWTH HABITAT. Old growth is a distinct successional stage in the development of a timber stand that has special significance for wildlife, generally characterized by: (1) large diameter trees (often exceeding 19" dbh) with a relatively dense, often multilayer canopy. (2) the presence of large, standing dead or dying trees. (3) down and dead trees, (4) stand decadence associated with the presence of various fungi and heartrots, (5) and an average age often in excess of 200 years.

OPEN ROAD DENSITY. A measure of the amount of open roads per area of land, usually expressed as miles per square mile

OUTBREAK. Sudden occurrence of a disease or insect pest.

OUTSLOPE. When the slope from inside of shoulder to outside of shoulder exceeds the alignment grade.

OVERMATURE. The condition that exists after an even-aged stand reaches maturity and decline in vigor, health and soundness.

OVERSTOCKED. Stands exceeding a prescribed standard or expected number of trees or basal area per acre.

OVERSTORY. The portion of trees in a forest which forms the uppermost layer of foliage.

P

PATCH. An area of vegetation that is relatively homogeneous internally with respect to composition and successional stage and that differs from what surrounds it.

PATHOGEN An organism which causes disease in another organism.

PAYMENTS TO STATES (or Payments to Counties) The portion of receipts derived from Forest Service resource management that is distributed to State and county governments as the Forest Service 25 percent fund payments.

PEAK FLOW. The greatest flow attained during the melting of the winter snowpack.

PERENNIAL STREAMS. Streams that flow continuously throughout the year.

PLANT ASSOCIATION. A potential natural plant community of definite floristic composition and uniform appearance.

PLANTATIONS. Areas in the forest where trees have been planted.

POPULATION. In statistics, the aggregate of all units forming the subject of study; otherwise, a community of individuals that share a common gene pool.

PRE-COMMERCIAL THINNING A felling made in an immature stand in order primarily to accelerate diameter increment but also, by suitable selection, to improve the average form of the trees that remain. Usually occurs in crowded (by crown competition or stems per acre) stands to give remaining trees (a prescribed desired number of trees) a competitive advantage for full development.

PREFERRED ALTERNATIVE. The agency's preferred alternative, one or more, that is identified in the impact statement (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 (ie: silviculture, wildlife management, reduction of fuel hazard, etc.)

PRESCRIBED FIRE. A wildland fire burning under preplanned specified conditions to accomplish specific planned objectives. It may result from either a planned or unplanned ignition.

PRESCRIPTION. Management practices selected and scheduled for application on a designated area to attain specific goals and objectives.

PROJECT AREA. The geographic area defining the scope of this document and the alternatives proposed by it.

PROJECT FILE. An assemblage of documents that contains all the information developed or used during an environmental analysis. This information may be summarized in an Environmental Assessment or an Environmental Impact Statement. The project file becomes part of the administrative record for judicial review in case of legal action.

R

RANGER DISTRICT. An administrative subdivision of the Forest, supervised by a District Ranger who reports to the Forest Supervisor.

REBURN. Re-ignition and burning on incompletely burned fuels.

RECONDITIONING. Road maintenance consisting of cleaning ditches and culverts, including inlets and outlets; removing slide material; scarifying and blading the road surface including turnouts, and approach road connections.

RECONTOUR. A form of road decommissioning or obliteration where fill material is pulled back onto the road surface to a more natural sideslope.

RECORD OF DECISION. A concise public document disclosing the decision made following preparation of an EIS and the rationale used by the deciding officer to reach that decision.

RECREATION OPPORTUNITY SPECTRUM (ROS). A range of possible combinations or recreation activities, settings, and experience opportunities, from Primitive to Urban, arranged along a continuum. Classes used herein are:

> **Roaded Natural Appearing (RNA)**- Area is characterized by predominantly natural appearing environment with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in the construction standards and design facilities.
>
> **Roaded Modified** – is a subclass of roaded natural that is less located along less used forest roads where the user will likely encounter large clear cuts and areas where management activities may be present.
>
> **Rural (R)**- Area is characterized by substantially modified natural environment. Resource modification and utilization practices are primarily to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of man are readily evident, and the interaction between users if often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate densities are provided far away from developed sites. Facilities for intensified motorized use and parking are available.

REFORESTATION. The natural or artificial restocking of an area with forest trees. It may include tree planting and seeding measures to obtain natural regeneration.

REGENERATION. The renewal of a tree crop, whether by natural or artificial means. This term may also refer to the crop (seedlings, saplings) itself.

REGENERATION HARVEST. Used in reference to clearcut, seedtree and shelterwood harvest methods which remove an existing stand to prepare a site for regeneration.

REHABILITATION. Returning of land to farm use or to productivity in conformity with a prior land use plan, including a stable ecological state that does not contribute substantially to environmental deterioration and is consistent with surrounding aesthetic values.

RELIC. A tree that has survived several stand replacing events.

RESERVE TREE. Trees retained after the regeneration period (pole sized or larger) under the clearcutting, seed tree, or shelterwood methods.

RESIDUAL TREE. Trees remaining after any harvest.

RESTOCKING. The process of adding additional trees by planting or seeding to bring the stocking up to prescribed conditions.

RESTORATION. The act of returning to historic site conditions or ecological processes that existed before the disruption or interruption of these processes.

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 an Order and posted that Order in accordance with 36 CFR 261.

RHIZOME. A rootlike stem under or on top of the ground, ordinarily in a horizontal position, which usually sends out roots from its lower surface and leafy shoots from its upper surface.

RIFFLE STABILITY INDEX (RSI). A system of measure that predicts channel substrate stability.

RIPARIAN AREAS/HABITATS. Land areas where the vegetation and microclimate are influenced by perennial and/or intermittent water.

RIPARIAN MANAGEMENT OBJECTIVES (RMOs). Quantifiable measures of stream and streamside conditions that define good fish habitat and serve as indicators against which attainment or progress toward attainment of goals will be measured.

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 headwater streams, and other areas where proper ecological functioning is crucial to maintenance of the stream's water, sediment, woody debris, and nutrient delivery systems.

RIPPING. A form of road surface treatment; a method of aerating the surface and subsurface material of a road, landing, and/or skid trail to allow water infiltration by tilling the soil with a piece of machinery equipped with ripper bars.

ROAD. A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified or temporary (36 CFR 212.1).

Classified Road. Roads wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long-term motor vehicle access, including State roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service (36 CFR 212.1).

Temporary Road. Roads authorized by contract, permit, lease, or other written authorization, or emergency operation, not intended to be a part of the forest transportation system and not necessary for long-term resource management (36 CFR 212.1).

Unclassified Road. Roads on National Forest System lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon termination of the authorization (36 CFR 212.1).

ROAD DECOMMISSIONING. Activities that result in the stablization and restoration of unneeded roads to a more natural state (36 CFR 212.1), (FSM 7703).

ROAD MAINTENANCE. The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective (FSM 7712.3)

ROAD MANAGEMENT OBJECTIVE. Defines the intended purpose of an individual road based on management area direction and access management objectives. Road management objectives contain design criteria, operation criteria, and maintenance criteria. (FSM 7721.31 and FSH 7790.55--33).

ROAD RECONSTRUCTION. Activity that results in improvement or realignment of an existing classified road as defined below:

Road Improvement. Activity that results in an increase of an existing road's traffic service level, expansion of its capacity, or a change in its original design function.

Road Realignment – Activitiy that results in a new location of an existing road or portions of an existing road and treatment of the old roadway (36 CFR 212.1).

ROOT CROWNS. The point at or just below the surface of the ground where the stem and root join.

ROOT DISEASE. A fungal organism which lives in organic matter i the soil and invades the living roots systems of trees.

ROSGEN CHANNEL CLASSIFICATION. A system of measure that utilizes various channel features to rate a stream or river into reproducible classes.

ROTATION. The planned number of years required to establish (including the regeneration period) and grow timber crops to a specified condition or maturity for regeneration harvest.

S

SALMONIDS . Members of the family of elongate soft-finned fishes Salmonidae - the trout and salmon family.

SALVAGE HARVEST. The cutting of trees that are dead, dying, or deteriorating before they lose commercial value as sawtimber. The removed trees are generally overmature, damaged by fire, wind, insects, fungi or other injurious agencies.

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.

SCREE Refers to slopes covered with loose rock fragments, including the accumulation of rock at a cliff or slope base (talus) as well as loose, unstable material lying on slopes without cliffs.

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.

SEDIMENT TRAP. Any natural or man-made feature in a stream that traps sediment.

SEED TREE. A tree selected as a natural seed source within a shelterwood or seedtree harvest cut; sometimes also reserved for seed collection.

SEEDTREE HARVEST. A regeneration method under an even-aged silvicultural system. A portion of the mature stand, usually 10-15 trees/acre, is retained as a source of seed for regeneration of the stand. The seed trees are intended for removal after regeneration is considered to be established. Note: where there is no intention of removing the seed trees once the stand is regenerated, a seedtree seed cut with reserves is the appropriate silvicultural system.

SEEDLINGS AND SAPLINGS. Non-commercial-size young trees, generally occurring in plantations.

SELECTION HARVEST. The periodic removal of trees, usually at 10-20 year intervals, individually or in small groups, from an uneven-aged forest in order to realize yield and establish regeneration of irregular constitution.

SENSITIVE SPECIES. Those species identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trends in (a) population numbers or density, or (b) habitat capability that would reduce a species' existing distribution.

SENSITIVITY LEVEL. A particular degree or measure of viewer interest in the scenic qualities of the landscape.

SERAL STAGE. A transitory or developmental stage of a biotic community in an ecological succession (does not include climax successional stage or pioneer stage).

SEROTINOUS Late in developing; particularly applied to plants that flower or fruit late in the season and to fruit and cones that remain closed for a year or more after the seeds mature, but also to bud opening, leaf shedding etc. . Applies to the nature of lodgepole pine cones, as a positive adaptive trait for fire dependent ecosystems.

SHELTERWOOD HARVEST. A regeneration method under an even-aged silvicultural system. A portion of the mature stand is retained as a source of seed and site protection during the regeneration period.

SHRUB. A plant with persistent woody stems and relatively low growth form; usually produces several basal shoots as opposed to a single bole; differs from a tree by its low stature and nonarborescent form.

SIGNIFICANT. As used in NEPA, requires consideration of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole, and the affected region, interests, and locality. Intensity refers to the severity of impacts (40 CFR 1508.27).

SILVICULTURE. The art and science of growing and tending forest vegetation, i.e., controlling the establishment, composition, and growth of forests, for specific management goals.

SILVICULTURAL DIAGNOSIS. The process of comparing existing stand conditions to a desired condition or "target stand", and determining a need for treatment to bring the stand to the desired condition.

SILVICULTURAL SYSTEM. A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the cuttings that remove the mature crop and provide for regeneration, and according to the type of forest thereby produced.

SITE PREPARATION. A general term for a variety of activities that remove or treat competing vegetation, slash, and other debris that may inhibit the establishment of regeneration.

SIZE CLASS. A classification of forest stands based on live trees in the stand. The classification uses a four letter acronym based on descriptive adjectives. For example, a stand that is designated as a size class MLRS is a mature stand (M) that is considered low risk to damaging insects or disease (LR) and is stocked with sawtimber sized trees of a specified diameter and stocking level (S).

SLASH. The residue left on the ground after felling and other silvicultural operations and/or accumulating there as a result of storm, fire, girdling, or poisoning of trees.

SLASH BURNING. The treatment or burning of slash so as to reduce fire or insect hazards.

SNAG. A standing dead tree usually without merchantable value for timber products, but may have characteristics of benefit to some cavity nesting wildlife species.

SNAG DEPENDENT WILDLIFE. Wildlife species that are dependent on snags for nesting or roosting habitat or for food.

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.

SPECIES. A unit of classification of plants and animals consisting of the largest and most inclusive array of sexually reproducing and cross-fertilizing individuals which share a common gene pool.

STAGNATION Refers to stand growth, implying that there is a failure to express dominance due to poor site conditions, competition of other trees that limit development of the crowns which suppresses individual tree growth and over all stand development. Usually diameter growth is severely limited and height growth still occurs but slowly.

STAND. A community of trees or other vegetation uniform in composition, constitution, spatial arrangement, or condition to be distinguishable from adjacent communities.

STAND COMPOSITION. The representation of tree species in a forest stand, expressed by some measure of dominance (ie % volume, number, basal area).

STAND DENSITY A measure of the degree of crowding of trees within stocked areas, commonly expressed by various growing-space ratios such as crown length to tree height, crown diameter to diameter at breast height, crown diameter to tree height, or of stem spacing to tree height.

STAND REPLACING FIRE. A fire that kills most or all of a stand, and causes a new stand to be started.

STAND STRUCTURE. The horizontal and vertical arrangement of the vegetation in a stand.

STANDARD. A particular action, level of performance, or threshold specified by the Forest Plan for resource protection or accomplishment of management objectives. Unlike "guidelines" which are optional, standards specified in the Forest Plan are mandatory.

STOCKED. Stands falling within a prescribed standard or expected number of trees or basal area per acre.

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 CHANNEL STABILITY. A classification system that utilizes ocular estimates of various channel, bank, and riparian area features to evaluate channel health.

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.

STRUCTURAL DIVERSITY. The variation in sizes and shapes of landscape elements, as well as diversity of pattern (ie: heterogeneity).

SUCCESSION. The changes in vegetation and in animal life that take place as the plant community evolves from bare ground to climax.

SUCCESSIONAL STAGE. A stage or recognizable condition of a plant community which occurs during its development from bare ground to climax.

SUMMER RANGE. A range, usually at higher elevation, used by deer and elk during the summer; a summer range is usually much more extensive than a winter range.

SUITABLE FOREST LAND. Forest land (as defined in CFR 219.3, 219.14) for which technology is available that will insure 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.

SUPPRESSED Refers to individual trees, very slowly growing trees with crowns entirely below the general level of the crown cover, receiving no direct light either from above or from the sides, common in stands that are considered overstocked.

SURFACE EROSION. Downslope movement of individual particles of soil by water transport. Surface erosion includes sheet erosion, riling and gullying.

T

TARGET STAND. A classification of individual forest stands that reflects the desired attributes within a range of stand conditions that have the potential in meeting timber management objectives as described in the Kootenai Forest Plan. Target stands are generally described for each habitat type group based on site productivity for even-aged, multi-storied, and uneven-aged silvicultural systems. The reference to site productivity is differentiated between Mixed Conifer 1 (MC 1), Mixed Conifer 2 (MC 2), and Lodgepole Pine (LP). For example, an MC 1 designation refers to the productivity group made up of commercial conifer (other than LP) that have the potential to produce >85 cubic feet/acre/year at the culmination of mean annual increment. An MC 2 designation includes the group that encompasses all stands not meeting the above conditions. The LP group includes lodgepole pine stands that have a full range of productivity.

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 cutting made to reduce stand density of trees primarily to improve growth, enhance forest health, or 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.

TIERING. The use of a previously written environmental document with a broad scope to cover discussion of issues common to both.

TIMBER TYPES. A descriptive classification of forestland based on present occupancy of an area by tree species (ie: 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. See Appendix A (Silvicultural Prescriptions) for more information.

TRAMPLING. A method of treating fuels by knocking down by walking over or through small trees with a piece of machinery.

TURBIDITY. An optical measure of how fine sediment inhibits the transmission light in a given water sample due to scattering and absorption by suspended particles.

TWO-STORIED. A forest stand or plant community having two main canopy layers or "stories".

U

UNDERBURN. Understory fuels treatment.

UNDERSTORY. Vegetation (trees or shrubs) growing under the canopy formed by taller trees.

UNSUITABLE FOREST LAND. Lands not selected for timber production in Step II and III of the suitability analysis during the development of the Forest Plan due to: (1) the multiple-use objectives for the alternative preclude timber production, (2) other management objectives for the alternative limit timber production activities to the point where management requirements set forth in 36 CFR 219.27 cannot be met, and (3) the lands are not cost-efficient over the planning horizon in meeting forest objectives that include timber production. Land not appropriate for timber production shall be designated as unsuitable in the Forest Plan.

UNROADED AREAS. Any area without the presence of a classified road, that is of a size and configuration sufficient to protect the inherent characteristics associatied with its roadless condition. Unroaded areas are distinct from and do not overlap with inventoried roadless areas (FSM 1920.5).

V

VERTICAL DIVERSITY. The diversity in an area that results from the complexity of the above ground structure of the vegetation; the more tiers of vegetation or the more diverse the species makeup is, the higher the degree of vertical diversity

VIABLE POPULATION. A wildlife population of sufficient size to maintain its existence over time in spite of normal fluctuations in population levels.

VIEWSHED. Sub-units of the landscape where the visitor's view is contained by topography similar to a watershed.

VISUAL QUALITY OBJECTIVE (VQO). A system of indicating the potential expectations of the visual resource by considering the frequency an area is viewed and the type of landscape.

Maximum Modification: A Visual Quality Objective meaning man's activity may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background.

Modification: A Visual Quality Objective meaning man's 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.

Partial Retention: A Visual Quality Objective which in general means man's activities may be evident but must remain subordinate to the characteristic landscape.

Retention: A Visual Quality Objective which in general means man's activities are not evident to the casual forest visitor.

Preservation: A Visual Quality Objective that provides for ecological change only.

Variety Class: Diversity of landscape character

Sensitivity Level: A particular degree or measure of viewer interest in the scenic qualities of the landscape.

VARIETY CLASS. A particular level of visual variety or diversity of landscape character.

VISUAL RESOURCE. The composite of landforms, water features, vegetative patterns and cultural features which create the visual environment.

W

WATER ROUTING. Spring snowmelt and storm runoff intercepted and redirected by roads, ditches, and trails.

WATER YIELD. The measured output of the Forest's streams.

WILDERNESS. All lands included in the National Wilderness Preservation System by public law; generally defined as undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation.

WILDFIRE. Any fire not designated and managed as a prescribed fire with an approved prescription.

WINDTHROW. The action of wind uprooting trees.

WINTER RANGE. A range, usually at lower elevation, used by migratory deer and elk during the winter months; usually better defined and smaller than summer ranges.

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.

ABBREVIATIONS AND ACRONYMS

ABIS	Aquatic Biota Information System
AIRFA	American Indian Religious Freedom Act of 1978
ALT	Alternative
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	Best Management Practices
CCE	Clearcut Equivalent Acres
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulation
CFS	Cubic Feet Per Second
CWA	Clean Water Act
CWD	Coarse Woody Debris
DBH	Diameter Breast Height
DEIS	Draft Environmental Impact Statement
EA	Environmental Assessment
ECA	Equivalent Clearcut Acres
EIS	Environmental Impact Statement
EMU	Elk Mangement Unit
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FDR	Forest Development Road
FEIS	Final Environmental Impact Statement
FP	Forest Plan
FSH	Forest Service Handbook
FSM	Forest Service Manual
GIS	Global Information Systems
HE	Habitat Effectiveness
IDT	Interdisciplinary Team
INFISH	Inland Native Fish Strategy
IPNF	Idaho Panhandle National Forest
IRA	Inventoried Roadless Area
KV	Knutson-Vandenberg Act of 1924
MA	Management Area
MIS	Management Indicator Species
MBF	Thousand Board Feet
MMBF	Million Board Feet
MOU	Memorandum of Understanding
MS	Management Situation
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NRT	National Recreation Trail
ORD	Open Road Density (mi/sq. mi.)
PL	Public Law
PFI	Peak Flow Increase
PNF	Present Net Value
RHCA	Riparian Habitat Conservation Area
RMO	Road Management Objective
ROS	Recreation Opportunity Spectrum
RSI	Riffle Stability Index
SCS	Stream Channel Stability
SHPO	State Historic Preservation Officer
SWCP	Soil and Water Conservation Practices
T&E	Threatened and Endangered Species
USC	United States Code
USDI	United States Department of the Interior
USFS	United States Forest Service
USGS	United States Geological Survey
USFWS	USDI-Fish & Wildlife Service
VQO	Visual Quality Objectives
VMS	Visual Management system
WQLS	Water Quality Limited Segments

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