United States
Department of
Agriculture

Forest
Service

Intermountain
Region

December
2014

Final Environmental Impact Statement

Golden Hand No. 1 and No. 2 Lode Mining Claims Project

Krassel Ranger District, Payette National Forest
Valley and Idaho County, Idaho

Volume 1
Summary
Chapter 1 – Purpose and Need
Chapter 2 – Alternatives
Chapter 3 – Affected Environment and Environmental Consequences
Chapter 4 – Consultation and Coordination
Glossary
Index
References
Appendix A
Appendix B
Appendix C
Appendix D

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FINAL ENVIRONMENTAL IMPACT STATEMENT
Golden Hand No. 1 and No. 2 Lode Mining Claims Final EIS

Krassel Ranger District
Payette National Forest
Valley and Idaho County, Idaho
December 2014

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ABSTRACT: This Final Environmental Impact Statement documents the analysis for the Golden Hand No. 1 and No. 2 Lode Mining Claims Project. Two action alternatives evaluate activities designed to achieve the project's purpose and need. Although a number of concerns were noted during scoping and the analysis, three concerns were identified as significant issues that necessitated development of a second action alternative.

The preferred alternative is Alternative C because it best meets the purpose and need identified for the project. Alternative C was developed to identify any terms and conditions needed to ensure that mining activities are conducted in a manner that minimizes adverse environmental impacts to National Forest surface resources. Additionally, Alternative C responds to issues identified during internal and external scoping. Alternative C would require one one-time, site specific non-significant amendment to the Forest Plan. This project is subject to the objection process pursuant 36 CFR 218 Subpart A and B.

Eligibility to File Objections: Objections will be accepted only from those who have previously submitted specific written comments regarding the proposed project either during scoping or other designated opportunity for public comment in accordance with § 218.5(a). Issues raised in objections must be based on previously submitted timely, specific written comments regarding the proposed project unless based on new information arising after designated opportunities.

Individual members of organizations must have submitted their own comments to meet the requirements of eligibility as an individual, objections received on behalf of an organization are considered as those of the organization only. If an objection is submitted on behalf of a number of individuals or organizations, each individual or organization listed must meet the eligibility requirement of having previously submitted comments on the project (§ 218.7). Names and addresses of objectors will become part of the public record.

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- Objector's name and address with a telephone number if available; with signature or
- other verification of authorship supplied upon request;
- Identification of the lead objector when multiple names are listed, along with verification
- upon request;
- Name of project, name and title of the responsible official, national forest/ranger district
- of project, and
- Sufficient narrative description of those aspects of the proposed project objected to, specific issues related to the project, how environmental law, regulation, or policy would be violated, and suggested remedies which would resolve the objection.
- Statement demonstrating the connection between prior specific written comments on this project and the content of the objection, unless the objection issue arose after the designated opportunity for comment.

Filing an Objection: The reviewing officer is the Regional Forester, Intermountain Region. Written objections, including any attachments, must be filed (regular mail, fax, email, hand-delivery, or express delivery) with the reviewing officer at Objection Reviewing Officer, Intermountain Region USFS, 324 25th Street, Ogden, Utah 84401; or fax to 801-625-5277; or by email to: objections-intermtn-regional-office@fs.fed.us within 45 days following the publication date of this legal notice in the newspaper of record. The office business hours for those submitting handdelivered objections are: 8:00 am to 4:30 pm Monday through Friday, excluding holidays. Electronic objections must be submitted in a format such as an email message, pdf, plain text (.txt), rich text format (.rtf), and Word (.doc or .docx) to objections-intermtn-regionaloffice@fs.fed.us . It is the responsibility of objectors to ensure their objection is received in a timely manner (§ 218.9). The publication date in the *Idaho Statesman*, newspaper of record, is the exclusive means for calculating the time to file an objection of this project. Those wishing to object to this proposed project should not rely upon dates or timeframe information provided by any other source.

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CONTENTS

CONTENTS..... 1

LIST OF TABLES..... 5

LIST OF FIGURES..... 5

LIST OF PHOTOS..... 6

CHAPTER 1 - PURPOSE AND NEED..... 1-1
1.1 Introduction..... 1-1
1.2 Project History..... 1-1
1.3 Project Area Description..... 1-2
1.4 Proposed Action..... 1-2
1.5 Purpose and Need for the Proposed Action..... 1-7
1.6 Decisions to be Made..... 1-8
1.7 Forest Plan Direction Relative to the Project Area..... 1-9
1.7.1 MPC 1.1 – Existing Wilderness..... 1-10
1.7.2 MPC 3.2 – Active Restoration and Maintenance of Aquatic, Terrestrial and Hydrologic Resources..... 1-10
1.7.3 MPC 4.1c – Undeveloped Recreation: Maintain Unroaded Character with Allowance for Restoration Activities..... 1-11
1.7.4 Frank Church River of No Return Wilderness Management Plan..... 1-11
1.8 Regulatory Requirements and Required Coordination..... 1-11
1.8.1 Central Idaho Wilderness Act (CIWA) and the Wilderness Act 1-11
1.8.2 Clean Water Act, The Federal Water Pollution Control Act of 1972 1-12
1.8.3 Endangered Species..... 1-12
1.8.4 General Mining Law of 1872..... 1-12
1.8.5 Migratory Bird Treaty Act..... 1-13
1.8.6 National Forest Management Act (NFMA)..... 1-13
1.8.7 National Historic Preservation Act..... 1-13
1.8.8 Idaho Stream Channel Protection Act..... 1-13
1.8.9 The Multiple Use Mining Act of July 23, 1955..... 1-13
1.8.10 The Clean Air Act, as amended in 1990..... 1-13
1.8.11 American Indian Religious Freedom Act, Executive Order 12875, Executive Order 13007, Executive Order 13175, and Native American Graves Protection and Repatriation Act..... 1-14
1.8.12 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)..... 1-14
1.8.13 Nez Perce Treaty of 1855 and 1863, Shoshone-Bannock Tribes Fort Bridger Treaty of 1868, Shoshone-Paiute Tribes Executive Order of 1877, Treaty Between the Cayuse, Umatilla..... 1-14
1.9 Public Involvement and Consultation 1-15
1.9.1 Public Involvement..... 1-15
1.9.2 Consultation Processes..... 1-15
1.10 Issues and Concerns..... 1-16
1.10.1 Issues..... 1-16
1.10.1.1 Wilderness Character and Experience..... 1-16
1.10.1.2 Scenic Environment..... 1-17
1.10.1.3 Water, Soil, and Fisheries..... 1-17
1.10.2 Concerns..... 1-17
1.11 Document Organization..... 1-17

CHAPTER 2 - ALTERNATIVES..... 2-1
2.1 Introduction..... 2-1
2.2 Development of Alternatives..... 2-1
2.2.1 Issues Used in Alternative Development..... 2-1
2.2.2 Concerns Not Used in Alternative Development..... 2-1
2.3 Alternatives Eliminated from Detailed Study..... 2-1
2.3.1 Helicopter Transport of Personnel and Equipment 2-1
2.3.2 Non-Mechanized with Access by Foot and Pack Stock 2-2

2.3.3 Winter Operations……... 2-2
2.3.4 Temporary Bridges in FC-RONR Wilderness…….. 2-3
2.3.5 Reduced Motorized Access…….. 2-3
2.3.6 Modifications to Use Electric Vehicles, Wind/Solar Charged Equipment…….. 2-4
2.3.7 Removal of Ella Excavated Material From the Wilderness…….. 2-4
2.3.8 Helicopter Transport for Drill Rigs…… 2-4
2.3.9 No Adverse Effects to ESA……... 2-4
2.4 Alternatives Considered in Detail…… 2-5
2.4.1 Alternative A - No Action……... 2-5
2.4.2 Alternative B - Proposed Action…… 2-5
2.4.2.1 Forest Plan Amendments Associated with Alternative B…….. 2-11
2.4.2.2 Design Features Specific to Alternative B…… 2-12
2.4.3 Alternative C…… 2-12
2.4.3.1 Forest Plan Amendments Associated with Alternative C…….. 2-17
2.4.3.2 Design Features Specific to Alternative C…… 2-17
2.4.4 Design Features Common to All Alternatives……... 2-18
2.5 Summary Comparison of Alternatives…… 2-29
2.5.1 Project Objective Indicators…… 2-31
2.5.1.1 Confirmation Activities…… 2-31
2.5.1.2 Access……... 2-31
2.5.1.3 Fuel Storage…… 2-31
2.5.1.3 Crew Housing…… 2-31
2.5.1.4 Equipment……... 2-31
2.5.1.5 Water…… 2-32
2.5.1.5 Mine Timbers…….. 2-32
2.5.2 Project Issue Indicators……... 2-32
2.5.2.1 Wilderness…… 2-32
2.5.2.2 Scenic…… 2-33
2.5.2.3 Water, Soil, and Fisheries…….. 2-34
2.5.3 Forest Plan Consistency/Other Key Items ……... 2-34
2.5.3.1 Forest Plan Amendments……... 2-34
2.5.3.2 Roadless Areas…… 2-34
2.5.3.3 Noxious Weeds…… 2-34
2.5.3.4 Air Quality…… 2-35
2.5.3.5 Recreation Opportunity Spectrum…… 2-35
2.5.4 Threatened and Endangered Species…….. 2-35
2.5.5 Sensitive Species, Including Candidate Species…… 2-36
2.5.6 Management Indicator Species……... 2-36
2.6 Identification of the Preferred Alternative…… 2-36

CHAPTER 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES…... 3-1
3.1 Introduction…… 3-1
3.1.1 Concerns Not Analyzed in Detail ……... 3-2
3.1.1.1 Vegetation …… 3-2
3.1.1.2 Socio/Economics …… 3-2
3.1.1.3 Wild and Scenic Rivers …… 3-2
3.1.1.4 Research Natural Areas …… 3-2
3.1.1.5 Groundwater …… 3-2
3.2 Mineral and Geology …… 3-4
3.2.1 Environmental Consequences Specific to Alternative A……... 3-12
3.2.2 Environmental Consequences Specific to Alternative B and C…… 3-12
3.2.3 Cumulative Effects …… 3-12
3.3 Wilderness Resource…… 3-13
3.3.1 Environmental Consequences Specific to Alternative A……... 3-19
3.3.2 Environmental Consequences Specific to Alternative B…… 3-19
3.3.3 Environmental Consequences Specific to Alternative C…… 3-21
3.3.4 Cumulative Effects …… 3-22
3.4 Fisheries and Watershed Resource …… 3-23
3.4.1 Environmental Consequences Specific to Alternative A…….. 3-38
3.4.2 Environmental Consequences Specific to Alternative B…….. 3-38
3.4.2.1 Interstitial Sediment Deposition…… 3-38
3.4.2.2 Chemical Contamination…… 3-41
3.4.3 Environmental Consequences Specific to Alternative C…….. 3-44

3.4.3.1 Interstitial Sediment Deposition…… 3-44
3.4.3.2 Chemical Contamination…… 3-44
3.4.4 Environmental Consequences Specific to Alternative B and C…… 3-44
3.4.4.1 Interstitial Sediment Deposition…… 3-45
3.4.4.2 Stream Flow…… 3-47
3.4.5 Cumulative Effects…… 3-48
3.5 Soil Resource…… 3-51
3.5.1 Environmental Consequences Specific to Alternative A …… 3-54
3.5.2 Environmental Consequences Specific to Alternative B and C…… 3-54
3.5.3 Cumulative Effects…… 3-55
3.6 Wildlife Resources…… 3-56
3.6.1 Boreal Owl (R4 Sensitive Species)…… 3-60
3.6.1.1 Environmental Consequences Specific to Alternative A…… 3-60
3.6.1.2 Environmental Consequences Specific to Alternative B…… 3-60
3.6.1.3 Environmental Consequences Specific to Alternative C…… 3-60
3.6.1.4 Cumulative Effects…… 3-61
3.6.2 Pileated Woodpecker (Management Indicator Species)…… 3-61
3.6.2.1 Environmental Consequences Specific to Alternative A…… 3-62
3.6.2.2 Environmental Consequences Specific to Alternative B…… 3-62
3.6.2.3 Environmental Consequences Specific to Alternative C…… 3-62
3.6.2.4 Cumulative Effects…… 3-62
3.6.3 Canada Lynx (Threatened)…… 3-63
3.6.3.1 Environmental Consequences Specific to Alternative A…… 3-64
3.6.3.2 Environmental Consequences Specific to Alternative B…… 3-64
3.6.3.3 Environmental Consequences Specific to Alternative C…… 3-64
3.6.3.4 Cumulative Effects…… 3-64
3.6.4 Gray Wolf (R4 Sensitive Species)…… 3-65
3.6.4.1 Environmental Consequences Specific to Alternative A…… 3-65
3.6.4.2 Environmental Consequences Specific to Alternative B…… 3-66
3.6.4.3 Environmental Consequences Specific to Alternative C…… 3-66
3.6.4.4 Cumulative Effects…… 3-66
3.6.5 Townsend's Big-Eared Bat (R4 Sensitive Species)…… 3-67
3.6.5.1 Environmental Consequences Specific to Alternative A…… 3-67
3.6.5.2 Environmental Consequences Specific to Alternative B…… 3-67
3.6.5.3 Environmental Consequences Specific to Alternative C…… 3-68
3.6.5.4 Cumulative Effects…… 3-68
3.6.6 Columbia Spotted Frog (R4 Sensitive Species)…… 3-69
3.6.6.1 Environmental Consequences Specific to Alternative A…… 3-69
3.6.6.2 Environmental Consequences Specific to Alternative B…… 3-69
3.6.6.3 Environmental Consequences Specific to Alternative C…… 3-69
3.6.6.4 Cumulative Effects…… 3-69
3.6.7 Wolverine (R4 Sensitive Species and Candidate)…… 3-70
3.6.7.1 Environmental Consequences Specific to Alternative A…… 3-71
3.6.7.2 Environmental Consequences Specific to Alternative B…… 3-71
3.6.7.3 Environmental Consequences Specific to Alternative C…… 3-71
3.6.7.4 Cumulative Effects…… 3-72
3.7 Roadless Resources…… 3-73
3.7.1 Environmental Consequences Specific to Alternative A…… 3-78
3.7.2 Environmental Consequences Specific to Alternative B…… 3-78
3.7.3 Environmental Consequences Specific to Alternative C…… 3-79
3.7.4 Cumulative Effects …… 3-80
3.8 Botanical Resources…… 3-83
3.8.1 Environmental Consequences Specific to Alternative A…… 3-87
3.8.2 Environmental Consequences Specific to Alternative B and C…… 3-87
3.8.3 Cumulative Effects …… 3-87
3.9 Noxious Weeds…… 3-89
3.9.1 Environmental Consequences Specific to Alternative A…… 3-89
3.9.2 Environmental Consequences Specific to Alternative B and C…… 3-89
3.9.3 Cumulative Effects …… 3-91
3.10 Air Quality…… 3-93
3.10.1 Environmental Consequences Specific to Alternative A…… 3-95
3.10.2 Environmental Consequences Specific to Alternative B…… 3-95
3.10.3 Environmental Consequences Specific to Alternative C…… 3-96
3.10.4 Cumulative Effects …… 3-96

3.11 Scenic Environment 3-98
3.11.1 Environmental Consequences Specific to Alternative A 3-101
3.11.2 Environmental Consequences Specific to Alternative B 3-101
3.11.3 Environmental Consequences Specific to Alternative C 3-104
3.11.4 Cumulative Effects 3-106
3.12 Cultural Resources 3-108
3.12.1 Environmental Consequences Specific to Alternative A 3-110
3.12.2 Environmental Consequences Specific to Alternative B 3-111
3.12.3 Environmental Consequences Specific to Alternative C 3-111
3.12.4 Cumulative Effects 3-111
3.13 Recreation Opportunity Spectrum (ROS) 3-113
3.13.1 Environmental Consequences Specific to Alternative A 3-115
3.13.2 Environmental Consequences Specific to Alternative B and C 3-115
3.13.4 Cumulative Effects 3-115
3.14 Irreversible and Irretrievable Effects 3-116
3.15 Other Disclosures 3-117

CHAPTER 4 - CONSULTATION AND COORDINATION 4-1
4.1 Introduction 4-1
4.2 List of Primary Preparers 4-1
4.3 Management and Review 4-2
4.4 Summary of Scoping, Public Involvement, Consultation, and Comments 4-2
4.5 List of Those Receiving Copies or Notification of the Draft EIS 4-3
4.6 Changes Made to the Draft EIS in Preparation of the Final EIS 4-3
4.7 Responses to Comments Received on the Draft EIS 4-4

GLOSSARY
INDEX
REFERENCES
APPENDIX A – Cumulative Effects
APPENDIX B – Watershed Condition Indicators
APPENDIX C – Monitoring
APPENDIX D – Drilling procedures related to groundwater resource protection
APPENDIX E – Response to Comment

LIST OF TABLES

Table #	Name of Table	Page #
Table 2-1	Proposed Temporary Roads and Maintenance for the Golden Hand Mine Project under Alternative B…….	2-7
Table 2-2	Proposed Temporary Roads and Maintenance for the Golden Hand Mine Project under Alternative C…….……..	2-14
Table 2-3	Comparison of Activities and Effects……...…….……..	2-30
Table 2-4	Equipment Needs in the FC-RONR Wilderness……	2-31
Table 3-1	Summary of IDEQ Listings of Approved TMDLS on Impaired Waters by Sub-basin……	3-24
Table 3-2	Documented Fish Species Presence (P) or Not Found (NF) in the Analysis Area…….	3-30
Table 3-3	Roads and Road Density within RCAs in the Golden Hand Analysis Area…	3-35
Table 3-4	Miles of Road Within 200 Feet of Stream Channels…….…….	3-36
Table 3-5	WEPP model sediment yield (lbs) for roads by alternative……...	3-40
Table 3-6	Wildlife Species Considered, Species Status, and Associated Source Habitat Suite and Family……...…….	3-57
Table 3-7	Crosswalk of Wilderness Qualities to Wilderness Attributes……	3-75
Table 3-8	Federally Listed USFWS Threatened and Candidate Plants (Payette National Forest) ……	3-83
Table 3-9	Federal, State, and Forest Service Status of Rare Plant Species with Potential or Known Habitat on the Payette National Forest…….	3-84
Table 3-10	National Ambient Air Quality Standards (NAAQS)…….	3-94
Table 3-11	Sensitive Areas, Air Quality…….	3-95
Table 3-12	Alternative B and C Pollutant Inputs…….	3-95
Table 3-13	Visual Quality Objectives for Sensitive Travel Routes or Use Areas……...	3-100

LIST OF FIGURES

Figure #	Name of Figure	Page #
Figure 1-1	Vicinity Map…….……..	1-5
Figure 1-2	Golden Hand No. 1 and No. 2 Lode Mining Claims Project Area...…….	1-6
Figure 1-3	Management Prescription Categories……..	1-9
Figure 2-1	Alternative B, Proposed Action, and Alternative C.....	2-9
Figure 3-1	Diamond Core Drill …….…….	3-7
Figure 3-2	Geologic Formations in the Golden Hand Vicinity …..……...……..	3-10
Figure 3-3	Trails and Roads in the Vicinity of Golden Hand …..……...	3-16
Figure 3-4a	Fishery and Watershed Analysis Area …….……...……..	3-26
Figure 3-4b	Fishery and Watershed Analysis Area …….……...……..	3-27
Figure 3-5	ESA Listed, Sensitive, and MIS Fish Distribution, and Designated Critical Habitat in Golden Hand Vicinity ……..……...……..	3-28
Figure 3-6	Road Maintenance and Reconstruction …….	3-29
Figure 3-7	Potential Landslide Prone Areas in Golden Hand Area……	3-52
Figure 3-8	Aerial Photography View of Confirmation Activities On or Near SINMAP Modeled Landlslide Prone Areas…….	3-53
Figure 3-9	Wildlife Analysis Area……..	3-59
Figure 3-10	Inventoried Roadless Area within the Project Area……..	3-74
Figure 3-11	Inventoried Noxious Weed Populations……..	3-90
Figure 3-12	Sensitive Travel Routes and Use Areas……	3-99
Figure 3-13	Recreation Opportunity Spectrum (ROS)…….	3-114

LIST OF PHOTOS

Figure #	Name of Figure	Page #
Photo 2-1	Road Bed Constructed Prior to Wilderness Designation in the FC-RONR Wilderness…….	2-7
Photo 3-1	Track-Mounted Reverse-Circulation Rotary Drill ……..……..……..	3-8
Photo 3-2	Forest Trail #013 Tread Width (White Rod Extended to 10 Feet) …….	3-17
Photo 3-3	Photographs of Streams within the Project Area……..	3-33
Photo 3-4	Photographs of Ford Repair in FC-RONR Wilderness……	3-41
Photo 3-5	Disturbed Area Near Bunkhouse ……	3-45
Photo 3-6	Downstream Ford of NF Smith Creek……	3-46
Photo 3-7	Seep on Forest Road 503739800……..	3-53
Photo 3-8	Vicinity of the Golden Hand Mine Site with Historic Building……	3-109
Photo 3-9	Bunkhouse North of Claim No's. 3 and 4 at the Golden Hand Mine Site……	3-110

SUMMARY

S.1 Introduction

This Final Environmental Impact Statement (EIS) discloses the environmental impacts of a proposed action and alternative actions for road maintenance/reconstruction, temporary road use authorization on unauthorized roads and confirmation sampling on the Golden Hand No. 1 and No. 2 lode mining claims, along with activities/equipment associated with accomplishing the aforementioned on the Krassel Ranger District of the Payette National Forest in Valley and Idaho Counties, Idaho.

This document has been prepared pursuant to the requirements of the National Environmental Policy Act (NEPA, 40 CFR 1500-1508), the National Forest Management Act (NFMA implementing regulations of 2005, including transition language at 36 CFR 219.14), the 2003 Payette National Forest Land and Resource Management Plan, as amended (USDA 2003, 2010) (Forest Plan), and the 2003 Frank Church - River Of No Return Wilderness Management Plan (also referred to as the Wilderness Plan). Formal planning for this project was initiated on November 21, 2008 with a Notice of Intent to prepare an EIS appearing in the Federal Register.

The Golden Hand No. 1 and No. 2 Lode Mining Claims Project Area is located in the Big Creek drainage on the Payette National Forest, approximately 19 miles north of Yellow Pine, ID (Figure S-1). The actual claims encompass approximately 20 acres each and are located near Coin Creek, a tributary of Beaver Creek, which flows into Big Creek, a tributary of the Middle Fork Salmon River. The project area includes 1,309 acres of National Forest System lands (Figure S-2).

Roughly 291 acres of the Frank Church River of No Return Wildness (FC-RONR Wilderness) lie within the Golden Hand No. 1 and No. 2 Lode Mining Claims Project Area. Project activities including the authorization of temporary roads and use of mechanized equipment for confirmation activity would occur within the FC-RONR Wilderness.

S.2 Proposed Action

On September 4, 2007 AIMMCO submitted an operating plan for drilling operations, trenching and sampling, and reopening the caved Ella Mine adit. The Forest Service worked with AIMMCO for more than two years to revise the initial proposal. A revised Plan of Operations was submitted to the Forest Service on June 4, 2010 and was further revised by a November 12, 2010 letter. AIMMCO has incorporated additional changes to their proposed plan since that time.

This alternative is based on the proposed plan of operations (operating plan or plan) submitted by American Independence Mines and Minerals Company (AIMMCO) to the Forest Service on June 4, 2010, along with subsequent revisions. It represents a reasonable plan which the Forest Service is required to approve, unless actions are needed to minimize adverse environmental impacts on National Forest System surface resources. The Proposed Action would allow AIMMCO to collect subsurface geologic information in order to prepare for a new mineral examination by the Federal Government. The claims encompass approximately 20 acres each and are located near Coin Creek, a tributary of Beaver Creek, which flows into Big Creek, a tributary of the Middle Fork Salmon River. Except for one drill location, the proposed drilling operations, rock chip sampling, and Ella Mine opening would occur on Golden Hand No. 1 and No. 2 lode mining claims (Figure S-3). The project area includes the Golden Hand claims, the connecting temporary roads between the claims and Pueblo Summit, the temporary road to the Werdenhoff, and Forest Service Roads 343, 371, and 373 (Figure S-2).

Because the Proposed Action does not meet Forest Plan standard SCST01 for Visual Quality, a one time, site specific, non-significant amendment to the Forest Plan would be necessary. This is described in section 2.4.2.1.

The following is a summary of the Proposed Action:

- Maintain portions of Forest Roads (FR) 371 and 373 between the Big Creek Trailhead and Pueblo Summit and maintain approximately 4.1 miles of temporary road, including 4.0 miles within the FC-RONR Wilderness. Reconstruct one short approach to a crossing of the North Fork of Smith Creek on FR 373.
- Repair a ford on a tributary to Coin Cr. and repair a ford on Coin Cr.
- Authorize up to 771 motorized trips into the FC-RONR Wilderness. Motorized trips within the Wilderness claim operating area to transport needed items from the storage area to work sites would be kept to the minimum necessary.
- Construct 11 drill pads from which 13-18 core holes would be drilled.
- Collect rock chip samples from pits excavated to bedrock at several locations in the temporary roads.
- Reopen and timber a caved mine adit (the "Ella") to allow access for underground mapping and sampling. Excavated material would be placed on the existing flat disturbed area in front of the portal location.
- Use a variety of vehicles and equipment including, but not limited to, four-wheel-drive pickup trucks, a 7 cubic yard dump truck, flatbed truck, D-8 (or equivalent) bulldozer, 3-cubic yard loader or small excavator, a track or skid-mounted drill rig, air compressor, small jackhammer, and generators.
- Store fuel on the claims or an adjacent valid lode claim (Golden Hand No. 8).
- Use the Penn Ida plaza for storage, if necessary.
- Use the Golden Hand bunkhouse within the FC-RONR Wilderness as office space.
- Establish a temporary camp at the Werdenhoff.
- Obtain water from Coin Creek in accordance with the water right, which would not exceed 25,000 gallons per day. The water would be obtained and used in accordance with a temporary water right issued by the Idaho Department of Water Resources.
- Conduct defined reclamation activities at the end of each season.
- Implement design features and/or mitigation to reduce or prevent undesirable effects resulting from proposed management activities.

A detailed description of the Proposed Action is provided in Section 2.4.2.

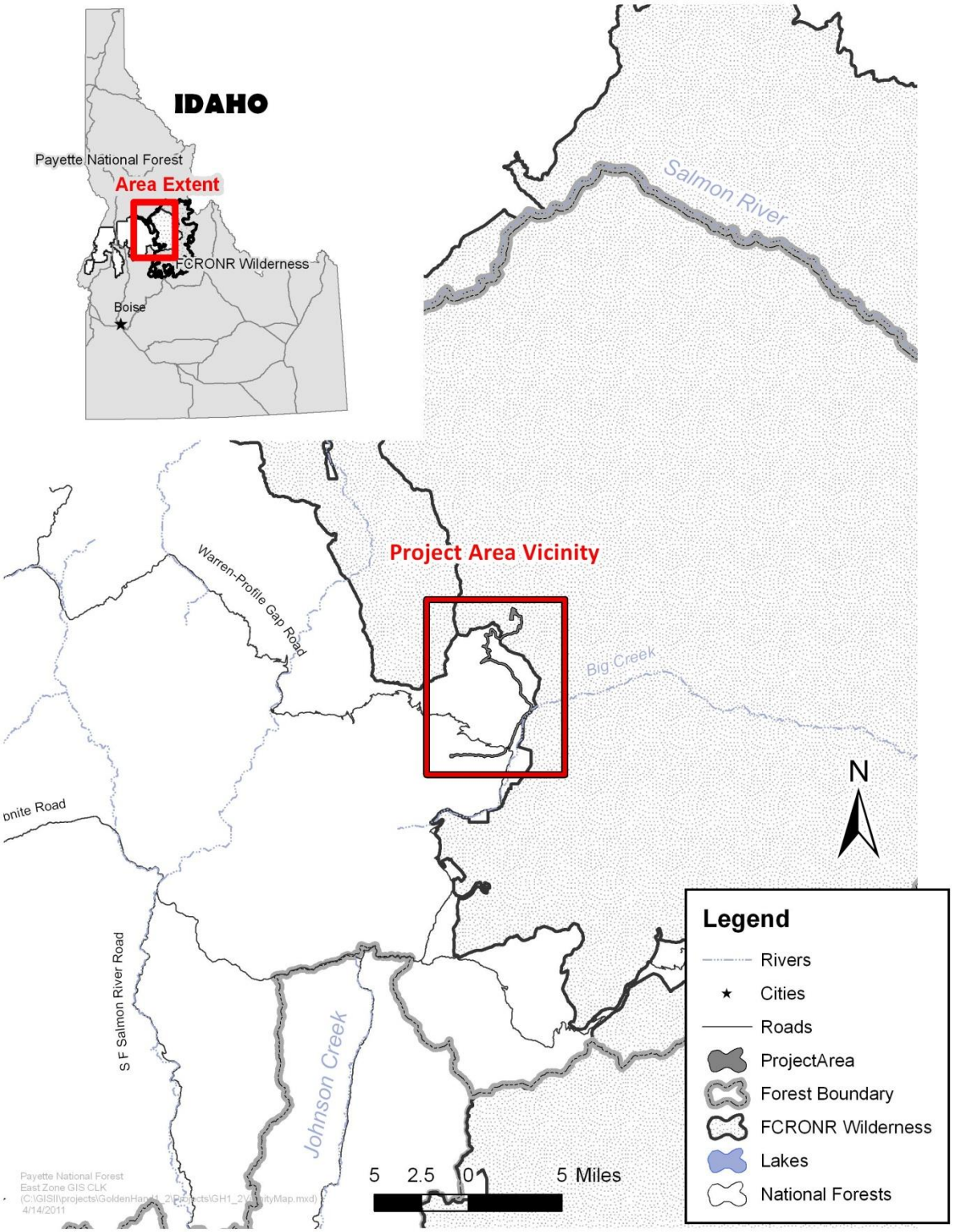


Figure S-1 Vicinity Map

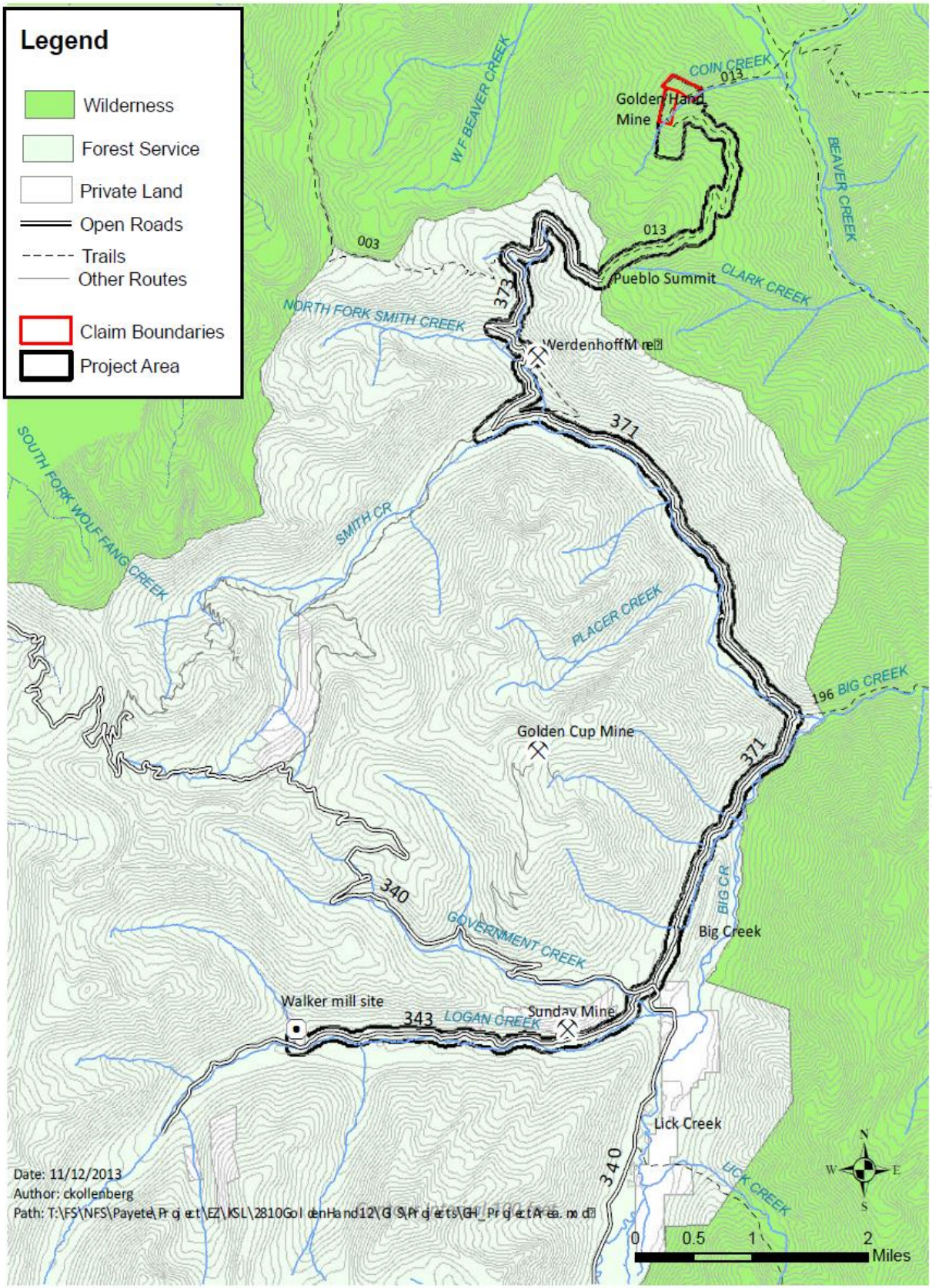


Figure S-2 Golden Hand No. 1 and No. 2 Lode Mining Claims Project Area

S.3 Purpose and Need for the Proposed Action

Law, regulation, agency policy, and court rulings define the purpose and need for the Forest Service response to AIMMCO's proposed plan of operations. The major laws and regulations governing such responses include the following:

- The 1872 Mining Law as amended (also referred to as the U.S. Mining Law[s]), provides in part that, "...all mineral deposits in land belonging to the United States are free and open to exploration and the lands in which they are found are open to occupation and purchase." This granting of statutory rights to explore, develop, and gain title to the minerals estate of federal lands open to mineral entry, remain in effect today.

- The 1897 the Organic Administration Act (16 USC 478, 551) created the National Forest System, and at the same time opened these lands to entry under the 1872 Mining Law. This law also gives the Secretary of Agriculture authority to regulate activities conducted under the Mining Law.

- The Multiple Use Mining Act of 1955 (30 USC 612) reserved to the United States the right to use the surface of unpatented mining claims providing such use did not endanger or materially interfere with prospecting, mining or processing operations or reasonably incident uses.

- Regulations defining Forest Service authority to manage locatable mineral activities were adopted in 1974, and are codified in 36 CFR 228A. In accordance with these regulations, an approved plan of operation is required for any locatable mineral activity on National Forest System land that would cause a significant disturbance of surface resources. These regulations also require the Forest Service to conduct an analysis that meets the requirements of the National Environmental Policy Act (NEPA) for each plan of operation received. Forest Service responses to a proposed plan of operation are defined by regulation at 36 CFR 228.5. The overall purpose of these regulations as stated in 36 CFR 228.1, is to manage operations so as to minimize adverse environmental impacts on National Forest System surface resources.

  The Wilderness Act of 1964 requires the Forest Service to ensure that valid rights exist prior to approving locatable mineral activities inside a congressionally designated Wilderness area. To establish valid existing rights, mining claimants must show they have made a discovery of a valuable mineral deposit on the claim(s) prior to the withdrawal date, and have maintained that discovery. The Wilderness Act allows for surface disturbing activities that are reasonably incident to mining or processing operations when valid rights have been found to exist (U.S. Congress 1964, Section 4[d-3]). The mining activities described may be implemented if such activity is carried on in a manner compatible with the preservation of the wilderness environment (U.S. Congress 1964, Section 4[d-2]). In the case of valid mining claims or other valid occupancies the Secretary of Agriculture shall permit ingress and egress to such surrounded areas by mean which have been or are being customarily enjoyed with respect to other such areas similarly situated (U.S. Congress 1964, Section 5[b]). The Wilderness Act also states that mineral leases, permits, and licenses covering lands within National Forest Wilderness, shall contain reasonable stipulations as may be prescribed by the Secretary of Agriculture for the protection of the wilderness character and consistent with the use of the land for the purposes for which they are leased, permitted, or licensed.

The Forest Service response is also guided by the following rulings:

- AIMMCO and Jim Collord located Golden Hand No's. 1-5 lode mining claims in 1979. In 1983, AIMMCO located Golden Hand No's. 6-8. Mr. Collord subsequently deeded his interest in claims No. 1-5 to AIMMCO. On December 31, 1983 the FC-RONR was withdrawn from entry under the mining law. Prior to any further mineral development activity on the claims a determination of the validity of the claims was required. Following a validity examination, a hearing before the Department of Interior- Office of Hearings and Appeals, and subsequent appeals by both parties, the Interior Board of Land Appeals (IBLA) ruled in 1992 that the Golden Hand No's. 3 and 4 lode mining claims within the FC-RONR Wilderness were valid. Claim No. 8 is also valid because the

government withdrew its contest against claim No. 8 in 1999. In summary, Golden Hand No's. 3, 4, and 8 lode mining claims have valid existing rights.

- On August 12, 2002, the U.S. District Court in Idaho ordered the Forest Service to complete the Environmental Impact Statement (EIS) on AIMMCO's proposed operating plan for Golden Hand No. 3 and No. 4 lode mining claims. That decision was signed on May 1, 2003 and was vacated on March 14, 2011. The court also directed that in regards to Golden Hand No. 1 and No. 2 lode mining claims "the Forest Service must recognize AIMMCO's right to prepare for (a) validity hearing, and allow work to that end, while requiring adherence to all applicable rules and regulations."

Other state and federal laws and regulations may apply to plans submitted under 36 CFR 228A, depending on the nature of the proposal and resources affected. Such laws include the Clean Water Act, Clean Air Act, Endangered Species Act, National Historic Preservation Act, and others. Forest Service planning direction also defines the purpose to be achieved by the Forest Service action.

AIMMCO has the legal right to develop the mineral resources on their Wilderness claims where valid existing rights have been established, and the Forest Service has the legal authority to manage those activities to minimize, where feasible, environmental impacts on surface resources, including Wilderness. AIMMCO's right to develop is limited to activities that are reasonably incident to mining and not needlessly destructive, and by the obligation to comply with applicable state and federal laws. The Forest Service's right to manage AIMMCO's activity is limited in that it may not deny a plan of operation for development of such resources provided that it is reasonably incident and not needlessly destructive, and complies with applicable federal mining laws and regulations, and applicable state and federal laws and regulations related to air, water, and solid waste.

The **Purpose** of the Forest Service in proposing this action is to minimize adverse environmental impacts to surface resources by regulating the functions, work, and activities connected with the miner's plan to remove locatable minerals from National Forest System lands. The compelling **Need** for the Forest Service to take this action is to comply with the legal requirements to respond to the claimant's reasonable Plan of Operations (36 CFR 228.4), and to ensure that "operations are conducted so as, where feasible, to minimize adverse environmental impacts on National Forest surface resources" (36 CFR 228.8).

S.4 Decisions to be Made

Based on the analysis documented in the Final EIS the Forest Supervisor will make decisions on this project. The decisions to be made include:

- Should the mining proponent be notified of changes or additions to the plan necessary to minimize, where feasible, adverse environmental impacts on National Forest surface resources?
- Should minor amendments to the Forest Plan be made at this time; and if so, what amendments?
- What monitoring should be applied to the project?

S.5 Issues and Concerns

Identification of issues included review of written and verbal comments, input from Forest Service resource specialists, review of the Forest Plan, and comments from state and other federal agencies. Comments identified during scoping were evaluated against the following criteria to determine whether or not the issue would be a major factor in the analysis process.

- Has the concern been addressed in a previous site-specific analysis, such as in a previous Environmental Impact Statement or through legislative action?

- Is the concern relevant to and within the scope of the decision being made and does it pertain directly to the Proposed Action?

- Can the concern be resolved through mitigation (avoiding, minimizing, rectifying, reducing or eliminating, or compensating for the proposed impact) in all alternatives?

- Can the issue be resolved through project design in all alternatives?

S.5.1 Issues

The Responsible Official identified three issues. These issues are points of unresolved conflict with the Proposed Action (Alternative B) identified during internal and external scoping efforts. Issues are used in environmental analysis to formulate alternatives, prescribe mitigation measures, and focus the analysis of environmental effects. Summaries of detailed analyses associated with these issues are presented in Chapter 3 of this document. Following each issue, indicators are listed for use in comparing how the different alternatives affect that issue.

S.5.1.1 Wilderness Character

Activities associated with the Proposed Action could result in a degradation of wilderness character.

Indicators:
- Would Activities Adversely Affect Natural Integrity?
- Would Activities Adversely Affect Untrammeled Condition?
- Would Activities Adversely Affect Solitude?
- Would Activities Adversely Affect Primitive Recreation?
- Authorized Use of Penn Ida for Storage?
- Number of Annual Authorized Motorized Trips into The FC-RONR Wilderness Expected During 100 Day Operating Season.
- Authorized Use of the Golden Hand Bunkhouse for Office Space.

S.5.1.2 Scenic Environment

Activities associated with the Proposed Action could result in undesirable impacts to the scenic environment.

Indicators:
- Would Activities Comply with Visual Quality Objectives (VQOs) Standards?
- Would Activities Allow the Use of the Golden Hand Bunkhouse within the FC-RONR Wilderness?

S.5.1.3 Water, Soil, and Fisheries

Activities associated with the Proposed Action could result in undesirable impacts to soil, water, and fishery resources.

Indicators:
- Modeled Interstitial Sediment Delivery (Pounds)
- Would Activities Result in Changes to Peak/Base Flow?
- Number of Annual Authorized Motorized Trips into The FC-RONR Wilderness Expected During 100 Day Operating Season.

S.6 Alternative Development

S.6.1 Alternative A - No Action

The National Environmental Policy Act (NEPA) requires consideration of a “No Action” alternative. The No Action Alternative serves as a baseline to analyze the environmental effects of the action alternatives. However, under Forest Service mining regulations at Title 36 Code of Federal Regulations (CFR) 228 Subpart A, this option can only be considered as an intermediate step in processing a plan of operation, provided that it has been properly submitted under the authority of the U.S. Mining Laws.

For example, some proposed plans or parts of proposed plans of operation may not represent logical and sequential development of mineral property, may not be feasible, may not comply with applicable state or federal laws, or may not be reasonably incident to mining. In such cases, the Forest Service may not simply deny approval of the plan, but has the obligation to notify the operator as required under 36 CFR 228.5, of changes to be made that are necessary for its approval. Ultimately, in accordance with law and regulation, holders of valid mining claims have a legal right to develop their claims and a reasonable plan of operations must be identified and approved.

S.6.2 Alternative B - Proposed Action

On September 4, 2007 AIMMCO submitted an operating plan for drilling operations, trenching and sampling, and reopening the caved Ella Mine adit. The Forest Service worked with AIMMCO for more than two years to revise the initial proposal. A revised Plan of Operations was submitted to the Forest Service on June 4, 2010 and was further revised by a November 12, 2010 letter. AIMMCO has incorporated additional changes to their proposed plan since that time.

This alternative is based on the proposed plan of operations (operating plan or plan) submitted by American Independence Mines and Minerals Company (AIMMCO) to the Forest Service on June 4, 2010, along with subsequent revisions. It represents a reasonable plan which the Forest Service is required to approve, unless actions are needed to minimize adverse environmental impacts on National Forest System surface resources. The Proposed Action would allow AIMMCO to collect subsurface geologic information in order to prepare for a new mineral examination by the Federal Government. The claims encompass approximately 20 acres each and are located near Coin Creek, a tributary of Beaver Creek, which flows into Big Creek, a tributary of the Middle Fork Salmon River. Except for one drill location, the proposed drilling operations, rock chip sampling, and Ella Mine opening would occur on Golden Hand No. 1 and No. 2 lode mining claims (Figure S-3). The project area includes the Golden Hand claims, the connecting temporary roads between the claims and Pueblo Summit, the temporary road to the Werdenhoff, and Forest Service Roads 343, 371, and 373 (Figure S-2).

Because the Proposed Action does not meet Forest Plan standard SCST01 for Visual Quality, a one time, site specific, non-significant amendment to the Forest Plan would be necessary. This is described in section 2.4.2.1.

The following is a summary of the Proposed Action:

- Maintain portions of Forest Roads (FR) 371 and 373 between the Big Creek Trailhead and Pueblo Summit and maintain approximately 4.1 miles of temporary road, including 4.0 miles within the FC-RONR Wilderness. Reconstruct one short approach to a crossing of the North Fork of Smith Creek on FR 373.

- Repair a ford on a tributary to Coin Cr. and repair a ford on Coin Cr.

- Authorize up to 771 motorized trips into the FC-RONR Wilderness. Motorized trips within the Wilderness claim operating area to transport needed items from the storage area to work sites would be kept to the minimum necessary.

- Construct 11 drill pads from which 13-18 core holes would be drilled.

- Collect rock chip samples from pits excavated to bedrock at several locations in the temporary roads.

- Reopen and timber a caved mine adit (the “Ella”) to allow access for underground mapping and sampling. Excavated material would be placed on the existing flat disturbed area in front of the portal location.

- Use a variety of vehicles and equipment including, but not limited to, four-wheel-drive pickup trucks, a 7 cubic yard dump truck, flatbed truck, D-8 (or equivalent) bulldozer, 3-

cubic yard loader or small excavator, a track or skid-mounted drill rig, air compressor, small jackhammer, and generators.

- Store fuel on the claims or an adjacent valid lode claim (Golden Hand No. 8).
- Use the Penn Ida plaza for storage, if necessary.
- Use the Golden Hand bunkhouse within the FC-RONR Wilderness as office space.
- Establish a temporary camp at the Werdenhoff.
- Obtain water from Coin Creek in accordance with the water right, which would not exceed 25,000 gallons per day. The water would be obtained and used in accordance with a temporary water right issued by the Idaho Department of Water Resources.
- Conduct defined reclamation activities at the end of each season.
- Implement design features and/or mitigation to reduce or prevent undesirable effects resulting from proposed management activities.

A detailed description of the Proposed Action is provided in Section 2.4.2.

S.6.2 Alternative C

This alternative was developed to identify any terms and conditions to ensure that activities are conducted in a manner that minimizes adverse environmental impacts to National Forest surface resources. Additionally, this Alternative responds to issues identified during internal and external scoping. This alternative would allow AIMMCO to collect subsurface geologic information in order to prepare for a new mineral examination by the Federal Government. The claims encompass approximately 20 acres each and are located near Coin Creek, a tributary of Beaver Creek, which flows into Big Creek, a tributary of the Middle Fork Salmon River. Except for one drill location, which is off claim on an existing roadbed to avoid the surface disturbance associated with construction of a new road, the proposed drilling operations, rock chip sampling, and Ella Mine opening would occur on Golden Hand No. 1 and No. 2 lode mining claims (Figure S-3). The project area includes the Golden Hand claims, the connecting temporary roads between the claims and Pueblo Summit, the temporary road to the Werdenhoff , and Forest Service Roads 343, 371, and 373 (Figure S-2).

Because this alternative does not meet Forest Plan standard SCST01 for Visual Quality, a one time, site specific, non-significant amendment to the Forest Plan would be necessary. This is described in section 2.4.3.1.

The following is a summary of Alternative C:

- Maintain portions of Forest Roads (FR) 371 and 373 between the Big Creek Trailhead and Pueblo Summit and maintain approximately 4.1 miles of temporary road, including 4.0 miles within the FC-RONR Wilderness. Reconstruct one short approach to a crossing of the North Fork of Smith Creek on FR 373.
- Repair a ford on a tributary to Coin Cr. and repair a ford on Coin Cr.
- Authorize up to 571 motorized trips into the FC-RONR Wilderness annually. Motorized trips within the Wilderness claim operating area to transport needed items from the storage area to work sites would be kept to the minimum necessary.
- Construct 11 drill pads from which 13-18 core holes would be drilled.

- Collect rock chip samples from pits excavated to bedrock at several locations in the temporary roads.
- Reopen and timber a caved mine adit (the "Ella") to allow access for underground mapping and sampling. Excavated material would be placed on the existing flat disturbed area in front of the portal location.
- Use a variety of vehicles and equipment including, but not limited to, four-wheel-drive pickup trucks, a 7 cubic yard dump truck, flatbed truck, D-8 (or equivalent) bulldozer, 3-cubic yard loader or small excavator, a track or skid-mounted drill rig, air compressor, small jackhammer, and generators.
- Store fuel at Werdenhoff.
- Establish a temporary camp at Werdenhoff.
- Obtain water from Coin Creek in accordance with the water right, which would not exceed 25,000 gallons per day. The water would be obtained and used in accordance with a temporary water right issued by the Idaho Department of Water Resources.
- Conduct defined reclamation activities at the end of each season.
- Implement design features and/or mitigation to reduce or prevent undesirable effects resulting from proposed management activities.

While covered below in detail in the descriptions the principle differences between Alterative B and Alternative C are: Fuel Storage would occur at Werdenhoff rather than within the FC-RONR Wilderness under Alternative C; the use of Penn Ida for storage would not occur under Alternative C; Alternative C would further restrict the number of daily motor vehicle trips into the FC-RONR Wilderness; and, the bunkhouse would not be used as an office under Alternative C. A detailed description of Alternative C is provided in Section 2.4.3.

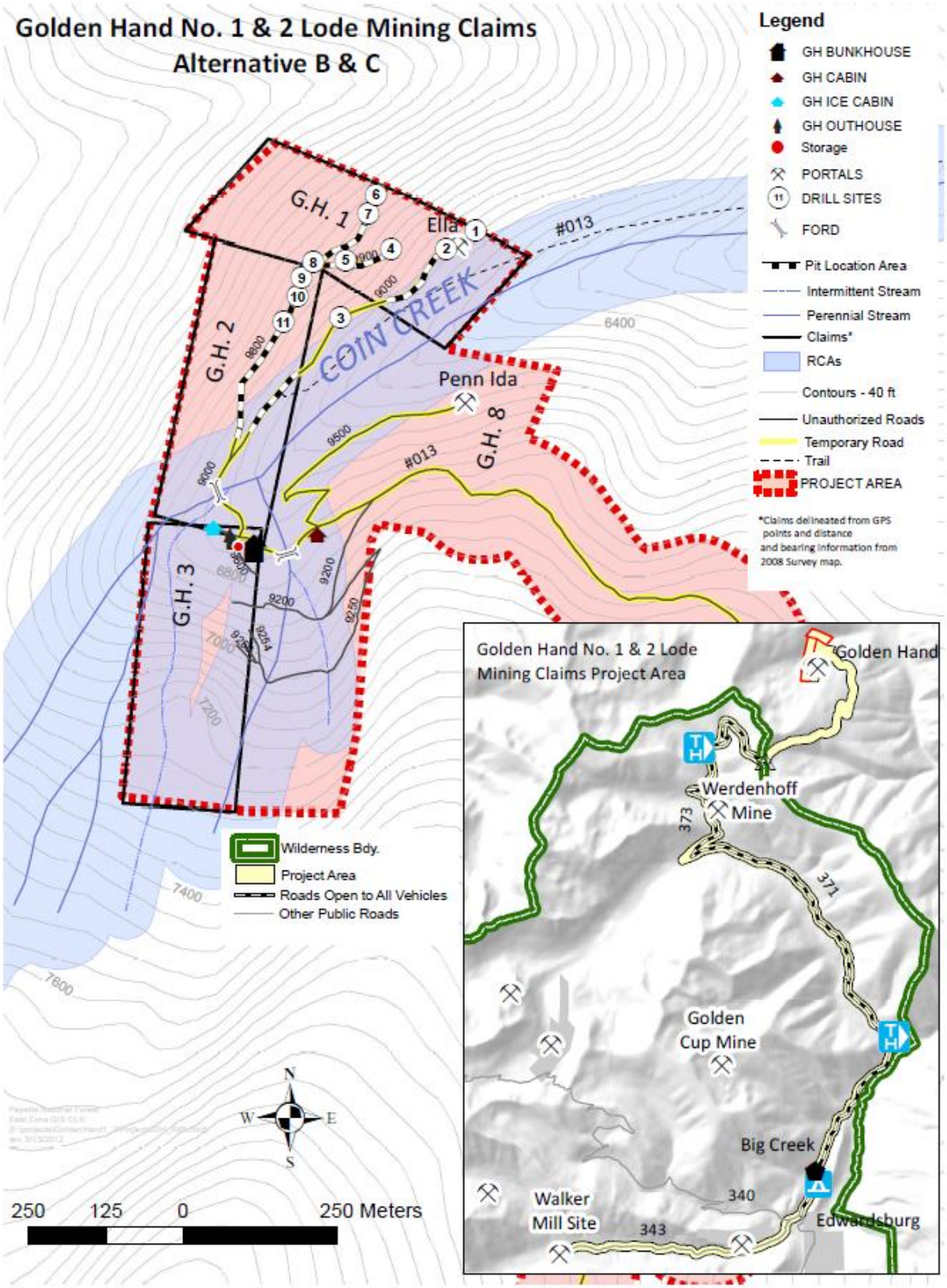


Figure S-3 Alternative B, Proposed Action, and Alternative C

S.7 Summary Comparison of Alternatives

Table S-1 presents a comparative summary of principle activities and the environmental effects for the alternatives being considered in detail. The summary is limited to the effects on project objectives, significant issues or concerns, Forest Plan standards, and other resources the Interdisciplinary Team deemed important for an informed decision. A brief discussion of the similarities and differences between the alternatives follows the table. More detailed information is available in the descriptions of the alternatives in Chapter 2 and in Chapter 3.

S.7.1 Project Objective Indicators

S.7.1.1 Confirmation Activities

Alternative A would not provide the proposed confirmation activities. Both Alternative B and C would authorize the proposed confirmation activities to meet the legal rights of the claim holder.

S.7.1.2 Access

Alternative A would not provide the needed access to conduct proposed activities. Current access in the project area would remain as is with only Forest Roads #371 and #373 being open to motorized travel.

Alternative B and C would both authorize the use of temporary roads to access the claims. Approximately 8.0 miles of National Forest system roads would be maintained. Approximately 4.1 miles of temporary road would be authorized to provided needed access; of which, 4.0 miles would be authorized in the FC-RONR Wilderness.

S.7.1.3 Fuel Storage

Alternative A would not authorize the storage of any fuel on National Forest System lands.

Under Alternative B, a 1,320 gallon tank would be transported empty and placed in lined containment at either the Penn Ida adit or outside of RCAs within the FC-RONR Wilderness. The diesel would be transferred as needed for each shift in truck mounted tanks.

Under Alternative C, a 1,320 gallon tank would be transported empty and placed in lined containment at Werdenhoff. The diesel would be transferred as needed for each shift in truck mounted tanks.

S.7.1.4 Crew Housing

Alternative A would not authorize crew housing or staging on National Forest System lands.

Under both Alternative B and C crews would be housed at Werdenhoff. Travel trailers and/or platform tents would be used to house crews and provide needed cooking and sanitation facilities. Werdenhoff would also serve as a staging area for needed equipment and supplies being transported in and out of the FC-RONR Wilderness.

Table S-1 Comparison of Activities and Effects

Project Objective Indicators	Alt. A	Alt. B	Alt. C
Number of Drill Sites	0	11	11
Number of Trench Sites	0	3	3
Mine Portals Opened for Sampling	0	1	1
Access Needs Met?	No	Yes	Yes
Fuel Storage Needs Met?	No	Yes	Yes
Crew Housing Suitable to Conduct Activities?	No	Yes	Yes
Equipment and Vehicle Needs Met	No	Yes	Yes
Water Needs Met?	No	Yes	Yes
Mine Timbers Provided?	No	Yes	Yes
Wilderness Project Issue Indicators	**Alt. A**	**Alt. B**	**Alt. C**
Would Activities Adversely Affect Natural Integrity?	No	Yes	Yes
Would Activities Adversely Affect Untrammeled Condition?	No	Yes	Yes
Would Activities Adversely Affect Solitude?	No	Yes	Yes
Would Activities Adversely Affect Primitive Recreation?	No	Yes	Yes
Authorized Use of Penn Ida for Storage?	No	Yes	No
Number of Annual Authorized Motorized Trips into The FC-RONR Wilderness Expected During 100 Day Operating Season.	0	771	571
Authorized Use of the Golden Hand Bunkhouse for Office Space?	No	Yes	No
Scenic Project Issue Indicators	**Alt. A**	**Alt. B**	**Alt. C**
Would Activities Comply with Visual Quality Objectives (VQOs) Standards?	Yes	No	No
Would Activities Allow the Use of the Golden Hand Bunkhouse within the FC-RONR Wilderness?	No	Yes	No
Watershed, Soil, and Fisheries Project Issue Indicators	**Alt. A**	**Alt. B**	**Alt. C**
Modeled Interstitial Sediment Delivery (Pounds)	6,200	182	182
Would Activities Result in Changes to Peak/Base Flow?	No	Yes	Yes
Number of Annual Authorized Motorized Trips into The FC-RONR Wilderness Expected During 100 Day Operating Season.	0	771	571
Forest Plan Consistency/Other Key Items	**Alt. A**	**Alt. B**	**Alt C.**
Activities Result in Forest Plan Amendment?	No	Yes	Yes
Activities Result in the Development of any IRA?	No	No	No
Activities Consistent with the Idaho Roadless Rule?	Yes	Yes	Yes
Activities Increase Potential Spread of Noxious Weeds?	No	Yes	Yes
Activities Compliant with National Historic Preservation Act and Archaeological Resources Protection Act?	Yes	Yes	Yes
Activities Result in Measureable Effects to any Class I Area or Monitoring Site for Air Quality?	No	No	No
Activities Consistent with ROS Designations?	Yes	Yes	Yes
Threatened, Endangered, and Proposed Species	**Alt. A**	**Alt. B**	**Alt. C**
Wildlife Species	NE	NE/NLAA	NE/NLAA
Plant Species	NE	NE	NE
Fish Species	NE	LAA	LAA
Sensitive Species	**Alt. B**	**Alt. B**	**Alt C**
Wildlife Species	NI	NI/MIIH	NI/MIIH
Plant Species	NI	NI/MIIH	NI/MIIH
Fish Species	NI	MIIH	MIIH
Management Indicator Species	**Alt. A**	**Alt. B**	**Alt C.**
Pileated Woodpecker Population Trend	Maintained	Maintained	Maintained
Bull Trout Population Trend	Maintained	Maintained	Maintained

NE = No Effect; LAA = May affect, likely to adversely affect, NLAA = May affect, not likely to adversely affect; NI = No Impact; BI = Beneficial Impact; MIIH = May impact individuals or habitat but would not likely contribute to a trend towards Federal listing or a loss of viability. Reference discussions below and in Chapter 3 for detailed information.

S.7.1.5 Equipment

Alternative A would not authorize the use of any equipment or vehicles to conduct project activities. The following table lists the known facilities, equipment, and vehicles to facilitate operations proposed under Alternative B and C within the FC-RONR Wilderness:

Table S-2 Equipment Needs in the FC-RONR Wilderness

Equipment/Vehicle Needs Alternative B	Equipment/Vehicle Needs Alternative C
• 1940 era International Harvester 6x6 Truck with 7 Cubic Yard Dump • 1940 era GMC 6x6 Truck with Flatbed • Dodge Ram 3500 Quad-Cab 4x4 with 8 foot box or Equivalents, Multiple, including DOT approved truck mounted tank • ATV and/or UTV, including DOT approved truck mounted tank • Bulldozer, Cat D-8 or Smaller • Air Compressor (≤600 cfm) • Light Plant • 3 Yard Loader Tracked or Rubber Tire • Excavator • Skid Mounted Core Drill • Telescopic Forklift, 10,000 lb. Capacity • Drill Rod Baskets • Mud Trailer • Service Trailer • 50 Gallon Hydraulic Oil Storage • Bean Supply Pump • Drilling Fluid Storage • Saws • Generators • Small Jackhammer • Toilets at worksite • Water pump, water storage tanks, water pipe • Bunkhouse • Fuel Truck (500 gallon) • 1,320 Gallon Diesel Storage	• 1940 era International Harvester 6x6 Truck with 7 Cubic Yard Dump • 1940 era GMC 6x6 Truck with Flatbed • Dodge Ram 3500 Quad-Cab 4x4 with 8 foot box or Equivalents, Multiple, including DOT approved truck mounted tank • ATV and/or UTV, including DOT approved truck mounted tank • Bulldozer, Cat D-8 or Smaller • Air Compressor (≤600 cfm) • Light Plant • 3 Yard Loader Tracked or Rubber Tire • Excavator • Skid Mounted Core Drill • Telescopic Forklift, 10,000 lb. Capacity • Drill Rod Baskets • Mud Trailer • Service Trailer • 50 Gallon Hydraulic Oil Storage • Bean Supply Pump • Drilling Fluid Storage • Saws • Generators • Small Jackhammer • Toilets at worksite • Water pump, water storage tanks, water pipe

S.7.1.6 Water

Alternative A would not authorize needed access to water, water storage, or water pipes to supply water for drilling operations.

Both Alternative B and C would provide the needed access to AIMMCO's water right. Additionally, multiple water tanks for storage along with the needed pipes and pumps to transport water to drilling operations would be authorized for use.

S.7.1.7 Mine Timbers

Alternative A would not authorize the cutting of needed mine timbers.

Both Alternative B and C would authorize the cutting of trees for mine timbers outside the FC-RONR Wilderness. All processing of timbers would be conducted prior to transport inside wilderness.

S.7.2 Project Issue Indicators

S.7.2.1 Wilderness

Alternative A would have no effects to Wilderness Character and Experience (Section 3.3).

Under Alternative B, the Wilderness user would see physical impacts to the land, motorized and mechanized equipment, and hear noise and could see dust from these machines from July to November for up to 3 years. This type and amount of development would adversely affect the Wilderness users' sense of solitude and remoteness and enjoyment of a primitive recreation experience in the Beaver Creek and Hand (Coin) Creek drainages, and the surrounding ridge tops that encompass the project area. The activities under this alternative involve use of motorized and mechanized equipment and vehicle support both on claims and associated off claim roads in the Wilderness. The actual use and the knowledge of these activities would adversely impact the Wilderness character by compromising the natural integrity and untrammeled conditions of the FC-RONR Wilderness (Section 3.3).

Alternative B would authorize the use of Penn Ida plaza for storage of fuel and supplies if needed along with a use for a rock source. Rock to repair fords within the FC-RONR Wilderness would be obtained from this site. This would potentially add to the miles of motorized travel within the wilderness by authorizing travel on additional 0.3 miles of temporary road on a daily basis. This additional road usage would apply to the 771 round trips as needed to acquire stored items at the Pend Ida plaza.

Assuming a 100 day operating season, it would be expected that approximately 771 round trips would be authorized annually to conduct project activities under Alternative B. The Golden Hand bunkhouse would be authorized for use as an office, thereby adding to amount of activities (refurbish of the cabin and general office use) and improving the condition of the building. The effects of these activities are captured in the effects to natural integrity, untrammeled condition, solitude, and primitive recreation (Section 3.3).

While not measurable, there would be slightly less impacts to wilderness character and experience from Alternative C because the alternative would authorize fewer motorized trips, the use of the bunkhouse for an office would be prohibited, and no motorized travel to the Penn Ida site for general storage would occur. (Section 3.3).

Alternative C would not authorize the use of the Penn Ida plaza for storage, but would authorize travel to the plaza to source rock. The only use of the site would be to obtain rock to repair fords within the FC-RONR Wilderness would be obtained from this site. No daily trips to obtain stored items would be authorized along the 0.3 miles of road.

Since fuel storage would occur at Werdenhoff, core removal would occur with shift change, and miscellaneous trips would be restricted to every other day on average, it would be expected that approximately 571 round trips would be authorized annually to conduct project activities under Alternative C. The bunkhouse and its associated activities and improvements would not be authorized. The effects of these activities at the bunkhouse are captured in the effects to natural integrity, untrammeled condition, solitude, and primitive recreation (Section 3.3).

S.7.2.2 Scenic

Alternative A would have no effects to wilderness character and experience (Section 3.11).

Alternatives B and C would require one amendment to the Forest Plan as disclosed in this chapter. This would be a one time, site specific, non-significant amendments that would not change overall Forest Plan goals, objectives, desired future conditions, or associated outputs. Both Alternatives would meet a maximum modification VQO within the FC-RONR wilderness (Section 3.11).

The principle difference in Alternatives is the use of the Golden Hand bunkhouse as an office. Alternative B would need to restore the bunkhouse to facilitate its use as an office. Restoration and occupation of the Golden Hand bunkhouse would be evident to casual observer within the FC-RONR Wilderness. The installation of such features as roofing, stove pipes, new logs, windows, porch posts/flooring would appear evident. These activities would appear as a deviation from the rustic and rundown appearance the observer expects of most structures in the wilderness. These activities would meet a VQO of maximum modification. It is expected that activities to improve the condition of the bunkhouse would not meet a VQO of preservation until the long term when the bunkhouse again takes on a more 'run downed' and weathered quality that the observer would expect to see (Section 3.11).

S.7.2.3 Water, Soil, and Fisheries

Alternative A would not alter the baseline condition for watershed, soils, or fisheries resources.

Alternative B and C would reduce the modeled interstitial sediment from approximately 6,200 pounds to roughly 182 pounds (Section 3.4 and 3.5). Fewer motorized trips within the FC-RONR Wilderness in Alternative C would result in less temporary and short term sediment delivery and turbidity, but there would be no difference in the long term reductions related to road improvements. Installation of stream crossing structure would result in temporary to long term benefits in North Fork Smith Creek.

Under Alternative B and C, the diversion of water would result in a minor temporary to short term degrade of base flow in Coin Creek that would not move the peak/base flow indicator for the Beaver Creek 6th HU from Functioning Acceptable to Functioning at Risk (Section 3.4.3.2).

S.7.3 Forest Plan Consistency/Other Key Items

The Forest Plan Consistency Checklist, contained in the project's planning record, lists all applicable standards and guidelines and discloses that all action alternatives would comply with those standards and guidelines with the exception of one standard requiring an amendment. In addition, the Interdisciplinary Team identified other items considered important in making an informed decision. The following discussions summarize the effects of the alternatives relative to those standards and/or guidelines and other items identified by the Interdisciplinary Team as key in this assessment.

S.7.3.1 Forest Plan Amendments

Alternative A would have no effects to wilderness character and experience.

Alternatives would B and C would require one amendment to the Forest Plan as discussed in this chapter. This would be a one time, site specific, non-significant amendments that would not change overall Forest Plan goals, objectives, Desired Future Conditions (DFC), or associated outputs.

S.7.3.2 Roadless Areas

Alternative A would have no effect on any IRA (Section 3.7).

The principle difference between Alternative B and C would be the potential for impacts on solitude. Assuming a 100 day operating season, it would be expected that approximately 771 round trips would be authorized annually to conduct project activities under Alternative B without prior approval from Werdenhoff to the mining site, while Alternative C would authorize approximately

571 trips annually to the mine site. It would still be expected that many of the trips described in Alternative B would still occur in Alternative C within or immediately adjacent to IRAs with the exception of fuel which would not be transported in bulk past Werdenhoff. Regardless, Alternative B could represent a slight increase when compared to Alternative C in noise and the associated impacts to solitude while the project is ongoing (Section 3.7).

Neither Alternative B or C would result in the development of any IRA. IRAs within the project area would remain suitable for wilderness designation by Congress. Both Alternatives are consistent with the Idaho Roadless Rule (36 CFR 294).

S.7.3.3 Noxious Weeds

Alternative A would have no effect on the potential introduction and distribution of noxious weeds.

Proposed activities and design features associated with Alternative B and C would not be expected to introduce noxious weeds into the analysis area. Alternative B and C may however contribute to the distribution of noxious weeds already present as vehicles pass along Forest Road #371 while completing project activities. Existing noxious weed populations would be addressed through the District's and the FC-RONR Wilderness noxious weed program (Section 3.9).

S.7.3.4 Air Quality

Alternative A would have no effect on air quality.

Based on estimates and assumptions it was calculated that Alternative B would annually produce approximately 5,500 pounds of PM-10 particulate matter, 700 pounds of PM-2.5 particulate matter, 23,500 pounds of nitrogen dioxide, and 1,600 pounds of sulfur dioxide (Table 3-11).

Based on estimates and assumptions it was calculated that Alternative C would annually produce approximately 4,900 pounds of PM-10 particulate matter, 630 pounds of PM-2.5 particulate matter, 20,100 pounds of nitrogen dioxide, and 1,400 pounds of sulfur dioxide (Table 3-11).

While Alternative B and C would increase pollutants from dust, vehicle, and other emissions in the project area, it would not likely have measurable effects on air quality in any Class I Area, the FC-RONR Wilderness, or at monitoring sites, given the distance and dilution that would occur as particles and air mix over distance.

S.7.3.5 Recreation Opportunity Spectrum (ROS)

Recreation Opportunity Spectrum classifications would remain unchanged with any Alternative.

Within the FC-RONR Wilderness activities would not be consistent the ROS classification due to impacts on wilderness characteristics (Section 3.3) and increased likelihood of frequent encounters with users expecting a primitive setting. However, the activities within the primitive setting are considered to be a setting inconsistency and being conducted pursuant the 1872 Mining Law (Section 1.5). Following project activities, the portion of analysis area in a primitive ROS setting would return to conditions indicative and consistent with the setting. The area would remain classified as a primitive ROS setting.

S.7.4 Threatened and Endangered Species

Determinations disclosed in Chapter 3 and documented in biological assessments and evaluations for threatened, endangered, proposed, and candidate species concluded that:

Alternative A does not propose any federal action that could affect listed species.

Alternative B and C would have no effect to any threatened or endangered plant species. No habitat for any threatened or endangered plant species occurs in the project analysis area (Section 3.8).

Alternative B and C could have temporary to short term negative effects to individual steelhead, bull trout and the associated designated critical habitat (Section 3.4). Effects to Chinook salmon and designated critical habitat would likely be negligible. Installation of stream crossing structure would result in temporary to short term benefits to steelhead. Alternative B and C may affect, likely to adversely affect Chinook salmon, bull trout, and steelhead. The USFWS submitted a biological opinion to the Forest Service on October 30, 2013 and NOAA on November 13, 2013. The NOAA opinion concluded that the action is not likely to jeopardize the continued existence of steelhead or Chinook salmon and is not likely to result in the destruction or adverse modification of designated critical habitat. The USFWS opinion concluded the action will not jeopardize the continued survival and recovery of bull trout and will not destroy or adversely modify designated critical habitat.

Alternative B and C would have no effect on Northern Idaho Ground Squirrel and may affect, not likely to adversely affect Canada Lynx (Section 3.6).

S.7.5 Sensitive Species, Including Candidate Species

Alternative A would have no impact on any sensitive species

Alternative B and C may impact individuals but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species of whitebark pine, *(Pinus albicaulisi*), a candidate and sensitive species. Alternative B and C would have no impact on any other candidate, proposed, or sensitive plant species.

Alternative Band C may impact individuals but would not likely contribute to a trend towards Federal Listing or cause a loss of viability to the population or species of westslope cutthroat trout.

Alternative B and C may impact individuals but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species of American three-toed woodpecker, boreal owl, fisher, northern goshawk, pileated woodpecker, flammulated owl, wolverine, gray wolf, Townsend's big-eared bat, or Columbia spotted-frog. Alternative B and C would have no impact on white-headed woodpecker, great gray owl, mountain quail, rocky mountain bighorn sheep, peregrine falcon, spotted bat, greater sage grouse, southern Idaho ground squirrel, Columbian sharp-tailed grouse, bald eagle, yellow-billed cuckoo, or common loon.

S.7.6 Management Indicator Species (MIS)

Alternative A would have no direct or indirect effects on any MIS species or their habitat and would maintain the current population trend.

Alternative B and C may disturb individual pileated woodpecker during implementation (Section 3.6); however, both alternatives are expected to maintain the current population trend of this species at the Forest and Ecogroup scale.

Alternatives B and C could negatively affect bull trout individuals in the temporary to short term, followed by long term minor beneficial effects. However, the few occurrences of disturbance or mortality of individuals from increased fording are not likely to result in measurable population level effects (Section 3.4.3.1), and long term beneficial effects would be minor. Therefore, Alternative B and C would maintain the current population trend of the species at the Forest and Ecogroup scale.

S.8 Identification of the Preferred Alternative

Alternative C is the Responsible Official's preferred alternative.

CHAPTER 1 - PURPOSE AND NEED

1.1 Introduction

This Final Environmental Impact Statement (EIS) discloses the environmental impacts of a proposed action and alternative actions for road maintenance/reconstruction, temporary road use authorization on unauthorized roads and confirmation sampling on the Golden Hand No. 1 and No. 2 lode mining claims, along with activities/equipment associated with accomplishing the aforementioned on the Krassel Ranger District of the Payette National Forest in Valley and Idaho Counties, Idaho.

This document has been prepared pursuant to the requirements of the National Environmental Policy Act (NEPA, 40 CFR 1500-1508), the National Forest Management Act (NFMA implementing regulations of 2005, including transition language at 36 CFR 219.14), the 2003 Payette National Forest Land and Resource Management Plan, as amended (USDA 2003, 2010) (Forest Plan), and the 2003 Frank Church - River Of No Return Wilderness Management Plan (also referred to as the Wilderness Plan). Formal planning for this project was initiated on November 21, 2008 with a Notice of Intent to prepare an EIS appearing in the Federal Register.

1.2 Project History

The administrative record on the Golden Hand claim group is lengthy. The recent events leading to the preparation of this EIS on AIMMCO's proposed plan of operations are briefly summarized as follows:

- The FC-RONR was withdrawn from mineral entry on December 31, 1983.
- In February, 1984 a Plan of Operations for Golden Hand claims 1 – 8 was submitted that proposed to clean the caved tunnel portal, sample and drill.
- In March, 1984, AIMMCO was advised that a field examination of the Golden Hand claims would be scheduled and that no operating plans could be approved until that examination had been completed and the basic facts of validity substantiated.
- On July 10, 1984, a field examination of Golden Hand claims 4, 5, 6 and 8 was made by Forest Service mining geologist Patrick Curtis who concluded, in a report dated August, 1984, that valid existing rights had been established on each of those claims before withdrawal. Curtis described Golden Hand claims 1-3 as "associated claims", but reported no findings concerning their validity.
- In August, 1984, the Forest Service advised AIMMCO it had received "favorable results" from its mineral examiners, requested additional information concerning the proposed Plan of Operations and authorized necessary assessment work.
- The Forest Service conducted another mineral examination of the Golden Hand claims in July 1985 to determine if any of the Golden Hand claims were valid prior to processing the plan of operations.
- The mineral report concerning the Golden Hand claims was completed in November 1986. It concluded that none of the eight claims were valid and recommended to the Department of Interior that contest be initiated against all of the claims.
- A validity contest concerning the Golden Hand claims was commenced February 25, 1987.
- AIMMCO timely responded to the BLM's contest notice and the validity contest was set for trial before Administrative Law Judge Ramon M. Child.
- In July, 1987, before trial of the validity contest, AIMMCO submitted an assessment work request to the Forest Service that included, among other things, drilling, trenching and opening a caved adit. This request was denied the same month.
- In July, 1988, AIMMCO filed a complaint in United States District Court for the District of Idaho. In that complaint, AIMMCO appealed the denial of its July, 1987 assessment work request and sought an order that it be permitted to access the Golden Hand claims with mechanized equipment to perform the described work. This complaint was stayed, by agreement, until the outcome of the validity contest was determined.

- In January, 1989, after receiving evidence at the validity contest trial, Administrative Law Judge Ramon M. Child held Golden Hand claim No.'s 1, 5, 6, and 7 to be invalid, that claims No's 2,3 4, and 8 were valid and dismissed the contest on claim No's. 2, 3, 4, and 8.
- Both parties appealed to the Interior Board of Land Appeals (IBLA). On February 10, 1992, the IBLA affirmed Judge Child's decision that claim No.'s 1, 5, 6, and 7 were invalid and that claim No.'s 3 and 4 were valid. It reversed his decision that claim No. 2 was valid and remanded claim No. 8 back to the Hearings Division for review of the historic value of silver as it bore on the validity of claim No. 8. The Forest Service later dismissed its contest against claim No. 8.
- On April, 16, 1996, AIMMCO submitted a proposed Plan of Operations for work on claims No. 3 and No. 4.
- In December, 1999 AIMMCO filed a motion to reactivate and amend the July, 1988 lawsuit in in Idaho Federal District Court to appeal from the IBLA decision that Golden Hand claim No's. 1 and 2 were invalid, to obtain an order requiring the Forest Service to allow access to Golden Hand claims 1 and 2 with mechanized equipment and requiring the Forest Service to act upon its April 16, 1996 Plan of Operations.
- On August 9, 2002, Judge B. Lynn Winmill entered Judgment reversing the decision that Golden Hand claim No's. 1 and 2 are invalid, ordering that the Forest Service allow AIMMCO access to Golden Hand claim Nos. 1 and 2 to give it a fair opportunity to prove the validity of the claims, and compelling the Forest Service to complete the EIS and its review of the 1996 plan by May 1, 2003.
- In October, 2002, the Forest Service filed a Notice of Appeal with the 9th Circuit Court of Appeals.
- On May 1, 2003 the Forest Supervisor, Payette National Forest, signed the Record of Decision (ROD) for the Golden Hand Claim Nos. 3 and 4 Plan of Operation and selected an alternative that required AIMMCO to amend the proposed plan of operations prior to implementation.
- In July, 2003, the Forest Service appeal to the 9th Circuit Court of Appeals was dismissed.
- On March 14, 2011 the ROD was withdrawn for the Golden Hand Claim Nos. 3 and 4 Plan of Operation.
- Formal planning for this project was initiated on November 21, 2008 with a Notice of Intent to prepare an EIS appearing in the Federal Register.
- A Notice of Availability of the Draft EIS appeared in the *Federal Register* on June 29, 2012. A Notice of Availability (Amended Notices) of the Draft EIS appeared in the *Federal Register* on August 17, 2012 and extended the comment period to September 17, 2012.

1.3 Project Area Description

The Golden Hand No. 1 and No. 2 Lode Mining Claims Project Area is located in the Big Creek drainage on the Payette National Forest, approximately 19 miles north of Yellow Pine, ID (Figure 1-1). The actual claims encompass approximately 20 acres each and are located near Coin Creek, a tributary of Beaver Creek, which flows into Big Creek, a tributary of the Middle Fork Salmon River. The project area includes 1,309 acres of National Forest System lands (Figure 1-2).

Roughly 291 acres of the Frank Church River of No Return Wildness (FC-RONR Wilderness) lie within the Golden Hand No. 1 and No. 2 Lode Mining Claims Project Area. Project activities including the authorization of temporary roads and use of mechanized equipment for confirmation activity would occur within the FC-RONR Wilderness.

1.4 Proposed Action

On September 4, 2007 AIMMCO submitted an operating plan for drilling operations, trenching and sampling, and reopening the caved Ella Mine adit. The Forest Service worked with AIMMCO for more than two years to revise the initial proposal. A revised Plan of Operations was submitted to the Forest Service on June 4, 2010 and was further revised by a November 12, 2010 letter. AIMMCO has incorporated additional changes to their proposed plan since that time.

This proposed action is based on the proposed plan of operations (operating plan or plan) submitted by American Independence Mines and Minerals Company (AIMMCO) to the Forest Service on June 4, 2010, along with subsequent revisions. It represents a reasonable plan which the Forest Service is required to approve, unless actions are needed to minimize adverse environmental impacts on National Forest System surface resources. The proposed action would allow AIMMCO to collect subsurface geologic information in order to prepare for a new mineral examination by the Federal Government. Except for one drill location, the proposed drilling operations, rock chip sampling, and Ella Mine opening would occur on Golden Hand No. 1 and No. 2 lode mining claims (Figure 2-1). The project area includes the Golden Hand claims, the connecting temporary roads between the claims and Pueblo Summit, the temporary road to the Werdenhoff, and Forest Service Roads 343, 371, and 373 (Figure 1-2).

Because the proposed action does not meet Forest Plan standard SCST01 for Visual Quality, a one time, site specific, non-significant amendment to the Forest Plan would be necessary. This is described in section 2.4.2.1.

The following is a summary of the proposed action:

- Maintain portions of Forest Roads (FR) 371 and 373 between the Big Creek Trailhead and Pueblo Summit and maintain approximately 4.1 miles of temporary road, including 4.0 miles within the FC-RONR Wilderness. Reconstruct one short approach to a crossing of the North Fork of Smith Creek on FR 373.

- Repair a ford on a tributary to Coin Cr. and repair a ford on Coin Cr.

- Authorize up to 771 motorized trips into the FC-RONR Wilderness. Motorized trips within the Wilderness claim operating area to transport needed items from the storage area to work sites will be kept to the minimum necessary.

- Construct 11 drill pads from which 13-18 core holes would be drilled.

- Collect rock chip samples from pits excavated to bedrock at several locations in the temporary roads.

- Reopen and timber a caved mine adit (the “Ella”) to allow access for underground mapping and sampling. Excavated material would be placed on the existing flat disturbed area in front of the portal location.

- Use a variety of vehicles and equipment including, but not limited to, four-wheel-drive pickup trucks, a 7 cubic yard dump truck, flatbed truck, D-8 (or equivalent) bulldozer, 3-cubic yard loader or small excavator, a track or skid-mounted drill rig, air compressor, small jackhammer, and generators.

- Store fuel on the claims or an adjacent valid lode claim (Golden Hand No. 8).

- Use the Penn Ida plaza for storage, if necessary.

- Use the Golden Hand bunkhouse within the FC-RONR Wilderness as office space.

- Establish a temporary camp at the Werdenhoff.

- Obtain water from Coin Creek in accordance with the water right, which would not exceed 25,000 gallons per day. The water would be obtained and used in accordance with a temporary water right issued by the Idaho Department of Water Resources.

- Conduct defined reclamation activities at the end of each season.

- Implement design features and/or mitigation to reduce or prevent undesirable effects resulting from proposed management activities.

A detailed description of the proposed action is provided in Section 2.4.2.

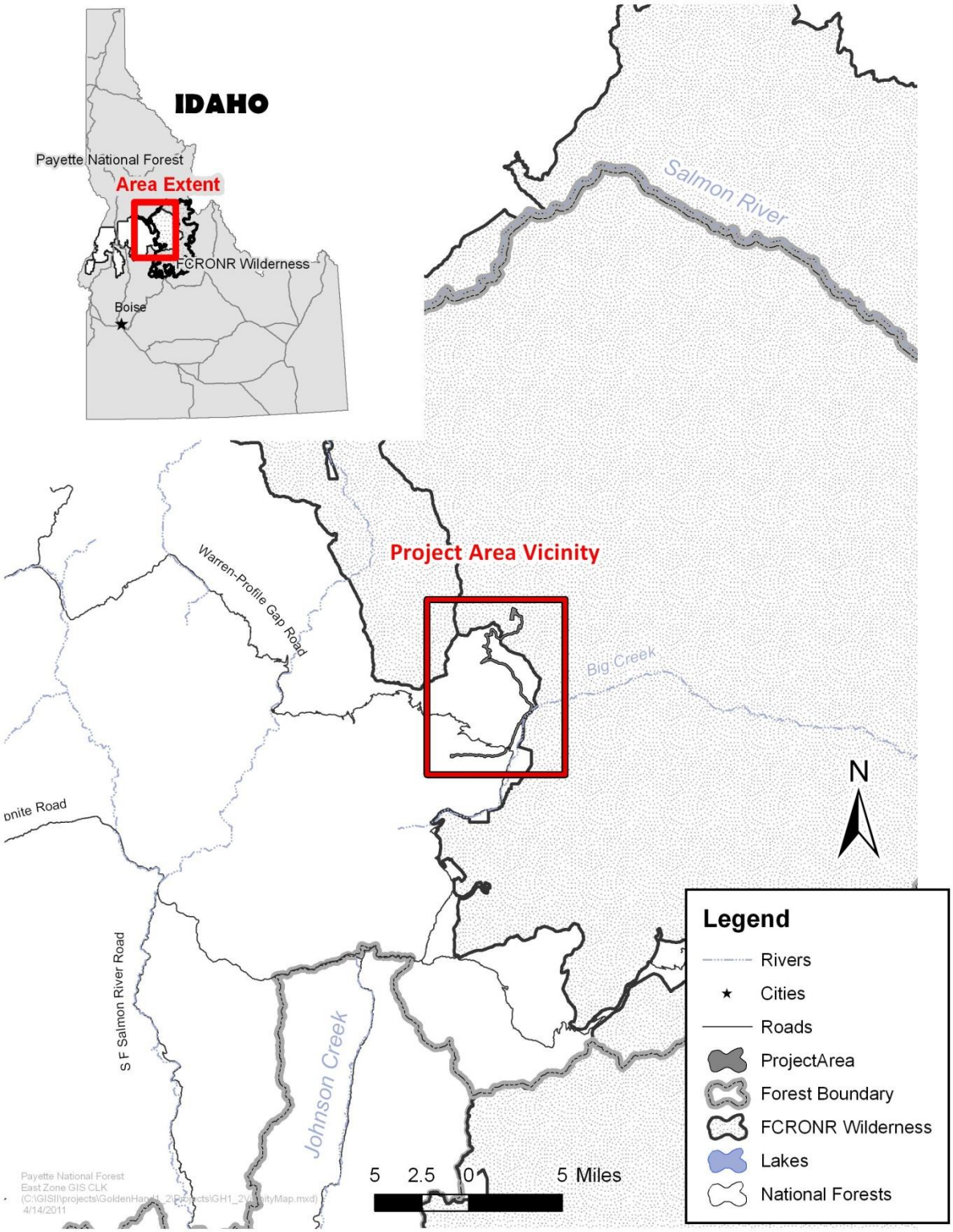


Figure 1-1 Vicinity Map

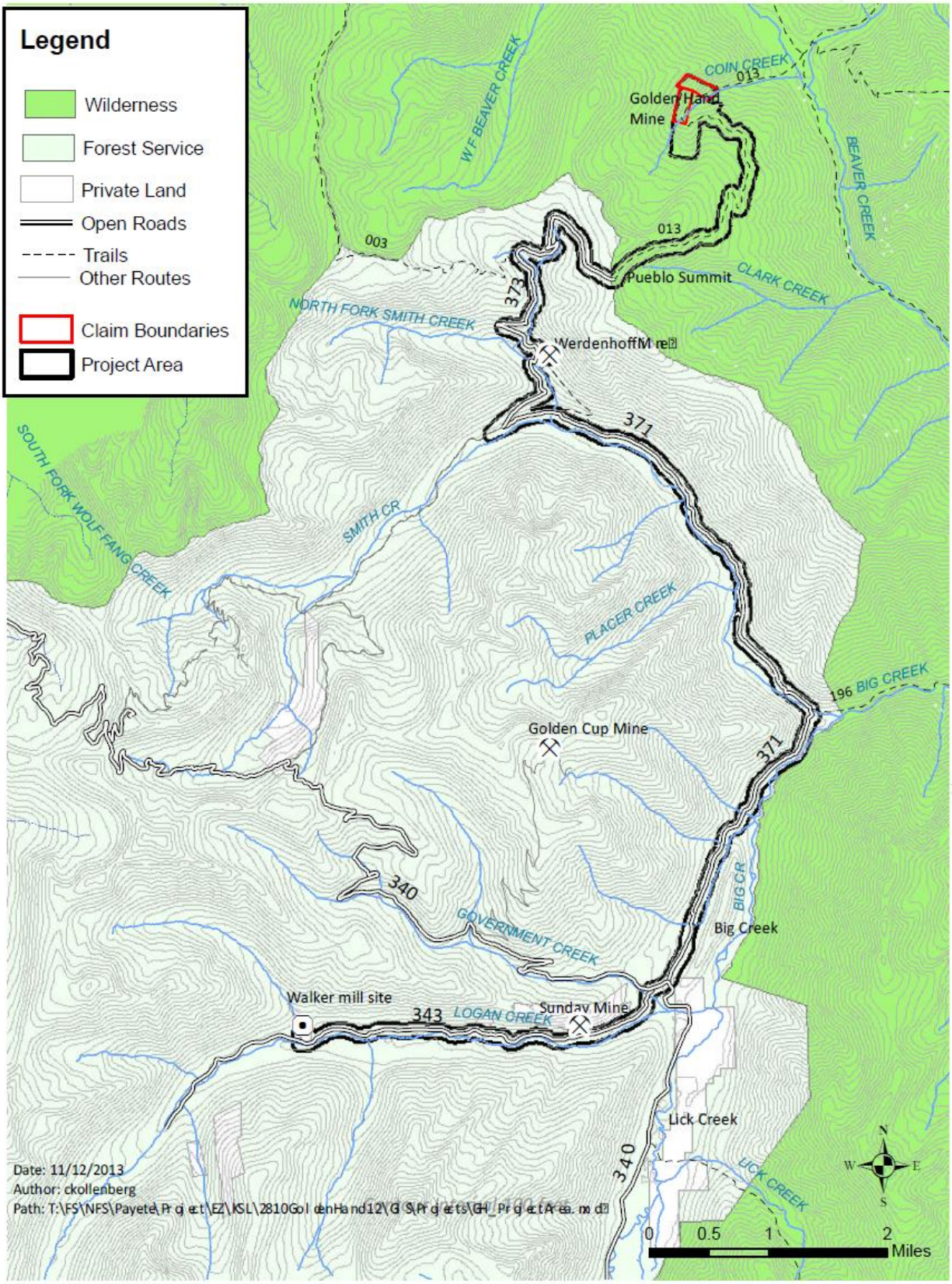


Figure 1-2 Golden Hand No. 1 and No. 2 Lode Mining Claims Project Area.

1.5 Purpose and Need for the Proposed Action

Law, regulation, agency policy, and court rulings define the purpose and need for the Forest Service response to AIMMCO's proposed plan of operations. The major laws and regulations governing such responses include the following:

- The 1872 Mining Law as amended (also referred to as the U.S. Mining Law[s]), provides in part that, "...all mineral deposits in land belonging to the United States are free and open to exploration and the lands in which they are found are open to occupation and purchase." This granting of statutory rights to explore, develop, and gain title to the minerals estate of federal lands open to mineral entry, remain in effect today.

- The 1897 the Organic Administration Act (16 USC 478, 551) created the National Forest System, and at the same time opened these lands to entry under the 1872 Mining Law. This law also gives the Secretary of Agriculture authority to regulate activities conducted under the Mining Law.

- The Multiple Use Mining Act of 1955 (30 USC 612) reserved to the United States the right to use the surface of unpatented mining claims providing such use did not endanger or materially interfere with prospecting, mining or processing operations or reasonably incident uses.

- Regulations defining Forest Service authority to manage locatable mineral activities were adopted in 1974, and are codified in 36 CFR 228A. In accordance with these regulations, an approved plan of operation is required for any locatable mineral activity on National Forest System land that would cause a significant disturbance of surface resources. These regulations also require the Forest Service to conduct an analysis that meets the requirements of the National Environmental Policy Act (NEPA) for each plan of operation received. Forest Service responses to a proposed plan of operation are defined by regulation at 36 CFR 228.5. The overall purpose of these regulations as stated in 36 CFR 228.1, is to manage operations so as to minimize adverse environmental impacts on National Forest System surface resources.

  The Wilderness Act of 1964 requires the Forest Service to ensure that valid rights exist prior to approving locatable mineral activities inside a congressionally designated Wilderness area. To establish valid existing rights, mining claimants must show they have made a discovery of a valuable mineral deposit on the claim(s) prior to the withdrawal date, and have maintained that discovery. The Wilderness Act allows for surface disturbing activities that are reasonably incident to mining or processing operations when valid rights have been found to exist (U.S. Congress 1964, Section 4[d-3]). The mining activities described may be implemented if such activity is carried on in a manner compatible with the preservation of the wilderness environment (U.S. Congress 1964, Section 4[d-2]). In the case of valid mining claims or other valid occupancies the Secretary of Agriculture shall permit ingress and egress to such surrounded areas by mean which have been or are being customarily enjoyed with respect to other such areas similarly situated (U.S. Congress 1964, Section 5[b]). The Wilderness Act also states that mineral leases, permits, and licenses covering lands within National Forest Wilderness, shall contain reasonable stipulations as may be prescribed by the Secretary of Agriculture for the protection of the wilderness character and consistent with the use of the land for the purposes for which they are leased, permitted, or licensed.

The Forest Service response is also guided by the following rulings:

- AIMMCO and Jim Collord located Golden Hand No's. 1-5 lode mining claims in 1979. In 1983, AIMMCO located Golden Hand No's. 6-8. Mr. Collord subsequently deeded his interest in claims No. 1-5 to AIMMCO. On December 31, 1983 the FC-RONR was withdrawn from entry under the mining law. Prior to any further mineral development activity on the claims a determination of the validity of the claims was required. Following a validity examination, a hearing before the Department of Interior- Office of Hearings and Appeals, and subsequent appeals by both parties, the

Interior Board of Land Appeals (IBLA) ruled in 1992 that the Golden Hand No's. 3 and 4 lode mining claims within the FC-RONR Wilderness were valid. Claim No. 8 is also valid because the government withdrew its contest against claim No. 8 in 1999. In summary, Golden Hand No's. 3, 4, and 8 lode mining claims have valid existing rights.

- On August 12, 2002, the U.S. District Court in Idaho ordered the Forest Service to complete the Environmental Impact Statement (EIS) on AIMMCO's proposed operating plan for Golden Hand No. 3 and No. 4 lode mining claims. That decision was signed on May 1, 2003 and was vacated on March 14, 2011. The court also directed that in regards to Golden Hand No. 1 and No. 2 lode mining claims "the Forest Service must recognize AIMMCO's right to prepare for (a) validity hearing, and allow work to that end, while requiring adherence to all applicable rules and regulations."

Other state and federal laws and regulations may apply to plans submitted under 36 CFR 228A, depending on the nature of the proposal and resources affected. Such laws include the Clean Water Act, Clean Air Act, Endangered Species Act, National Historic Preservation Act, and others. Forest Service planning direction also defines the purpose to be achieved by the Forest Service action.

AIMMCO has the legal right to develop the mineral resources on their Wilderness claims where valid existing rights have been established, and the Forest Service has the legal authority to manage those activities to minimize, where feasible, environmental impacts on surface resources, including Wilderness. AIMMCO's right to develop is limited to activities that are reasonably incident to mining and not needlessly destructive, and by the obligation to comply with applicable state and federal laws. The Forest Service's right to manage AIMMCO's activity is limited in that it may not deny a plan of operation for development of such resources provided that it is reasonably incident and not needlessly destructive, and complies with applicable federal mining laws and regulations, and applicable state and federal laws and regulations related to air, water, and solid waste.

The **Purpose** of the Forest Service in proposing this action is to minimize adverse environmental impacts to surface resources by regulating the functions, work, and activities connected with the miner's plan to remove locatable minerals from National Forest System lands. The compelling **Need** for the Forest Service to take this action is to comply with the legal requirements to respond to the claimant's reasonable Plan of Operations (36 CFR 228.4), and to ensure that "operations are conducted so as, where feasible, to minimize adverse environmental impacts on National Forest surface resources" (36 CFR 228.8).

1.6 Decisions to be Made

This Final EIS does not document a decision. The purpose of this document is to disclose the effects and consequences of alternative strategies being considered in detail. Based upon information disclosed in this Final EIS, its associated planning record, and public feedback, the Forest Supervisor (Responsible Official) will make a decision which will be documented in a Record of Decision (ROD).

Given the Purpose and Need, the deciding official will review the Proposed Action, the other Alternatives, and the environmental consequences of each to decide which of these alternatives most effectively minimizes adverse effects to surface resources consistent within the intent and constraints of regulations and the Forest Service Manual direction concerning such terms and conditions.

Based on the analysis documented in the Final EIS the Forest Supervisor will make decisions on this project. The decisions to be made include:

- Should the mining proponent be notified of changes or additions to the plan necessary to minimize, where feasible, adverse environmental impacts on National Forest surface resources?
- Should minor amendments to the Forest Plan be made at this time; and if so, what amendments?
- What monitoring should be applied to the project?

1.7 Forest Plan Direction Relative to the Project Area

This document is tiered to the 2003 Payette National Forest Land and Resource Management Plan, as amended (USDA 2003, 2004, 2010)(Forest Plan). Information from the Forest Plan, the Forest Plan amendments, the Final Environmental Impact Statement prepared in concert with that plan, and all associated appendices, have been referenced and incorporated into this document.

Chapter III of the Forest Plan describes management direction to guide Forest personnel to achieve desired outcomes and conditions for both land stewardship and public service. This direction is presented in two sections: (1) Forest-wide Management Direction, and (2) Management Area Description and Direction. The Forest-wide management direction provides general direction for all Forest resources and the foundation for more specific direction at the management area level. The management area description and direction describes these areas in detail, highlights resource areas of importance or concern, and prescribes specific management direction to address these concerns.

Activities within the various management areas are further directed by management prescription categories (MPCs), several of which may occur within any given management area. Management prescriptions are defined as, "Management practices and intensity selected and scheduled for application on a specific area to attain multiple use and other goals and objectives" (36 CFR 219.3). MPCs are broad categories of management prescriptions that indicate the general management emphasis prescribed for a given area.

The project area lies within Management Area 14 (Frank Church – River of No Return Wilderness), discussed on pages III-269 through III-274 in the Forest Plan and within Management Area 13 (Big Creek/Stibnite) discussed on pages III-257 through III-267. Several Management Prescription Categories (MPCs) apply within these Management Areas (MA). However, the Project Area only includes MPC 1.1, 3.2, and 4.1c (Figure 1-3). MPC 1.1 incorporates the Frank Church – River of No Return Wilderness Management Plan via a standard associated with the MPC.

1.7.1 MPC 1.1 – Existing Wilderness

This prescription applies to areas designated by Congress as Wilderness. The main management objective is preserving wilderness attributes, including natural appearance, ecological integrity, opportunities for solitude, opportunities for primitive recreation, and identified special features. The area is managed to allow ecological processes to prevail, with little or no evidence of human development. Current wilderness management plans and approved fire management plans provide specific direction for management activities.

1.7.2 MPC 3.2 – Active Restoration and Maintenance of Aquatic, Terrestrial and Hydrologic Resources

This prescription is designed to minimize temporary and short-term risks and avoid long-term risks from management actions to soil/hydrologic conditions and aquatic, botanical and terrestrial habitats. The objective of this prescription is to actively restore or maintain conditions for Threatened, Endangered, Proposed/Petitioned, Candidate, and Sensitive (TEPCS) fish, wildlife, and botanical species, or 303(d) impaired water bodies through a combination of management activities and natural processes. Management activities used to achieve this objective include watershed restoration, noxious weed treatments, and vegetative treatments that include prescribed fire, wildland fire use, and mechanical. Restoration is focused on those components of the ecosystem that are not functioning properly, or are outside the range of desired conditions, while maintenance helps to preserve those components that are functioning properly.

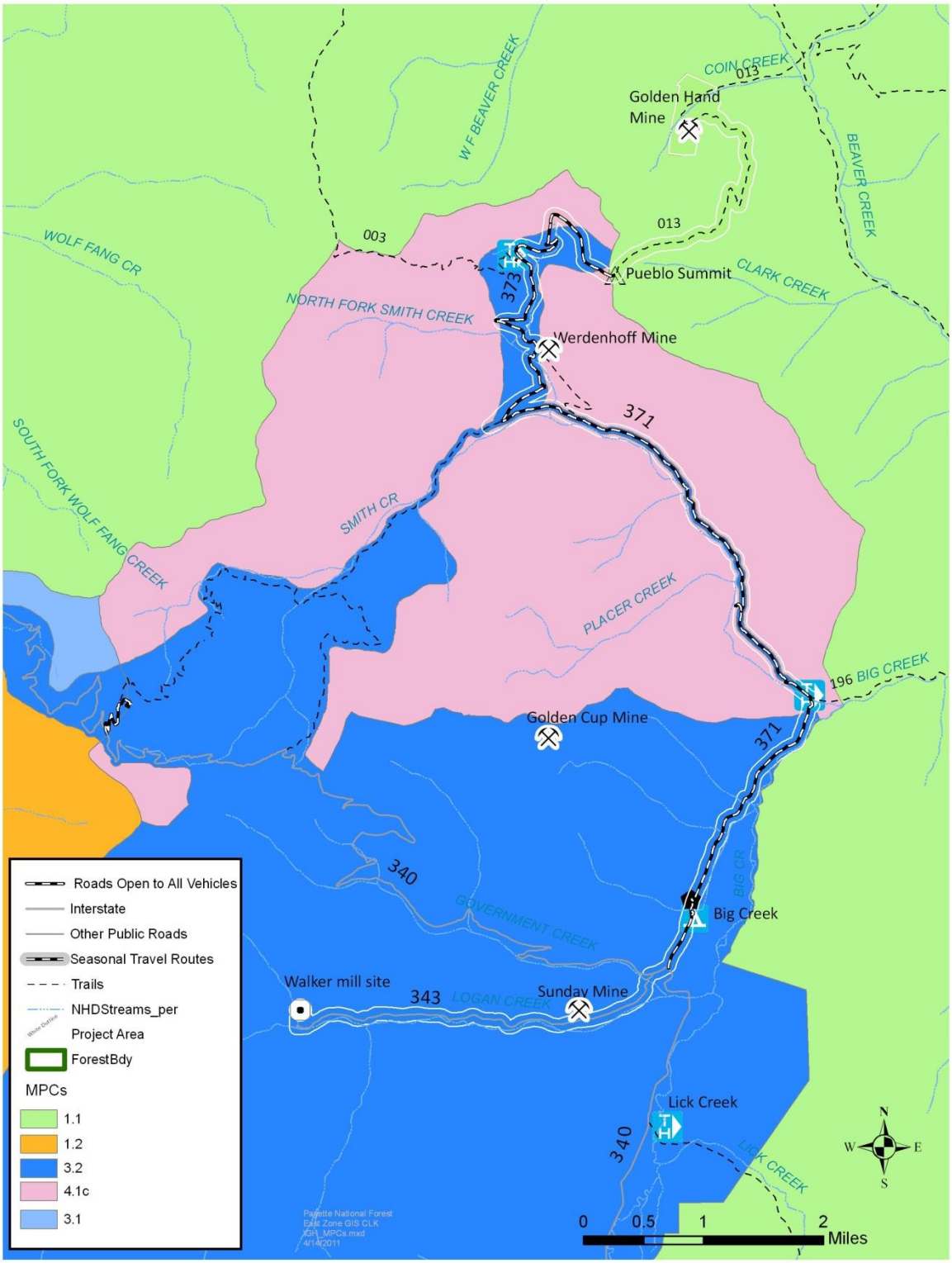


Figure 1-3 Management Prescription Categories

1.7.3 MPC 4.1c – Undeveloped Recreation: Maintain Unroaded Character with Allowance for Restoration Activities

This prescription applies to lands where dispersed recreation uses are the primary emphasis. Providing dispersed recreation opportunities in an unroaded landscape is the predominant objective. Both motorized and non-motorized recreation opportunities may be provided. Other resource uses are allowed to the extent that they do not compromise ROS settings. The area has a predominantly natural-appearing environment, with slight evidence of the sights and sounds of people. Species habitat and recreational uses are generally compatible, although recreation uses may be adjusted to protect TEPCS species.

1.7.4 Frank Church River of No Return Wilderness Management Plan

The FC-RONR Wilderness Management Plan (also referred to as the Wilderness Plan) provides management direction for each of the four National Forests (Bitterroot, Salmon-Challis, Nez Perce, and Payette) administering portions of the FC-RONR Wilderness. The Wilderness Plan direction for minerals states:

"Use Forest Service Mineral Examiners to assess the proposed mineral development in determining:

a. Status of the asserted rights of the claimant

b. That proposed methods of development are needed and reasonable and that the proposed operation is the next logical step in the orderly development of the mineral resources

c. Which alternative methods are possible and reasonable to minimize or mitigate impacts on surface resources" (USDA 2003, p. 2-44).

The Wilderness Plan includes standards for mineral access, "Reasonable access is allowed to valid mineral claims established before December 31, 1983. Such access is only for essential and exclusive use for the valid mining operations." (USDA 2003, p. 2-43). Additionally, the Wilderness Plan states "Reasonable access will be located to have the least lasting impact in wilderness values. To accomplish this, the use of motorized access by ground or air to claims shall be authorized only when proven essential. Road, trail, bridge, or aircraft landing area construction or improvements is limited to those clearly identified as essential to the operation." (USDA 2003, p 2-43).

1.8 Regulatory Requirements and Required Coordination

The Proposed Action was developed to respond to the claimant's reasonable plan of operations (36 CFR 228.4), and to ensure that "operations are conducted so as, where feasible, to minimize adverse environmental impacts on National Forest surface." Several of the design features presented in Chapter 2 were developed and incorporated to insure these requirements are met. The Interdisciplinary Team found Alternatives B and C to be consistent with federal legal requirements. Although all requirements would be met, the following summarizes the legal requirements and/or the results of the analysis for those concerns most often noted.

1.8.1 Central Idaho Wilderness Act (CIWA) and the Wilderness Act

The US Congress designated the FC-RONR Wilderness in 1980 with the passage of the CIWA. The CIWA mandated the development of a comprehensive wilderness management plan. The CIWA includes mining direction prohibitions for areas of the FC-RONR Wilderness but specific direction is provided in the Wilderness Act (US Congress 1964, 16 USC 1131-1136).

The Wilderness Act of 1964 (amended in 1978) was enacted by Congress to "secure for the American people, an enduring resource of wilderness for the enjoyment of present and future generations". This act was passed "in order to ensure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition..."(Section 2 [a]). The Wilderness Act contains provisions for mining that include: "Mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining

or processing operations and uses reasonably incident hereto...subject to valid existing rights" (Section 4 [d-3]). Additional provisions in the Act and affects are described in the Minerals and Geology and Wilderness Resources section, Chapter 3.

1.8.2 Clean Water Act, The Federal Water Pollution Control Act of 1972 (PL 92-500) as amended in 1977 (PL 95-217) and 1987 (PL 100-4)

The objective of the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources. This Act establishes a non-degradation policy for all federally proposed projects to be accomplished through planning, application, and monitoring of Best Management Practices (BMPs) (Section 2.4.2.2, Section 2.4.3.2, and Section 2.4.4). Identification of BMPs is mandated by Section 319 of the Water Quality Act of 1987 (also referred to as the Clean Water Act), which states, "It is national policy that programs for the control of nonpoint sources of pollution be developed and implemented." Additional information on BMPs (PDFs) is provided in Chapter 2.

The Forest Service is not currently aware of any circumstance that would necessitate permitting for stormwater discharges from roads. EPA's October 22, 2012, comment letter on the DEIS did not identify a need to obtain a NPDES permit for project activities.

The Supreme Court's ruling in Decker v. Northwest Environmental Defense Center (NEDC) and Georgia Pacific v. NEDC (nos. 11-347 and 11-338), backed EPA's policy that logging roads are not industrial point-source pollution and consequently don't require Clean Water Act permits and represents the latest ruling on forest roads. Construction or maintenance of Forest roads, or temporary roads for moving mining equipment qualify for an exemption from Section 404 dredge or fill permitting requirements, in waters of the United States including wetlands (404)(f)(1)(A), if they are constructed and maintained in accordance with BMPs to assure that flow and circulation patterns and chemical and biological characteristics of the waters are not impaired (404)(f)(1)(E). Regardless, the project will comply with all applicable NPDES permitting requirements in place at the time implementation is initiated and at all times during the implementation process.

1.8.3 Endangered Species

The Endangered Species Act (ESA, 16 USC 35 §§1531 et seq. 1988) provides for the protection and conservation of threatened and endangered plants and animal species. All alternatives were assessed to determine their effects on threatened and endangered plant and animal species. The U.S. Fish and Wildlife Service (USFWS) provides a list of threatened, endangered, proposed, and candidate species to consider in project planning. The current list identifies two threatened wildlife species, Canada Lynx and Northern Idaho Ground Squirrel and three threatened fish species, Spring/Summer Chinook, Steelhead Trout, and Bull Trout (USFWS 2012). Additional information on effects determinations can be found in Chapter 2 and 3.

Formal consultation with the USFWS and National Oceanic and Administration (NOAA) was initiated. The USFWS submitted a Biological Opinion to the Forest Service on October 30, 2013 and NOAA submitted a Biological Opinion to the Forest Service on November 18, 2013.

1.8.4 General Mining Law of 1872, as amended (30 USC 22, *et seq*.)

This law allows U.S. citizens the right to locate, explore, and develop mining claims on federal lands, such as National Forests, open to mineral entry. Additional information is provided in the Minerals and Geology section, Chapter 3.

1.8.5 Migratory Bird Treaty Act

The Migratory Bird Treaty Act decreed that all migratory birds and their parts (including eggs, nests, and feathers) were fully protected. Under the Act, taking, killing or possessing migratory birds is unlawful. The original intent was to put an end to the commercial trade in birds and their feathers that had wreaked havoc on the populations of many native bird species. On January 17, 2001, President William Clinton signed an executive order directing executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act (FR Vol. 66, No.11, January 17, 2001).

Migratory birds occupy all source habitats found in the analysis area. If new requirements or direction result from subsequent interagency memorandums of understanding pursuant to Executive Order 13186, this project would be reevaluated to ensure that it is consistent.

1.8.6 National Forest Management Act (NFMA)

This Act guides development and revision of National Forest Land Management Plans and contains regulations that prescribe how land and resource management planning is to be conducted on NFS lands to protect National Forest resources. The different alternatives for this project were developed to comply with NFMA, and represent varying degrees of resource protection.

1.8.7 National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966 is the principle, guiding statute for the management of cultural resources on NFS lands. Section 106 of NHPA requires federal agencies to consider the effects of their activities and programs on historic properties. *Historic Properties* are any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained in the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. [36cfr800.16 (l)(1)]. The criteria for National Register eligibility and procedures for implementing Section 106 of NHPA are outlined in the U.S. Code of Federal Regulations (36 CFR Parts 60 and 800, respectively).

1.8.8 Idaho Stream Channel Protection Act

In general terms, the Stream Channel Protection Act applies to any type of alteration work, including recreational dredge mining, done inside the ordinary high water marks of a continuously flowing stream.

A stream channel alteration is defined as any activity that will obstruct, diminish, destroy, alter, modify, relocate or change the natural existing shape or direction of water flow of any stream channel. This includes taking material out of the channel or placing material or structures in or across the channel where the potential exists to affect flow in the channel.

1.8.9 The Multiple Use Mining Act of July 23, 1955 (30 USC 611, *et seq*.)

The Act requires, among other things, that any unpatented mining claim "…shall not be used, prior to issuance of patent therefore, for any purpose other than prospecting, mining, or processing operations and uses reasonably incident thereto."

1.8.10 The Clean Air Act, as amended in 1990

The purpose of this Act is "…to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population; to initiate and accelerate a national research and development program to achieve the prevention and control of air

pollution; to provide technical and financial assistance to State and local governments in connection with the development and execution of their air pollution prevention and control programs; and to encourage and assist the development and operation of regional air pollution prevention and control programs."

1.8.11 American Indian Religious Freedom Act, Executive Order 12875, Executive Order 13007, Executive Order 13175, and Native American Graves Protection and Repatriation Act

The American Indian Religious Freedom Act, Public Law No. 95-341, 92 Stat. 469 (Aug. 11, 1978) (commonly abbreviated to AIRFA), is a United States federal law and a joint resolution of Congressthat was passed in 1978. AIRFA was enacted to protect and preserve the traditional religious rights and cultural practices of American Indians, Eskimos, Aleuts, and native Hawaiians. Executive Order 13175 established a requirement for regular and meaningful consultation between federal and tribal government officials on federal policies that have tribal implications. Executive Order 12785 was enacted in order to reduce unfunded mandates upon State, local, and tribal governments; to streamline the application process for and increase the availability of waivers to State, local, and tribal governments; and to establish regular and meaningful consultation and collaboration with State, local, and tribal governments on Federal matters that significantly or uniquely affect their communities. Executive Order 13007 was enacted in order to protect and preserve Indian religious practices. The Native American Graves Protection and Repatriation Act provides a process for museums and Federal agencies to return certain Native American cultural items, such as human remains, funerary objects, sacred objects, or objects of cultural patrimony, to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations.

1.8.12 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

Nothing in this document or in the approval of a Plan of Operations by the USDA Forest Service authorizes or in any way permits a release or threat of a release of hazardous substances into the environment that will require a response action or result in the incurrence of response costs. All designs, monitoring plans, and analyses required by the Plan of Operations are subject to the requirement of 36 CFR 228.8 that mining operations be conducted so as, where feasible, to minimize adverse environmental impacts on National Forest surface resources. However, the operator's compliance with such requirement in no way insulates or releases it from any liability or obligations which may arise with respect to its operations under any applicable environmental law, including but not limited to the CERCLA, 42 U.S.C. 9601 et seq. The United States reserves its rights and claims under CERCLA to seek performance of response actions and/or reimbursement of response costs that may be incurred as a result of any release or threat of a release of a hazardous substance, or any ancillary operation for the confirmation activity.

1.8.13 Nez Perce Treaty of 1855 and 1863, Shoshone-Bannock Tribes Fort Bridger Treaty of 1868, Shoshone-Paiute Tribes Executive Order of 1877, Treaty Between the Cayuse, Umatilla

The Nez Perce, Shoshone-Bannock, Shoshone-Paiute, and the confederated tribes of the Umatilla Indian Reservation interests go beyond spiritual, cultural, and economic to the unique legal relationship that the U.S. government has with American Indian tribal governments. Federally recognized tribes are sovereign nations who work with the federal government and its agencies through the process of

government-to-government consultation. The federal trust relationship with each tribe was recognized by, and has been addressed through, the U.S. Constitution, treaties, executive orders, statutes, and court decisions.

The ancestors of the modern day Nez Perce, Shoshone-Bannock, Shoshone-Paiute, and the confederated tribes of the Umatilla Indian Reservation were present in the Ecogroup area long before the establishment of the PAF and continue to use the land to this day. Many of the treaties and executive orders signed by the U.S. government in the mid-1800s reserved homeland for the tribes. Additionally, the treaties with the Nez Perce, Shoshone-Bannock, and confederated tribes of the Umatilla Indian Reservation reserved certain rights outside of established reservations, including fishing, hunting, gathering, and grazing rights.

1.9 Public Involvement and Consultation

1.9.1 Public Involvement

Public involvement has been extensive throughout the planning and analysis process leading to this document. Formal planning for this project was initiated on November 21, 2008 with a Notice of Intent to prepare an Environmental Impact Statement (EIS) appearing in the Federal Register.

A Notice of Intent to prepare an EIS was published in the *Federal Register* (November 21, 2008), a scoping package describing the Proposed Action was mailed to more than 300 individuals, agencies, and/or groups on March 16, 2010. In response to these scoping efforts more than 20,500 oral and written comments were received.

The Draft EIS was released for a 45-day comment period in June of 2012. A Notice of Availability of the Draft EIS appeared in the *Federal Register* on June 29, 2012. Legal notice announcing the availability of the Draft EIS appeared in *The Idaho Statesman* on June 29, 2012. The comment period was extended in August of 2012. A Notice of Availability (Amended Notices) of the Draft EIS appeared in the *Federal Register* on August 17, 2012 and extended the comment period to September 17, 2012. Legal notice announcing the extension appeared in *The Idaho Statesman* on August 17, 2012. 312 letter and 20,952 emails were sent to notifying interested parties of the availability of the Draft EIS on June 15, 2012. 312 letters and20,939 emails were sent to notify interested parties of the extension on August 6, 2012. Over 17,000 comments were received in response to these efforts.

Commenters voiced a variety of concerns including, but not limited to, potential adverse impacts on wildlife and wildlife habitat, proper bonding levels, season of operation, minimum tools needed to accomplish the project, public access, affects to historic properties, approval of off-claim drill pads, and contaminants. The planning record contains all written comments received relative to this project and discloses how the Interdisciplinary Team addressed those concerns.

1.9.2 Consultation Processes

On January 27, 2011, the conceptual idea of this project was discussed by representatives of the U.S. Forest Service, U.S. Fish and Wildlife Service, and NOAA Fisheries at a scheduled Level 1 Meeting. Follow-up meetings have been held at scheduled Level 1 Meetings on March 8, 2011, November 30, 2011, February 22, 2012, February 28, 2013, April 9, 2013, and May 21, 2013, . In addition, scoping letters addressed specifically to the U.S. Fish and Wildlife Service and NOAA Fisheries representatives were mailed on March 16, 2010 soliciting comments on the Proposed Action. Letters notifying both Services of the availability of the Draft EIS were sent on June 15, 2012. Letters notifying both Services of the comment extension for the Draft EIS were sent on August 6, 2012.

A proposal of the project was presented to tribe representatives at the April 8, 2010, June 10, 2010, April 12, 2012, February 13, 2014, and December 5, 2014 Wings and Roots Meeting. Individual scoping packages were also forwarded to representatives of the Shoshone-Bannock and Nez Perce Tribes in March of 2010. The project was presented to the Shoshone – Bannock Tribe in Fort Hall on

June 22, 2011 and again on September of 2013. The project was also presented at the Nez Perce Tribe and Payette National Forest Staff to Staff meeting on May 11, 2010, June 7, 2012, and December 3, 2014. A letter notifying the Nez Perce Tribe and Shoshone-Bannock Tribe of Draft EIS availability was sent on June 11, 2012. A letter notifying the Shoshone-Bannock Tribe and the Nez Perce Tribe of the comment extension was sent on August 6, 2012. The project was discussed with the Nez Perce Tribe Executive Council on April 8, 2014. Additional coordination with the Tribes will be conducted as needed or requested before a decision on this project is made to ensure that Tribes interests are considered.

Individual scoping packages were forwarded to Valley and Idaho County Commissioners in March of 2010. Letters notifying both counties of the availability of the Draft EIS were sent on June 15, 2012. Letters notifying both counties of the comment extension for the Draft EIS were sent on August 6, 2012.

1.10 Issues and Concerns

Identification of issues included review of written and verbal comments, input from Forest Service resource specialists, review of the Forest Plan, and comments from state and other federal agencies. Comments identified during scoping were evaluated against the following criteria to determine whether or not the issue would be a major factor in the analysis process.

- Has the concern been addressed in a previous site-specific analysis, such as in a previous Environmental Impact Statement or through legislative action?
- Is the concern relevant to and within the scope of the decision being made and does it pertain directly to the Proposed Action?
- Can the concern be resolved through mitigation (avoiding, minimizing, rectifying, reducing or eliminating, or compensating for the proposed impact) in all alternatives?
- Can the issue be resolved through project design in all alternatives?

1.10.1 Issues

The Responsible Official identified three issues. These issues are points of unresolved conflict with the Proposed Action (Alternative B) identified during internal and external scoping efforts. Issues are used in environmental analysis to formulate alternatives, prescribe mitigation measures, and focus the analysis of environmental effects. Summaries of detailed analyses associated with these issues are presented in Chapter 3 of this document. Following each issue, indicators are listed for use in comparing how the different alternatives affect that issue.

1.10.1.1 Wilderness Character

Activities associated with the Proposed Action could result in a degradation of wilderness character.

Indicators:
- Would Activities Adversely Affect Natural Integrity?
- Would Activities Adversely Affect Untrammeled Condition?
- Would Activities Adversely Affect Solitude?
- Would Activities Adversely Affect Primitive Recreation?
- Authorized Use of Penn Ida for Storage?
- Number of Annual Authorized Motorized Trips into The FC-RONR Wilderness Expected During 100 Day Operating Season.
- Authorized Use of the Golden Hand Bunkhouse for Office Space.

1.10.1.2 Scenic Environment

Activities associated with the Proposed Action could result in undesirable impacts to the scenic environment.

Indicators:
- Would Activities Comply with Visual Quality Objectives (VQOs) Standards?
- Would Activities Allow the Use of the Golden Hand Bunkhouse within the FC-RONR Wilderness?

1.10.1.3 Water, Soil, and Fisheries

Activities associated with the Proposed Action could result in undesirable impacts to soil, water, and fishery resources.

Indicators:
- Modeled Interstitial Sediment Delivery (Pounds)
- Would Activities Result in Changes to Peak/Base Flow?
- Number of Annual Authorized Motorized Trips into The FC-RONR Wilderness Expected During 100 Day Operating Season.

1.10.2 Concerns

The Responsible Official reviewed other concerns raised during scoping. These concerns were valuable, but they did not raise unresolved conflicts. Numerous concerns were raised during internal and external scoping processes.

In addition to concerns raised by the public during scoping and the comment period for the DEIS, the IDT identified concerns. As a result several of these internal and external concerns were addressed through analysis or project design features in this Final EIS. The concerns include minerals and geology, soil, wildlife, Idaho roadless areas, fuel haul, groundwater, botanical, noxious weeds, air quality, cultural, and recreation (ROS). Summaries of these detailed analyses are presented in Chapter 3 of this document.

Comments received on the DEIS and the Forest Service response to those comments are contained in Appendix E.

1.11 Document Organization

This document is tiered to the Final EIS supporting the Record of Decision for the 2003 Forest Plan. Documented analyses in the Forest Plan Final EIS have been referenced rather than repeated in some instances. Detailed information that supports the analyses presented in this document, unless specifically noted otherwise, is contained in the project planning record located at the Krassel Ranger District Office.

Analyses pertaining to the Final EIS for the 2003 Forest Plan as amended in 2003 and 2010 are contained in the forest planning record located at the Forest Supervisor's Office in McCall Idaho.

This document consists of the following main chapters:

- **Chapter 1 - Purpose and Need**: Describes the Proposed Action, need and purpose of the action, decisions to be made, Forest Plan direction, regulatory requirements and required coordination, public involvement, and identification of issues.

- **Chapter 2 - Alternatives**: Includes design features common to all action alternatives, descriptions of the alternatives considered in detail, alternatives considered but eliminated from detailed study, and a comparative summary of the environmental consequences, activities, and outputs.

- **Chapter 3 - Affected Environment and Environmental Consequences**: Describes the existing conditions of the resources within the analysis area and the environmental impacts of the alternatives on those resources.

- **Chapter 4 - Consultation and Coordination**: Provides a list of the primary preparers of this document; a summary of the scoping and public involvement efforts; and; a list of agencies, organizations, and persons to whom copies of the EIS have been sent.

- **Appendix A – Cumulative Effects**

- **Appendix B – Watershed Condition Indicators**

- **Appendix C – Monitoring**

- **Appendix D – Core Drilling**

- **Appendix E – Response to Comment**

CHAPTER 2 - ALTERNATIVES

2.1 Introduction

This chapter describes and compares two action alternatives that fully or partially meet the purpose and need identified in Chapter 1, and a No Action Alternative (Alternative A). Each alternative reflects a different response to the significant issues identified through the scoping and analysis process, and each alternative would result in different environmental effects. This chapter concludes with a comparative summary of the alternatives considered in detail. This comparison, combined with the more detailed disclosure of impacts in Chapter 3, provides the information necessary for the decision-maker to make an informed choice between alternatives.

2.2 Development of Alternatives

The Proposed Action was developed by the Interdisciplinary Team using the American Independence Mines and Minerals Co. (AIMMCO) Plan of Operation, revised on June 4, 2010, and further revised on November 12, 2010. The plan was accepted by the Forest Service after more than two years of negotiation to develop a reasonable plan of operations that:

1. met the needs of the proponent
2. complied with the August 12, 2002 decision of the Idaho District Court
3. minimized wilderness impacts
4. utilized the smallest sized equipment capable of completing the needed work in a timely manner
5. minimized road construction/reconstruction needs
6. complied with applicable laws, rules, and regulations

The accepted plan of operations was then reviewed and approved by the Responsible Official. As disclosed in this chapter, any action alternative would require a minor Forest Plan amendment for Visual Resources. The Interdisciplinary Team developed alternatives to the Proposed Action in response to issues and/or concerns identified through internal and external scoping.

2.2.1 Issues Used in Alternative Development

As disclosed in Chapter 1 of this document, three issues were identified during internal or external scoping and comment. The effects to wilderness character and experience, scenic environment, and water/soil/fisheries could not be resolved, nor could anticipated impacts be mitigated.

2.2.2 Concerns Not Used in Alternative Development

Concerns relating to other resource components were evaluated in the analysis. Net effects to these concerns were limited or would be relatively the same for all action alternatives. These concerns are generally addressed by requiring compliance with specific laws, Best Management Practices (BMPs/PDFs), agency policy, and/or Forest Plan standards.

2.3 Alternatives Eliminated from Detailed Study

In addition to the alternatives fully evaluated in this document, other management approaches were considered by the Interdisciplinary Team in response to concerns generated from internal and external scoping and comment. These alternatives, which were not considered in detail, are described in this section along with an explanation of why the alternatives were not considered further.

2.3.1 Helicopter Transport of Personnel and Equipment

To avoid the need for temporary roads in the FC-RONR Wilderness, reduce effects to soil and water and fisheries, and attempt to better maintain wilderness character and experience, the ID Team

considered an alternative that accessed the claims via helicopter. Although AIMMCO's proposal could have been implemented using helicopter support, it was determined that this method would be disruptive to Wilderness users and possibly to wildlife and create undue noise. Mobilization would require more trips than proposed with action alternatives due to the need to break down equipment and fly in multiple loads. Daily staffing, maintenance, and supply would also require more trips due to typical weight restrictions on helicopters that would be used for this type of task at the elevations in the area. Construction of one or more helispots within and potentially outside the wilderness would be required. In addition to requiring more trips, the use of helicopters would create higher noise levels and the noise would carry over greater distances than action alternatives propose. Lastly, helicopter operations needed to support operations would require the transport of more fuel into the project area than the action alternatives propose.

2.3.2 Non-Mechanized with Access by Foot and Pack Stock

Directives contained in the Wilderness Act and at 36 CFR 228.15 guide motorized incursion into the Wilderness associated with minerals. The Wilderness Act allows for surface disturbing activities that are reasonably incident to mining or processing operations when valid rights have been found to exist (U.S. Congress 1964, Section 4[d-3]). The mining activities described may be implemented if such activity is carried on in a manner compatible with the preservation of the wilderness environment (U.S. Congress 1964, Section 4[d-2]). In the case of valid mining claims or other valid occupancies the Secretary of Agriculture shall permit ingress and egress to such surrounded areas by means which have been or are being customarily enjoyed with respect to other such areas similarly situated (U.S. Congress 1964, Section 5[b]). Operations shall be conducted so as to protect National Forest surface resources in accordance with the general purposes of maintaining the National Wilderness Preservation System unimpaired for future use and enjoyment as wilderness and to preserve its wilderness character, consistent with the use of the land for mineral location, exploration, development, drilling, and production and for transmission lines, water lines, telephone lines, and processing operations, including, where essential, the use of mechanized transport, aircraft or motorized equipment (36 CFR 228.15(b)). Persons with valid mining claims wholly within National Forest Wilderness shall be permitted access to such surrounded claims by means consistent with the preservation of National Forest Wilderness which have been or are being customarily used with respect to other such claims surrounded by National Forest Wilderness (36 CFR 228.15(c)). Other directives associated with the wilderness are contained in Chapters 1 and 3.

A reasonable development scenario would still include the use of drilling equipment and other motorized equipment to conduct confirmation work. Non-mechanized tools would not allow proposed operations to occur and was not considered reasonable by the Forest Service. The proposed activities of core drilling, trenching, and adit opening would not customarily be completed by non-motorized methods. Subsequently there would be a need to provide access to work areas for equipment, whether by air (Section 2.3.1) or ground. While not covered in extensive detail, motorized access throughout the life of the project would likely shorten the overall amount of time intrusions of motorized equipment and vehicles impacted the wilderness thereby limiting the temporal impacts to wilderness characteristics associated with motorized use (Section 3.3). Past instances that required non-motorized means of access were generally more restricted in the scope and type of the activity proposed by the miner. The scope and type of activity associated with this project would necessitate motorized access and likely limit the duration of the activity in the wilderness, therefore a non-mechanized alternative was dropped from further consideration.

2.3.3 Winter Operations

To avoid the typical season of use in the wilderness an alternative was considered but eliminated that would have only allowed winter operations. While the number of human visitors to the wilderness would be minimal during that time period, the effects of activities on wilderness characteristics would still exist. Winter operations would also necessitate the use of helicopters described in Section 2.3.1. It would be reasonably anticipated that the road to the Big Creek airstrip would require plowing, to facilitate a base for aerial operations. While the plowing of snow is feasible, it would create access that would not normally exist into the area and result in additional effects from the plowing itself. Water is

typically used as the means for removing cuttings from the hole while drilling and due to freezing winter temperatures on the claims would need to be replaced by other fluids. While snow loads vary greatly from year to year, snow loads can be substantial with the Deadwood SNOTEL site located to the south of project area having 120 inches of standing snow in January of 2008. Snow loads could substantially affect the conduct and timeliness of all activities and frozen ground could substantially affect the ability to cleanly conduct trenching activities and work at the Ella Mine. Lastly, personnel, including those needed by the Forest Service to administer operations, involved in operations would be subjected to increased risk from avalanches, freezing temperatures, and be possibly stranded should helicopters not be able to fly.

2.3.4 Temporary Bridges in FC-RONR Wilderness

An alternative was suggested that would have installed a temporary bridge at the ford on a tributary of Coin Creek instead of repairing with a rock and filter fabric design. Getting the needed materials into the FC-RONR wilderness may have necessitated further road maintenance to widen and clear temporary roads to accommodate the length and type of materials needed. The construction of a temporary bridge could have necessitated more trips into the wilderness than the use of rock and filter fabric with rock sourced inside the FC-RONR wilderness. Bridge installation would have likely necessitated the construction of bridge abutments requiring removal and subsequent restoration following removal of the bridge at the conclusion of the project. Following removal of the bridge, the trail would still require repair to provide a trail ford of the creek for user access on Forest Trail #13. Additionally, road alignment and grade may have required adjustment to provide a safe approach onto the bridge

2.3.5 Reduced Motorized Access

An alternative was suggested that would have required foot or horse travel for shift changes, core sample transport, and miscellaneous supplies/overhead transport when possible. This alternative would have required foot or horse travel of approximately 3 to 3.5 miles one-way when supply loads associated with the trip, including fuel, would not have otherwise necessitated motorized travel into the FC-RONR Wilderness.

Potential effects to wilderness character of requiring stock use instead of motorized use for travel, to slightly reduce the number of motorized intrusions, to and from the site for shift changes was looked at in regards to the four tangible qualities of wilderness. Using stock for travel to and from the site in lieu of a motor vehicle would still not eliminate the need for motor vehicle transport during the project life and this motorized use would continue to impact the qualities of wilderness. Since motorized use would still be necessary, the road maintenance required to facilitate the operations would still be necessary. Using non-mechanized means to conduct operations would potentially lengthen the overall project duration and extend the impacts to wilderness character. It is not possible to quantify the actual increase in duration, but the nature of this travel is slower and throughout an operating season situations normally arise where motorized access would lessen down time. This alternative would potentially have a greater impact on the wilderness quality of “solitude or a primitive and unconfined type of recreation” because of the assumed additional time it would take to accomplish the project. The additional time required to walk or ride would likely result in a three shift day, thereby further impacting solitude at more frequent intervals than a two shift day. Repeatedly using stock to carry gear, supplies and workers to the site also could present a safety issue for the stock with the large objects required at the site on a daily basis and would require night time operations of stock. The use of large quantities of stock would impact the trail similar to motorized use except for the width of impact and would still require the same level of road maintenance to get ingress/egress for other equipment. Holding areas needed within the wilderness while freight is offloaded, reloaded, and crews transfer from shift to shift would result in disturbance and associated impacts to wilderness character. Stock pens would be needed immediately outside the wilderness and result in additional soil disturbance, water needs, and the trips to supply feed. The use of stock would not reduce the impacts to the pristine nature (naturalness and untrammeled) of the wilderness, since all other impacts would still occur to get needed equipment into the site and stock could create additional impacts. Outside of solitude the use of stock would not reduce any impacts to wilderness character and could add to impacts from high levels

of stock usage. Stock and walking are marginally quieter than motorized equipment; however solitude would still be impacted and increased due to more daily shift changes and overall project duration. This additional impact to a wilderness quality was gaged to be significant enough to warrant dropping this alternative from in-depth analysis. The interdisciplinary team believed, after comparing the advantages and disadvantages of non-motorized access, that the best way to minimize the effects to wilderness character is to minimize the time necessary to complete the project. Because there was no clear benefit to wilderness character with this alternative, it was dropped from in-depth analysis.

2.3.6 Modifications to Use Electric Vehicles, Wind/Solar Charged Equipment

An alternative was suggested that would have required the use of solar/battery or wind/battery powered equipment when possible. The availability of this type of equipment for the commercial applications being proposed is not currently available.

2.3.7 Removal of Ella Excavated Material from the Wilderness

An alternative was suggested that would have removed material generated from the Ella Excavation outside the wilderness. The premise of this alternative would have been to remove material that would have the potential to generate acids from the wilderness where they could be managed more effectively. There would be no increased potential for acid generation or metals leaching as a result of opening the Ella adit, since the excavated collapse material is all unmineralized colluvium and there would be no additional waste rock generated. This would result in many more motorized trips in the Wilderness and additional transport of fuel for project implementation. Only small channel samples would be removed from underground. Since acid generation or metals leaching is not expected to increase, this alternative was eliminated from detailed study.

2.3.8 Helicopter Transport for Drill Rigs

An alternative was suggested that would have flown drill rigs only to reduce impacts to the wilderness. To the extent practicable, equipment would be convoyed into the wilderness. The drill would have to be broken down (4 or more pieces) and moved from one drill pad to the next. Using a helicopter to shuttle a drill rig a hundred feet or less when the road is there is impractical and constitutes a greater noise disturbance to the wilderness character. This alternative would result many additional intrusions into the wilderness using a helicopter and still require the same amount of other motorized equipment. Section 2.3.1 discloses other rationale for eliminating helicopter transport.

2.3.9 No Adverse Effects to ESA

An alternative was suggested that would have eliminated adverse impacts to ESA listed fish species. Adverse effects t listed species and their designated critical habitat are due to repair and use of fords on North Fork of Smith Creek and Coin Creek, and installation of a permanent open bottom crossing structure on North Fork of Smith Creek that would allow fish passage. The installation of the stream crossing structure would be a long term benefit to ESA listed fish, but temporary adverse effects are unavoidable because fish need to be relocated when the channel is dewatered. Installation of a temporary bridge over the lower ford on North Fork Smith Creek is not feasible for this project because of the large span necessary and associated cost. Biological Opinions from the FWS and NFMS requires development of a solution to minimize adverse effects at the ford by 2017. Installation of a temporary bridge over Coin Creek would reduce impacts to steelhead critical habitat by minimal amounts over fording, would produce little benefit for fish which occur in the lower portions of Coin Creek a mile downstream of the ford, and has potential to cause substantially more impacts to Wilderness. Section 2.3.1 discloses the rationale for eliminating helicopter transport.

2.4 Alternatives Considered in Detail

2.4.1 Alternative A - No Action

The National Environmental Policy Act (NEPA) requires consideration of a "No Action" alternative. The No Action Alternative serves as a baseline to analyze the environmental effects of the action alternatives. However, under Forest Service mining regulations at Title 36 Code of Federal Regulations (CFR) 228 Subpart A, this option can only be considered as an intermediate step in processing a plan of operation, provided that it has been properly submitted under the authority of the U.S. Mining Laws. For example, some proposed plans or parts of proposed plans of operation may not represent logical and sequential development of mineral property, may not be feasible, may not comply with applicable state or federal laws, or may not be reasonably incident to mining. In such cases, the Forest Service may not simply deny approval of the plan, but has the obligation to notify the operator as required under 36 CFR 228.5, of changes to be made that are necessary for its approval. Ultimately, in accordance with law and regulation, holders of valid mining claims have a legal right to develop their claims and a reasonable plan of operations must be identified and approved.

2.4.2 Alternative B - Proposed Action

On September 4, 2007 AIMMCO submitted an operating plan for drilling operations, trenching and sampling, and reopening the caved Ella Mine adit. The Forest Service worked with AIMMCO for more than two years to revise the initial proposal. A revised Plan of Operations was submitted to the Forest Service on June 4, 2010 and was further revised by a November 12, 2010 letter. AIMMCO has incorporated additional changes to their proposed plan since that time.

This alternative is based on the proposed plan of operations (operating plan or plan) submitted by American Independence Mines and Minerals Company (AIMMCO) to the Forest Service on June 4, 2010, along with subsequent revisions. It represents a reasonable plan which the Forest Service is required to approve, unless actions are needed to minimize adverse environmental impacts on National Forest System surface resources. The Proposed Action would allow AIMMCO to collect subsurface geologic information in order to prepare for a new mineral examination by the Federal Government. The claims encompass approximately 20 acres each and are located near Coin Creek, a tributary of Beaver Creek, which flows into Big Creek, a tributary of the Middle Fork Salmon River. Except for one drill location, the proposed drilling operations, rock chip sampling, and Ella Mine opening would occur on Golden Hand No. 1 and No. 2 lode mining claims (Figure 2-1). The project area includes the Golden Hand claims, the connecting temporary roads between the claims and Pueblo Summit, the temporary road to the Werdenhoff, and Forest Service Roads 343, 371, and 373 (Figure 1-2).

Because the Proposed Action does not meet Forest Plan standard SCST01 for Visual Quality, a one time, site specific, non-significant amendment to the Forest Plan would be necessary. This is described in section 2.4.2.1.

The following is a summary of the Proposed Action:

- Maintain portions of Forest Roads (FR) 371 and 373 between the Big Creek Trailhead and Pueblo Summit and maintain approximately 4.1 miles of temporary road, including 4.0 miles within the FC-RONR Wilderness. Reconstruct one short approach to a crossing of the North Fork of Smith Creek on FR 373.

- Repair a ford on a tributary to Coin Cr. and repair a ford on Coin Cr.

- Authorize up to 771 motorized trips into the FC-RONR Wilderness. Motorized trips within the Wilderness claim operating area to transport needed items from the storage area to work sites would be kept to the minimum necessary.

- Construct 11 drill pads from which 13-18 core holes would be drilled.

- Collect rock chip samples from pits excavated to bedrock at several locations in the temporary roads.
- Reopen and timber a caved mine adit (the "Ella") to allow access for underground mapping and sampling. Excavated material would be placed on the existing flat disturbed area in front of the portal location.
- Use a variety of vehicles and equipment including, but not limited to, four-wheel-drive pickup trucks, a 7 cubic yard dump truck, flatbed truck, D-8 (or equivalent) bulldozer, 3-cubic yard loader or small excavator, a track or skid-mounted drill rig, air compressor, small jackhammer, and generators.
- Store fuel on the claims or an adjacent valid lode claim (Golden Hand No. 8).
- Use the Penn Ida plaza for storage, if necessary.
- Use the Golden Hand bunkhouse within the FC-RONR Wilderness as office space.
- Establish a temporary camp at the Werdenhoff.
- Obtain water from Coin Creek in accordance with the water right, which would not exceed 25,000 gallons per day. The water would be obtained and used in accordance with a temporary water right issued by the Idaho Department of Water Resources.
- Conduct defined reclamation activities at the end of each season.
- Implement design features and/or mitigation to reduce or prevent undesirable effects resulting from proposed management activities.

A detailed description of activities proposed under Alternative B is provided below.

Access, Road Maintenance, Temporary Roads

Access to the claims would be on Forest Roads (FR) 371 and 373 to the FC-RONR Wilderness boundary at Pueblo Summit, north of Edwardsburg. Maintenance activities would occur on approximately 8.0 miles of system road, from the trailhead at Big Creek to Pueblo Summit. On Forest Roads (FR) 371 and 373, the road maintenance and reconstruction proposed to facilitate project activities and reduce sediment would:

- Construct drivable dips where appropriate along FR 371 and 373.
- Place coarse and well graded aggregate on approximately 500 feet of road surface.
- Construct an insloped ditch on FR 373 for approximately 450 feet.
- Repair a small (approximately 50 linear feet of road) section of road fill on FR 373 by adding additional material. At the same location, widen a section of FR 373 by further cutting into the slope.
- Install a box culvert/steel arch pipe capable of Aquatics Organism Passage (AOP) on FR 373 at the North Fork Smith Creek near Werdenhoff. Improve the road alignment on both sides of the stream to straighten the approaches.
- Armor, by placing coarse gravel, approaches to several North Fork Smith Creek crossings of FR 371.
- Raise the road surface where substantial portions of road with poor drainage exist.

Proposed ongoing maintenance along these roads would include clearing loose rock to the original road width, removing fallen trees, and clearing brush to provide access to vehicles and equipment described in Table 2-4. Any brush and trees cleared for road maintenance would be placed along the side of the road and serve as a slash-filter windrow. Additionally, a 0.1 mile temporary road to provide access to Werdenhoff would be authorized along an existing unauthorized road. Temporary access would be provided by clearing loose rock to the original road width, removing fallen trees, and clearing brush, if necessary. Table 2-1 displays the mileage of individual segments of road maintenance and reconstruction needed to accomplish proposed activities.

Within the FC-RONR Wilderness, this alternative proposes to authorize 4.0 miles of temporary road to facilitate proposed activities. Temporary road authorization would occur on roughly 1.0 mile of existing unauthorized roads, all of which were built as roads prior to the designation of the FC-RONR Wilderness (Photo 2-1 displays road beds in the FC-RONR Wilderness built prior to designation). While these unauthorized roads are not part of the current National Forest system of roads, they remain in very good condition overall. Approximately 3.0 miles of Forest Service System Trail #13 would be authorized as a temporary road. Forest Service Trail #13 was originally a road accessing the Golden Hand claims and has been maintained as a foot and pack stock trail following the designation of the FC-RONR Wilderness. Table 2-1 displays the mileage of individual segments of temporary road authorization needed to accomplish proposed activities. Maintenance activities required on these temporary roads would include the removal of brush from existing roadbeds, the casting of rock debris in the prism to the fill side of the road, the clearing of loose rock slough to the original road width, and the placement of slash from brushing activities on the fill side of the road. Temporary roads accessing several of the drill locations would have drainage improved where water has saturated the road by reestablishing drainage from the road surface and/or reinforcing the road bed with geotextile fabric.

Photo 2-1 – Road Bed Constructed Prior to Wilderness Designation in the FC-RONR Wilderness

A ford on a tributary to Coin Creek would require repair to provide access. The repair would consist of filling the hole with large rock, a layer of rock sandwiched in filter fabric, and a layer of finer material with larger rock to armor the channel. Fill rock would be sourced from the talus slope located on the road from the Golden Hand bunkhouse to the Ella Portal or the Penn Ida site.

Table 2-1. Proposed Temporary Roads and Maintenance for the Golden Hand Mine Project under Alternative B.

Route	Activity	Mileage	Within the FC-RONR
013	Authorization of Temporary Road and Maintenance	3.0	Yes
371	Road Maintenance	4.1	
373	Road Maintenance and Reconstruction	3.9	
503731000	Authorization of Temporary Road and Maintenance	0.1	
503739000	Authorization of Temporary Road and Maintenance	0.3	Yes
503739500	Authorization of Temporary Road and Maintenance	0.3	Yes
503739800	Authorization of Temporary Road and Maintenance	0.3	Yes
503739900	Authorization of Temporary Road and Maintenance	0.1	Yes

Additionally, the ford at Coin Creek would be repaired to provide passage. The rock substrate in the creek would require no further armoring. Approaches to the stream would be armored. If needed, coarse rock material would be obtained from the talus slope located on the road from the Golden Hand bunkhouse to the Ella Portal or the Penn Ida site. An intermittent stream channel intersecting the road approximately 50 feet southeast of this ford would have drainage features maintained/installed to allow proper drainage of the channel where it intersects the road.

Confirmation Activity

Core Drilling

Core drilling would occur on eleven drill sites in the project area (Figure 2-1). Temporary roads would be used to access 11 drill sites (with 13-18 drill holes). Drilling would be conducted by one drilling rig on a 24 hour basis utilizing two crews on 12 hour shifts. Drill pads would be constructed by widening the temporary roadways to provide a 20 foot by 20 foot drill pad.

A mud pit with an approximate capacity of 4,000 gallons of drilling fluid and cuttings would be constructed in the road at each drill pad or a portable pit would be used. After drilling at each site is completed, drill cuttings would be excavated from the pit and placed on the road to complete drying. After drilling at each site is completed, the sump would be back-filled, recontoured, seeded and mulched.

Appendix D contains details of the procedures that would be utilized for core drilling on this project.

Silt fences would be placed down slope of drill pads.

Drill holes would be approximately 500 to 800 feet in depth. The principle drilling fluid would be a mixture of a naturally occurring clay (sodium bentonite) and water along with minor amounts of additives. If necessary, other drilling fluids containing, but not limited to, sodium bentonite, polyacrylamide, silica, mineral or vegetable oil, and gypsum products may also be used. Drill core would be boxed and transported daily to Werdenhoff for logging. Additionally, Werdenhoff would serve as a staging area for supplies. Drill core would be stored at Werdenhoff until transported off Forest for assay or permanent storage.

Rock Chip Sampling

Rock chip samples would be collected from three pits excavated to bedrock (Figure 2-1). Constructed pits would occur within roadways with a dimension of approximately 6 feet wide by 15 feet long by 10 feet deep. Excavated material would be temporarily stockpiled on roadways. Rock chip samples would be collected from the pit using a small jackhammer and transported to Werdenhoff. Following sample collection the pit would be backfilled with the stockpiled material.

Ella Mine Opening

The Ella adit would be opened to allow for rock chip sampling and geologic mapping (Figure 2-1). The currently caved adit would be opened using a small excavator or equivalent to remove caved/sloughed material from the portal. This material would be removed until bedrock is reached. If bedrock is not reached within approximately 30 feet, a technique called spiling would be used to advance the excavation through unconsolidated ground. The portal and adit would be timbered to provide safe working conditions. Timbers would be brought from outside the FC-RONR Wilderness. Rock samples would be transported to Werdenhoff.

The disturbed area around the portal (the plaza) would be cleared of larger rock to provide a work area and store excavated material in lifts of appropriate size. A locked gate or door would be installed at the portal to prevent unauthorized entry and screened to exclude bats.

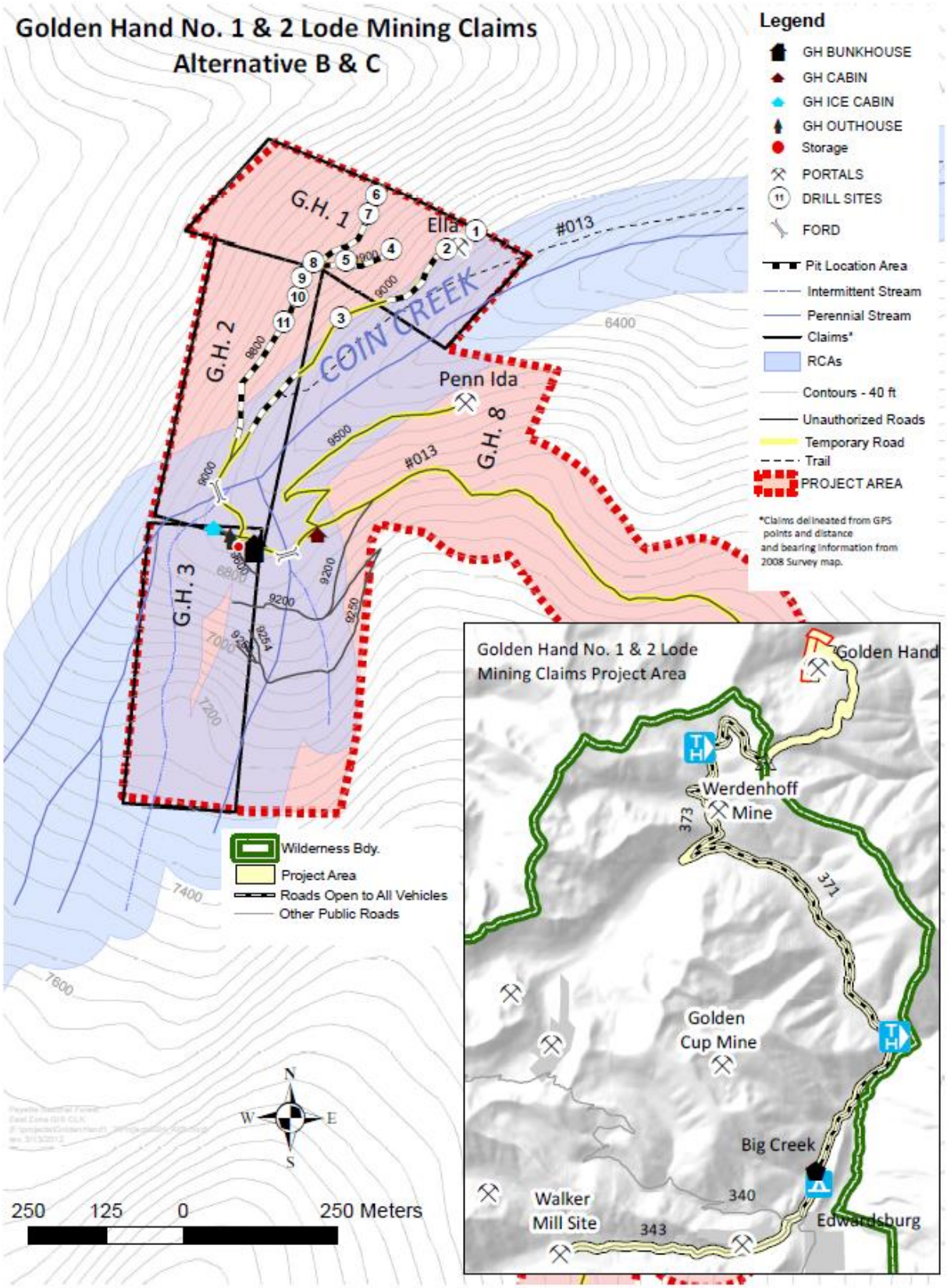


Figure 2-1 Alternative B, Proposed Action, and Alternative C

Vehicles and Equipment
Alternative B proposes to bring supplies, equipment, and personnel from the Werdenhoff staging area to the project area using four-wheel drive vehicles. All-Terrain Vehicles (ATVs/UTVs) could also be used to move personnel around the site. Regular motorized access to the mine site would include the use of two larger 6x6 vintage 1940 era trucks. Drill rigs would consist of skid or track-mounted core or reverse circulation types. A complete list of vehicles and equipment expected to be used during the project is provided in Table 2-4.

Travel to and from the site would be kept to the minimum necessary. It is anticipated that following each shift a pickup/service truck (two vehicles) would make a twice daily round trip from the operations area to the Werdenhoff staging area on average over the season. Additionally while drilling, a daily round trip to transport core samples (consistent with needed chain of custody) would be incurred on average over the season and up to one round trip per day for needed supplies, management, and consultants could occur on average over the season. While confirmation activities take place, approximately 500 gallons of diesel fuel would be brought to the drill site every other day on average over the season in a DOT approved truck mounted tank. The GMC 6x6 would move equipment in and out at the beginning and end of each season and would transports goods such as timbers and other equipment associated with the operation. Drilling and related equipment would be brought in at the beginning of the season, remain on site, and be removed at the end of the season.

Once on site within the wilderness, crews would be authorized to travel back and forth from the work sites to wilderness storage areas (Golden Hand Bunkhouse and Penn-Ida) to obtain necessary equipment to conduct activities using motorized vehicles. These trips would be considered part of a round trip as described above for shift change. These motorized trips to transport needed items from the storage area to work sites would be kept to the minimum necessary and to extent practicable be accomplished as trips described above pass the storage area and proceed to the work areas.

It is reasonable to expect that a vehicle or piece of equipment that was not anticipated may be needed. Those that fall within a 96 inch by 161 inch wheelbase may be approved for use after the Forest Service is notified.

Hazardous Materials
Hazardous substances associated with the project would include, but are not limited to, diesel fuel, gasoline. A Spill Prevention Containment and Countermeasures (SPCC) plan would be prepared in accordance with EPA regulation prior to project implementation. Contract drillers would maintain spill kits on site for use in case of a spill. All mechanical equipment would be inspected to ensure good working condition and determination of no visible leaks. Unless specifically approved by a Forest Service Fishery Biologist, storage of fuel and other toxicants would be located outside of RCAs.

Fuel would be transported from outside of the project area to AIMMCO's operations on Logan Creek. Fuel delivery would typically occur via a commercial vendor in up to 4,000 gallon capacity fuel trucks, but may also arrive in smaller quantities such as 500 gallon tanks or smaller slip on truck bed tanks. While drilling, up to 500 gallons of diesel fuel could be brought to the site no more than every other day in a DOT approved truck mounted tank from AIMMCO's operations on Logan Creek to the Golden Hand Mine. The diesel would be stored in a 1,320 gallon (maximum) double-walled trailer mounted tank. The 1,320 (maximum) gallon tank would be transported empty and placed in lined containment at either the Penn Ida adit or outside of RCAs. Gasoline for vehicles would be transported from Logan Creek to Werdenhoff Mine site, in DOT approved truck mounted tanks (<300 gallons), on an as needed basis, likely to be weekly.

Timbers
Timbers would be transported from outside the Wilderness.

Work Crew Housing and Storage
The work crew would include approximately seven people. Larger crews may be necessary at times; for example, field crews may temporarily increase to nine or ten during drilling crew cycle changes and

management personnel may be added to this number on a temporary and irregular basis. The work crew would be housed at Werdenhoff. Travel trailers, the Werdenhoff bunkhouse, and/or platform tents would be used to house crews and provide needed cooking and sanitation facilities. Trailers or tents would also serve as needed office space at Werdenhoff.

Alternative B proposes to use the existing bunkhouse on Claim 3 for office space. Toilets (self-contained) would be placed on the relatively level, open ground west of the Golden Hand Bunkhouse. AIMMCO would engage in limited restoration of the bunkhouse to facilitate use as a meeting space, including:

- Foundation repair/putting the building on a level basis through the replacement of rotted lower logs with logs obtained from outside the Wilderness.
- Repair of the front porch and the roof support.
- Replacement or repair of broken windows on the backside of the bunkhouse exposed to the hillside.
- While it is unlikely that a new roof would be required, the stove pipes protruding from the roof could be replaced with weathered used pipe.

Minor leveling of about 4000 square feet of the area west of the Golden Hand Bunkhouse may be needed to accommodate the storage of drilling supplies and a service trailer.

If necessary, additional storage needs could be met by using the level work area at the Penn-Ida portal on Claim 8. The area would be cleared of brush after opening an existing, 0.3 mile unauthorized roadbed that would be maintained as a temporary road to facilitate access to the site. Brush would be removed from the existing road bed using a chainsaw, rock/debris in the prism would be cast to the side, and slash from brushing activities would be placed on the fill side of the road cut.

Water

The operation would utilize water from Coin Creek near the bunkhouse location for drilling operations. Water would be directed from the creek to the point of use via a plastic pipe. Water delivered by pump or gravity from Coin Creek would be contained in multiple (approximately two) 5,000 gallon capacity tanks, located on the temporary road, and then conveyed to drill sites through PVC pipes by pump or gravity. Overall, it is expected that the proposed drilling activities would use between 4,000 and 8,000 gallons of water per day. Regardless of the expected daily use for actual drilling, water diversion would not exceed 25,000 gallons of water per day for drilling and recharging storage tanks.

Timing and Duration

The general field season for the activity is during the summer and fall months, but typically only lasts for four months out of the year. The project is projected to be completed within 3 field seasons, unless unanticipated delays occur.

Reclamation and Bonding

Alternative B proposes a number of reclamation activities at the end of various operations. All drill holes would be abandoned to state standards. The following would apply:

- All holes would be plugged with low-permeability bentonite-based grout
- The top three feet of the hole would be cemented, unless artesian flow is encountered. In which case, the holes would be cemented from the bottom to the top.

Additionally, trenches (including sump pits) would back filled and drill pad locations would be recontoured to the original cross-section.

Under Forest Service Mining Regulations at 36 CFR 228 Subpart A, reclamation bonds that are required must be posted with the Forest Service prior to final approval of the plan of operation.

Project Design Features incorporated into the project contain other reclamation specifics.

2.4.2.1 Forest Plan Amendments Associated with Alternative B

Alternative B would require one amendment to the Forest Plan. This would be a one time, site specific, non-significant amendment that would not change overall Forest Plan goals, objectives,

DFC, or associated outputs. Alternative B would:

- Amend Forest Plan Standard SCST01 to allow for activities not meting Visual Quality Objectives associated with the Golden Hand No. 1 and No. 2 Lode Mining Claims Project to occur, by appending the following: "For the Golden Hand No. 1 and No. 2 Lode Mining Claims Project allow activities within that portion of the project area, approximately 291 acres within the FC-RONR Wilderness, which would not meet the Visual Quality Objective of Preservation."

2.4.2.2 Design Features Specific to Alternative B

In addition to Forest Plan standards and guidelines designed to mitigate impacts, the following measures would be applicable to Alternative B. These design features have been incorporated to reduce or prevent undesirable effects resulting from proposed management activities.

Wilderness/Recreation
Once mobilization has occurred motorized access into the wilderness would be limited to two trips per day for shift change, one trip for core sample transport, one trip for miscellaneous supplies/overhead, and one trip every other day for fuel delivery. Motorized trips inside the FC-RONR Wilderness for other purposes or in excess of that described would only occur with prior approval from the Forest Service[(1)].

Following excavation and sampling of the Ella Portal, a gate would be installed and securely locked.

Facilities
Repairs conducted to the bunkhouse are not limited to those described in Section 2.4.2 and would entail all items needed to make the structure habitable per applicable standards for the purposes described as directed by the Forest Service at the time of project implementation [(1)].

2.4.3 Alternative C

This alternative was developed to identify any terms and conditions to ensure that activities are conducted in a manner that minimizes adverse environmental impacts to National Forest surface resources. Additionally, this Alternative responds to issues identified during internal and external scoping. This alternative would allow AIMMCO to collect subsurface geologic information in order to prepare for a new mineral examination by the Federal Government. The claims encompass approximately 20 acres each and are located near Coin Creek, a tributary of Beaver Creek, which flows into Big Creek, a tributary of the Middle Fork Salmon River. Except for one drill location, which is off claim on an existing roadbed to avoid the surface disturbance associated with construction of a new road, the proposed drilling operations, rock chip sampling, and Ella Mine opening would occur on Golden Hand No. 1 and No. 2 lode mining claims (Figure 2-1). The project area includes the Golden Hand claims, the connecting temporary roads between the claims and Pueblo Summit, the temporary road to the Werdenhoff , and Forest Service Roads 343, 371, and 373 (Figure 1-2).

Because this alternative does not meet Forest Plan standard SCST01 for Visual Quality, a one time, site specific, non-significant amendment to the Forest Plan would be necessary. This is described in section 2.4.3.1.

[1] While not included in AIMMCO's plan of operation, these design features are documented to clarify activities that are considered standard operating procedure during mineral/general project implementation, minimize effects of the activities, and/or are needed mitigation to meet Forest Plan standards and guidelines where possible

The following is a summary of Alternative C:

- Maintain portions of Forest Roads (FR) 371 and 373 between the Big Creek Trailhead and Pueblo Summit and maintain approximately 4.1 miles of temporary road, including 4.0 miles within the FC-RONR Wilderness. Reconstruct one short approach to a crossing of the North Fork of Smith Creek on FR 373.

- Repair a ford on a tributary to Coin Cr. and repair a ford on Coin Cr.

- Authorize up to 571 motorized trips into the FC-RONR Wilderness annually. Motorized trips within the Wilderness claim operating area to transport needed items from the storage area to work sites would be kept to the minimum necessary.

- Construct 11 drill pads from which 13-18 core holes would be drilled.

- Collect rock chip samples from pits excavated to bedrock at several locations in the temporary roads.

- Reopen and timber a caved mine adit (the "Ella") to allow access for underground mapping and sampling. Excavated material would be placed on the existing flat disturbed area in front of the portal location.

- Use a variety of vehicles and equipment including, but not limited to, four-wheel-drive pickup trucks, a 7 cubic yard dump truck, flatbed truck, D-8 (or equivalent) bulldozer, 3-cubic yard loader or small excavator, a track or skid-mounted drill rig, air compressor, small jackhammer, and generators.

- Store fuel at Werdenhoff.

- Establish a temporary camp at Werdenhoff.

- Obtain water from Coin Creek in accordance with the water right, which would not exceed 25,000 gallons per day. The water would be obtained and used in accordance with a temporary water right issued by the Idaho Department of Water Resources.

- Conduct defined reclamation activities at the end of each season.

- Implement design features and/or mitigation to reduce or prevent undesirable effects resulting from proposed management activities.

While covered below in detail in the descriptions the principle differences between Alterative B and Alternative C are: Fuel Storage would occur at Werdenhoff rather than within the FC-RONR Wilderness under Alternative C; the use of Penn Ida for storage would not occur under Alternative C; Alternative C would further restrict the number of daily motor vehicle trips into the FC-RONR Wilderness; and, the bunkhouse would not be used as an office under Alternative C. A detailed description of the activities proposed under Alternative C is provided below.

Access, Road Maintenance, Temporary Roads
Access to the claims would be on Forest Roads (FR) 371 and 373 to the FC-RONR Wilderness boundary at Pueblo Summit, north of Edwardsburg. Maintenance activities would occur on approximately 8.0 miles of system road, from the trailhead at Big Creek to Pueblo Summit. On Forest Roads (FR) 371 and 373, the road maintenance and reconstruction proposed to facilitate project activities and reduce sediment would:

- Construct drivable dips where appropriate along FR 371 and 373.
- Place coarse and well graded aggregate on approximately 500 feet of road surface.
- Construct an insloped ditch on FR 373 for approximately 450 feet.

- Repair a small (approximately 50 linear feet of road) section of road fill on FR 373 by adding additional material. At the same location, widen a section of FR 373 by further cutting into the slope.
- Install a box culvert/steel arch pipe capable of Aquatics Organism Passage (AOP) on FR 373 at the North Fork Smith Creek near Werdenhoff. Improve the road alignment on both sides of the stream to straighten the approaches.
- Armor, by placing coarse gravel, approaches to several North Fork Smith Creek crossings of FR 371.
- Raise the road surface where substantial portions of road with poor drainage exist.

Proposed ongoing maintenance along these roads would include clearing loose rock to the original road width, removing fallen trees, and clearing brush to provide access to vehicles and equipment described in Table 2-4. Any brush and trees cleared for road maintenance would be placed along the side of the road and serve as a slash-filter windrow. Additionally, a 0.1 mile temporary road to provide access to the Werdenhoff would be authorized along an existing unauthorized road. Temporary access would be provided by clearing loose rock to the original road width, removing fallen trees, and clearing brush, if necessary. Table 2-2 displays the mileage of individual segments of road maintenance and reconstruction needed to accomplish proposed activities.

Within the FC-RONR Wilderness, this alternative proposes to authorize 4.0 miles of temporary road to facilitate proposed activities. Temporary road authorization would occur on roughly 1.0 mile of existing unauthorized roads, all of which were built as roads prior to the designation of the FC-RONR Wilderness. While these unauthorized roads are not part of the current National Forest system of roads, they remain in very good condition overall. Approximately 3.0 miles of Forest Service System Trail #13 would be authorized as a temporary road. Forest Service Trail #13 was originally a road accessing the Golden Hand claims and has been maintained as a foot and packstock trail following the designation of the FC-RONR Wilderness. Table 2-2 displays the mileage of individual segments of temporary road authorization needed to accomplish proposed activities. Maintenance activities required on these temporary roads would include the removal of brush from existing roadbeds, the casting of rock debris in the prism to the fill side of the road, the clearing of loose rock slough to the original road width, and the placement of slash from brushing activities on the fill side of the road. Temporary roads accessing several of the drill locations would have drainage improved where water has saturated the road by reestablishing drainage from the road surface and/or reinforcing the road bed with geotextile fabric.

A ford on a tributary to Coin Cr. would require repair to provide access. The repair would consist of filling the hole with large rock, a layer of rock sandwiched in filter fabric, and a layer of finer material with larger rock to armor the channel. Fill rock would be sourced from the talus slope located on the road from the Golden Hand bunkhouse to the Ella Portal or the Penn Ida site.

Additionally, the ford at Coin Creek would be repaired to provide passage. The rock substrate in the creek would require no further armoring. Approaches to the stream would be armored. If needed, coarse rock material would be obtained from the talus slope located on the road from the Golden Hand bunkhouse to the Ella Portal or the Penn Ida site. An intermittent stream channel intersecting the road approximately 50 feet southeast of this ford would have drainage features maintained/installed to allow proper drainage of the channel where it intersects the road.

Table 2-2. Proposed Temporary Roads and Maintenance for the Golden Hand Mine Project under Alternative C.

Route	Activity	Mileage	Within the FC-RONR
013	Authorization of Temporary Road and Maintenance	3.0	Yes
371	Road Maintenance	4.1	
373	Road Maintenance and Reconstruction	3.9	
503731000	Authorization of Temporary Road and Maintenance	0.1	
503739000	Authorization of Temporary Road and Maintenance	0.3	Yes
503739500	Authorization of Temporary Road and Maintenance	0.3	Yes
503739800	Authorization of Temporary Road and Maintenance	0.3	Yes
503739900	Authorization of Temporary Road and Maintenance	0.1	Yes

Confirmation Activity

Core Drilling

Core drilling would occur on eleven drill sites in the project area (Figure 2-1). Temporary roads would be used to access 11 drill sites (with 13-18 drill holes). Drilling would be conducted by one drilling rig on a 24 hour basis utilizing two crews on 12 hour shifts. Drill pads would be constructed by widening the temporary roadways to provide a 20 foot by 20 foot drill pad.

A mud pit with an approximate capacity of 4,000 gallons of drilling fluid and cuttings would be constructed in the road at each drill pad or a portable pit would be used. After drilling at each site is completed, drill cuttings would be excavated from the pit and placed on the road to complete drying. After drilling at each site is completed, the sump would be back-filled, recontoured, seeded and mulched.

Appendix D contains details of the procedures that would be utilized for core drilling on this project.

Silt fences would be placed down slope of drill pads.

Drill holes would be approximately 500 to 800 feet in depth. The principle drilling fluid would be a mixture of a naturally occurring clay (sodium bentonite) and water along with minor amounts of additives. If necessary, other drilling fluids containing, but not limited to, sodium bentonite, polyacrylamide, silica, mineral or vegetable oil, and gypsum products may also be used. Drill core would be boxed and transported daily to Werdenhoff for logging. Additionally, Werdenhoff would serve as a staging area for supplies. Drill core would be stored at Werdenhoff until transported off Forest for assay or permanent storage.

Rock Chip Sampling

Rock chip samples would be collected from three pits excavated to bedrock (Figure 2-1). Constructed pits would occur within roadways with a dimension of approximately 6 feet wide by 15 feet long by 10 feet deep. Excavated material would be temporarily stockpiled on roadways. Rock chip samples would be collected from the pit using a small jackhammer and transported to Werdenhoff. Following sample collection the pit would be backfilled with the stockpiled material.

Ella Mine Opening

The Ella adit would be opened to allow for rock chip sampling and geologic mapping (Figure 2-1). The currently caved adit would be opened using a small excavator or equivalent to remove caved/sloughed material from the portal. This material would be removed until bedrock is reached. If bedrock is not reached within approximately 30 feet, a technique called spiling would be used to advance the excavation through unconsolidated ground. The portal and adit would be timbered to provide safe working conditions. Timbers would be brought from outside the FC-RONR Wilderness. Rock samples would be transported to Werdenhoff.

The disturbed area around the portal (the plaza) would be cleared of larger rock to provide a work area and store excavated material in lifts of appropriate size. A locked gate or door would be installed at the portal to prevent unauthorized entry and screened to exclude bats.

Vehicles and Equipment

Alternative C proposes to bring supplies, equipment, and personnel from the Werdenhoff staging area to the project area using four-wheel drive vehicles. All-Terrain Vehicles (ATVs/UTVs) could also be used to move personnel around the site. Regular motorized access to the mine site would include the use of two larger 6x6 vintage 1940 era trucks. Drill rigs would consist of skid or track-mounted core or reverse circulation types. A complete list of vehicles and equipment expected to be used during the course of the project is provided in Table 2-4.

Travel to and from the site would be kept to the minimum necessary. It is anticipated that following each shift a pickup/service truck (two vehicles) would make a twice daily round trip from the operations area to the Werdenhoff staging area on average over the season. Additionally, a miscellaneous trip to transport needed drill core (consistent with needed chain of custody), consultants, management, and supplies would be authorized every other day on average over the season. The GMC 6x6 would move equipment in and out at the beginning and end of each season and would transports goods such as timbers and other equipment associated with the operation. Drilling and related equipment would be brought in at the beginning of the season, remain on site, and be removed at the end of the season.

Once on site within the wilderness, crews would be authorized to travel back and forth from the work sites to the wilderness storage area (Golden Hand Bunkhouse) to obtain necessary equipment to conduct activities using motorized vehicles. These trips would be considered part of a round trip as described above for shift change. These motorized trips to transport needed items from the storage area to work sites would be kept to the minimum necessary and to extent practicable be accomplished as trips described above pass the storage area and proceed to the work areas.

It is reasonable to expect that a vehicle or piece of equipment that was not anticipated may be needed. Those that fall within a 96 inch by 161 inch wheelbase would be approved for use after the Forest Service is notified.

Hazardous Materials
Hazardous substances associated with the project would include, but are not limited to, diesel fuel and gasoline. In compliance with all state and federal hazardous substance regulations, any hazardous substance spills would be cleaned immediately and resulting waste would be transferred off-site in accordance with all applicable local, state, and federal regulations. The Forest Service and State of Idaho would be notified of reportable spills immediately. A Spill Prevention Containment and Countermeasures (SPCC) plan would be prepared in accordance with EPA regulation prior to project implementation. Contract drillers would maintain spill kits on site for use in case of a spill. All mechanical equipment would be inspected to ensure good working condition and determination of no visible leaks. Unless specifically approved by a Forest Service Fishery Biologist, storage of fuel and other toxicants would be located outside of RCAs.

Fuel would be transported from outside of the project area to AIMMCO's operations on Logan Creek. Fuel delivery would typically occur via a commercial vendor in up to 4,000 gallon capacity fuel trucks, but may also arrive in smaller quantities such as 500 gallon tanks or smaller slip on truck bed tanks. Up to 500 gallons of diesel fuel could be brought to the Werdenhoff staging area no more than every other day in a DOT approved truck mounted tank. The diesel would be stored in a 1,320 gallon (maximum) double-walled trailer mounted tank and transferred as needed for each shift. The 1,320 gallon (maximum) tank would be transported empty and placed in lined containment at Werdenhoff. Gasoline for vehicles would be transported from Logan Creek to Werdenhoff Mine site, in DOT approved truck mounted tanks (<300 gallons), on an as needed basis, likely to be weekly.

Timbers
Timbers would be transported from outside the Wilderness.

Work Crew Housing and Storage
The work crew would include approximately seven people. Larger crews may be necessary at times; for example, field crews may temporarily increase to nine or ten during drilling crew cycle changes and management personnel may be added to this number on a temporary and irregular basis. The work crew would be housed at Werdenhoff. Travel trailers, the Werdenhoff bunkhouse, and/or platform tents would be used to house crews and provide needed cooking and sanitation facilities. Trailers or tents would also serve as needed office space at Werdenhoff.

Toilets (self-contained) would be placed on the relatively level, open ground west of the Golden Hand Bunkhouse. Minor leveling of about 4000 square feet of the area west of the bunkhouse may be needed to accommodate the storage of drilling supplies and a service trailer.

Water
The operation would utilize water from Coin Creek near the bunkhouse location for drilling operations. Water would be directed from the creek to the point of use via a plastic pipe. Water delivered by pump or gravity from Coin Creek would be contained in multiple (approximately two) 5,000 gallon capacity tanks, located on the temporary road, and then conveyed to drill sites through PVC pipes by pump or gravity. Overall, it is expected that the proposed drilling activities would use between 4,000 and 8,000 gallons of water per day. Regardless of the expected daily use for actual drilling, water diversion would not exceed 25,000 gallons of water per day for drilling and recharging storage tanks.

Timing and Duration
The general field season for the activity is during the summer and fall months, but typically only lasts for four months out of the year. The project is projected to be completed within 3 field seasons, unless unanticipated delays occur.

Reclamation and Bonding
Alternative C proposes a number of reclamation activities at the end of various operations. All drill holes would be abandoned to state standards. The following would apply:

- All holes would be plugged with low-permeability bentonite-based grout
- The top 3 feet of the hole would be cemented, unless artesian flow is encountered. In which case, the holes would be cemented from the bottom to the top.

Additionally, trenches (including sump pits) would back filled and drill pad locations would be recontoured to the original cross-section.

Under Forest Service Mining Regulations at 36 CFR 228 Subpart A, reclamation bonds that are required must be posted with the Forest Service prior to final approval of the plan of operation.

Project Design Features incorporated into the project contain other reclamation specifics.

2.4.3.1 Forest Plan Amendments Associated with Alternative C

Alternative C would require one amendment to the Forest Plan. This would be a one time, site specific, non-significant amendment that would not change overall Forest Plan goals, objectives, Desired Future Conditions, or associated outputs. Alternative C would:

- Amend Forest Plan Standard SCST01 to allow for activities not meting Visual Quality Objectives associated with the Golden Hand No. 1 and No. 2 Lode Mining Claims Project to occur, by appending the following: "For the Golden Hand No. 1 and No. 2 Lode Mining Claims Project allow activities within that portion of the project area, approximately 291 acres within the FC-RONR Wilderness, which would not meet the Visual Quality Objective of Preservation."

2.4.3.2 Design Features Specific to Alternative C

In addition to Forest Plan standards and guidelines designed to mitigate impacts, the following measures would be applicable to Alternative C. These design features have been incorporated to reduce or prevent undesirable effects resulting from proposed management activities.

Wilderness/Recreation
Once mobilization has occurred motorized access into the wilderness would be limited to two trips per day for shift change. Additionally, a miscellaneous trip to transport needed drill core (consistent with needed chain of custody), consultants, management, and supplies would be authorized every other day on average over the season. Motorized trips inside the FC-RONR Wilderness for other purposes or in excess of that described would only occur with prior approval from the Forest Service [(1)].

Following excavation and sampling of the Ella Portal, the first sets of timbers would be removed and the portal backfilled[(1)].

2.4.4 Design Features Common to All Alternatives

In addition to Forest Plan standards and guidelines designed to mitigate impacts, the following measures would be applicable to all action alternatives. These design features would be incorporated to reduce or prevent undesirable effects resulting from proposed management activities.

Wilderness/Recreation
Operators would remove trash generated from project activities. All trash would be removed from National Forest System lands.

All equipment usage, including UTV/ATV, within the FC-RONR Wilderness would be kept to a practicable minimum to accomplish project activities and would only be used to accomplish actions described specifically under either action alternative. Where feasible, non-mechanized means of travel would be utilized to obtain supplies or perform other functions, e.g. obtaining small items from supplies at the Golden Hand Bunkhouse supply area needed to support drill operations [(1)].

Informational signs would be posted to inform users of the project activities. Signs would be posted at Pueblo Summit, north and east of the project area on Forest Trail #013, and in the Big Creek area at location(s) deemed appropriate by the Forest Service [(1)].

The gate at Pueblo Summit would remain closed and locked immediately after use [(1)].

Mobilization inside the wilderness would begin no more than 15 days prior to the commencement of actual operations each operating season. Project activities would not commence until all mobilization is completed and approved. Demobilization from the wilderness would be completed no more than 10 days following completion of each operating season. To the extent practicable, mobilization of equipment would be convoyed within the FC-RONR Wilderness[(1)].

Gray water would be disposed of in accordance with the Frank Church plan, and outside of the RCA [(1)].

To the extent practicable, all equipment used within the FC-RONR Wilderness would be fitted with devices that provide maximum noise dampening. Noise dampening devices would be maintained for utmost effectiveness[(1)].

Unless approved by the Forest Service, the clearing of brush and trees would be limited to hand powered tools within the FC-RONR Wilderness [(1)].

Ensure that disruptions to public access and use of Forest Trail #013 would be avoided or minimized[(1)].

Ensure the borrow source for road maintenance on the talus slope located on the road from the Golden Hand bunkhouse to the Ella Portal is out of view of Forest Trail #013 [(1)].

Any drainage structures constructed as part maintenance on Forest Trail #013 would use native non-treated materials [(1)].

Firewood, if needed, would be cut outside the FC-RONR Wilderness and hauled in. Only a small amount of firewood should remain at the end of each operating season. Firewood would not be cut and stored in anticipation of next season's activity. Firewood gathering would be consistent with current permit requirements for personal use gathering on the Payette National Forest[(1)].

Cameras or road counters would be installed at or near Pueblo Summit and at appropriate locations near confirmation activities to record trips [(1)].

The clearing or constructing of new trails would not be permitted[(1)].

Air Quality
Operations would comply with federal and state air quality standards.

To the extent practicable, dust from use of roads would be minimized by minimizing vehicular traffic and using prudent vehicle speeds.

When drilling or trenching activities create fugitive dust at levels impacting overall visibility in the FC-RONR Wilderness, water to abate dust would be applied at appropriate intervals [(1)].

To the extent practicable, all equipment used within the FC-RONR Wilderness would be fitted with appropriate devices for that type of equipment to reduce emissions, i.e. catalytic converter or other suitable devices. Emission reducing devices would be maintained for utmost effectiveness [(1)].

Watershed/Fisheries (Transportation)
Upon completion of activities, ford approaches on temporary roads within the FC-RONR Wilderness would be rehabilitated and decommissioned. Approximately 200 to 300 feet either side of the fords would be rehabilitated and decommissioned by reducing the contributing area for sediment by converting the road to a trail. Rehabilitation would include some or all of the following activities[(1)]:

- Create a single track trail by scarifying/ripping the road to a depth of up to 18 inches until a single tread remains.
- Retain fords for foot and stock travel.
- Following scarifying/ripping, some or all of the subsequent activities would take place on the disturbed area:
  - Distribute slash and large wood material, where available, in an effort to cover at least 30 percent of the exposed surface.
  - Place plugs, using a backhoe, of adjacent native vegetation randomly throughout the disturbed area.
  - Mulch the surface using a noxious weed free straw or other suitable material.
  - Fertilize the scarified surface with BioSol or similar fertilizer.
  - Seed with native seed mixture appropriate for the elevation and habitat.

Where practicable, roads would not be widened beyond the original cleared width[(1)].

At the reconstructed ford crossing of the North Fork of Smith Creek an equivalent area of RCA would be rehabilitated at the abandoned crossing. Rehabilitation would include re-establishing drainage patterns of the seeps with emphasis on reducing sediment delivery, decompaction of old ford approaches and planting riparian vegetation such as alder or willow where appropriate [(1)].

Construction material needed for road maintenance may be taken from a borrow source at the talus slope located on the road from the Golden Hand bunkhouse to the Ella Portal, Werdenhoff, or Penn Ida. Sources within the FC-RONR Wilderness would only be utilized for road maintenance within the wilderness. A metals leachability test (Synthetic Precipitation Leaching Procedure or equivalent) would be completed prior to use of waste rock as aggregate. If used, the Werdenhoff gravel source used for this project would be reclaimed at the end of the project by recontouring the site, mulching, and seeding with native seed[(1)].

Transport of equipment, supplies, or personnel would not use the South Fork Salmon Road, Lick Creek Road, or Elk Creek Road. All transport of equipment and supplies would use the Johnson Creek Route [(1)].

The road to Penn-Ida (FR 503739500) would not be bladed.

Alder thickets cleared during road maintenance activities would be cut rather than uprooted[(1)].

Motorized travel on roads would be restricted when roads are saturated with water and rutting could occur [(1)].

All road maintenance would require Forest Service approval[(1)].

The following would apply to maintenance activities occurring along Forest Roads #371 and #373:

Berms would not be left along the outside edge of roads.

Grading and shaping would be done in a manner to conserve surface material. Grading would be accomplished in a manner that maintains or improves the surface drainage[(1)].

Ditches and culverts would be inspected on a regular basis and cleaned when needed. Cleaning would be conducted in a manner that removes the debris, while minimizing sediment production. With the exception of one site on Forest Road #373,the cut slope and ditch back slope would not be undercut. Debris obstructing any drainage system would be removed promptly[(1)].

When blading roads, avoid side-casting excess fine material on to the fill slope. Excessive fine material that cannot be bladed into the surface would be hauled to an approved storage or disposal site[(1)].

Coarse rocks (approx. Cobble size or greater) could be cleared (usually bladed) from the road except within 300 feet of perennial stream and 100 feet of an intermittent stream[(1)].

Road maintenance activities would be avoided during times in which listed fish eggs or alevins are in gravels near enough to be affected. Unless agreed otherwise, a Forest Service Fish Biologist would determine those times and areas where maintenance would be avoided [(1)].

Road maintenance would not occur when surface material is saturated with water[(1)].

Road clearing of encroaching vegetation would not be in excess of that needed to provide access or adequate site distance[(1)].

Large woody debris located in RCAs requiring removal for road maintenance would be placed on the down slope side of roads[(1)].

Existing drain gullies on the road sites would be repaired to direct runoff away from streams[(1)].

Water drafting locations would require prior approval from a journey level fisheries biologist. Intake would be screened with a mesh size of 3/32 inch or smaller[(1)].

Watershed/Fisheries (Fuel Haul and Storage/Contaminants)

Unless specifically approved by a Forest Service Fishery Biologist, locate fuel and other toxicant storage outside of RCAs[(1)].

Pumps and fuel containers would be placed in spill containment.

The maximum shipment of fuel on Forest Roads #371 and #373 would be 500 gallons. Fuel shipments into the project area would use Johnson Creek Road[(1)].

Crews would maintain spill kits on site for use in case of a spill[(1)].

Appropriate spill containment would be provided for all stored toxicants. The operator would adhere to the guidelines pertaining to transport, storage, handling, and disposal of hazardous materials and spill response cited in the Best Management Practices for Mining in Idaho. A Spill Prevention Containment and Countermeasures (SPCC) plan would be prepared in accordance with

EPA regulation prior to project implementation. If prepared, a copy would be made available to the Forest Service [(1)].

Unless specifically approved by a Forest Service Fishery Biologist, the fuel tank would be placed in a liner capable of containing 120 percent of the tanks volume[(1)].

The fuel plan would be followed for all activities associated with fuel delivery [(1)].

Road clearing and maintenance activities on County Roads would be coordinated with Valley County as necessary [(1)].

Fuel haul would not occur during spring break up and would not commence until the annual weight restrictions for road protection during the break up period are lifted by Valley County [(1)].

The Forest Service project administrator and Valley County sheriff dispatch would be notified a minimum of 48 hours in advance of the fuel delivery [(1)].

Adequate support personnel would be scheduled, including -trained spill responders [(1)].

The day of the fuel haul trip [(1)]:

- Prior to the trip leaving Cascade, a health and safety meeting would be conducted with the trip staff. Topics to be discussed at a minimum include:
    i. Anticipated road conditions and weather forecast.
    ii. Roles and responsibilities of all participants.
    iii. Communication plan protocols (including truck to truck radios, satellite phones, site communication when the trip reaches Yellow Pine and notification protocol in event of accident or fuel release).
    iv. Emergency response procedures and available equipment. Goals of on-site first responders, safety issues, and protocols.
    v. Emergency numbers and call order.
    vi. SPOT™ GPS Messenger operation (provides satellite tracking of trip location and has emergency notification capabilities).
    vii. Discussion of proper pace (speed), driver fatigue, scheduled, and unscheduled stops.
- Setup and confirmation of caches for spill response equipment would occur along portions of Johnson Creek Road, the Stibnite Road, and Profile Gap Road.
- Road signs would be established at the Landmark and the Yellow Pine ends of Johnson Creek Road and at the Stibnite Road and Logan Creek Road ends of the Profile Gap Road indicating to the public that a fuel trip is in progress and to use caution.

During the fuel haul trip [(1)]:

- A safe speed of travel would be maintained. Speed would be determined by the trip leader, would not exceed posted speed limits and would be based on road conditions.
- Communication with management would occur by using the SPOT™GPS Messenger – signal check-in/OK at least hourly, and signal arrival (custom message) upon reaching the site camp, and upon safely returning to Cascade. The Forest Service project administrator would be notified upon safe return to Cascade.
- A SPOT™GPS Messenger button would be used in an emergency to alert emergency responders.
- Site security would clear all oncoming traffic before proceeding up or down Stibnite Road between the Yellow Pine guard station and Profile Gap Road. Trip progress would be radioed to security according to established protocols.

A scheduled fuel delivery would be delayed if driving visibility is poor [(1)].

Fuel haul would travel during daylight hours [(1)].

The fuel haul pilot truck would be responsible for communicating to the fuel trucks locations of road hazards and if necessary placing flagging around the hazards. All trip vehicles would be equipped with radio communication [(1)].

The fuel haul trip lead would be responsible for knowing road conditions prior to travel, including areas of road hazards such as soft shoulders and wash out areas [(1)].

Fuel haul trips would not occur if there are flooding conditions on roads or the imminent threat of a flood [(1)].

Overall emphasis on timing of convoy trips would be during snow-free conditions in an effort to limited trips during snow/ice conditions. Weather forecast would be evaluated and incorporated into travel "go/no go" decisions [(1)].

Tire chains would be required for snow or ice road conditions during fuel haul. The need for chains would be determined by the trip lead. All trucks would be equipped with properly sized chains for both steering and drive tires [(1)].

Documented annual inspections of commercial transport vehicles are required in 49 CFR 396.17-23. Inspections would be conducted by a qualified DOT inspector. Commercial transport vehicles would also be inspected at Landmark by the driver prior to accessing Johnson Creek. Transport companies are required to document DOT annual inspections and Landmark vehicle inspections [(1)].

Drivers would be experienced in fuel truck hauling on NFS roads [(1)].

The fuel haul pilot truck would warn oncoming traffic of the trip and request that oncoming traffic pull aside (or wait) for the trucks. The truck would be made aware of any oncoming traffic through radio communication with the pilot truck. Radio communication would be maintained between trucks and pilot vehicle [(1)].

Drivers would be experienced in fuel truck hauling on NFS roads and would be familiar with the travel routes including locations of steep slopes that require downshifting (for vehicles with manual transmissions). Radio communication would be used to warn drivers of upcoming steep grades and also of any oncoming traffic that may require trucks to slow down or stop [(1)].

Drivers engaged in fuel haul would be DOT-licensed and adhere to driver log and driving time restrictions as set by DOT [(1)].

The fuel haul trip lead would be responsible for assessing driver physical condition. Rest stops would occur during the trip and the frequency of stops would be determined by the trip lead as well as request by drivers [(1)].

Trucks would maintain safe distances between trucks based on speed, road conditions, and stopping distances. Fuel haul trip leader would be responsible for ensuring safe separation between trucks. Separation distance requirements would be discussed in driver training and during the pre-trip meeting [(1)].

Watershed/Fisheries (Water Withdrawal)

Water would be conducted from a stream or tanks to the drill pads by means of a flexible plastic pipe laid slightly inclined to the land contour to avoid excess head pressure at discharge end. At the water diversion intake, no excavation or stream channel modifications other than hand placement of rocks would be permitted. A shut-off valve would be installed at the pipe discharge[(1)].

The Forest Service would approve the use of a waterline to be placed in Coin Creek[(1)].

The rate of diversion must be measured with a flow meter approved by the Forest Service. Daily in stream flow monitoring would be performed throughout the period of operation. Flow in Coin Creek

would be measured on a daily basis below the point of diversion and upstream of the tributary that joins Coin Creek downstream of FSST 013. AIMMCO would report measured withdrawal rates and daily flow monitoring to the Forest Service. The water diversion rate would be reduced if the flow at the point of measurement dropped below 0.4 cfs in order to maintain a removal of less than 10 percent of the flow[(1)].

If water use at the pad is not anticipated for more than twelve hours, the intake end of the line would be removed from the stream after each use period[(1)].

Water for activities at the Werdenhoff site would be brought in from off site.

Watershed/Fisheries/Soils (Operations)
Road surface drainage improvements, and repair of fords on Coin Creek including drainage improvements would occur prior to mobilization of equipment to drilling areas [(1)].

All drill pads and trenches would utilize silt fence with metal posts and wire mesh backing below the disturbed area[(1)].

Any excavated material would be placed on the road bed or sidecast. If sidecast onto the slope below the constructed drilling pad/trench the material would be placed close enough to the pad edge that it could all be retrieved for placement back into the cutslope during reclamation [(1)].

If a pit is to be used for drilling fluid disposal (unlined), it would be located in a part of the pad which was not constructed from fill material (e.g. in the old roadbed) [(1)].

No additives for drilling fluids, outside of those identified in the plan of operations, would be used without prior approval[(1)].

Settling basins at drill pads would be excavated at lowest point of pad, downslope of all potential discharge sources, and would be of a size that is sufficient to contain 120% of the maximum volume expected to be used[(1)].

All mechanical equipment would be inspected by PNF to ensure good working condition and determination of no visible leaks[(1)].

Oil absorbent pads would be on site and placed, prior to any activities, under the drilling platform and any possible sources of fuel, oil, or hydraulic fluid leakage. Soiled pads would be disposed of per applicable Federal and/or State requirements[(1)].

Reclamation of the project area would include recontouring to the original slope shape where this project has altered slopes and revegetation of the disturbed ground. Roads would not be fully recontoured, but would be returned to the original width at drill pad locations. All disturbed areas would be seeded with a certified weed-free native seed mix and mulched [(1)].

A Forest Service Minerals Administrator would be on site during the opening of the Ella adit [(1)].

Prior to excavating the collapsed material, a small sediment trap would be excavated on the plaza in front of the Ella adit at a location approved by Forest Service personnel [(1)].

If water seepage is encountered on the working face during excavation the following actions would be taken [(1)] :

- Work would be immediately suspended and a Forest Service representative would be called on site.
- A wellpoint with a shutoff valve (or similar device) would then be driven into the remaining material to act as a probe for stored water.

- If it is determined that a substantial volume of water is likely to be present behind the collapsed material, a sample would be taken for chemical analysis.
- If the water quality meets State groundwater standards, excavation would proceed to release the water in a controlled manner to the sediment trap to infiltrate.
- There would be no discharge to surface water.
- After the adit is opened, any water that is deemed necessary to be pumped out for disposal would have to meet groundwater standards.
- If any water to be discharged does not meet groundwater standards, operations would be suspended until an appropriate disposal method was approved by the Forest Service.

Watershed/Fisheries (General Erosion Control Measures)
All ground disturbance would require erosion control measures as determined by the Forest Service (e.g., soil movement barriers, water control devices, mulch or erosion control matting, revegetation plants and grass seed) [(1)].

Mulch and native grass seed would be used on all disturbed areas, unless specified otherwise[(1)].

Generic avoidance/minimization measures that can be used include: silt fence and filter barriers; straw-bale sediment barriers; erosion control blankets and mats; hydro-mulching; mulching; waterbars and rolling dips; temporary sediment basins; straw rolls; straw bale dikes; slash filter windrows; scattered slash; brush layering; and shrub planting. If using silt fence, fence should be considered only a temporary sediment control measure; restored vegetation would be the preferred final erosion control. Silt fences would be maintained by removing stored sediment, and fence would be removed as soon as vegetative erosion control measures have effectively reduced sediment production[(1)].

Watershed/Fisheries (Arched/Box Culvert)
Sediment entering streams would be minimized by: using silt-fence, or straw bales between structures and stream.

Stream fording would be minimized during installation as much as is practicable[(1)].

Structures and any needed abutments would be installed well outside of active stream channel. A Forest Service fisheries biologist or hydrologist would determine the extent of active stream channel[(1)].

Fisheries (Biological Opinion Terms and Conditions)
At least a three pass method is employed when electroshocking to ensure the greatest level of fish salvage, unless previously approved by the appropriate Level 1 Team to perform fewer passes [(1)].

Work is halted if turbidity levels exceed 50 NTU above background for more than 1 hour at a location 600 feet downstream of the project area (i.e., culvert installation site). Halting work would allow time for the turbidity plume to dissipate [(1)].

Vehicles and heavy equipment fording the lower portion of NF Smith Creek at the beginning and end of each operating season do so as closely (timing) as practicable (i.e., groups) in order to minimize the number of fish that could move into or immediately below the ford area between crossings and thus potentially be crushed or harassed [(1)].

All erosion control and water management is in place before the end of the operating season to minimize sediment delivery to streams [(1)].

If revegetation efforts on disturbed areas are not successful the first year, continue to apply mulch and see in subsequent years until natural vegetation is established [(1)].

The water line used to convey water from Coin Creek to storage tanks is in good working condition and free of leaks [(1)].

Inspection of road improvements and stream crossing improvements are inspected annually during the life of the project. If sediment delivery is occurring, then maintenance would be performed to minimize the delivery of sediment to streams [(1)].

All captured, handled, injured, and killed ESA-listed fish shall be identified, counted, and recorded [(1)].

Turbidity monitoring shall be conducted to assess the intensity and duration of the turbidity plume to ensure the extent of take is not exceeded. Turbidity monitoring shall occur during cofferdam installation and removal activities. Turbidity readings shall be collected at the following locations: (1) Upstream of the project area; and (2) 600 feet downstream of the project area. Turbidity at the downstream sample location shall be recorded every 30 minutes until the plume has dissipated. Project activities would adjusted to ensure that turbidity levels do not, at any time, reach a level of 50 NTUs for a duration of one hour [(1)].

Turbidity monitoring shall be conducted to assess the extent and duration of turbidity plumes associated with fording of the lower NF Smith Creek during mobilization and demobilization of heavy equipment the first operating season. This monitoring shall occur once in NF Smith Creek, approximately 300 feet downstream of the ford. Monitoring shall be performed immediately following fording (i.e., when the plume reaches the monitoring location), and occur every 5 minutes until the plume dissipates. Background turbidity shall be collected prior to fording, and may be collected at the downstream monitoring location. The type and number of vehicles/heavy equipment fording the stream shall also be recorded [(1)].

A post-project report summarizing the results of the monitoring above shall be submitted to NMFS by December 31 of the year in which activities were implemented. The post-project report shall also include a statement that all the terms and conditions of this Opinion were successfully implemented [(1)].

If a steelhead or salmon becomes sick, injured, or killed as a result of project-related activities, and if the fish would not benefit from rescue, the finder should leave the fish alone, make note of any circumstances likely causing the death or injury, location and number of fish involved, and take photographs, if possible. If the fish in question appears capable of recovering if rescued, photograph the fish (if possible), transport the fish to a suitable location, and record the information described above. Adult fish should generally not be disturbed unless circumstances arise where an adult fish is obviously injured or killed by proposed activities, or some unnatural cause. The finder must contact the Boise Field Office of NMFS Law Enforcement at (208) 321-2956 as soon as possible. The finder may be asked to carry out instructions provided by Law Enforcement to collect specimens or take other measures to ensure that evidence intrinsic to the specimen is preserved [(1)].

The project would only conduct work in the flowing channel during daylight hours to minimize disturbance to migrating bull trout [(1)].

Inspection of road improvements and stream crossing improvements shall occur annually during the life of the project. If sediment delivery is occurring, then maintenance would be performed to minimize the delivery of sediment to streams prior to commencement of that seasons work [(1)].

The North Fork Smith Creek AOP site would not be crossed once the ford becomes unusable and before the open-bottom culvert or bridge is safe to cross [(1)].

Noxious Weeds
Equipment used for drilling, road construction, reclamation, and similar activities would be thoroughly cleaned prior to entering National Forest System lands.

Source sites for gravel and borrow materials would be inspected prior to use for noxious weeds[(1)].

Wildlife
To the extent practicable, trees found to contain nesting cavities or nests would not be disturbed or cut. No trees with active nests would be cut. [(1)].

Any gate or door installed at the Ella would have screening suitable to exclude entry and colonization by bats [(1).]

Equipment and drill rigs will have limited external lighting and will employ noise-minimizing practices (e.g. mufflers). [(1)].

The Forest Service wildlife biologist will be notified of any occupied sensitive species nests or dens encountered during implementation that may be associated with listed or sensitive species. If necessary to maintain key features of nesting/denning habitat or to avoid disruption of nesting/denning activities, prescribed activities will be modified [(1)].

Restrict activities within a 650 foot radius of an active goshawk nest tree to avoid disturbance and retain vegetative structure around the nest site. In addition, no drill pad construction, drilling operations, or roadwork activities would occur within a 1,500-foot buffer (Jones 1979) around active goshawk nest tree(s) from April 1 to August 15 to avoid disrupting nesting activities. Exact distance for which restrictions apply would be determined by a Wildlife Biologist based upon topography and vegetative screening on a site-specific basis. Timing restrictions would only be required for active nest sites. Timing restrictions would not restrict planned road use patterns, public access or fuel hauling. Because goshawks commonly move to alternate nest sites within a territory, the nest site location would be re-identified annually [(1)].

Personnel and contractors traveling in vehicles will be encouraged to observe posted speed limits or state secondary road speed limits and to drive at speeds appropriate to reduce the possibility of vehicle-wildlife accidents[(1)].

Mud sumps used for drilling operations will contain perimeter fencing to keep wildlife from accidently falling into the excavation [(1)].

Any adverse wildlife encounters will be reported to appropriate state and federal wildlife managers [(1)].

Sightings of listed or sensitive wildlife species will be reported to the Forest Service [(1)].

Cultural
The project covers the use of existing structures on National Forest for a variety of activities associated with the project, but does not authorize rehabilitation. Any alterations to structures on National Forest administered lands would require additional consultation with Idaho SHPO to ensure compliance with the National Historic Preservation Act and implementing regulations (36CFR800 as amended).

If previously undiscovered cultural resources (historic or prehistoric objects, artifacts, or sites) are exposed on NFS land as a result of project operations, those operations would not proceed until notification is received from the Forest Service that the proponent has complied with provisions for mitigating unforeseen impacts as required by 36 CFR 228.4(e) and 36 CFR 800.

Visuals
To the extent practicable, within the FC-RONR Wilderness temporary facilities such as storage units or tents would be colored to blend with the characteristic landscape (natural or neutral color) [(1)].

During night operations, lighting fixtures would be pointed downward to the extent practicable to reduce light impacts within the FC-RONR Wilderness[1].

All stumps from the cutting of trees for timbers would be within six inches of the ground on the high side [1].

Slash associated with the cutting of trees for timbers would be lopped and scattered to within one foot of the ground [1].

Along that portion of Forest Road #50371 having a VQO of retention, 70 percent or more of the merchantable trees would be retained in areas where trees for timbers are cut [1].

Botanical

Seed with native seed mixtures appropriate for the elevation and habitat[1].

Where practicable, avoid removal or heavy trimming whenever possible of whitebark pine [1].

Fire
All applicable federal and state fire laws and regulations would be adhered to during operations.

Reasonable measures to prevent and suppress fires in the project area would be taken by employees, contractors, and sub-contractors.

All vehicles and equipment would have spark arrestors and fire suppression tools and supplies.

The base camp would have a fire tools cache on site.

Smoking and the building of fires by persons engaged in project operations would be prohibited, except at established camps. At the request of the operator the Forest Service would designate places where (1) campfires may be built or (2) smoking may be permitted. Such designated places would be cleared of flammable material to mineral soil prior to use[1].

Sufficient fire tools of a kind and type satisfactory for fire suppression would be made available to equip persons engaged in project operations. Fire tools would be used only for suppressing fires. Tools would be stored in fireboxes and be readily available to employees. Each toolbox would be marked "Tools for Fire Only," painted red and kept sealed[1].

Each piece of equipment, truck, or other form of vehicle used in conjunction with activities would be equipped with one size 0, or larger, round-pointed shovel. Shovels would be so placed on the machines that they could be readily obtained at all times[1].

Each gasoline or diesel internal combustion engine, except powersaws, would be equipped with a spark-arresting device which has been approved by Forest Service. After installation, spark-arresting devices would be kept in a satisfactory working condition[1].

Each gasoline powersaw would have a spark arrester muffler affixed and in good working condition. Said spark arrester-muffler would be of the construction and maintained to the standards approved by Forest Service. In addition, one chemical pressurized fire extinguisher of not less than 8-ounce capacity, by weight, and one size 0, or larger, round-pointed shovel would also be provided to the powersaw operators when in use. The spark arrester-muffler, extinguisher, and shovel would be maintained in good working condition at all times. The shovel and extinguisher would be readily available[1].

If gasoline, oil, grease, or other highly flammable materials are stored in a building, all flammable debris would be cleared away within a radius of 25 feet[1].

A suitable shovel, and dry sand in a covered container of not less than 25-gallon capacity in the aggregate (or a fire extinguisher of not less than 2-quart capacity of a type approved by the Underwriter Laboratory for gasoline and oil fires), would be placed at each gasoline, diesel, and oil shed or storage site, or other motor-fueling station. Mobile servicing units would be equipped with a fire extinguisher of not less than 2-quart capacity of a type approved by the Underwriter Laboratory for gasoline and oil fires[(1)].

Stoves, stovepipes, chimneys, and electric wiring would be located and maintained to the safety standards set forth in applicable sections of the Forest Service Health and Safety Code, dated March l970, as revised[(1)].

Minerals
All water associated with drilling would be contained on or near the drill pads.

Where practicable, minimize the number of total mud pits by consolidating drill site use of sumps[(1)].

The Forest Service would identify and mark trees to be cut for timbers. Trees cut for this purpose would be within the project area, outside the FC-RONR Wilderness, standing dead, and outside of Riparian Conservation Areas (RCAs). Any milling or processing of the timbers would occur outside the wilderness[(1)].

Trees cut for timbers would be cabled to existing authorized roads and off-road access would be limited to that needed to align for proper skidding by cable [(1)].

Applicable Best Management Practices for Mining in Idaho would be utilized[(1)].

No additives for drilling fluids, outside of those identified in the plan of operations, would be used without prior approval [(1)].

Drill pads would be leveled and graded to drain surface runoff to a point where the water can be managed [(1)].

Mud sumps would be excavated for recirculation and ultimate disposal of drill cuttings and drilling fluid. Self-contained holding tanks could be substituted for the mud sump [(1)].

Silt fencing, straw bales, and/or sediment traps would be used for water management and erosion control on the drill pads [(1)].

Petroleum products would be kept in containment and spill prevention kits would be available on site [(1)].

The drilling rig would be placed on an impervious material (such as HDPE liner material) to retain any leaked or spilled petroleum products [(1)].

Lubricants, such as pipe thread lubricant, would be a food grade vegetable product [(1)].

Surface casing would be set once the hole has penetrated sufficiently into solid bedrock [(1)].

The annular space would be sealed with a bentonite-based grout [(1)].

Bentonite products used for annular seals or abandonment would have a permeability rating no greater than 10-7 cm/sec [(1)].

The surface casing would be rotated during the sealing process to ensure an effective seal [(1)].

The top three feet of grout filling the annular space would be removed and replaced with neat cement [(1)].

Water-based bentonite drilling fluid would be used [(1)].

All drilling fluid additives would be certified (NSF/ANSI Stan dard 60) for use in domestic water supply wells [(1)].

Lost circulation zones and water entry zones encountered during drilling would be promptly sealed [(1)].

Boreholes would be promptly abandoned after completion using a bentonite-based grout [(1)].

Surface casing would be removed before abandonment [(1)].

The top three feet of a borehole would be sealed with cement during abandonment [(1)].

Any borehole that produces artesian flow at the surface would be promptly abandoned using neat cement grout to fill the entire depth of the borehole [(1)].

Discharge occurring from any surface flowing artesian borehole prior to abandonment would be prevented from entering surface water by storage in sumps or tanks, or by infiltrating into the ground [(1)].

Emergency packers for artesian flow control would be available on all drill rigs [(1)].

2.5 Summary Comparison of Alternatives

Table 2-3 presents a comparative summary of principle activities and the environmental effects for the alternatives being considered in detail. The summary is limited to the effects on project objectives, significant issues or concerns, Forest Plan standards, and other resources the Interdisciplinary Team deemed important for an informed decision. A brief discussion of the similarities and differences between the alternatives follows the table. More detailed information is available in the descriptions of the alternatives in this chapter and in Chapter 3.

Table 2-3 Comparison of Activities and Effects

Project Objective Indicators	Alt. A	Alt. B	Alt. C
Number of Drill Sites	0	11	11
Number of Trench Sites	0	3	3
Mine Portals Opened for Sampling	0	1	1
Access Needs Met?	No	Yes	Yes
Fuel Storage Needs Met?	No	Yes	Yes
Crew Housing Suitable to Conduct Activities?	No	Yes	Yes
Equipment and Vehicle Needs Met	No	Yes	Yes
Water Needs Met?	No	Yes	Yes
Mine Timbers Provided?	No	Yes	Yes
Wilderness Project Issue Indicators	**Alt. A**	**Alt. B**	**Alt. C**
Would Activities Adversely Affect Natural Integrity?	No	Yes	Yes
Would Activities Adversely Affect Untrammeled Condition?	No	Yes	Yes
Would Activities Adversely Affect Solitude?	No	Yes	Yes
Would Activities Adversely Affect Primitive Recreation?	No	Yes	Yes
Authorized Use of Penn Ida for Storage?	No	Yes	No
Number of Annual Authorized Motorized Trips into The FC-RONR Wilderness Expected During 100 Day Operating Season.	0	771	571
Authorized Use of the Golden Hand Bunkhouse for Office Space?	No	Yes	No
Scenic Project Issue Indicators	**Alt. A**	**Alt. B**	**Alt. C**
Would Activities Comply with Visual Quality Objectives (VQOs) Standards?	Yes	No	No
Would Activities Allow the Use of the Golden Hand Bunkhouse within the FC-RONR Wilderness?	No	Yes	No
Watershed, Soil, and Fisheries Project Issue Indicators	**Alt. A**	**Alt. B**	**Alt. C**
Modeled Interstitial Sediment Delivery (Pounds)	6,200	182	182
Would Activities Result in Changes to Peak/Base Flow?	No	Yes	Yes
Number of Annual Authorized Motorized Trips into The FC-RONR Wilderness Expected During 100 Day Operating Season.	0	771	571
Forest Plan Consistency/Other Key Items	**Alt. A**	**Alt. B**	**Alt C.**
Activities Result in Forest Plan Amendment?	No	Yes	Yes
Activities Result in the Development of any IRA?	No	No	No
Activities Consistent with the Idaho Roadless Rule?	Yes	Yes	Yes
Activities Increase Potential Spread of Noxious Weeds?	No	Yes	Yes
Activities Compliant with National Historic Preservation Act and Archaeological Resources Protection Act?	Yes	Yes	Yes
Activities Result in Measureable Effects to any Class I Area or Monitoring Site for Air Quality?	No	No	No
Activities Consistent with ROS Designations?	Yes	Yes	Yes
Threatened, Endangered, and Proposed Species	**Alt. A**	**Alt. B**	**Alt. C**
Wildlife Species	NE	NE/NLAA	NE/NLAA
Plant Species	NE	NE	NE
Fish Species	NE	LAA	LAA
Sensitive Species	**Alt. B**	**Alt. B**	**Alt C**
Wildlife Species	NI	NI/MIIH	NI/MIIH
Plant Species	NI	NI/MIIH	NI/MIIH
Fish Species	NI	MIIH	MIIH
Management Indicator Species	**Alt. A**	**Alt. B**	**Alt C.**
Pileated Woodpecker Population Trend	Maintained	Maintained	Maintained
Bull Trout Population Trend	Maintained	Maintained	Maintained

NE = No Effect; LAA = May affect, likely to adversely affect, NLAA = May affect, not likely to adversely affect; NI = No Impact; BI = Beneficial Impact; MIIH = May impact individuals or habitat but would not likely contribute to a trend towards Federal listing or a loss of viability. Reference discussions below and in Chapter 3 for detailed information.

2.5.1 Project Objective Indicators

2.5.1.1 Confirmation Activities

Alternative A would not provide the proposed confirmation activities. Both Alternative B and C would authorize the proposed confirmation activities to meet the legal rights of the claim holder.

2.5.1.2 Access

Alternative A would not provide the needed access to conduct proposed activities. Current access in the project area would remain as is with only Forest Roads #371 and #373 being open to motorized travel.

Alternative B and C would both authorize the use of temporary roads to access the claims. Approximately 8.0 miles of National Forest system roads would be maintained. Approximately 4.1 miles of temporary road would be authorized to provided needed access; of which, 4.0 miles would be authorized in the FC-RONR Wilderness.

2.5.1.3 Fuel Storage

Alternative A would not authorize the storage of any fuel on National Forest System lands.

Under Alternative B, a 1,320 gallon tank would be transported empty and placed in lined containment at either the Penn Ida adit or outside of RCAs within the FC-RONR Wilderness. The diesel would be transferred as needed for each shift in truck mounted tanks.

Under Alternative C, a 1,320 gallon tank would be transported empty and placed in lined containment at Werdenhoff. The diesel would be transferred as needed for each shift in truck mounted tanks.

2.5.1.4 Crew Housing

Alternative A would not authorize crew housing or staging on National Forest System lands.

Under both Alternative B and C crews would be housed at Werdenhoff. Travel trailers and/or platform tents would be used to house crews and provide needed cooking and sanitation facilities. Werdenhoff would also serve as a staging area for needed equipment and supplies being transported in and out of the FC-RONR Wilderness.

2.5.1.5 Equipment

Alternative A would not authorize the use of any equipment or vehicles to conduct project activities. The following table lists the known facilities, equipment, and vehicles to facilitate operations proposed under Alternative B and C within the FC-RONR Wilderness:

Table 2-4 Equipment Needs in the FC-RONR Wilderness

Equipment/Vehicle Needs Alternative B	Equipment/Vehicle Needs Alternative C
• 1940 era International Harvester 6x6 Truck with 7 Cubic Yard Dump • 1940 era GMC 6x6 Truck with Flatbed • Dodge Ram 3500 Quad-Cab 4x4 with 8 foot box or Equivalents, Multiple, including DOT approved truck mounted tank • ATV and/or UTV, including DOT	• 1940 era International Harvester 6x6 Truck with 7 Cubic Yard Dump • 1940 era GMC 6x6 Truck with Flatbed • Dodge Ram 3500 Quad-Cab 4x4 with 8 foot box or Equivalents, Multiple, including DOT approved truck mounted tank • ATV and/or UTV, including DOT

Equipment/Vehicle Needs Alternative B	Equipment/Vehicle Needs Alternative C
approved truck mounted tank • Bulldozer, Cat D-8 or Smaller • Air Compressor (≤600 cfm) • Light Plant • 3 Yard Loader Tracked or Rubber Tire • Excavator • Skid Mounted Core Drill • Telescopic Forklift, 10,000 lb. Capacity • Drill Rod Baskets • Mud Trailer • Service Trailer • 50 Gallon Hydraulic Oil Storage • Bean Supply Pump • Drilling Fluid Storage • Saws • Generators • Small Jackhammer • Toilets at worksite • Water pump, water storage tanks, water pipe • Bunkhouse • Fuel Truck (500 gallon) • 1,320 Gallon Diesel Storage	approved truck mounted tank • Bulldozer, Cat D-8 or Smaller • Air Compressor (≤600 cfm) • Light Plant • 3 Yard Loader Tracked or Rubber Tire • Excavator • Skid Mounted Core Drill • Telescopic Forklift, 10,000 lb. Capacity • Drill Rod Baskets • Mud Trailer • Service Trailer • 50 Gallon Hydraulic Oil Storage • Bean Supply Pump • Drilling Fluid Storage • Saws • Generators • Small Jackhammer • Toilets at worksite • Water pump, water storage tanks, water pipe

2.5.1.6 Water

Alternative A would not authorize needed access to water, water storage, or water pipes to supply water for drilling operations.

Both Alternative B and C would provide the needed access to AIMMCO's water right. Additionally, multiple water tanks for storage along with the needed pipes and pumps to transport water to drilling operations would be authorized for use.

2.5.1.7 Mine Timbers

Alternative A would not authorize the cutting of needed mine timbers.

Both Alternative B and C would authorize the cutting of trees for mine timbers outside the FC-RONR Wilderness. All processing of timbers would be conducted prior to transport inside wilderness.

2.5.2 Project Issue Indicators

2.5.2.1 Wilderness

Alternative A would have no effects to Wilderness Character and Experience (Section 3.3).

Under Alternative B, the Wilderness user would see physical impacts to the land, motorized and mechanized equipment, and hear noise and could see dust from these machines from July to November for up to 3 years. This type and amount of development would adversely affect the Wilderness users' sense of solitude and remoteness and enjoyment of a primitive recreation experience in the Beaver Creek and Hand (Coin) Creek drainages, and the surrounding ridge tops that encompass the project area. The activities under this alternative involve use of motorized and

mechanized equipment and vehicle support both on claims and associated off claim roads in the Wilderness. The actual use and the knowledge of these activities would adversely impact the Wilderness character by compromising the natural integrity and untrammeled conditions of the FC-RONR Wilderness (Section 3.3).

Alternative B would authorize the use of Penn Ida plaza for storage of fuel and supplies if needed along with a use for a rock source. Rock to repair fords within the FC-RONR Wilderness would be obtained from this site. This would potentially add to the miles of motorized travel within the wilderness by authorizing travel on additional 0.3 miles of temporary road on a daily basis. This additional road usage would apply to the 771 round trips as needed to acquire stored items at the Pend Ida plaza.

Assuming a 100 day operating season, it would be expected that approximately 771 round trips would be authorized annually to conduct project activities under Alternative B. The Golden Hand bunkhouse would be authorized for use as an office, thereby adding to amount of activities (refurbish of the cabin and general office use) and improving the condition of the building. The effects of these activities are captured in the effects to natural integrity, untrammeled condition, solitude, and primitive recreation (Section 3.3).

While not measurable, there would be slightly less impacts to wilderness character and experience from Alternative C because the alternative would authorize fewer motorized trips, the use of the bunkhouse for an office would be prohibited, and no motorized travel to the Penn Ida site for general storage would occur. (Section 3.3).

Alternative C would not authorize the use of the Penn Ida plaza for storage, but would authorize travel to the plaza to source rock. The only use of the site would be to obtain rock to repair fords within the FC-RONR Wilderness would be obtained from this site. No daily trips to obtain stored items would be authorized along the 0.3 miles of road.

Since fuel storage would occur at Werdenhoff, core removal would occur with shift change, and miscellaneous trips would be restricted to every other day on average, it would be expected that approximately 571 round trips would be authorized annually to conduct project activities under Alternative C. The bunkhouse and its associated activities and improvements would not be authorized. The effects of these activities at the bunkhouse are captured in the effects to natural integrity, untrammeled condition, solitude, and primitive recreation (Section 3.3).

2.5.2.2 Scenic

Alternative A would have no effects to wilderness character and experience (Section 3.11).

Alternatives B and C would require one amendment to the Forest Plan as disclosed in this chapter. This would be a one time, site specific, non-significant amendments that would not change overall Forest Plan goals, objectives, desired future conditions, or associated outputs. Both Alternatives would meet a maximum modification VQO within the FC-RONR wilderness (Section 3.11).

The principle difference in Alternatives is the use of the Golden Hand bunkhouse as an office. Alternative B would need to restore the bunkhouse to facilitate its use as an office. Restoration and occupation of the Golden Hand bunkhouse would be evident to casual observer within the FC-RONR Wilderness. The installation of such features as roofing, stove pipes, new logs, windows, porch posts/flooring would appear evident. These activities would appear as a deviation from the rustic and rundown appearance the observer expects of most structures in the wilderness. These activities would meet a VQO of maximum modification. It is expected that activities to improve the condition of the bunkhouse would not meet a VQO of preservation until the long term when the bunkhouse again takes on a more ‘run downed’ and weathered quality that the observer would expect to see (Section 3.11).

2.5.2.3 Water, Soil, and Fisheries

Alternative A would not alter the baseline condition for watershed, soils, or fisheries resources.

Alternative B and C would reduce the modeled interstitial sediment from approximately 6,200 pounds to roughly 182 pounds (Section 3.4 and 3.5). Fewer motorized trips within the FC-RONR Wilderness in Alternative C would result in less temporary and short term sediment delivery and turbidity, but there would be no difference in the long term reductions related to road improvements. Installation of stream crossing structure would result in temporary to long term benefits in North Fork Smith Creek.

Under Alternative B and C, the diversion of water would result in a minor temporary to short term degrade of base flow in Coin Creek that would not move the peak/base flow indicator for the Beaver Creek 6th HU from Functioning Acceptable to Functioning at Risk (Section 3.4.3.2).

2.5.3 Forest Plan Consistency/Other Key Items

The Forest Plan Consistency Checklist, contained in the project's planning record, lists all applicable standards and guidelines and discloses that all action alternatives would comply with those standards and guidelines with the exception of one standard requiring an amendment. In addition, the Interdisciplinary Team identified other items considered important in making an informed decision. The following discussions summarize the effects of the alternatives relative to those standards and/or guidelines and other items identified by the Interdisciplinary Team as key in this assessment.

2.5.3.1 Forest Plan Amendments

Alternative A would have no effects to wilderness character and experience.

Alternatives would B and C would require one amendment to the Forest Plan as discussed in this chapter. This would be a one time, site specific, non-significant amendments that would not change overall Forest Plan goals, objectives, Desired Future Conditions (DFC), or associated outputs.

2.5.3.2 Roadless Areas

Alternative A would have no effect on any IRA (Section 3.7).

The principle difference between Alternative B and C would be the potential for impacts on solitude. Assuming a 100 day operating season, it would be expected that approximately 771 round trips would be authorized annually to conduct project activities under Alternative B without prior approval from Werdenhoff to the claims, while Alternative C would authorize approximately 571 trips annually to the claims. It would still be expected that many of the trips described in Alternative B would still occur in Alternative C within or immediately adjacent to IRAs with the exception of fuel which would not be transported in bulk past Werdenhoff. Regardless, Alternative B could represent a slight increase when compared to Alternative C in noise and the associated impacts to solitude while the project is ongoing (Section 3.7).

Neither Alternative B or C would result in the development of any IRA. IRAs within the project area would remain suitable for wilderness designation by Congress. Both Alternatives are consistent with the Idaho Roadless Rule (36 CFR 294).

2.5.3.3 Noxious Weeds

Alternative A would have no effect on the potential introduction and distribution of noxious weeds.

Proposed activities and design features associated with Alternative B and C would not be expected to introduce noxious weeds into the analysis area. Alternative B and C may however contribute to

the distribution of noxious weeds already present as vehicles pass along Forest Road #371 while completing project activities. Existing noxious weed populations would be addressed through the District's and the FC-RONR Wilderness noxious weed program (Section 3.9).

2.5.3.4 Air Quality

Alternative A would have no effect on air quality.

Based on estimates and assumptions it was calculated that Alternative B would annually produce approximately 5,500 pounds of PM-10 particulate matter, 700 pounds of PM-2.5 particulate matter, 23,500 pounds of nitrogen dioxide, and 1,600 pounds of sulfur dioxide (Table 3-11).

Based on estimates and assumptions it was calculated that Alternative C would annually produce approximately 4,900 pounds of PM-10 particulate matter, 630 pounds of PM-2.5 particulate matter, 20,100 pounds of nitrogen dioxide, and 1,400 pounds of sulfur dioxide (Table 3-11).

While Alternative B and C would increase pollutants from dust, vehicle, and other emissions in the project area, it would not likely have measurable effects on air quality in any Class I Area, the FC-RONR Wilderness, or at monitoring sites, given the distance and dilution that would occur as particles and air mix over distance.

2.5.3.5 Recreation Opportunity Spectrum (ROS)

Recreation Opportunity Spectrum classifications would remain unchanged with any Alternative.

Within the FC-RONR Wilderness activities would not be consistent the ROS classification due to impacts on wilderness characteristics (Section 3.3) and increased likelihood of frequent encounters with users expecting a primitive setting. However, the activities within the primitive setting are considered to be a setting inconsistency and being conducted pursuant the 1872 Mining Law (Section 1.5). Following project activities, the portion of analysis area in a primitive ROS setting would return to conditions indicative and consistent with the setting. The area would remain classified as a primitive ROS setting.

2.5.4 Threatened and Endangered Species

Determinations disclosed in Chapter 3 and documented in biological assessments and evaluations for threatened, endangered, proposed, and candidate species concluded that:

Alternative A does not propose any federal action that could affect listed species.

Alternative B and C would have <u>no effect</u> to any threatened or endangered plant species. No habitat for any threatened or endangered plant species occurs in the project analysis area (Section 3.8).

Alternative B and C could have temporary to short term negative effects to individual steelhead, bull trout and the associated designated critical habitat (Section 3.4). Effects to Chinook salmon and designated critical habitat would likely be negligible. Installation of stream crossing structure would result in temporary to short term benefits to steelhead. Alternative B and C <u>may affect, likely to adversely affect</u> Chinook salmon, bull trout, and steelhead. The USFWS submitted a biological opinion to the Forest Service on October 30, 2013 and NOAA on November 13, 2013. The NOAA opinion concluded that the action is not likely to jeopardize the continued existence of steelhead or Chinook salmon and is not likely to result in the destruction or adverse modification of designated critical habitat. The USFWS opinion concluded the action would not jeopardize the continued survival and recovery of bull trout and would not destroy or adversely modify designated critical habitat.

Alternative B and C would have <u>no effect</u> on Northern Idaho Ground Squirrel and <u>may affect</u>, <u>not likely to adversely affect</u> Canada Lynx (Section 3.6).

2.5.5 Sensitive Species, Including Candidate Species

Alternative A would have no impact on any sensitive species

Alternative B and C may impact individuals but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species of whitebark pine, *(Pinus albicaulisi*), a candidate and sensitive species. Alternative B and C would have no impact on any other candidate, proposed, or sensitive plant species.

Alternative Band C may impact individuals but would not likely contribute to a trend towards Federal Listing or cause a loss of viability to the population or species of westslope cutthroat trout.

Alternative B and C may impact individuals but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species of American three-toed woodpecker, boreal owl, fisher, northern goshawk, pileated woodpecker, flammulated owl, wolverine, gray wolf, Townsend's big-eared bat, or Columbia spotted-frog. Alternative B and C would have no impact on white-headed woodpecker, great gray owl, mountain quail, rocky mountain bighorn sheep, peregrine falcon, spotted bat, greater sage grouse, southern Idaho ground squirrel, Columbian sharp-tailed grouse, bald eagle, yellow-billed cuckoo, or common loon.

2.5.6 Management Indicator Species (MIS)

Alternative A would have no direct or indirect effects on any MIS species or their habitat and would maintain the current population trend.

Alternative B and C may disturb individual pileated woodpecker during implementation (Section 3.6); however, both alternatives are expected to maintain the current population trend of this species at the Forest and Ecogroup scale.

Alternatives B and C could negatively affect bull trout individuals in the temporary to short term, followed by long term minor beneficial effects. However, the few occurrences of disturbance or mortality of individuals from increased fording are not likely to result in measurable population level effects (Section 3.4.3.1), and long term beneficial effects would be minor. Therefore, Alternative B and C would maintain the current population trend of the species at the Forest and Ecogroup scale.

2.6 Identification of the Preferred Alternative

Alternative C is the Responsible Official's preferred alternative.

CHAPTER 3 - AFFECTED ENVIRONMENT And ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter describes the existing conditions of the environment in and/or adjacent to the Golden Hand No. 1 and No. 2 Mining Claims Project Area that may affect or be affected by the alternatives presented in Chapter 2. The individual discussions are organized by resource.

This chapter also discloses the effects on the environment that would occur following implementation of the alternatives presented in Chapter 2. The direct and indirect; temporary (0 to 3 years), short (>3 to 15 years), and long term (>15 years), and; cumulative effects are discussed by resource area. Section 3.14 discloses the irreversible and irretrievable effects resulting from the alternatives.

Pursuant to direction found at 40 CFR 1500.1(b) and 1500.4, the discussions presented here are summaries of the completed analyses and form the scientific and analytical basis for the alternatives' comparison at the end of Chapter 2. Unless specifically stated otherwise, the project record (40 CFR 1502.21) is incorporated by reference and contains the detailed data, methodologies, analysis, references, and other technical documentation used in the assessment.

The Golden Hand No. 1 and No. 2 Mining Claims Project Area is located in the Big Creek drainage on the Payette National Forest, approximately 19 miles north of Yellow Pine, ID (Figure 1-1). The actual claims encompass approximately 20 acres each and are located near Coin Creek, a tributary of Beaver Creek, which flows into Big Creek, a tributary of the Middle Fork Salmon River. The project area includes 1,309 acres of National Forest System lands (Figure 1-2).

Incomplete or Unavailable Information
The Council on Environmental Quality (CEQ) regulations for implementing procedural provisions of the National Environmental Policy Act (NEPA) (40 CFR 1502.22) require Federal agencies to identify relevant information that may be incomplete or unavailable for evaluating reasonably foreseeable significant adverse effects in an EIS. If the information is essential to a reasoned choice between alternatives and the cost of gathering it is not excessive, it must be included or addressed in the EIS.

The necessary inventory and management of mineral projects can be complex depending on the scope, scale, and location. However, existing geological and ecological conditions and relationships are well established, and a substantial amount of credible information about ecosystems and geology in the project area and resource analysis areas is known. All alternatives were evaluated using the best available information.

The data collection effort for this analysis can generally be categorized into several groups:

- Resource databases used to compile and summarize information
- Geographic information system (GIS) spatial analyses linking database information to geographic locations
- Expert science reviews of methodology and assumptions
- Information and analysis documented in reports prepared by Non-Agency firms
- Current scientific literature reviews
- Field review, inventory, and/or analysis

Additional detail about the data used by the Interdisciplinary Team (IDT) members to support their analyses and the limitations of these data is summarized in each resource section and described in more detail in related project record documentation.

3.1.1 Concerns Not Analyzed in Detail

The following is a discussion of the concerns not analyzed in detail and the reasons regarding their categorization. Additional information on each of these concerns is found in the project record.

3.1.1.1 Vegetation

Vegetation was not analyzed in detail because all the alternatives would be similar with respect to effects. The effects are limited. Because of limited effects and similarity between alternatives, vegetation would not be useful in distinguishing between alternatives. Both Alternatives would be consistent with Forest Plan and Wilderness Plan standards and guidelines and consistency is documented in the project record. These considerations eliminated the vegetation as concern for detailed environmental analysis. The potential for effects is documented in a technical report in the project record and is not considered meaningful at the stand level. Potential effects to noxious weeds are discussed in Section 3.9 and botanicals are discussed in section 3.8.

3.1.1.2 Socio/Economics

Socio/Economics was not analyzed in detail because all the alternatives would be similar with respect to effects. The effects are limited in this case as well. Because of limited effects and similarity between alternatives, socio/economics would not be useful in distinguishing between alternatives. Both Alternatives would be consistent with Forest Plan and Wilderness Plan standards and guidelines and consistency is documented in the project record. These considerations eliminated socio/economics as concern for detailed environmental analysis in this EIS. The potential for effects is documented in a technical report in the project record and would only result in roughly 6 to 8 jobs.

3.1.1.3 Wild and Scenic Rivers

Wild and scenic rivers were not analyzed in detail because the project area was not in or immediately adjacent to any designated segments. Access routes were in proximity to the South Fork Salmon River were Warm Lake Highway (FH 22) crosses and Johnson Creek were the Forest Road #413 is adjacent. These river segments are eligible of inclusion as Wild and Scenic Rivers along with their corridors which extend 0.25 miles on each side of the watercourse. However, eligibility for potential addition to the National Wild and Scenic Rivers System for the South Fork Salmon River and Johnson Creek, and their outstandingly remarkable values and free-flowing characteristics would be maintained under Alternatives A, B, and C.

Because the management activities for both alternatives would be similar with respect to Wild and Scenic Rivers and the effects of the proposed activities are limited, Wild and Scenic Rivers was not a concern that was useful in distinguishing between the alternatives. The Outstanding Remarkable Values (ORVs) and the Free Flowing Characteristics of the river segment are maintained under the Proposed Action. These considerations eliminated Wild and Scenic Rivers as an issue for detailed environmental analysis for this proposal. The consistency with Forest Plan and Wilderness Plan standards and guidelines is documented in the project record.

3.1.1.4 Research Natural Areas

Wild and scenic rivers were not analyzed in detail because the project area was not in or immediately adjacent to any Research National Areas (RNAs). There would be no effects to this resource without activities within or adjacent to RNAs.

3.1.1.5 Groundwater

Groundwater was not analyzed in detail because all the alternatives would be identical with respect to effects. The effects are limited with potential for effect considered negligible. Because of the

limited effects and similarity between alternatives, groundwater would not be useful in distinguishing between alternatives. Both Alternatives would be consistent with Forest Plan and Wilderness Plan standards and guidelines and consistency is documented in the project record. Applicable aspects of the groundwater technical report are incorporated in the Fishery and Watershed Resource Section (Section 3.4) and drilling procedures related to groundwater resource protection are described in Appendix D.

The groundwater technical report located in the project record discusses the potential for the project to affect groundwater flow and discharge, water quality, drilling fluid filtrate mixing with groundwater, groundwater mixing with other groundwater, surface water mixing with groundwater, drill fluid and drill cuttings disposal, and the opening of Ella adit in detail.

The following conclusions can be made regarding the existing condition of groundwater resources:

- Any aquifer within the project area that could be impacted by drilling is likely to be located in a shallow and relatively thin zone comprised of the lower regolith and the underlying fractured bedrock.
- Groundwater is expected to be of very limited occurrence deeper within the bedrock.

The technical report concludes the effects on groundwater resources from implementation of the proposed project are expected to be negligible, temporary, and insignificant. This assessment of the overall significance of the effects of the proposed project on groundwater resources is based upon 1) the existing condition of groundwater resources, 2) the degree of risk of water quality degradation posed by the proposed action, and 3) the severity of consequences should mixing of chemically different waters occur.

The benign nature of the drilling fluids and the limited potential for interaction between aquifers having differing water quality poses little risk of aquifer degradation. If minor transient aquifer cross-flow does result in the mixing of small amounts of water, the consequences are slight since 1) the aquifer volume affected is very limited and 2) effects to surface discharge sources (springs and seeps) would be negligible and temporary.

3.2 Minerals and Geology

This section of the document discusses the existing conditions and characteristics for minerals and geology within the project area, as well as the effects of the various alternatives on those resources. The analysis area for direct and indirect effects to the mineral resource is the project area described in Chapter 1 (Figure 1-2).

The 1872 Mining Law, as amended (30 USC 22, *et seq*.), allows U.S. citizens the right to locate, explore, and develop mining claims on federal lands that are open to mineral entry. Mining claims on lands closed to mineral entry may be developed subject to "valid existing rights". The validity of Golden Hand No's 3, 4 and 8 lode mining claims has been established. Golden Hand claim No's. 1 and 2 were validly located before the withdrawal date. The discovery of a valuable mineral deposit on Golden Hand claim No's. 1 and 2 has been challenged by the Federal government. A legal determination cannot be made until completion of the current Plan of Operation and any amendments that may result from this analysis.

Section 4 of the Multiple Use Mining Act of 1955 (69 Stat. 367) states that, prior to patent, mining claims may be used only for "...prospecting, mining or processing, and uses reasonably incident thereto." Additionally, the Wilderness Act of 1964 provides and allows for surface disturbing activities that are reasonably incident to mining or processing operations when valid rights have been found to exist (Wilderness Act 1964, Central Idaho Wilderness Act 1980).

History of the Golden Hand Mine Site
J.M. Hand discovered the Golden Hand deposit in 1889. It is located in the Edwardsburg Mining District. The first development occurred on small veins on the north side of Coin Creek. Two short adits produced $1,200 in gold (Shenon and Ross 1936). Sometime after 1896 the property was acquired by the Penn-Idaho Company, which developed two adits (total length of 1150 feet) on the Neversweat No.1 claim (presently Golden Hand claim No. 8) on the south side of Coin (Cache) Creek. No production figures are available for this period. By 1933, ownership had passed to Golden Hand, Inc. with the property consisting of 26 unpatented lode claims. Development at this time was focused on the Neversweat No.2 claim located approximately where the present Golden Hand No's. 3 and 4 claims lie. Two short adits and two open cuts were mined; with most of the recorded production coming from high-grade oxidized ore in these near-surface workings. Production during the period of 1932-34 totaled 1,368 ounces of gold and 301 ounces of silver. Production decreased until 1941, after which no production or development was reported (Cater et al. 1973). The total recorded gold and silver production value was $44,212 (ibid). Later exploration work was apparently unsuccessful, although some exploratory drifting in 1938 reportedly cut a vein having extremely high assay values (Lorain 1938). Claude Elliott relocated the claims in 1963. Golden Hand No's. 1-5 lode mining claims were located by Jim Collord and American Independence Mines and Minerals, Inc. (AIMMCO) in 1979. In 1983, AIMMCO located Golden Hand No's. 6-8. Jim Collord subsequently deeded his interest in claims No. 1-5 to AIMMCO.

After 1941, exploration and development was been limited to geologic mapping, surface and underground sampling, and construction of dozer trenches on several of the Golden Hand claims (McRae 1956). Most of this activity occurred before 1979. After the Idaho Primitive Area was established in 1931, preexisting travel routes were all considered trails. Motorized access to the Golden Hand was authorized through the issuance of Class D Road Use Permits. The Forest Service issued these permits for the purpose of conducting assessment and exploration/development work until the end of 1983, when the FC-RONR Wilderness was withdrawn from mineral entry under provisions of the Wilderness Act. For several years AIMMCO was authorized by the Forest Service to access the Golden Hand claims using motorized equipment to conduct assessment, exploration and development work. The approved activities included:

1980 - Clearing roads to allow vehicle access, and "recovery of gold bearing material…by means of pick and shovel and a hand operated rocker box".
1981 – "Clean out caved tunnel portals & sample…drilling". Equipment included backhoe-loader, compressor, and tractor.
1982 – "…similar to 1981".
1983 – The "work plan for this property is identical as that filed for 1982 with no change".

1984- "…drilling and soil sampling…ore extracted will be hauled out of the wilderness area for mill testing and processing". *This activity was inadvertently approved after the withdrawal date in the Central Idaho Wilderness Act.*

Most of the actions listed above, including the drilling and opening closed adits, were authorized by the Forest Service without a plan of operations. An approved plan of operations became mandatory after creation of the FC-RONR Wilderness.

Administrative Record

The administrative record on the Golden Hand claim group is lengthy. The recent events leading to the preparation of this Environmental Impact Statement on AIMMCO's proposed plan of operations are briefly summarized as follows:

- The FC-RONR was withdrawn from mineral entry on December 31, 1983.
- In February, 1984 a Plan of Operations for Golden Hand claims 1 – 8 was submitted that proposed to clean the caved tunnel portal, sample and drill.
- In March, 1984, AIMMCO was advised that a field examination of the Golden Hand claims would be scheduled and that no operating plans could be approved until that examination had been completed and the basic facts of validity substantiated.
- On July 10, 1984, a field examination of Golden Hand claims 4, 5, 6 and 8 was made by Forest Service mining geologist Patrick Curtis who concluded, in a report dated August, 1984, that valid existing rights had been established on each of those claims before withdrawal. Curtis described Golden Hand claims 1-3 as "associated claims", but reported no findings concerning their validity.
- In August, 1984, the Forest Service advised AIMMCO it had received "favorable results" from its mineral examiners, requested additional information concerning the proposed Plan of Operations and authorized necessary assessment work.
- The Forest Service conducted another mineral examination of the Golden Hand claims in July 1985 to determine if any of the Golden Hand claims were valid prior to processing the plan of operations.
- The mineral report concerning the Golden Hand claims was completed in November 1986. It concluded that none of the eight claims were valid and recommended to the Department of Interior that contest be initiated against all of the claims.
- A validity contest concerning the Golden Hand claims was commenced February 25, 1987.
- AIMMCO timely responded to the BLM's contest notice and the validity contest was set for trial before Administrative Law Judge Ramon M. Child.
- In July, 1987, before trial of the validity contest, AIMMCO submitted an assessment work request to the Forest Service that included, among other things, drilling, trenching and opening a caved adit. This request was denied the same month.
- In July, 1988, AIMMCO filed a complaint in United States District Court for the District of Idaho. In that complaint, AIMMCO appealed the denial of its July, 1987 assessment work request and sought an order that it be permitted to access the Golden Hand claims with mechanized equipment to perform the described work. This complaint was stayed, by agreement, until the outcome of the validity contest was determined.
- In January, 1989, after receiving evidence at the validity contest trial, Administrative Law Judge Ramon M. Child held Golden Hand claim No.'s 1, 5, 6, and 7 to be invalid, that claims No's 2,3 4, and 8 were valid and dismissed the contest on claim No's. 2, 3, 4, and 8.
- Both parties appealed to the Interior Board of Land Appeals (IBLA). On February 10, 1992, the IBLA affirmed Judge Child's decision that claim No.'s 1, 5, 6, and 7 were invalid and that claim No.'s 3 and 4 were valid. It reversed his decision that claim No. 2 was valid and remanded claim No. 8 back to the Hearings Division for review of the historic value of silver as it bore on the validity of claim No. 8. The Forest Service later dismissed its contest against claim No. 8.
- On April, 16, 1996, AIMMCO submitted a proposed Plan of Operations for work on claims No. 3 and No. 4.
- In December, 1999 AIMMCO filed a motion to reactivate and amend the July, 1988 lawsuit in Idaho Federal District Court to appeal from the IBLA decision that Golden Hand claim No's. 1 and 2 were invalid, to obtain an order requiring the Forest Service to allow access to Golden Hand claims 1 and 2 with mechanized equipment and requiring the Forest Service to act upon its April 16, 1996 Plan of Operations.

- On August 9, 2002, Judge B. Lynn Winmill entered Judgment reversing the decision that Golden Hand claim No's. 1 and 2 are invalid, ordering that the Forest Service allow AIMMCO access to Golden Hand claim Nos. 1 and 2 to give it a fair opportunity to prove the validity of the claims, and compelling the Forest Service to complete the EIS and its review of the 1996 plan by May 1, 2003.
- In October, 2002, the Forest Service filed a Notice of Appeal with the 9th Circuit Court of Appeals.
- On May 1, 2003 the Forest Supervisor, Payette National Forest, signed the Record of Decision for the Golden Hand claim Nos. 3 and 4 Plan of Operation and selected an alternative that required AIMMCO to amend the proposed plan of operations prior to implementation.
- In July, 2003, the Forest Service appeal to the 9th Circuit Court of Appeals was dismissed.
- On March 14, 2011, a notice withdrawing the Golden Hand No. 3 and No. 4 Lode Mining Claim Proposed Plan of Operations FEIS was published in the Federal Register. The Record of Decision was rescinded on March 14, 2011.

Management Direction

The Forest Plan (USDA 2003, 2010) and federal and state laws and regulations guide management of mineral resources on the Payette National Forest. Mineral development in Wilderness is also guided by the Wilderness Act of 1964, the Central Idaho Wilderness Act (1980) and the FC-RONR Wilderness Management Plan (USDA 2010).

Regulations defining Forest Service authority to manage locatable mineral activities were adopted in 1974 and are codified in 36 CFR 228A. In accordance with these regulations, an approved plan of operations is required for any locatable mineral activity on National Forest System land that would cause a significant disturbance of surface resources. The Forest Service responses to a proposed plan of operations are defined by regulation at 36 CFR 228.5. The overall purpose of these regulations as stated in 36 CFR 228.1, is to manage operations so as to minimize adverse environmental impacts on National Forest System surface resources.

Mining in Wilderness

The Wilderness Act allows mining development in designated Wilderness on valid claims located before December 31, 1983. In addition, Section 4 (d) (2) of the Act states:

> (2) Nothing in this Act shall prevent within national forest wilderness areas any activity, including prospecting, for the purpose of gathering information about mineral or other resources, if such activity is carried on in a manner compatible with the preservation of the wilderness environment.

Direction for managing mining activities in wilderness under Forest Service mining regulations is found at 36 CFR Section 228.15 that states, in part, at section 228.15 (c):

> Persons with valid mining claims wholly within National Forest Wilderness shall be permitted access to such surrounded claims by means consistent with the preservation of National Forest Wilderness which have been or are being customarily used with respect to other such claims surrounded by National Forest Wilderness.

Activities Reasonably Incident to Mining

The Forest Service minimizes, where feasible, adverse impacts to National Forest surface resources by ensuring that use of the surface for mining activity is reasonably incident to mining. Adverse impacts that are not acceptable are those uses of the surface that cause significant disturbance that is not reasonably incident to mining.

The authority for the Forest Service to ensure that National Forest lands, including those under mining claim locations, are used only for purposes required for and reasonably incident to mining and in a manner that minimizes adverse environmental impacts, falls under the agency's broad authorities primarily, but not limited to, the following statutes and case law:

- The Organic Act of 1897 (16 USC 478, 551)
- Multiple Use Mining Act of July 23, 1955 (30 USC 612).
- Title 36 Code of Federal Regulations, Part 228, Subpart A - Locatable Minerals
- U.S. v. Richardson, 599 F. 2d 290 (1979); Cert. denied, 444 U.S. 1014 (1980)

Access
Access to unpatented mining claims is a statutory right granted to claimants under the 1872 Mining Law, as amended. Access, however, is not uncontrolled or unconditioned even on claims having "valid existing rights". Where access may cause significant impacts to surface resources, Forest Service mining regulations at 36 CFR 228 Part A require that a plan of operations be submitted and evaluated and that the Forest Service minimize, where feasible, adverse impacts.

The operating plan submitted by AIMMCO proposes to maintain the road between Edwardsburg and Pueblo Summit (Forest Roads (FR) #371 and #373). Beginning at Pueblo Summit, FS Trail #013 would be improved on the existing roadbed to allow drill rigs, support vehicles, and other vehicles to access the mine site. To access drill sites and pit locations, roadbeds from old exploration and mine roads would be utilized for temporary authorized roads.

Reclamation and Bonding
Forest Service mining regulations at Title 36 CFR 228.8 and 228.13 provide direction for reclamation and bonding. On all mining claims validly established on lands within the National Wilderness Preservation System, the operator shall take all reasonable measures to remove any structures, equipment and other facilities no longer needed for mining purposes in accordance with the provisions in Sec. 228.10 and restore the surface in accordance with the requirements in Sec. 228.8(g) (36 CFR 228.15(b)).

Drilling
Drilling is one of the methods proposed to collect subsurface information. Diamond core is the method of drilling proposed.

Diamond core drilling is the most versatile of all methods (Peters 1987). It is relatively expensive, but can be used at almost any location and holes can be directed at virtually any angle. Drills are commonly mounted on trucks, tracked carriages, and articulated "buggies" with large, low-pressure tires (Figure 3-1). Small, portable drills capable of drilling to depths greater than 400 meters can be transported using mules and even manually (see Photo 3-1).

Core drill rigs can be very versatile: "Diamond drill rigs can be transported, assembled, and placed on "pads" by using primitive trails and by helicopter" (Peters 1987).

In diamond core drilling, the cylindrical core is cut by a donut-shaped bit having a cutting surface (the "donut") with embedded diamonds. The core is recovered in the inner tube of the core barrel and brought to the surface. The fluid used to lubricate the bit, carry the drill cuttings to the surface, and stabilize the hole walls is usually water with a weighting agent mud (bentonite) and sometimes other additives (cottonseed hulls, cellulose, soap, etc.) (Figure 3-1).

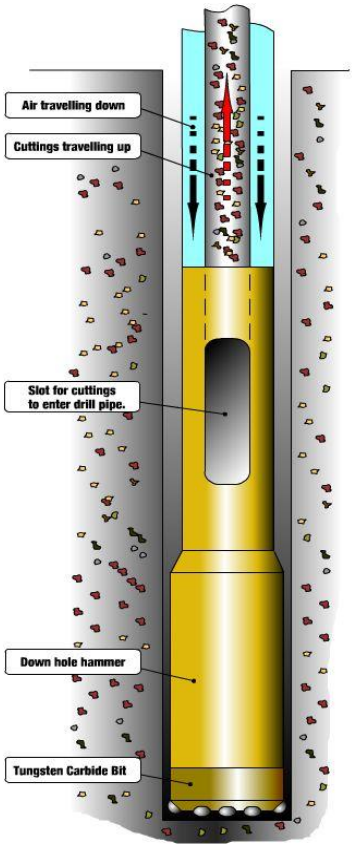


Figure 3-1 Diamond Core Drill

Site requirements for drills vary depending primarily on size and the type of carrier. Drill holes are commonly situated on roads to minimize disturbance and reduce costs.

Track and buggy-mounted drills are generally capable of operating on steeper slopes without constructing large pads ($\leq$500 ft^2) (Photo 3-1). Smaller level areas are still needed to locate mud tanks and provide work areas to log core and chips.

Photo 3-1 Track-Mounted Reverse-Circulation Rotary Drill

Pits
Pits may be used to collect rock chip samples of unweathered, mineralized material. Pits are generally excavated using equipment such as backhoes and tracked excavators. Pits can provide fresh exposures where vegetation or colluvium obscures lithology or geologic contacts. They can provide access to ore for sampling if they can be located accurately.

Occupancy
Occupancy, whether involving the construction or use of a permanent structure or camping beyond normal "stay limits", must be authorized in a plan of operations under 36 CFR 228 A. Failure to do so is a violation of Forest Service regulation at 36 CFR 261.10(a) and (b). In *United States v. Burnett*, 750 F.Supp. 1029, 1035 (D. Idaho 1990), the Court held that the maintenance of structures "under the Forest Service's current policies and the law of this circuit, is a significant surface disturbance which requires an operating plan."

Golden Hand No's. 1 and 2 lode mining claims are located within the congressionally designated FC-RONR Wilderness. Both the 1964 Wilderness Act (16 USC 1121, *et seq.)* and the 1980 Central Idaho Wilderness Act (P.L 96-312) provide for the exercise of valid existing rights.

36 CFR 228.15(a) states:

> "The United States mining laws shall extend to each National Forest Wilderness for the period specified in the Wilderness Act and subsequent establishing legislation to the same extent they were applicable prior to the date the Wilderness was designated by Congress as a part of the National Wilderness Preservation System. Subject to valid existing rights, no person shall have any right or interest in or to any mineral deposits which may be discovered through prospecting or other information-gathering activity after the legal date on which the United States mining laws cease to apply to the specific Wilderness."

36 CFR 228.15(b) states (in relevant part):

> "Holders of unpatented mining claims validly established on any National Forest Wilderness prior to inclusion of such unit in the National Wilderness Preservation System shall be accorded the rights provided by the United States mining laws as then applicable to the National Forest land involved."

After the withdrawal date, per the Wilderness Act, the mining laws (and attendant rights to use the surface) no longer apply to the wilderness surface where there are no valid existing rights. Golden Hand claim No's. 1 and 2 were validly located before the withdrawal date. Whether Golden Hand claim No's. 1 and 2 contain a discovery of a valuable mineral deposit has been challenged but can't be legally determined until completion of the current Plan of Operation and any amendments that may result from this analysis.

Affected Environment

Physiography

The Golden Hand Mine site is situated in the northern Rocky Mountain Physiographic Province, in the Salmon River Mountains of Central Idaho. Elevations on Golden Hand lode mining claims No.1and No.2 are between 6,800 feet and 7,600 feet. The claims lie within the Coin Creek drainage. Coin Creek occupies a steep northeast-trending glacial valley with elevations ranging from 8,682 feet at the north end of the Pueblo Ridge to 5,800 feet at the confluence of Coin Creek and Beaver Creek. The Golden Hand Mine site lies in a transition zone where the broad upper valley narrows down to a glacial trough. Slopes are generally steep and often rocky.

Regional Geology

The oldest rocks in the area belong to the North American Continental Province and are metamorphic and igneous rocks of Mesoproterozoic age (approximately 1,500 million years ago) to Neoproterozoic age, approximately 700 million years ago (Lund, unpublished) (see Figure 3-1). During the Late Cretaceous period (95-70 million years ago) two distinct series of plutons (a body of igneous rock that has formed beneath the surface of the earth by consolidation from magma (AGI 1976) intruded the North American Continental rocks to form the Idaho Batholith. Post-Cretaceous crustal extension resulted in the eruption of the Eocene (51-39 million years ago) Challis volcanics and emplacement of associated intrusive rocks. Most of the Quaternary deposits in the area are a result of Pleistocene glaciation (15-10 thousand years ago).

Geology of Project Area

The Golden Hand Mine site is located along the northwestern boundary of a large area of North American Continental rocks known as the Big Creek roof pendant. Mesoproterozoic biotite phyllite forms the Pueblo Ridge above the mine site (Figure 3-2). Using the revised stratigraphic nomenclature of Tysdal (2000), Lund (unpublished) correlates this unit with the Apple Creek Formation from the upper Lemhi Group. Below Pueblo Ridge, quartzite and argillite outcrop immediately above the mine. These rocks (along with the biotite phyllite above) were thought to belong to the Yellowjacket Formation by early authors, but whether they strictly correlate with the Yellowjacket Formation as redefined by Tysdal (2000), is uncertain. This analysis will use the general term Yellowjacket Formation for the metamorphic rocks that outcrop in the immediate vicinity of the mine site. Cretaceous biotite-muscovite granite outcrops north of the mine. This granite is the roof of a late-series Idaho Batholith pluton that was the source of mineralization. Further to the northeast Eocene granite porphyry crops out. This belongs to the roof facies of the Chamberlain Basin pluton that intruded both the Proterozoic metasediments and Cretaceous granite. Tertiary dikes of variable composition cut both the Yellowjacket strata and the Idaho Batholith granite.

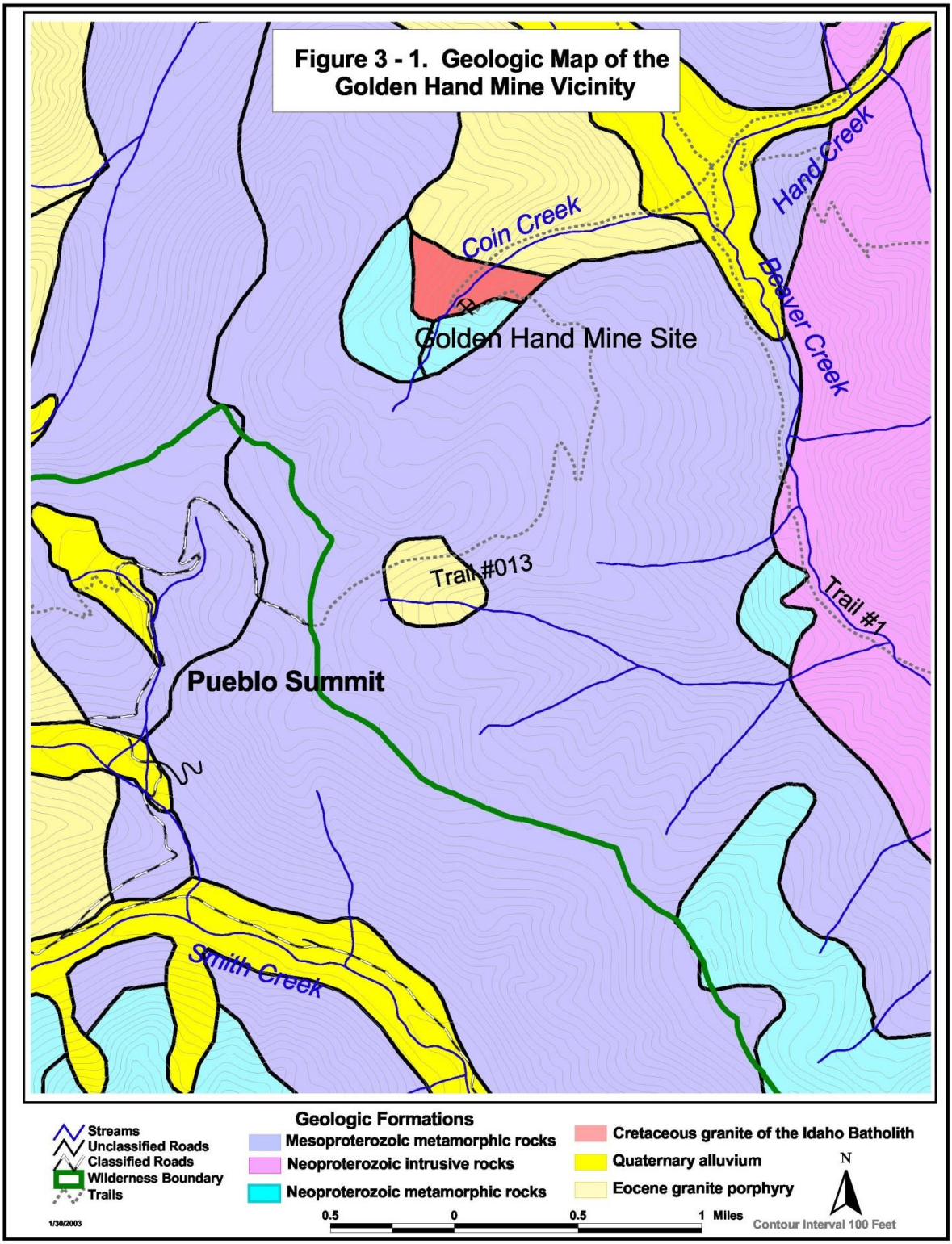


Figure 3-2 Geologic Formations in the Golden Hand Vicinity

Structure
The oldest structure in the area is a northeast-trending fault that cuts the Yellowjacket Formation approximately along the course of Coin Creek (Kirkpatrick 1974). The Golden Hand site lies near the northern end of a zone of north-northeast trending dikes, shear zones, and quartz-filled fissures referred to by Bell (1934) as the Big Creek mineral belt. This zone lies within the larger zone of mineralization known as the Thunder Mountain – Dixie belt (Bookstrom et al. 1998) which runs along the eastern margin of the Idaho Batholith. Two parallel, north-striking shear zones run through the Golden Hand claims (O'Hara 1989). The age of these shear zones is uncertain, but they either pre-date or are contemporaneous with emplacement of the Idaho Batholith. Tertiary dikes in the immediate area strike northeast on the south side of Cache Creek and northwest on the north side of the creek. The dikes may be associated with emplacement of the Chamberlain Basin pluton, and/or outliers of the Profile Gap – Smith Creek dike swarm (a set of numerous, parallel dikes). This north-northeast trending dike swarm lies a couple miles west of the mine and extends as far north as the headwaters of the West Fork of Cache Creek (as mapped by Cater and others 1973).

Mineralization
Mineralization at the Golden Hand occurs primarily near the Yellowjacket Formation –Idaho Batholith contact and is interpreted as being the depositional product of dilute mesothermal fluids related to the granite (Bookstrom et al. 1998). The shear zones (mentioned above) provided conduits of increased permeability for the fluids. O'Hara (1989) determined that the trace element content of alteration minerals in the two shear zones is distinctly different, and suggested that either two separate hydrothermal systems were present, or that two mineralization events occurred at different times in the same system. Bookstrom and others (1998) note that up to six distinct episodes of mineralization have been identified in gold-silver mixed-metal veins of the Edwardsburg district. These mineralization events occurred 79-69 million years ago.

The minerals of interest at the Golden Hand are gold (Au) and silver (Ag). Primary ore minerals are pyrite, galena, sphalerite, tetrahedrite, chalcopyrite, and free gold. Gangue (nonvaluable metalliferous or nonmettalliferous minerals in the ore) minerals include quartz, calcite, sericite, and epidote (Shennon and Ross 1936). Ore was deposited in a variety of environments. Lorain (1938) reports that the ore on the north side of Coin Creek occurs in small quartz veins formed along bedding planes in the Yellowjacket Formation. The Penn-Ida adits on the Golden Hand No. 8 claim cut two different sets of quartz veins in the Idaho Batholith granite. In addition, disseminated pyrite and tetrahedrite occur in a quartz latite porphyry dike. Most of the ore at the "Glory Hole" (an open cut and adit system) on the Golden Hand No. 3 and No. 4 claims occurs as veinlets and discontinuous stringers in the highly fractured and silicified Yellowjacket-Batholith contact zone. Some ore is disseminated in argillite of the Yellowjacket Formation. The near-surface zone of the Glory Hole had the largest historic production.

Other Mining Activity
The Edwardsburg mining district is bounded by Big Creek on the south, Beaver Creek on the east and north, and Mosquito Ridge on the west (Cater et al. 1973). Active mining in this area has been limited. Only the Fourth of July, Camp Bird, and Velvet Quartz Mine properties have seen exploratory or intermittent efforts at development in the last 15 years. AIMMCO has undertaken substantial, non-surface disturbing geophysical, geochemical and geologic work outside the wilderness during this period. Numerous lode and placer deposits in the district have been explored in the past, but the Golden Hand is one of the few lode gold deposits known to have been productive.

There are no active mining claims in the Coin Creek or Beaver Creek drainages, which were withdrawn from mineral entry in their entirety on December 31, 1983, by the Central Idaho Wilderness Act. This means no claims may be located in the future.

Numerous active mining claims (where the annual maintenance fees are current) exist in the Logan Creek, Smith Creek, Government Creek, and Big Creek drainages outside the FC-RONR Wilderness.

The Fourth of July and Camp Bird Mines are owned by Jack Walker (operating partner of AIMMCO) and located in Government Creek and Logan Creek, respectively. The Fourth of July is on NFS land and its operation is authorized by a plan of operations approved by the Payette National Forest in 1989. The Camp Bird is on private land. The Fourth of July has operated sporadically over the last 12 years but, outside of maintenance, the Camp Bird has seen little activity for more than 30 years.

The Velvet Quartz Mine and Mill (Jerry and Lettie Tucker) are in the N. Fork of Smith Creek, about two miles southwest of the Golden Hand. The mill and mine are on NFS land, operating under a plan approved by the Forest Service in 1984. This very small one or two person operation produces at most only a few tons of ore annually.

3.2.1 Environmental Consequences Specific to Alternative A

Alternative A would not allow AIMMCO the opportunity to obtain the geologic information it has stated is necessary to prepare for a new validity determination and would not comply with the 2003 decision of the Federal District Court for Idaho.

3.2.2 Environmental Consequences Specific to Alternative B and C

Alternative B and C would allow AIMMCO the opportunity to obtain the geologic information it has stated is necessary to prepare for a new validity determination and would comply with the 2003 decision of the Federal District Court for Idaho.

3.2.3 Cumulative Effects

Cumulative effects to the mineral resource are evaluated for the Edwardsburg Mining District - bounded by Big Creek on the south, Beaver Creek on the east and north, and Mosquito Ridge on the west (Cater et al. 1973).

Effects on other existing mining properties in the Edwardsburg/Big Creek area is deemed to be negligible because AIMMCO's proposed operating plan is confirmatory in nature and not likely by itself to inordinately encourage other activity on other mining properties. Cumulative effects were tracked relative to the indicators of geologic information obtained, activities reasonably incident to mining, and compliance with PACFISH direction for minerals.

Five mining claims are located in the Beaver Creek watershed; three of which (Golden Hand No's. 3, 4, and 8) have valid existing rights. Work on claims 1 and 2 would increase the area in which AIMMCO obtained general geologic information. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The cumulative effect of Alternative A on the mineral development is limited to the level of geologic information obtained that could be obtained without a formal operating plan. There would be no cumulative effects or development work on claims 3, 4 and 8.

Alternatives B and C may be considered to have implications on the determination of future activities reasonably incident to mining on claims 1 and 2, but, in fact, any evaluation of activities reasonably incident to mining should be made separately for each proposed plan, based on the current geologic information and stage of development. Alternatives B and C in combination with other Golden Hand Claims (Golden Hand No's. 3, 4, and 8) having valid existing rights would incrementally increase the area in which AIMMCO has obtained general geologic information.

3.3 Wilderness Resource

This section of the document discusses the existing conditions and characteristics for wilderness resources within the project area, as well as the effects of the various alternatives on those resources. The Golden Hand No.1 and No. 2 Lode Mining Claims Project is located within the Frank Church-River of No Return (FC-RONR) Wilderness, designated as Wilderness by the 1980 Central Idaho Wilderness Act. The Wilderness Act (1964), the Central Idaho Wilderness Act (1980), and the FC-RONR Wilderness Management Plan are the primary sources of Forest Service management direction for the Wilderness portion of the project area. The Payette National Forest Land and Resource Management Plan incorporates the direction of the FC-RONR Wilderness Management Plan by reference.

For Wilderness Character, indirect effects were analyzed for the entire FC-RONR Wilderness. For direct effects, the analysis area only the Beaver Creek and Hand Creek drainages, and the surrounding ridge tops that encompass the project area.

Background
The National Wilderness preservation system was created to "assure that an increasing population accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States…" (The Wilderness Act, 1964). The incremental degradation of Wilderness throughout the country by allowing increases in mechanized and motorized uses, human habitation, and development tends to weaken the integrity of Wilderness.

The impact of the project activities on the Wilderness has been identified and is acknowledged, as a significant issue. There are several different components and aspects of the impacts to Wilderness that would occur under this proposal. Of paramount concern is the statutory and legal basis for pursuing activities and action in Wilderness that clearly, on the surface, appear to directly conflict and be inconsistent with, Wilderness designation, preservation, and management.

The 1964 Wilderness Act (also referred to as the Act) defines Wilderness as:

> A Wilderness in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of Wilderness is further defined to mean…an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions…(Sec 2[b]).

The Wilderness Act further states: "Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use." (Sec 4[b]).

The Wilderness Act of 1964 was enacted "In order to ensure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition..."(Section 2 [a]). The Act defines wilderness as an area "untrammeled by man" that has "outstanding opportunities for solitude or a primitive and unconfined type of recreation" and directs agencies to preserve wilderness character and natural conditions. The Act restricts (with some exceptions) activities in the wilderness such as construction of roads, motor vehicles, motorized equipment, structures, installations, aircraft landings and mechanical transport (Section 4 [c]).

However, the Act provides latitude for mining claims, determined to be valid prior to January 1, 1984, to be used for mining and processing and uses "reasonably incident thereto" (Section 4 [d][3]). Section 5 (b) provides for ingress and egress to valid mining claims within designated wilderness … consistent with the preservation of the area as wilderness, and be permitted to utilize means which have been or are being customarily enjoyed with respect to other such areas similarly situated.

Wilderness Character
Each wilderness is very unique. Because of this uniqueness, wilderness character cannot be compared from one wilderness to another. Since the 1964 Wilderness Act did not explicitly define "wilderness character" the Forest Service national framework team (Landres et al. 2005) identified four tangible qualities of wilderness in an attempt to make the idealized description of wilderness character relevant and practical to wilderness stewardship:

- Untrammeled: An area where the earth and its community of life are untrammeled by man, and conditions where human influence does not impede the free play of natural forces or interfere with natural processes.
- Natural: wilderness ecological systems are substantially free from the effects of modern civilization. .
- Undeveloped: an area of undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation, with the imprint of man's work substantially unnoticeable. This quality is degraded by the presence of structures, installations, use of motor vehicles, motorized equipment or mechanical transport;
- Solitude or a primitive and unconfined type of recreation: this quality is about the opportunity for people to experience wilderness, free from excessive visitor encounters, or signs of modern civilization, and is degraded by settings that reduce these opportunities.

Even though natural integrity and untrammeled conditions are similar, they differ in that untrammeled means "…freedom from human control rather than lack of human influences" (Cole 2000). Thus, an area could be low in natural integrity because of previous human influences, but high in untrammeled conditions if natural processes are being allowed to operate freely. Wilderness character can also be expressed in terms of solitude and sense of remoteness, and opportunities for primitive and unconfined recreation. Activities that can affect wilderness character include encounters with motorized vehicles, acres and type of physical disturbance, noise, and signs of mechanization and development. The duration of these impacts is also an important factor to consider when analyzing the effects on the wilderness experience.

Within these qualities resides societal ideals integral to the understanding of wilderness character. These ideals encompass personal experiences in natural environments that are relatively free from the encumbrances and signs of modern society.

Wilderness is a resource that consists of many interacting and contributing biophysical and social elements that include: wildlife, fish, recreation, soils, water, vegetation, wildness, scenery, and cultural resources. As such, wilderness can be viewed as a "composite" resource, and management must focus on the whole rather than the component parts (Hendee et al. 1990). In analyzing the effects on the wilderness resource, all of these interacting elements need to be taken into consideration.

Wilderness character can be realized on-site when visiting a wilderness area or off-site by simply knowing that the National Wilderness Preservation System exists to provide for preservation of natural and untrammeled conditions. As shown in the survey results discussed below, there is satisfaction in realizing that areas have been designated "… to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition… (The Wilderness Act, 1964, Sec2 [a]).

A 1995 national survey rated the importance of 13 values of wilderness (Cordell et al 1998). Results indicated that respondents held off-site values including the knowledge that water quality, wildlife habitat, and air quality were being protected for future generations, as the most important. On-site values such as recreational opportunities were found to be less important. Haas et al (1986) also conducted a study on the values people place on wilderness, and found that people place a lot of importance on biophysical resources, and knowing they have the option now and in the future to visit an area that they perceive as being "unimpaired for future use and enjoyment as wilderness".

Affected Environment
The Golden Hand claims No. 1 and No. 2 (hereafter referred to as the Golden Hand) occur in an area

that has been altered by past mineral exploration and development activities dating from the late 1800s to 1941 (Cater et. al 1973). After production and development ended in 1941, the road from Pueblo Summit to the Golden Hand was abandoned and managed under Idaho Primitive Area guidelines. This road (Trail #013) continues to serve non-motorized uses. The Idaho Primitive Area was designated in 1931 to "conserve primitive conditions of environment, habitation, subsistence and transportation for the enjoyment of those who cherish the early traditions…" (USDA 1978). Figure 3-3 displays the trails and roads in the vicinity of Golden Hand.

Maps of the late 1950s and 1960s of the Payette National Forest and Idaho Primitive Area show FR #373 terminating two miles below Pueblo Summit, where both the Mosquito Ridge (#003) and Pueblo Summit (#013) trails originated. However, unauthorized motorized use of the Pueblo Summit trail (#013) was known to occur. In the late 1970s, the Forest Service physically blocked this old mining road at Pueblo Summit (the Primitive Area boundary) to try to prevent these unauthorized intrusions into the Primitive Area.

In 1980, the United States Congress designated the River of No Return Wilderness (now known as the Frank Church-River of No Return Wilderness (FC-RONR Wilderness) with the passage of the Central Idaho Wilderness Act. This Wilderness included 2,361,767 acres of federal land that had largely been managed as a primitive area since the 1930s (Idaho Primitive Area, Salmon River Breaks Primitive Area, and adjacent Roadless Area Review and Evaluation [Rare] II units). The FC-RONR Wilderness represents the largest contiguous block of designated wilderness land in the lower 48, when combined with the adjacent Gospel Hump and Selway Bitterroot Wildernesses, which adjoin it at its boundaries. . Four national forests currently have a level of administrative responsibilities for the FC-RONR Wilderness (Bitterroot, Salmon-Challis, Nez Perce, and Payette). The PNF administers approximately 795,515 acres of the wilderness.

The Golden Hand claims are located in the FC-RONR Wilderness and are accessed via FR #371 and #373 to Pueblo Summit, and then 3.0 miles into the Wilderness on Forest Trail #013. Pueblo Summit is considered an undeveloped trailhead portal to the FC-RONR Wilderness. This trailhead is marked with a Wilderness boundary sign, a gate to block motorized intrusions into the Wilderness and a trailhead registration box. Dispersed camping, generally associated with hunting in the fall, occurs along the Wilderness boundary, in the area where the road access transitions to a trail. There are no user amenities or parking controls provided at this location.

Voluntary Trailhead registration data has been collected on the district since 1975. Since registration is voluntary, registration information reflects only a portion of the total actual use. The most recent data suggests a possible registration rate of approximately 28 to 30 percent. Trailhead registration information indicates that Forest Trail #013 receives low use with an average of only about 4.5 groups registering per year over the 30 year period between 1982 and 2011. Based on an estimated registration rate of 30 percent, this would equate to an overall average of roughly15 groups entering the Wilderness annually via the Pueblo Summit Trailhead over this 30 year period.

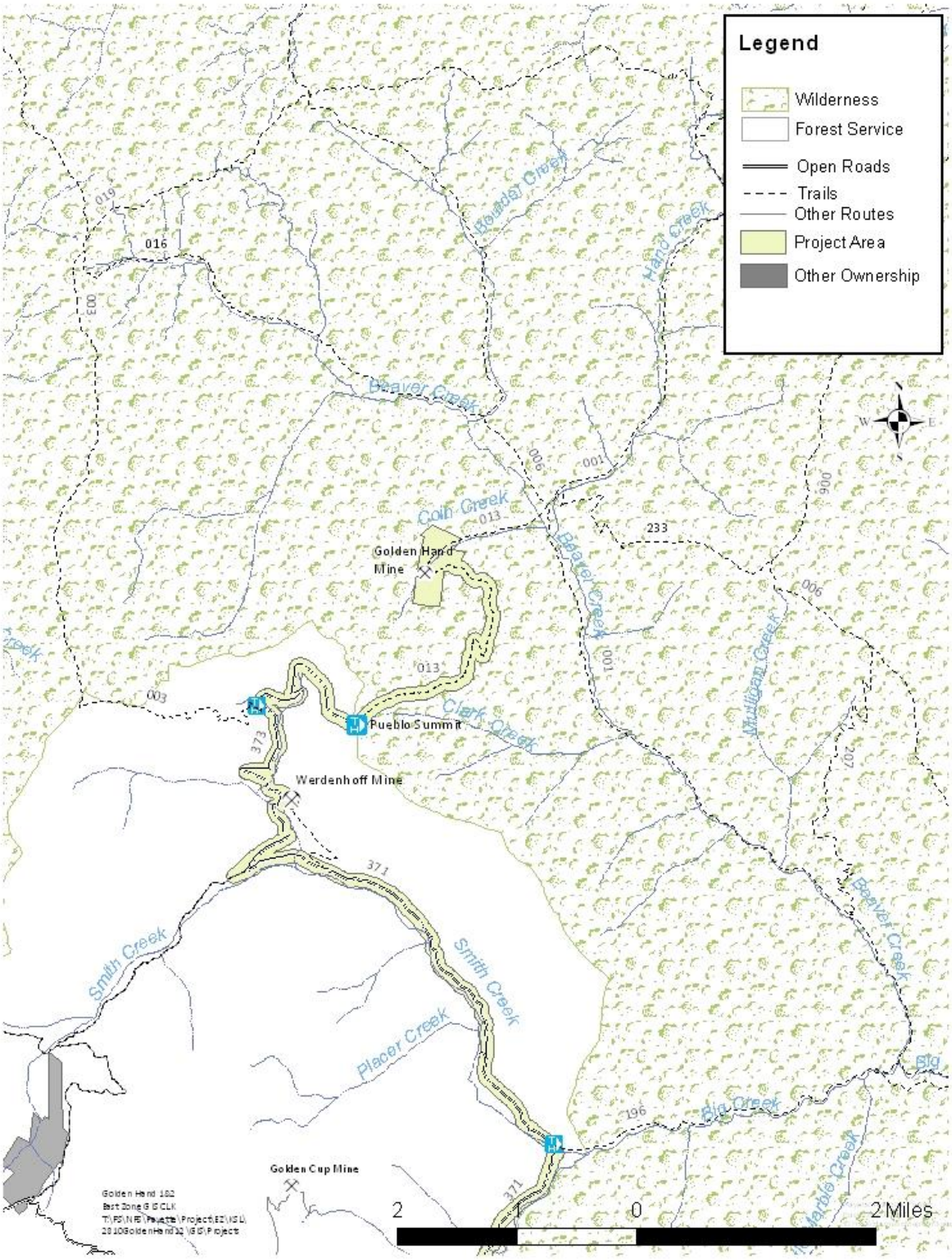


Figure 3-3 Trails and Roads in the Vicinity of Golden Hand

The Pueblo Summit trailhead provides access to the FC-RONR Wilderness along Forest Trail #013. The first 3.0 miles of the trail is an old roadbed that was used to access the Golden Hand area. It is unknown precisely when this road was constructed or if it was originally built for vehicle or wagon traffic. This road was abandoned and has been managed and maintained for use as a non-motorized trail; no active rehabilitation or re-contouring of the old roadbed has taken place. Since the end of the mining operations and abandonment of the road, this route has been maintained to Wilderness trail standards, which includes maintaining an eighteen inch tread and a clearing width of three to four feet from trail center and ten feet overhead. This maintenance has prevented greater deterioration of the old roadbed. A few trees have established in the roadbed and cut banks, and rocks and deadfall have entered the old roadbed. Sloughing of the cut slope has also taken place (Photo 3-2).

Photo 3-2 Forest Trail #013 Tread Width (White Rod Extended to 10 Feet)

The Golden Hand area includes signs of the past mineral activity and occupancy such as a bunkhouse, ice house, cabin, outhouse, and collapsed mill. Old mining equipment, adits, waste rock dumps, and exploration and haul roads are visible in the area. The abandoned exploration and haul roads have become almost impassable, even to those traveling on foot because of the lodgepole pine and dense alder thickets that have become established. Most of the adits have collapsed and the old buildings and structures are in disrepair. Natural processes are clearly at work to re-establish a more natural system.

Northwest of the claims, Forest Trail #013 converts from old roadbed to a Wilderness trail, with an 18-inch trail tread. The trail follows Coin Creek to the Beaver Creek confluence, and ends at the junction with the Chamberlain Trail (Forest Trail #001), approximately 2.5 miles from the Golden Hand.

The Chamberlain Trail is one of the Krassel Ranger District's primary trails that provide the most direct route from the Big Creek / Smith Creek Trailhead to Chamberlain Basin. The Big Creek / Smith Creek Trailhead serves as the access point for the greatest numbers of Wilderness visitors on the Krassel Ranger District (USDA 2011). Based on an assumed registration rate of 30 percent, an average of roughly 215 groups have annually entered the FC-RONR Wilderness via the Big Creek / Smith Creek Trailhead over the past 30 year period (1982-2011).

Mosquito Ridge trail takes off from FR #373, two miles below Pueblo Summit. This is another undeveloped trailhead, with limited parking and no visitor amenities. Some dispersed camping occurs in the area of this trail / road junction and an outfitter works out of the trailhead from September 1 through mid-November. This trailhead is another recognized portal into the FC-RONR Wilderness and accesses the Mosquito Ridge area (trail #003), which offers extensive views into the South Fork of the Salmon River drainage, Beaver Creek drainage, and Chamberlain Basin. Based on a registration rate of 30

percent, an average of roughly 29 groups annually entered the FC-RONR Wilderness via the Mosquito trail over the past 30 years.

Outfitter and Guides
There are two Outfitter and Guides that operate in the vicinity of the Golden Hand: Big Creek Lodge and Outfitters, Inc. and Elk Springs Outfitters. Pueblo Summit trailhead has been used in the past, on an intermittent basis, as an access point to the Wilderness for Big Creek Lodge and Outfitters, Inc. This outfitter more frequently will enter the Wilderness from the Big Creek/Smith Creek Trailhead and operates a camp on Ramey Ridge. The previous Special Use Permit and Operating Plan authorized 250 client service days (any day on the National Forest where an outfitter and guide provides services to a client), most of which occurs in an operating area to the east and adjacent to the project area.

Elk Springs Outfitters enter the Wilderness using Mosquito Ridge Trail #004. An assigned camp is located near Mosquito Springs in close proximity to the divide between the Beaver Creek and South Fork of the Salmon River drainages. Client service activities do occur within the Beaver Creek drainage. Elk Springs Outfitter's current Special Use Permit and Operating Plan authorize 230 client service days. Season of use is generally from September 1 through November 18; however, limited summer use also occurs in some seasons depending on client demand.

Wilderness Character
Roderick Nash suggests that Wilderness can be defined as a "scale between two poles" where "…wilderness and civilization become antipodal influences which combine in varying proportions to determine the character of an area" (Nash 1982). Wilderness then can be defined as "the range closest to the wilderness pole". Wilderness, therefore, incorporates some elements of civilization or human activity, but it is the limited presence of civilization that lends wilderness its unique character.

In the immediate area of the Golden Hand site, the Wilderness character, specific to natural integrity and untrammeled conditions, has been compromised by past human activity. Evidence of human influences associated with past mining activities is clearly visible and the naturalness of the area has been altered. While these mining remnants provide the Wilderness visitor with a sense of history, these past human-related developments at the site compromise the wilderness character of the area by affecting the natural integrity.

Over the entire FC-RONR Wilderness, evidence of past human activities exists. There are 1,398 prehistoric and historic properties that have been identified in the FC-RONR Wilderness, approximately 2,400 miles of trail, and approximately 1,400 inventoried camp locations. The passage of time has allowed the natural processes to begin to take over at many of these locations so that untrammeled conditions (freedom from human control) exist.

The effects on the Wilderness resource can be difficult to quantify and qualify because of the many differing and highly personal views of wilderness and the complexity of this composite resource (USDA 1997). For some members of the public, the effects on ***Wilderness character*** tend to be viewed as an absolute, so that simply knowing that activities are taking place in the Wilderness is an adverse impact (Hendee, et al. 1990). The physical effects on Wilderness character are disclosed under Fisheries and Watershed Resource, Wildlife Resource, and the Soils Resource sections (Section 3.4, 3.5, and 3.6). The social importance of maintaining and protecting a natural ecosystem free from human control and influence is addressed in this section. The social and spiritual values of an intact, un-compromised Wilderness are highly valued as expressed in the public comments on the Proposed Action for this project.

Looking at the wilderness qualities of Undeveloped and Solitude or a primitive and unconfined type of recreation, there is evidence at the Golden Hand site of previous mining activities. The site is an altered environment that has mining remnants such as a waste rock pile, bunkhouse and other facilities, old roads, and adits. To some people, these features at the Golden Hand site represent an environment that has been altered by man, but to others it provides the visitor with a sense of history and independence,

which is consistent with the definition of Wilderness in the Wilderness Act. " …may also contain ecological, geological, or other features of scientific, educational, scenic or historical values" (Section 2. [c]).

Because the site is difficult to access (four to five hour drive from McCall, the nearest full service community) and an hour to an hour and a half hike, the sense of remoteness and the opportunity for solitude is high. Although the claims are only a few miles from the Pueblo Summit Trailhead, it is difficult to get to the trailhead. The limited use of the trail and trailhead provides ample opportunities for solitude and a primitive recreation experience in the area.

When traveling through the FC-RONR Wilderness, there is a sense of tranquility, isolation, and independence. There is little evidence of human modernization and mechanization with the exception of aircraft use at designated airstrips and jet boat use along the Salmon River. When leaving the immediate area of the Golden Hand site, signs of human activity lessen and are sporadic. Visitors can expect to see little to no signs of human impact or mechanization within the interior of the FC-RONR Wilderness, and the wilderness experience is quite high.

The effects on the Wilderness qualities of untrammeled and natural can be difficult to quantify and qualify because of the many differing and highly personal views of wilderness and the complexity of this composite resource (USDA 1997). The effects to undeveloped and solitude are slightly more quantifiable, where the extent of the mining and mining-related activities can have impacts on the visitor's experience of solitude and sense of remoteness, and primitive recreation. Impacts to undeveloped and solitude can be quantified to some elative degree using number of vehicle roundtrips, noise, number of operating years, number of operating hours per day, length of operating season, and amount of physical disturbance (including tree removal, drilling and trenching, and amount of temporary road maintenance).

3.3.1 Environmental Consequences Specific to Alternative A

There would be no new adverse effects to ***Wilderness character*** under Alternative A. Since no activities would take place, the natural and untrammeled conditions at the Golden Hand would continue to be restored through natural processes. With no development, no use of mechanized equipment, and no on-site occupancy, the FC-RONR Wilderness would continue to be perceived as "an enduring resource" protected for present and future generations.

Opportunities for solitude and sense of remoteness and *undeveloped* e recreation would be preserved with no mining or mining-related activities. As the Golden Hand site continues to recover naturally from sporadic activity over the past century, the Wilderness experience is enhanced. The abandoned mining roads are becoming heavily vegetated, and the structures are in various states of decay. Access to the Golden Hand site would continue to be a challenge since the roads to Pueblo Summit would receive no improvement, minimizing visitor use and preserving the current sense of remoteness and solitude in the adjacent Wilderness.

3.3.2 Environmental Consequences Specific to Alternative B

The following activities could affect the **wilderness character qualities of "untrammeled", "natural", "undeveloped", and "solitude or a primitive unconfined type of recreation":**

- Motorized access to claims (up to 771 vehicle roundtrips in the FC-RONR Wilderness per year)
- Motorized equipment use and activity on the claims (up to 24 hour a day basis)
- 4.0 miles of temporary road authorized, maintained, and used in the FC-RONR Wilderness
- Construct and operate 11 drill pads
- Three sample collection for pits / trenches constructed to bedrock
- Reopening and timber of the caved "Ella" adit
- Roughly 4 months of operation per year
- Three years of mineral development activity
- Road maintenance and use of FR #373

- Use of bunkhouse
- Use of bunkhouse area for storage
- Use of Penn Ida for storage
- Use of Penn Ida for rock source
- Water withdrawal and piping
- Ford rehabilitation and decommission

AIMMCO's proposal would allow for an extensive, when viewed from a wilderness perspective, amount of physical disturbance to the Wilderness, which would adversely affect wilderness character by allowing for the greatest amount of human influence and control. Authorization and maintenance of temporary roads on abandoned roadbeds in the Wilderness would involve clearing routes of vegetation and debris. The drilling at 11 sites and excavation of trenches would result in greater access needs and a larger amount of disturbed area. Ground disturbing activities would compromise the preservation of natural and untrammeled conditions in the FC-RONR Wilderness now and for future generations.

Alternative B would allow for motorized and mechanized use in the Wilderness, which is not consistent with wilderness character as stated in the Wilderness Act (Sec 2). This use would adversely affect the natural integrity and untrammeled conditions. Motorized and mechanized use represents human influence and human control or "expanding settlement and growing mechanization" (Wilderness Act Section 2 [a]). The vehicle roundtrips to the Golden Hand would result in frequent motorized entry into the Wilderness (up to 771 vehicle roundtrips in the FC-RONR Wilderness per year).

However as previously noted, the Wilderness Act clearly provides for motorized and mechanized use for mining and processing and uses "reasonably incident thereto" on claims determined to be valid prior to January 1, 1984 (Section 4 [d][3]). Section 5 (b) of the Act provides for permitting the ingress and egress to valid mining claims within designated wilderness … consistent with the preservation of the area as wilderness, by means which have been or are being customarily enjoyed with respect to other such areas similarly situated.

The activities under this alternative involve use of motorized and mechanized equipment and vehicle support both on claims and associated off claim roads in the Wilderness. The actual use and the knowledge of these activities would adversely impact the Wilderness character by compromising the natural integrity and untrammeled conditions of the FC-RONR Wilderness.

Any use or maintenance of the bunkhouse would also adversely affect the natural integrity and untrammeled conditions, being inconsistent with the Wilderness Act's definition of Wilderness as a place "... where man is a visitor who does not remain and is an area of …undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation…" (1964 Wilderness Act, Sec 2[b]).

The vehicle use into the Wilderness would adversely affect the wilderness "undeveloped" quality. Currently, an estimated 15 groups of recreationists enter the FC-RONR Wilderness annually via the Pueblo Summit Trailhead and along trail #013. At the current use levels, it is unlikely that visitors see other Wilderness users on the trail between Pueblo Summit and the mouth of Coin Creek. The approximately 771 vehicle roundtrips would adversely affect those seeking solitude and escape from settlement and mechanization in the Beaver Creek and Hand Creek drainages and the surrounding ridge tops that encompass the project area. During the maximum proposed operating season (approximately July through October) the potential for encountering motorized or mechanized use along Forest Trail #013 from the trailhead to the claims would be high and would greatly impact the sense of solitude and remoteness, and opportunities for a primitive recreation experience. In addition, opportunities to see, hear, or otherwise notice project related activities would exist from some locations both in and outside of the Wilderness.

There would be an estimated 4.0 miles of temporary road authorized, maintained, and used in the FC-RONR Wilderness (including the 3.0 miles of Forest Trail #013). In addition, 11 drill pads would be constructed and sampling trenches / pits would be excavated. This amount of construction and confirmation activity would adversely affect Wilderness experience. Wilderness was created as an area

where man's impacts are unnoticed and where solitude and remoteness, and primeval nature are expected.

The drilling, trenching, and temporary road maintenance would occur under this alternative with the use of mechanized and motorized vehicles, which would result in both noise and possibly dust. The expectation of the Wilderness visitor is to visit a primitive area where one can escape the mechanized and developed world. This would have a large impact on the Wilderness user's sense of solitude and remoteness. This would also impact the primitive recreation experience in the Beaver Creek and Hand Creek drainages and the surrounding ridge tops that encompass the project area. As the visitor leaves the area and ventures further into the Wilderness the direct impacts could lessen; however, the overall experience could be negatively impacted.

Under this alternative, a three year operating period is proposed. The likelihood of encountering motorized and mechanized uses along Forest Trail #013 from the trailhead to the claims is high over that period of time and would affect the Wilderness experience within the Beaver Creek and Hand (Coin) Creek drainages and the surrounding ridge tops that encompass the project area. Generally, access to the FC-RONR Wilderness via Pueblo Summit is from July to November, so there would be limited opportunities over the three year operating period when the public could visit the area without the operations taking place. The longer the operations occur, the longer the impacts would be to the wilderness experience.

The length of operation per day would not be limited under this alternative; therefore Wilderness visitors may experience noise, dust, and lights over a 24 hour work day, adversely affecting solitude and remoteness and opportunities for a primitive recreation experience. All of these practices would affect the "opportunities for solitude or a primitive unconfined type of recreation" experience.

The proposed roadwork on FR #371 and FR #373 would be expected to allow easier access to both Forest Trail #013 and #003, which could encourage an increase in visitation to the Wilderness. Though it would provide improved access to a primitive recreation experience, it could also have adverse impacts on the sense of solitude and remoteness that currently exists in the Wilderness and in the areas accessed by Forest Trail #013 and #003. The impacts at both these unimproved and undeveloped trailheads could increase, where the situation is already marginal in terms of the recreation experience and opportunity being provided and the protections in place.

In summary, under Alternative B, the Wilderness user would see physical impacts to the land, motorized and mechanized equipment, and hear noise and could see dust from these machines from July to November for up to 3 years. This type and amount of development would adversely affect the Wilderness users' sense of solitude and remoteness and enjoyment of a primitive recreation experience in the Beaver Creek and Hand (Coin) Creek drainages, and the surrounding ridge tops that encompass the project area. Motorized intrusions would insure that motorized and mechanical activities overall duration is reduced and limited to the temporary term. Due to the improved access, impacts and changes to the availability of the Wilderness experience and opportunity could reach into the long term.

3.3.3 Environmental Consequences Specific to Alternative C

While covered in detail in the descriptions of the Alternatives in Chapter 2, the principle differences between Alterative B and Alternative C would be:

- Fuel Storage would occur at Werdenhoff rather than within the FC-RONR Wilderness under Alternative C.
- The use of Penn Ida for storage and the associated motorized wilderness travel to access the site would not occur.
- Alternative C would further restrict motorized access to claims (up to 571 vehicle roundtrips in the FC-RONR Wilderness per year).
- Under Alternative C the bunkhouse would not be used as an office.

The effects of this alternative are essentially the same as for Alternative B, in terms of effects on **wilderness character** and the four qualities associated with the character. There is really no pragmatic

or substantially identifiable difference. While not measurable, there would be slightly less impact from Alternative C because the alternative would authorize potentially fewer motorized trips, use of the bunkhouse for an office would not be approved under this alternative, Penn Ida would not be cleared for additional storage, and no motorized travel to the Penn Ida site for general storage would occur.

3.3.4 Cumulative Effects

Cumulative effects to the wilderness resource are limited to the analysis area; therefore, the cumulative effect analysis area would the analysis area for wilderness character. When considering the cumulative effects of the proposed project, including road maintenance, ground disturbance, motorized and mechanized uses, and access into the FC-RONR Wilderness, other impacts to the wilderness character must be considered.

Throughout the FC-RONR Wilderness there are signs of human impacts resulting from current and past occupancy and use of the land. For example, there are 1,398 prehistoric and historic properties identified in the FC-RONR Wilderness and approximately 1,920 inventoried camp locations. These sites are recognized in the Central Idaho Wilderness Act as conforming activities.

The Central Idaho Wilderness Act allows for a number of "nonconforming" activities in the FC-RONR Wilderness. These uses include jet boating on the Salmon River and the landing of aircraft at a number of private, state, and federal landing strips within the Wilderness. Currently, there are eight airstrips operated by the Forest Service for public use in the FC-RONR Wilderness, all of which provide motorized access into the interior of the Wilderness. It is likely that these ongoing uses would continue to increase and impact wilderness character.

Outfitter and Guide activities, recreation use, research activities, noxious weed control, fire management, airstrip maintenance, search and rescue, trail maintenance, and cultural resource management activities can contribute to cumulative effects on wilderness character. Requests for motorized equipment and mechanized transport in the Wilderness occurs on an annual basis. The Forest Service may approve emergency use of helicopters, pumps, and chain saws on a case-by-case basis for Forest Service fire management activities and county search and rescue operations. Outfitter and Guides, aviators, and Forest Service personnel may request the use of motorized and/or mechanized equipment such as wheelbarrows, chain saws, rock drills, and generators for non-emergency purposes. Other agencies and researchers request the use of motorized and mechanized access or equipment in the Wilderness. Based on current trends, it is expected that the number of requests and approvals would continue to increase, with cumulative impacts to wilderness character. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

During fiscal year 2002, there were 49 reported authorizations for administrative use of motorized or mechanized equipment in the FC-RONR Wilderness. While in the most recent year of record (2011), there were 16 separate authorizations reported, which accounted for about 128 instances of motorized / mechanized equipment use (helicopters, chains saws, pumps, air drops of retardant, cargo or smoke jumpers). The full extent of illegal motorized and mechanized intrusions into the FC-RONR Wilderness is unknown, although there are annual reports of incidents.

Alternative A would not contribute to cumulative effects to wilderness character over the entire FC-RONR Wilderness beyond the past, present, or foreseeable future activities.

Alternatives B and C would both allow for many additional days of motorized or mechanized use in the Wilderness that would extend over an estimated 291 acre area that includes temporary roads and the claims. Alternative B and C in combination with ongoing motorized or mechanized use in the FC-RONR Wilderness would add to the authorized use and impact wilderness character.

3.4 Fisheries and Watershed Resource

This section of the document discusses the existing hydrologic characteristics of the watershed, fisheries, and fish habitat, as well as the effects of the Alternatives on those resources. Consultation with the FWS and NOAA on the effects of the proposed project on ESA listed fish has been completed and the Biological Assessments and Biological Opinions are on file in the Project Record. The Golden Hand mining claims are adjacent to Coin Creek, a tributary to Beaver Creek. Coin Creek is fish bearing in its lower reaches. Access roads to the mine are located along portions of Logan Creek, Big Creek, Smith Creek, and North Fork Smith Creek (Figure 3-5). Fish species of concern are also located in these streams.

Analysis Area
The analysis area for fisheries and watershed extends to all subwatersheds (6th level Hydrologic Unit (HU) in which the project area occurs, including: Beaver Creek, Smith Creek, Logan Creek, Big Creek-Little Marble Creek, and Upper Big Creek (Figure 3-4a). The analysis also includes discussion of project access routes through the South Fork Salmon River, East Fork South Fork Salmon River and North Fork Payette River watersheds. For this report the analysis area is synonymous with activity area as defined in the Forest Plan (Figure 3-4b). The streams in this area include Upper Big Creek and its tributaries, including Beaver, Smith, North Fork Smith, Logan and Coin Creeks. Big Creek flows into the Middle Fork Salmon River, and is within the Lower Middle Fork Salmon River 4th level HU. The analysis area was selected because the subwatersheds encompass the entire project area, including primary travel routes. The Big Creek portion of the analysis area was selected because the subwatersheds encompass the entire project area, including primary travel routes. In addition, the magnitude of effects are not expected to be large enough to extend beyond the Big Creek portion of the analysis area. Subwatersheds downstream of the selected analysis area were not included because they are located in Wilderness where management related watershed effects are relatively small and effects will be diluted as flows increase downstream.

The analysis of direct and indirect effects to the fisheries and watershed resources focuses on the portion of the project area from the Big Creek trail head to the Golden Hand claims No. 1 and No. 2 (Figure 2-1). This area includes FR #371 and #373 to Pueblo Summit, the access route down Forest Trail #013 to the claims, and the road up Logan Creek (FR #343). The analysis area of the project area access routes (figure 2) includes routes between McCall and Cascade Idaho to the claim.

The majority of the proposed project activities would occur on the Golden Hand lode mining claims (Figure 3-6, Figure 2-1). The claims are adjacent to an unnamed tributary of Coin Creek, a tributary of Beaver Creek, which, in turn, flows into Big Creek. The project area also includes the travel route between the claims and proposed fuel storage area east of the Walker Mill site (Figure 2-1). This route (16.4 miles) includes FS Trail #013, which is a system trail in the FC-RONR Wilderness that is located on an old road bed, and FR #371, #373, and #343, which are system roads. The travel route occurs within the Smith Creek, Logan Creek, and Coin Creek drainages, which all drain into Big Creek (Figure 3-6).

Water Quality Regulatory Requirements
Congress intended the Clean Water Act of 1972 (Public Law 92-500) as amended in 1977 (Public Law 95-217) and 1987 (Public Law 100-4) to protect and improve the quality of water resources and maintain their beneficial uses. The Clean Water Act (Section 313) and Executive Order 12088 of January 23, 1987 address Federal agency compliance and consistency with water pollution control mandates. Agencies must be consistent with requirements that apply to "any governmental entity" or private person. Compliance is to be in line with "all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution".

Compliance with State requirements for protection of waters within Idaho (Idaho Administrative Code IDAPA 58.01.02) means that "The existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected" and "wherever attainable, surface waters of the state shall be protected for beneficial uses, which for surface waters includes all recreational use in and on the water surface, and the preservation and propagation of desirable species of aquatic life." Further, the Department shall "assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources, and cost-effective and reasonable best management practices (BMPs)

for nonpoint source control". Big Creek, the receiving drainage of Coin and Smith Creeks, is designated as a Special Resource Water by the State of Idaho (Idaho APA 58.01.02).

The Clean Water Act (Sections 208 and 319) recognized the need for control strategies for nonpoint source pollution. The National Nonpoint Source Policy (December 12, 1984), the Forest Service Nonpoint Strategy (January 29, 1985), and the USDA Nonpoint Source Water Quality Policy (December 5, 1986) provide a protection and improvement emphasis for soil and water resources and water-related beneficial uses. Soil and water conservation practices (BMPs) were recognized as the primary control mechanisms for nonpoint source pollution on National Forest System lands. The Environmental Protection Agency supports this perspective in their guidance, "Nonpoint Source Controls and Water Quality Standards" (August 19, 1987).

The Forest Service applies Best Management Practices (BMPs) to achieve Idaho Water Quality Standards. The site-specific application of BMPs, with a monitoring and feedback mechanism, is the approved strategy for controlling nonpoint source pollution. Furthermore construction or maintenance of Forest roads, or temporary roads for moving mining equipment qualify for an exemption from Section 404 dredge or fill permitting requirements, in waters of the United States including wetlands (404)(f)(1)(A), if they are constructed and maintained in accordance with BMPs to assure that flow and circulation patterns and chemical and biological characteristics of the waters are not impaired (404)(f)(1)(E). Appropriate BMPs for this project are described as project design features in Section 2.4.4.

According to Idaho Administrative Code IDAPA 58.01.02, streams in the analysis area are non-designated surface waters and, as such, are protected for beneficial uses, which include all recreational use in and on the water and the protection and propagation of fish and wildlife, wherever attainable. Because waters in the analysis area support cold-water aquatic life and primary or secondary contact recreation beneficial uses, the State of Idaho applies cold-water aquatic life and primary or secondary contact recreation criteria to these waters. The streams in the analysis area are also protected for bull trout spawning and rearing. Water temperatures cannot be caused to exceed ten degrees Celsius daily average during June, July, and August for juvenile bull trout rearing; and nine degrees Celsius daily average during September and October for bull trout spawning.

Section 303(d) of the federal CWA requires Idaho to develop a list of water bodies, subject to U.S. Environmental Protection Agency (USEPA) approval, that fail to meet water quality standards. IDEQ evaluates water bodies and their water quality standards as part of a sub-basin assessment. If a waterbody does not meet the standards, it is considered impaired. States and tribes must publish a priority list of impaired waters every two years. For impaired waters, IDEQ determines the sources of pollutants and sets maximum pollutant levels called total maximum daily loads (TMDLS). Table 3-1 lists approved TMDLS on impaired waters that are within the project area access route sub-basins.

Table 3-1 - Summary of IDEQ Listings of Approved TMDLS on Impaired Waters by Sub-basin

Sub-basin	Name of Creek/Water Segment	Pollutant
Salmon River	Buckhorn Creek	Temperature
	Dollar Creek	Temperature
	Elk Creek	Temperature
	EFSFSR (between Sugar Creek and Meadow Creek)	Combined biota/habitat bioassessments
	Grouse Creek	Temperature
	Johnson Creek	Temperature
	Johnson Creek/Sand Creek/Trout Creek	Combined biota/habitat bioassessments
	Lick Creek	Temperature
	Profile Creek	Temperature
	Rice Creek	Temperature
	South Fork Salmon River	Sediment/Temperature
	South Fork Salmon River/Tyndall Creek	Temperature
	Warm Lake Creek	Temperature

Table 3-1 - Summary of IDEQ Listings of Approved TMDLS on Impaired Waters by Sub-basin

Sub-basin	Name of Creek/Water Segment	Pollutant
North Fork Payette	Fall Creek	Temperature
	Big Creek	Sediment

The *South Fork Salmon River TMDL* (IDEQ 1991) addresses general watershed characteristics and describes water quality impairment due to sediment. The *South Fork Salmon River Sub-basin Assessment* (IDEQ 2002) and *South Fork Salmon River Sub-basin Assessment Addendum* (IDEQ 2003) included additional data and a more comprehensive review of sub-basin characteristics. The EFSFSR was on Idaho's 303(d) list as impaired by sediment downstream from the activity area and was removed for sediment and metal concentrations while the SFSR continues to be impaired for excessive sediment. The SFSR is close to meeting its Total Maximum Daily Loads (TMDLs) sediment targets that would bring it into compliance with State water quality standards for this pollutant and overall is in relatively good condition (IDEQ 2011). Since the original TMDL standard was established in 1991, sediment reduction projects have been implemented by the Forest Service in the South Fork Salmon River basin, including the EFSFSR basin (IDEQ 2011). Sediment TMDL implementation projects completed to date include decommissioning roads and stabilizing roads, trails, and slopes (IDEQ 2011).

The North Fork Payette River Sub-basin Assessment and Total Maximum Daily Load (IDEQ 2005) listed Big Creek as impaired for excessive sediment in the lower reaches. DEQ water body assessment data indicated active bank erosion was the cause of impairment and a TMDL was developed based on an 80% bank stability target.

In 2012, IDEQ published the *South Fork Salmon River Sub-basin Temperature Total Maximum Daily Loads and Revised Sediment Targets* (IDEQ 2012), an addendum to the *SF Salmon River Sub-basin Assessment and TMDL* (IDEQ 2011). TMDLS were established for waterbodies not meeting water quality standards for temperature (Table 3-1). Stream temperature is affected when riparian vegetation canopy shading is reduced from natural and anthropogenic impacts such as landslides and/or wildfires, roads, and timber harvest. Many streams in the South Fork Salmon River Sub-basin have been heavily impacted by recent wildfire resulting in excess solar loads. The lower canyon sections of the major rivers, the South Fork Salmon and Johnson Creek, are in relatively good condition with respect to shade primarily because they are wide with low shade targets to begin with, and are in a more sparsely vegetated dry forest zone (IDEQ 2011). IDEQ made revisions to TMDL sediment monitoring targets for the mainstem and tributaries. The interstitial sediment deposition (tributary South Fork Salmon River target) is any single mean free matrix count over 27 percent or a 5-year mean free matrix count of 17 percent or more. The intra-gravel quality (mainstem South Fork Salmon River target) is a 5-year mean fines < 6.3 millimeters concentrations at depth of 28 percent or less, with no more than 2 years between 28 percent and 36 percent.

Fish Populations

The analysis area provides habitat for three fish species listed as threatened under the Endangered Species Act (ESA, 16 USC 1531 *et seq*.), Snake River Spring/Summer Chinook salmon (*Oncorhynchus tshawytscha*), Snake River Basin steelhead (*O. mykiss gairdneri*), and Columbia River bull trout (*Salvelinus confluentus*), and one Region 4, Payette National Forest sensitive fish species, westslope cutthroat trout (*O. clarkii lewisi*). In addition to being threatened, bull trout are a Payette National Forest (PNF) Management Indicator Species (MIS). Distinguishing between redband trout (AKA rainbow trout) and steelhead is difficult because they are conspecific and no distinction among them is made unless a barrier restricting anadromy is present. Redband trout are resident, fresh water fish; steelhead are anadromous, migrating to and from the sea. Reference to "steelhead" throughout this document would include both anadromous and resident redband trout.

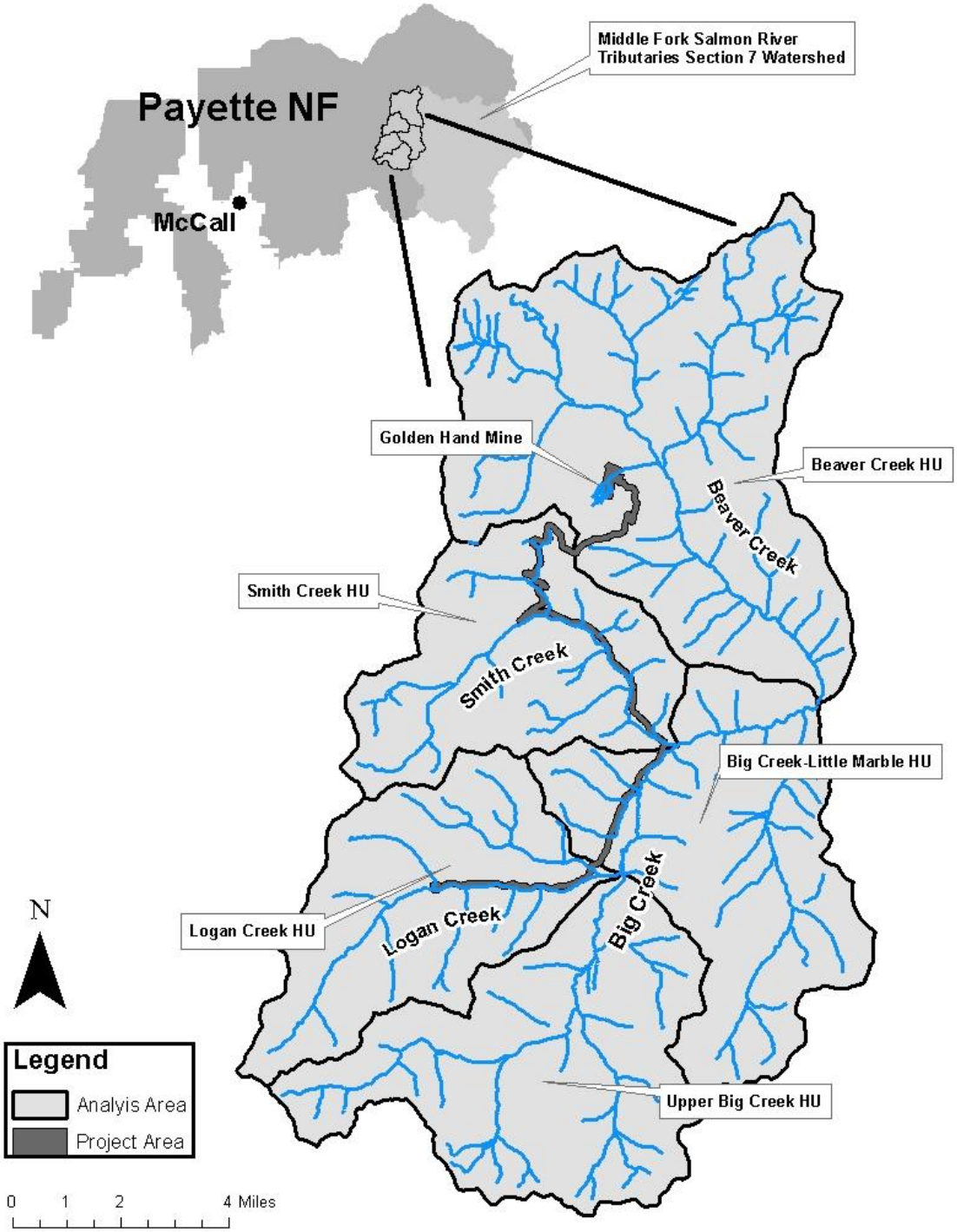


Figure 3-4a. Fishery and Watershed Analysis Area

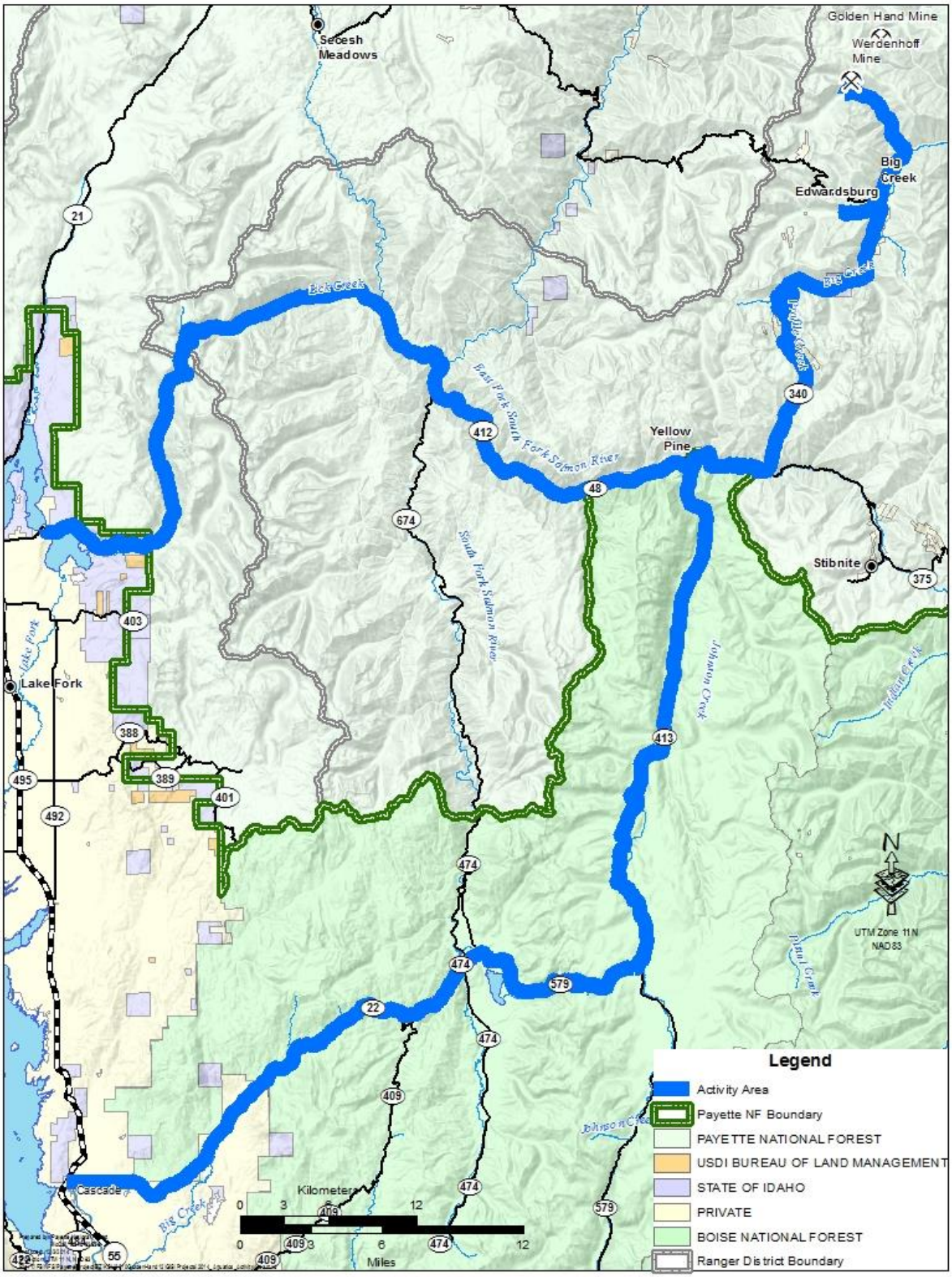


Figure 3-4b. Fishery and Watershed Analysis Area

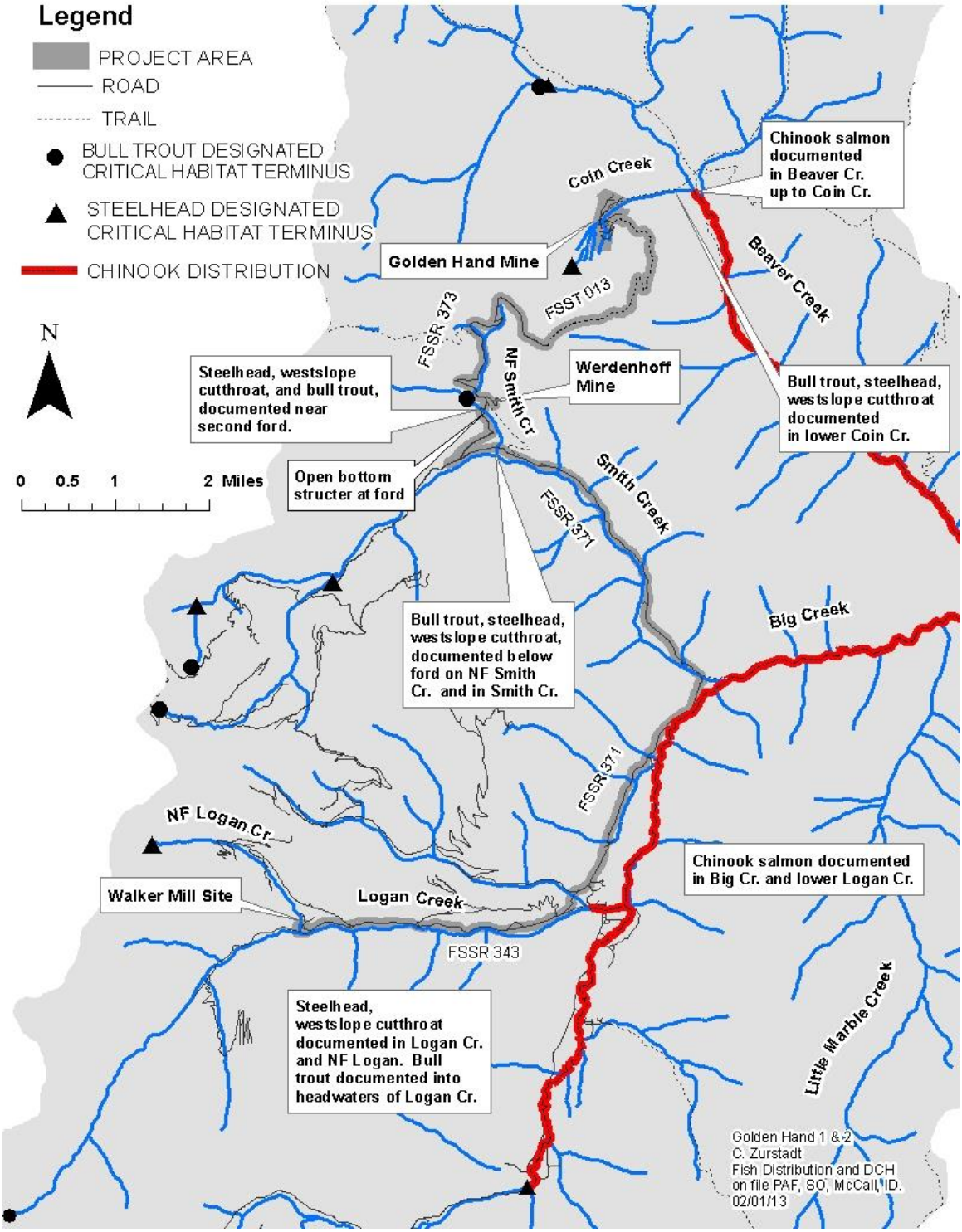


Figure 3-5. ESA Listed, Sensitive, and MIS Fish Distribution, and designated critical habitat in Golden Hand Vicinity. Designated critical habitat for Chinook salmon is coincident with the species distribution and extents into all stream channels with suitable habitat and no natural barriers, such as lower North Fork Smith Creek.

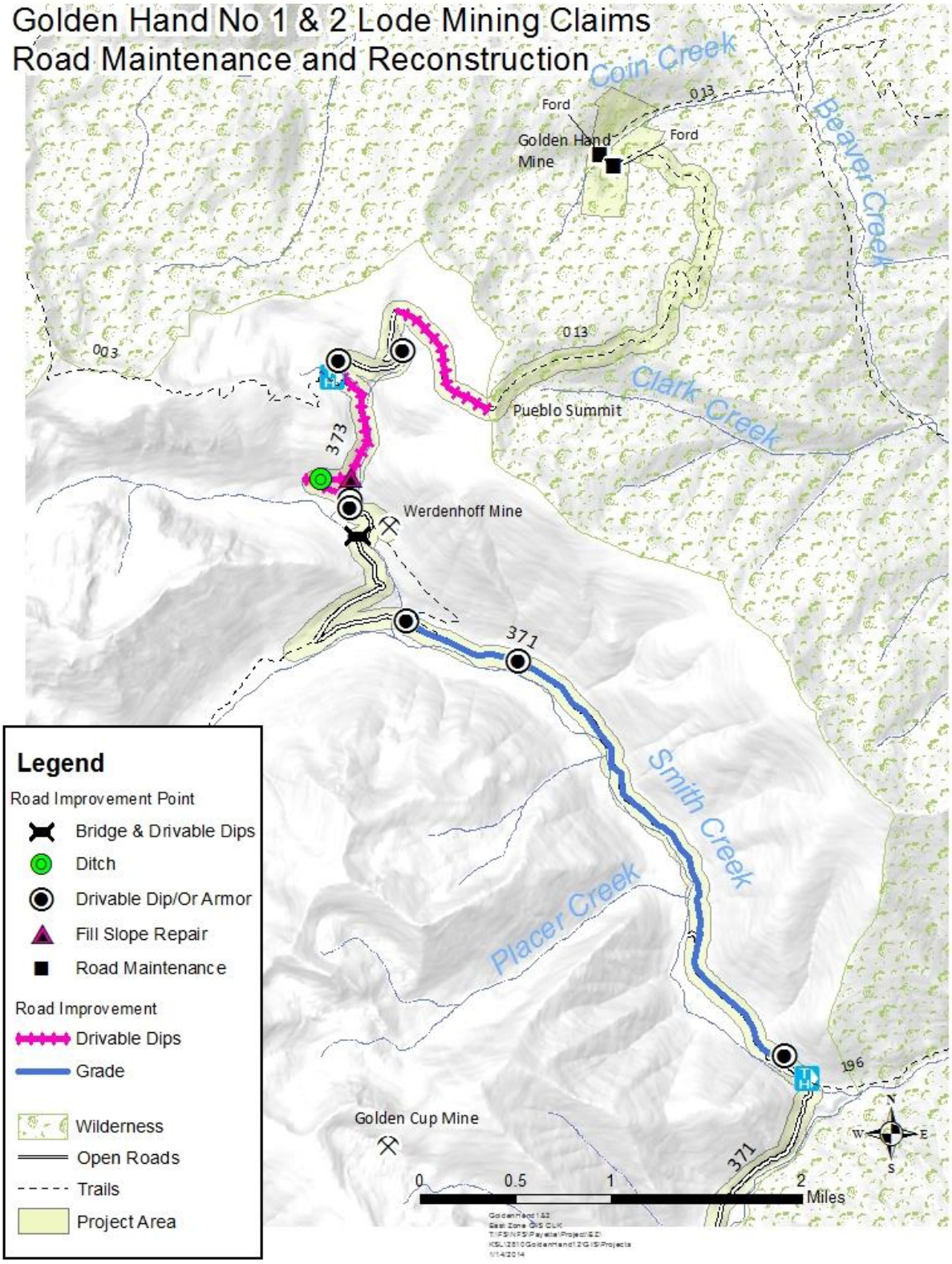


Figure 3-6 Road Maintenance and Reconstruction

The project and analysis areas contain ESA listed as *Threatened*, Forest Service *Sensitive*, and PAF Management Indicator Species (MIS) described below. Raleigh Consultants (Raleigh 1994) conducted fish presence and fish habitat surveys in Coin, Beaver, Smith, Logan, and Upper Big Creeks in 1993 and 1994 using Region 1/Region 4 Habitat Inventory guidelines (Overton et al. 1997). PAF fisheries technicians inventoried portions of Logan, Beaver, Coin, Smith, and North Fork Smith Creeks in 1999 and 2002, 2003, and 2008 (data on file PAF Supervisors Office (SO) McCall, ID) using modified R1/R4 Habitat Inventory guidelines for snorkeling. Additional distribution work was completed by the PAF in 2013 on Smith Creek, North Fork Smith Creek, South Fork Smith Creek, and Logan Creek (data on file Krassel District Office, McCall, ID). PAF fisheries technicians conducted spawning surveys for steelhead in Smith Creek in 2003, and 2004, and bull trout in 2002, 2003, and 2004 (data on file PAF SO, McCall, ID). House et al. (2005) electrofished and inventoried habitat in 2004 and 2005. These data have provided baseline information to evaluate current fish distribution (Table 3-2) and fish habitat condition throughout the Big Creek portion of the analysis area.

Table 3-2 Documented Fish Species Presence (P) or Not Found (NF) in the Big Creek portion of the Analysis Area[a]

Stream	Upper Big Cr.	Coin Creek	Beaver Creek	Smith Creek	NF Smith Cr.	Logan Creek
Chinook salmon	P	NF	P	NF	NF	P
Steelhead (Redband trout)	P	P	P	P	P	P
Bull Trout	P	P	P	P	P	P
Westslope Cutthroat Trout	P	P	P	P	P	P
Brook Trout	P	NF	NF	NF	NF	P
Other	whitefish	NF	whitefish	sculpin	sculpin	sculpin

[a]Raleigh, 1994, House et al. 2005, Zurstadt 2013. Species distribution surveys have been conducted over numerous years by numerous parties. If a species was detected by any particular survey the species is presumed present (P) even if a subsequent survey failed to detect the species. The assumption that the species is still likely present is sound because typical fish distribution surveys often fail to detect fish even when they are present.

Chinook Salmon

Snake River spring/summer Chinook salmon (hereafter referred to as "Chinook salmon") were listed as *threatened* on April 22, 1992 by the National Marine Fisheries Service (NMFS) (57FR14653). Critical habitat for Chinook salmon was established December 28, 1993 (58FR68543). Designated critical habitat (DCH) for Snake River spring/summer Chinook salmon consists of river reaches of the Columbia, Snake, and Salmon Rivers, and all tributaries of the Snake and Salmon Rivers (except for the Clearwater River), and adjacent riparian zones (i.e., 300 feet on either side of the normal high water line [50 CFR 226.205]), presently or historically accessible to Snake River spring/summer Chinook, except reaches above impassible natural falls and Hells Canyon Dam. The analysis area includes streams designated as Chinook salmon critical habitat.

Chinook salmon were documented in Beaver Creek (up to Hand Creek, Zurstadt 2012), Big Creek, and Logan Creek (Raleigh 1994, House et al. 2005, Zurstadt 2013)[1]. No Chinook salmon were identified in Smith Creek, but the streams appear to provide sufficient habitat (Raleigh 1994, House et al. 2005, Zurstadt 2012). The analysis area is part of the Chinook salmon's critical habitat due to historical use. Chinook salmon have not been detected in North Fork Smith Creek or Coin Creek. Chinook salmon occur in some of the streams adjacent to the access routes in the analysis area (data on file PAF SO, McCall, ID)

Steelhead

Snake River steelhead (hereafter referred to as "steelhead") were listed as *threatened* August 18, 1997 by the NMFS (62FR43937). The final rule designating critical habitat for steelhead was published by NMFS on September 2, 2005, and took effect on January 2, 2006 (70 FR 52630). In the case of steelhead, critical habitat includes only the water column and streambed, not adjacent riparian areas. Upper Big Creek, Logan Creek, Smith Creek, Beaver Creek and Coin Creek are all DCH (50 CFR 226.212) (Figure 3-5).

Tributaries of the Middle Fork Salmon River provide principal rearing habitat for steelhead. Spawning habitat is found throughout the analysis area in the Big Creek drainage. Steelhead have been documented in the upper Big Creek, Logan Creek, Smith Creek, North Fork Smith Creek, and Beaver Creek drainages,

including the lower 500 m of Coin Creek (Figure 3-5; Raleigh 1994; House et al. 2005; Zurstadt 2013)[1]. Forest Service surveys (Zurstadt 2013) also documented steelhead in North Fork of Logan Creek. The PNF conducted spawning surveys in Smith Creek in 2003 and 2004, but had minimal success detecting redds. Steelhead spawning surveys in a remote location like Smith Creek and Big Creek are problematic due to access issues in the spring and variable flow conditions during snow melt that can make viewing fish or substrate difficult. Steelhead occur in some of the streams adjacent to the access routes in the analysis area (data on file PAF SO, McCall, ID)

Bull Trout

Columbia River bull trout (hereafter referred to as "bull trout") were listed as *threatened* June 10, 1998 by the United States Fish and Wildlife Service (USFWS) (63FR31647). On October 18, 2010 the USFWS designated critical habitat for bull trout, which includes upper Big Creek, Logan Creek, Smith Creek, North Fork Smith Creek, and Beaver Creek (75 FR 63898) (Figure 3-5). As with steelhead, bull trout critical habitat includes only the water column and streambed, not adjacent riparian areas. Bull trout is the only aquatic MIS for the Payette National Forest (Forest Plan p. E-3).

Bull trout have been documented in the analysis area in Big Creek, Logan Creek, Smith Creek, North Fork Smith Creek, and Beaver Creek, and the lower 500 meters of Coin Creek (Figure 3-5; Raleigh 1994, House et al. 2005, Zurstadt 2013)[1]. Forest Service surveys (Zurstadt 2013) have also documented bull trout in the North Fork of Logan Creek. Spawning bull trout (fluvial and resident based on relatively small the size of fish observed) were identified in Smith Creek below the confluence of the North Fork Smith Creek (Zurstadt 2013). Bull trout occur in some of the streams adjacent to the access routes in the analysis area (data on file PAF SO, McCall, ID)

Westslope Cutthroat Trout

Westslope cutthroat trout are designated as *sensitive* species by the Intermountain Regional Forester. Westslope cutthroat trout were petitioned in 2000 for listing (65FR20120) under the Endangered Species Act but were not approved for listing by the USFWS (65FR21020). Critical habitat is not designated for sensitive species. Westslope cutthroat trout occur throughout the analysis area including Beaver Creek, lower Coin Creek, Smith Creek, North Fork Smith Creek, and Logan Creek (Figure 3-5).

Westslope cutthroat trout have been documented in the Logan Creek, Smith Creek, North Fork Smith Creek from the mouth to upstream of the 2nd ford, Beaver Creek, and upper Big Creek drainages, in the North Fork of Logan Creek, and in the lower 500 meters of Coin Creek (Figure 3-5; Raleigh 1994; House et al. 2005, Zurstadt 2013) [1]. Westslope cutthroat trout occur in some of the streams adjacent to the access routes in the analysis area (data on file PAF SO, McCall, ID)

Other Fish Species

Other fish species that occur in the analysis area include mountain whitefish (*Prosopium williamsoni*), sculpin (*Cottus* spp.) and brook trout (*S. fontinalis*), which are an introduced species. In some areas of the PNF brook trout are considered a risk to bull trout population viability (Burns et al. 2005). Brook trout were observed in upper Big Creek, Logan Creek in 1993, and in Lick Creek in 1999. Brook trout were not detected in surveys of Logan Cr., NF Logan Cr., and Government Cr. in 2004. No brook trout have been detected in Smith Cr. Hybridization between brook trout and bull trout is likely, but the extent is unknown. (Burns et al. 2005, Zurstadt 2013).

Fish Habitat Conditions

Habitat data were compared with Forest Plan Watershed Condition Indicators (WCIs) to assess if habitat parameters are functioning appropriately, functioning at risk, or functioning at unacceptable risk (USDA 2003, 2010 pp. B-12-21). Forest Plan WCIs provide a means to assess how management actions may influence the condition and trend of aquatic resources, including native and desired non-native fish (USDA 2003, 2010 pp. B-12-21). The functioning appropriately value for WCIs can also be interpreted to indicate desired future condition for various habitat parameters. The time scales for effects analysis are defined in

[1] Species distribution surveys have been conducted over numerous years by numerous parties. If a species was detected by any particular survey the species is presumed present even if a subsequent survey failed to detect the species. The assumption that the species is still likely present is sound because typical fish distribution surveys often fail to detect fish even when they are present.

the Forest Plan as temporary (0-3 years), short-term (> 3 years to 15 years), and long-term (>15 years) (USDA 2003, 2010 p. III-4).

The Forest Plan Appendix B, provides options and criteria for Riparian Conservation Area (RCA) deliniation (USDA 2003, 2010, p. B-33). Option 1 was selected, which uses 300-foot slope distance from the ordinary high water mark on perennial streams, and 150-foot slope distance from the ordinary high water mark on intermittent streams.

Since the early 1990's, various fish habitat inventory and monitoring occurred in portions of the analysis area. Temperature data have been collected with varying levels of consistency from 1994 - 2010. These surveys have provided the baseline information to evaluate current condition throughout the project area. The Mineral and Soil Resource Section (Sections 3.2 and 3.5) provides additional detail on geologic characteristics, soil types, landslide potential, and riparian condition and channel characteristics.

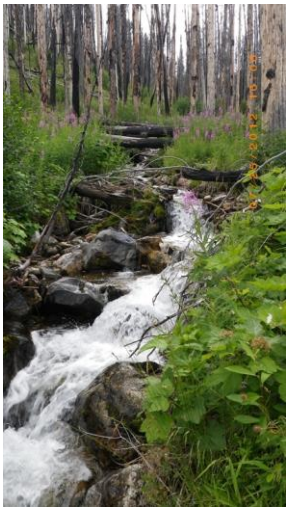
In general, the following information describes habitat conditions in streams in the Big Creek portion analysis area and photographs of typical stream reaches are contained in Photo3-3.

- Channels contain abundant large woody debris.
- Cobble embeddedness exceeds 19 percent at all sites except Big Creek near the confluence with Smith Creek.
- Road density is low overall, but concentrated in RCAs, and over 20 miles of road are within 200 feet of streams.
- Stream temperatures are cool (generally below 12ºC).
- Streams have no known chemical contamination.
- Channels are steep and entrenched, streams are cascading (Rosgen Type A) or moderately entrenched, riffle-dominated (Rosgen Type B).
- Channel average widths range from 1.7-10.2 meters.
- Channel average depths range from 0.05-0.33 meters.
- Width to maximum depth ratios are less than 10.
- Stream banks are stable.

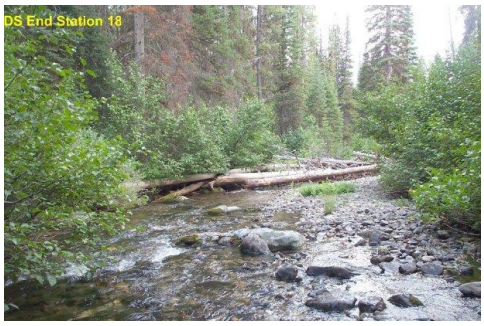
It was determined that the following WCIs were relevant for the analysis of effects for the proposed project: interstitial sediment deposition, change in peak/base flows, and chemical contaminants. The baseline condition and project effects to these WCIs are discussed in more detail than other WCIs. Inventory data are on file at the PNF Supervisors Office (Zurstadt 2013) and detailed information on current condition of all WCIs can be referenced in Appendix B, Table B. Discussion of habitat condition along access routes is restricted to interstitial sediment deposition and chemical contaminants because those are the only indicators with potential for effect from increased traffic. Since the potential for effects along access routes is very limited, the majority of discussion focuses on the Big Creek portion of the analysis area where measurable effects could occur.

Photo 3-3. Photographs of Streams within the Project Area

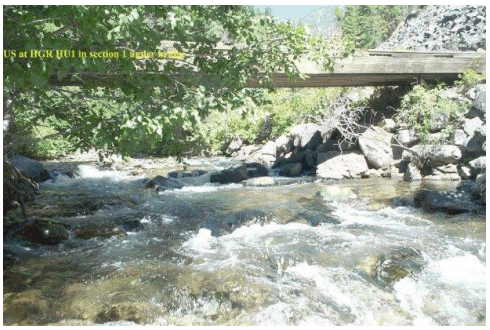
Coin Creek near old bunkhouse



Coin Creek near confluence with Beaver Creek



Beaver Creek downstream of Coin Creek



Beaver Creek at confluence with Big Creek

North Fork Smith Creek upstream of second ford Creek

Smith Creek downstream of North Fork Smith

Interstitial Sediment Deposition
The current condition of the interstitial sediment deposition indicator is determined by summarizing data on fine sediment levels in the analysis area using measures of cobble embeddedness and surface fines.

Cobble embeddedness is the degree in which cobble substrate (e.g., substrate particles ranging from approximately 45 to 300 mm) are surrounded or covered by fine sediment. The rearing capacity of salmon habitat is decreased as cobble embeddedness levels increase. Suttle et al. (2004) found that growth and survival of juvenile steelhead declined with a measure of increasing substrate embeddedness.

Surface fines are sediment particles less than 6 mm that are visible on the surface of the streambed. An estimate of the percent of streambed surface covered by fine sediment is used by the Forest Service as an indicator of fine sediment levels within the streambed; however, a clear relationship between surface fines and salmonid survival and growth has not been established.

Based on the most current data, the interstitial sediment deposition indicator is rated Functioning at Unacceptable Risk within the Big Creek portion of the analysis area. The rating is based on values for cobble embeddedness and free matrix (a surrogate for cobble embeddedness) that are Functioning at Risk or Functioning at Unacceptable Risk at all sites except for Big Creek near the confluence with Smith Creek (Appendix B, Table B-1). In addition, many of the surface fines estimates are Functioning at Risk or Functioning at Unacceptable Risk. Adjacent to the project area access routes, interstitial sediment deposition ranges from Functioning Appropriately to Functioning at Unacceptable Risk.

Sediment Deposition Related to Road Density and Location
Several studies document fish habitat or fish density changes associated with road density. Nelson et al. (2004b) evaluated relationships between road density and fish habitat attributes on the Payette National Forest, and found that sediment deposition (e.g., percent surface fines) was positively correlated with road density. Similar trends in sediment delivery and road density were documented in Montana (McCaffery et al. 2007) and were modeled for the Oregon Coast range (Luce et al. 2001).

RCAs include riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems. Protection of these areas is vital in maintaining current and future sources of large woody material, intact riparian vegetation communities, and functional ecological processes of temperature regulation (water, air, and soil). Protection of RCAs is often accomplished by delineating riparian area buffer, and restricting or prohibiting management activities, such as roads, within these areas (USDA 2003, 2010). There are approximately 33 miles of road within RCAs in the Big Creek portion of the analysis area, with Smith and Logan Creeks having the highest mileages (Table 3-3).

Table 3-3 Roads and Road Density within RCAs in the Big Creek Portion of the Analysis Area

	Road Length (miles)				Road Density (mi/mi^2)					
	Big Creek Portion Analysis Area		In RCAs[c]		Big Creek Portion Analysis Area			In RCAs[c]		
Analysis Area 6th Hucs	**System[a]**	**Un-authorized[b]**	**System[a]**	**Un-authorized[b]**	**System[a]**	**Un-authorized[b]**	**Total**	**System[a]**	**Un-authorized[b]**	**Total**
Beaver Cr	0	4.7*	0	1.2[c]	0	0.1	0.1	0	0.2*	0.2
Big Cr-Little Marble Cr	2.8	2.1	1.1	0.5	0.1	0.1	0.2	0.3	0.1	0.4
Logan Creek	11.6	21.3	6.7	5.3	0.5	1.0	1.5	2.2	1.8	4.0
Smith Creek	16.1	10.1	7.6	2.7	0.8	0.5	1.3	2.4	0.8	3.3
Upper Big Creek	9.4	9.2	4.9	3.3	0.3	0.3	0.7	1.0	0.7	1.7
Overall	**39.8**	**47.3**	**20.5**	**12.8**	**0.3**	**0.3**	**0.6**	**0.9**	**0.6**	**1.5**

[a]System: roads wholly or partially within or adjacent to NFS lands needed for long-term motor vehicle access, including state roads, county roads, privately owned roads, NFS roads, other FS authorized roads.
[b]Unauthorized: roads not constructed or maintained or intended for long-term use.
[c]RCAs estimated from GIS stream layer by placing 150-ft. buffers around intermittent streams and 300 ft.-buffers around perennial streams.
[d]A non-motorized trail (#013) is located on 2.8 miles of old road bed, which is classified as unauthorized road in this table.

About half the roads in the Big Creek portion of the analysis area are system (39.8 miles), and half are unauthorized (47.3 miles). System roads in the Big Creek portion of the analysis area are native-surface roads used by miners, hunters, and the general public. These roads are occasionally maintained. Unauthorized roads in the Big Creek portion of the analysis area are not open for public use and are not maintained.

Overall, system road densities across the watersheds are low (0.3), but the combined densities of system and unauthorized roads in RCAs are of concern at 1.5 miles per square miles of RCA (Table 3-3).

Road densities are generally low when measured across watersheds (Table 3-3). The highest (system and unauthorized combined) road densities are located in Logan Creek (1.5 mi/mi^2) and Smith Creek (1.3 mi/mi^2). The highest (system and unauthorized combined) road densities in RCAs occur in the Logan Creek subwatershed. Of the 87.1 miles of roads in the Big Creek portion of the analysis area, 33.3 miles (38 percent) are located within RCAs.

Sediment travel distances and buffer strip efficiencies vary based on geologic erosion factors, road location, design, and the application of BMPs to control sediment flows. Erosion from roads generally increases when motorized use increases (Dexter et al. 2008; Bilby et al. 1989; Reid and Dunne 1984). Sediment delivery to streams from roads increases substantially when the roads are within 200 feet of the stream channel (Belt et al 1992). The largest sediment loss occurs in the first two or three years after construction or reconstruction. Sediment loss usually decreases substantially after those initial few years, as the cut and fill slopes stabilize and become revegetated (Burroughs and King 1989, Ketcheson and Megahan 1996). Logan and Smith Creek are the most notable having 8.2 and 6.0 miles within 200 feet of a channel. Over 20 miles of system and unauthorized roads occur within 200 feet of stream channels within the Big Creek portion of the analysis area (Table 3-4). On steep slopes derived of gneiss and schist parent materials in the Nez Perce National Forest in Idaho, Burroughs and King (1989) found that 90 percent of the non-channelized sediment traveled less than 88 feet below outsloped roads, and 90 percent of the channelized sediment from insloped roads traveled 200 feet or less. In a study based on a model of sediment yields by road lengths and buffer strips, the model showed that road segments between cross drains 10 meters or less in length had no noticeable sediment yield at any slope as long as a 10-meter buffer was in place. In this modeling study, Morfin and others (1996) showed that 80-100 percent of the sediment was trapped on a buffer strip 130 feet wide for any road length or slope in the Idaho climate.

Table 3-4 Miles of Road Within 200 Feet of Stream Channels in the Big Creek Portion of the Analysis Area

6th Field HUC	Road Length (miles) within 200 Feet of Stream Channels		
	System[a]	Unauthorized[b]	Total
Beaver Cr	0	0.9 [c]	0.9
Big Cr-Little Marble Cr	0.4	0.3	0.7
Logan Creek	4.8	3.4	8.2
Smith Creek	4.4	1.6	6.0
Upper Big Creek	3.2	1.9	5.1
Overall	**12.9**	**8.0**	**20.9**

[a]System: roads wholly or partially within or adjacent to NFS lands needed for long-term motor vehicle access, including state roads, county roads, privately owned roads, NFS roads, other FS authorized roads.
[b]Unauthorized: roads not constructed or maintained or intended for long-term use.
[c] A non-motorized trail (#013) is located on 2.8 miles of old road bed, which is classified as unauthorized road in this table.

The road density and location indicator is rated at Functioning at Unacceptable Risk overall within the Big Creek portion of the analysis area.

Sediment Delivery from Roads

Roads are generally the primary source of accelerated erosion and management-related sediment on National Forests (Gucinski et al. 2001). The areas of highest sediment delivery are within Riparian Conservation Areas (RCAs) where roads either run parallel to or across streams and wetlands. Excessive sedimentation can increase width/depth ratios, reduce pools, and increase fine sediment on the streambed, which can adversely affect cold-water biota and other beneficial uses (Gucinski et al. 2001).

Soil erosion and sedimentation from roads is controlled by a variety of environmental factors that affect soil particle detachment and movement down slope. Key factors that influence the amount of sediment delivery include slope, soil and climate (Elliot et al. 1999). Soils within the analysis area are derived from predominantly metamorphic rocks, and are more cohesive and less erodible than soils derived from granitic rocks of the Idaho Batholith. Geologic erosion factor estimates for this area are approximately one third those found in the Idaho Batholith (Arnold 1988). Sediment production and delivery has also been positively correlated with traffic volume (Reid and Dunne 1984, Luce and Black 2001).

The largest sediment loss from roads occurs in the first two or three years after construction or reconstruction. Sediment loss usually decreases substantially after those initial few years, as the cut and fill slopes stabilize and become revegetated (Burroughs and King 1989, Megahan and Ketcheson 1996). Sediment travel distances and buffer strip efficiencies vary based on geologic erosion factors, road location, design, and the application of BMPs to control sediment flows. On steep slopes derived of gneiss and schist parent materials in the Nez Perce National Forest in Idaho, Burroughs and King (1989) found that 90 percent of the non-channelized sediment traveled less than 88 feet below outsloped roads, and 90 percent of the channelized sediment from insloped roads traveled 200 feet or less. In a study of sediment yields by road lengths and buffer strips (Morfin et al. 1996), modeling showed that road segments between cross drains 10 meters or less in length had no noticeable sediment yield at any slope as long as a 10-meter buffer was in place. This modeling study also showed that 80-100 percent of the sediment was trapped on a buffer strip 130 feet wide for any road length or slope in the Idaho climate.

Road-related concerns identified during road surveys conducted during 2002 in the project area included downcutting of inslope ditches, eroding banks at stream crossings, and insufficient drainage of the road surface causing rutting and a loss of surface fines (Figure 3-6 displays the road maintenance and reconstruction designed to mitigate these concerns). The major concern associated with stream crossings was the need to replace fords with culverts or bridges or armor the crossing approaches. Sediment delivery from the identified locations was analyzed using numerical models.

There are several models available that are designed to quantify sediment delivery from roads to streams. The two models used for this analysis are The Water Erosion Prediction Project (WEPP) model and the Geomorphic Road Analysis and Inventory Package (GRAIP). The WEPP model was used to estimate the existing condition and to compare the effects of different alternatives, while the GRAIP model was only used to estimate the existing condition. Although the estimated existing sediment delivery differs by an order of magnitude between the two models, it is the relative difference between alternatives modeled with WEPP that is of most relevance to this analysis. The Soil and Water Specialist Report (Project Record) and Zurstadt and Rygh (2014) provide further discussion of the two models, and their application to the project.

The model WEPP:Road is an interface to the primary WEPP model that is designed to predict runoff and sediment yield specifically from roads (Elliot et al.1999). The WEPP:Road sediment model predicts sediment delivery from a road segment on a yearly basis using average slope, local climate, soil type, cross drain spacing, road width and a vegetative buffer component (Elliot et al. 1999). The model was used to predict and compare project and management-induced sediment delivery between existing conditions (Alternative A) and the action alternatives. For most midslope forest roads, only those road segments and fillslopes near stream crossings have a high potential to contribute eroded material to streams (Burroughs and King 1989). Therefore, only road segments at stream crossings were quantitatively evaluated in the analysis.

Within the project area, WEPP existing condition model results for FR 371 and 373 outside the Wilderness show a total of 6,120 pounds/year of sediment is delivered to streams under existing conditions (Project Record). The two stream crossings on Forest Trail 013 were also modeled. Results of that effort estimate that the two crossings contribute about 40.4 pounds of sediment per year. The GRAIP existing condition model predicted 35 metric tons of sediment delivery per year from the Smith Creek Road (FR 371) up to the North Fork Smith Creek and the Pueblo Summit Road (FR 373).

Chemical Contaminants and/or Nutrients

The potential contaminants of concern are heavy metals and petroleum products. The literature describing the toxic effects of heavy metals on fish is voluminous. Klein et al. (1987) provide a long list of citations to toxicity studies for specific metals. Metal concentrations for waters designated for aquatic life can be found in IDAPA 58.01.02. Fuels and petroleum products (e.g., fuel, oil, hydraulic fluid) are moderately to highly toxic to salmonids, depending on concentrations and exposure time (Mason 1991). Fuels and other petroleum products that leak or are spilled can directly poison salmonids and their aquatic invertebrate food source. Free oil and emulsions can adhere to gills and interfere with respiration, and heavy concentrations of oil can suffocate fish. Evaporation, sedimentation, microbial degradation, and hydrology act to determine the fate of fuels entering fresh water (Mason 1991). Leakage of fuel, oil, or hydraulic fluid from drilling equipment poses a risk to the environment.

Surface water quality data in the area is limited to a single water sample taken from Coin Creek below the historic mining disturbance in October 2002. Chemical analysis determined that all metals in the sample were below detection limits. All of these metal concentrations are below the applicable surface water quality standards (IDAPA 58.01.02) except for cadmium and mercury. Due to the detection limits of the specific analytical method used for cadmium it is unknown if the concentrations are above or below the acute aquatic life standards. For the same reason the mercury concentration is known to be below acute aquatic life standards, but may be above or below chronic aquatic life standards. A water sample was taken from adit drainage that infiltrates into a waste rock dump located on the nearby Golden Hand #4 claim. The water sample showed total dissolved metal concentrations below the detection limits for all metals except for lead (1 µg/L). All metal concentrations are below the applicable groundwater quality standards (IDAPA 58.01.11). Bookstrom (1998) notes that mine drainage waters from the type of ore deposits that have previously been mined at the Golden Hand are “not likely to be strongly acidic, or to have high contents of dissolved metals.”

No water quality testing was done for petroleum products because there is no evidence of fuel or petroleum product spillage from previous operations at the mine site. Roads are located adjacent to Big Creek and its tributaries, and the possibility of a toxic fuel spill exists.

For upper Big Creek watershed the chemical contaminants and/or nutrients indicator is rated FA in the analysis because there are no 303d water quality limited water bodies, and there is no evidence of contamination from past mining actions (Jim Egnew, Minerals, PAF, personal communication, 2011).

Change in Peak/Base Flows
Stream flows are a critical part of fish habitat and viability. Changes in flow can reduce fish habitat by increasing stream temperatures, resulting in reduction of productivity, and access to habitat (i.e., pools) (Spence et al. 1996). The stream flows for the project area are generally high in spring during snowmelt and during winter rain-on-snow floods, and generally low in late summer and during winter stream freeze-ups. Where low flows are caused to be extreme, the reduced living space, reduced cover availability, and elevated temperature can significantly reduce fish populations (Orth and White 1993). Maintenance of ninety percent of normal stream flow contributes substantially toward the protection of fish migration, spawning and other life stages at and downstream of diversions (Orth and White 1993). Tennant (1976) found that habitat characteristics such as velocity, wetted width, depth, and discharge, change dramatically when flows are reduced to below 10 percent of average annual flow. The magnitude of effect and rate of change decline significantly when flows are greater than 60 percent of the average annual flow (Tennant 1976).

There are a number of State water rights for irrigation, domestic, culinary, and hydropower use in the Big Creek portion of the analysis area. Water rights with recent or current Forest Service authorization in the Big Creek portion of the analysis area total 4.55 cfs. There are water rights for an additional 1.3 cfs without Forest Service authorization and the extent of actual use is currently unknown. Some of these diversions withdraw more than 10% of base flows from smaller fish bearing tributaries.

Using the USGS flow prediction model (USGS 2011) the lowest predicted flows for Big Creek below the confluence with Beaver Creek occur in October when flows are estimated to exceed 64.8 CFS 80 percent of the time. Base flow in Beaver Creek near Big Creek has been estimated at 40 CFS (Raleigh 1994), and the lowest predicted flow (USGS model) occur in October when flows are estimated to exceed 28.1 CFS 80 percent of the time.

There are currently no diversions in Coin Creek or Beaver Creek. Coin Creek near Forest Trail #013 crossing was estimated at 0.5 CFS on two separate occasions (Raleigh 1994; 2010 data on file Project Record), and 1.9 cfs on July 29, 2012. Flow near the mouth of Coin Creek has been estimated at 6.25 CFS (Sept. 8, 2008), and 3.35 CFS (July 30, 2002) and as low as 0.71 CFS on September 23, 1993 by Raleigh (1994).

The indicator for peak/base flows in the Big Creek portion of the analysis area is considered Functioning at Risk for Big Creek due to the influence of the various diversions on tributaries to Big Creek, and Functioning Appropriately for Coin and Beaver Creek (Beaver Creek 6th HU) where no diversions occur.

3.4.1 Environmental Consequences Specific to Alternative A

This alternative would have no direct or indirect effects on any watershed condition indicator (WCI), fish habitat, or fish populations. This alternative would have no influence on the existing functionality ratings of the WCIs in the analysis area.

3.4.2 Environmental Consequences Specific to Alternative B

Detailed information on the effects to all WCIs can be referenced in Appendix B.

3.4.2.1 Interstitial Sediment Deposition

Interstitial Sediment Deposition Related to System Road and Temporary Road Use Outside of the FC-RONR Wilderness
Prior to mobilizing equipment to drilling areas, approximately 8 miles of system road outside of the FC-RONR Wilderness (Smith Creek Subwatershed), FR #371 and #373, would be maintained and

improved reducing WEPP modeled sediment delivery to stream channels in the temporary, short, and long term (Table 3-5). The model does not account for temporary increased sediment from ford reconstruction or road maintenance. The road would be improved in the following ways:

- Construct driveable dips where appropriate along FR #371 and #373.
- Place coarse and well graded aggregate on approximately 500 feet of road surface.
- Construct an insloped ditch on FR 373 for approximately 450 feet.
- Repair a small (approximately 50 linear feet of road) section of road fill on FR 373 by adding additional material. At the same location, widen a section of FR 373 by further cutting into the slope.
- Install a box culvert/steel arch pipe capable of Aquatics Organism Passage (AOP) on FR 373 at the North Fork Smith Creek near Werdenhoff. Improve the road alignment on both sides of the stream to straighten the approaches.
- Armor approaches to a number of North Fork Smith Creek crossings of FR #371.
- Raise the road surface where substantial portions of road with poor drainage exist.

Approximately 0.1 miles of temporary road would be authorized on an old road bed to access the Werdenhoff site where crew camping would occur. The total number of trips within the FC-RONR Wilderness by motorized vehicles is estimated to be 771 per operating season.

Total trips into the Werdenhoff from outside the project area and from the fuel storage facility near the Walker Mill site would not exceed 600 trips per year. Increased motorized travel on the system road from the fuel storage area near the Walker Mill site (on Logan Creek) to Smith Creek (Figure 2-1) is not expected to cause a measurable increase in sediment over baseline because the roads are in good condition (i.e., gravel, bridges, culverts, more maintenance) and travel would mostly be limited to fuel transport. Due to the short length and long distance from a stream, use of 0.1 miles of temporary road to access the Werdenhoff is not expected to result in measurable sediment delivery to streams channels.

Road stream crossings can be a major point of sediment delivery from roads (Gucinski et al. 2001; Taylor et al. 1999; Furniss et al. 1991). Fording can increase sediment delivery in three ways: Wave action from fording vehicles eroding streambanks, tire rutting concentrating surface runoff on approaches, and water draining off vehicles and eroding approaches (Brown 1994). Fording streams can also temporally increase turbidity by mobilizing fine material in the substrate of the ford. This type of turbidity represents redistribution of fine sediment within the channel rather than increased sediment yield from sources outside the channel. Although suspended sediment can kill fish at high concentrations (Waters 1995), it is not usually considered an important source of mortality. Turbidity can reduce the ability of fish to locate food and can damage respiratory tissues (Waters 1995), but short-term increases in turbidity are most likely to result in simple avoidance of turbid water. There are approximately nine stream crossings (all fords) along FR #371 and #373 including two fords of the North Fork Smith Creek. An open bottom stream crossing structure (e.g., arch pipe, cement box, or bridge) would be installed at the second upstream ford of North Fork Smith Creek (Figure 3-3), which would reduce turbidity generated from fording. Additional road improvements (e.g. graveling approaches to stream crossings, cross drains) and maintenance would offset sediment delivery in the temporary to long term (as long as maintenance occurs) generated from increase motorized use (Table 3-5). The approaches to fords are naturally rocky and well armored and approaches would be further armored by adding rock; therefore, sediment delivery from wave action, rutting, or water draining off vehicles is not likely. Installation of an open bottom structure on North Fork Smith Creek near the Werdenhoff would prevent turbidity. Sediment delivery could increase temporarily during installation of dips, adding rock to road, and other road maintenance, but the project design features described in Chapter 2.2.4 would minimize delivery.

Table 3-5 WEPP model sediment yield[b] (lbs) for roads by alternative.

Alternative	Sediment Yield (lbs) Outside Wilderness FR #371 and #373 [a] Temporary to Long Term	Sediment Yield (lbs) Inside Wilderness Temporary to Short-Term	Sediment Yield (lbs) Inside Wilderness Long-Term
A	6,120	40.4	40.4
B	180	1.2	0.7
C	180	1.2	0.7

[a] WEPP output from McGreer (2005).
[b] The model does not account for temporary increases in sediment from repair of ford or road maintenance.

Traffic from outside the Project Area
Increased motorized travel to the project area along Lick Creek (FR 412), Johnson Creek (FR 413), South Fork Salmon River (FR 674), and the Warm Lake Road (FR 579) is not expected to cause a measurable increase in sediment delivery to streams over baseline because the roads are in good condition (i.e., pavement or gravel, bridges, culverts, more drainage maintenance) and travel would be significantly less than within the project area.

Interstitial Sediment Deposition in the FC-RONR Wilderness Related to Use of Temporary Road and Maintenance of Fords on Coin Creek
Approximately 4.0 miles of abandoned roadbed inside the FC-RONR Wilderness would be used and maintained as temporary road. Of the 4.0 miles of temporary road 0.7 miles would be in RCAs (Table 3-3) and 0.5 miles within 200 feet of stream channels (Table 3-4). Prior to mobilizing drilling equipment to the area use of the temporary road would require repair of a ford on Coin Creek and a ford of a tributary to Coin. The total number of trips within the FC-RONR Wilderness by motorized vehicles is estimated to be 771 per operating season. Many of the vehicles and heavy equipment would only need to make one round trip per operating season. The most frequent trips would be made by supply, fuel, and personnel transport.

Inside the FC-RONR Wilderness maintenance of roads (i.e., moving rock, dirt and other debris, and trees that have grown in from road prism, maintenance of fords) on the old road beds would be required to make them drivable. Adding cross drains would minimize the temporary to short term increase in sediment delivery from motorized travel. Maintenance and use of roads that are generally greater than 200 feet from stream channels, such as FR 503739500 to the Penn Ida (Figure 3-6), would not likely result in sediment delivery to streams because drainage features would be added where needed. Restricting road use when conditions are unacceptable due to moisture and limiting the number of trips to what is necessary to accomplish the activities would further minimize sediment delivery to streams. Additionally, per the USFWS and NOAA Biological Opinion Term and Condition (USFWS 2013; NOAA 2013) road and stream channel crossing improvements would annually be inspected for the life of the project. If sediment delivery is occurring then maintenance would be performed to minimize the delivery of sediment to streams prior to commencement of the season's activities.

The ford that washed out on an unnamed tributary to Coin Creek would be maintained (Figure 3-6; Photo 3-4). The repair would occur prior to mobilizing equipment to the drilling area, and would consist of filling the hole with large rock, a layer of rock sandwiched in filter fabric, and a layer of finer material with larger rock to armor the channel. Stream flow would be diverted as necessary to minimize turbidity, but the repair would still likely result in temporary sediment delivery (Taylor et al. 1999). The use of course, clean rock would minimize sediment delivery during maintenance of the ford. Drainage improvements would be made on the approaches to the ford to route water and

sediment off of the road and into the vegetation, which would further minimize temporary to short term sediment delivery. Long term sediment delivery would be reduced below the current baseline through rehabilitation of ford approaches (Chapter 2.4.4).

Photo 3-4 Photograph on Left Shows Road Washout on Tributary to Coin Creek That Would Be Repaired. Photograph on Right Shows Ford on Coin Creek That Would Be Repaired.

A second ford is located between the bunkhouse facility and the Ella Portal (Figure 3-6; Photo 3-4). This ford would require improvements and maintenance to drain water properly, reduce sediment, and be passable to vehicles. The road surface would be bladed, cross drains would be added, and the approaches to the ford would be pulled back to improve drivability. Approaches to the stream would be armored with aggregate, unless the graded material is coarse enough to provide necessary armoring. If needed, coarse rock material would be obtained from the talus slope located on the road from the Golden Hand bunkhouse to the Ella Portal or the Penn Ida site. Cross drains (water bars or dips) would be added to the approaches as needed. An intermittent stream channel intersecting the road approximately 50 feet southeast of this ford would have drainage features maintained/installed to allow proper drainage of the channel where it intersects the road. The ford would not be dewatered; therefore, equipment and vehicles would travel through perennial water during implementation. Maintenance of the ford would cause some temporary sediment delivery due to soil disturbance on the ford approaches (Taylor et al 1999). The approaches to the ford have a high natural rock content, which would help minimize erosion and sediment delivery. Drainage improvements would be made at the crossing, which would help route water and sediment off of the road and away from the stream helping minimize sediment delivery in the temporary to short-term (Table 3-5). Long term sediment delivery would be reduced below the current baseline through rehabilitation of ford approaches (Section 2.4.4). The rocky, armored approaches would minimize sediment delivery caused by wave action, rutting, and water drainage from vehicles. There would be increased turbidity when vehicles crossed the fords stirring up fine material in the fords, but the plumes would likely be diffuse and settle out of the water column rapidly.

3.4.2.2 Chemical Contamination

Under Alternative B, project activities analyzed for potential to contaminate waterways include:

- Transport, storage, handling, and usage of fuel and drilling additives
- Core drilling, adit opening, and mine waste rock usage

- Use of portable latrines

Hazardous substances associated with the project would include diesel fuel and gasoline. In the event hazardous or regulated materials were spilled, measures would be taken to control and contain the spill and the Forest Service and the State of Idaho would be notified, as required. Any hazardous substance spills would be cleaned immediately and resulting waste would be transferred off-site in accordance with all applicable local, state, and federal regulations. All equipment used would be inspected by the Forest Service to ensure that it is in good working order and has no visible leaks. Contract drillers would maintain spill kits on site for use in case of a spill. Appropriate spill containment would be provided for all stored toxicants. The operator would adhere to the guidelines pertaining to transport, storage, handling, and disposal of hazardous materials and spill response cited in the Best Management Practices for Mining in Idaho. A Spill Prevention Containment and Countermeasures (SPCC) plan would be submitted for Forest Service approval prior to project implementation.

Fuel delivered to the project area would use the Johnson Creek Road and the fuel transportation plan described in Chapter 2 (Watershed/Fisheries Fuel/Contaminants Section) would be followed. Following the fuel transportation plan would minimize the potential for an accidental spill and spill containment and countermeasure plans with trained responders would minimize the magnitude of an accidental spill. While drilling, up to 500 gallons of diesel fuel could be brought to the site no more than every other day in a DOT approved tank from AIMMCO's operations on Logan Creek to the Golden Hand Mine. Gasoline for vehicles would be transported from Logan Creek to the Werdenhoff Mill site on an as needed basis, likely to be weekly. Gasoline would be transported in DOT approved truck mounted. Transport of fuel in DOT approved tanks would minimize the chance of fuel spills.

Diesel fuel stored in the FC-RONR Wilderness would be in a 1,320 gallon dual lined trailer mounted tank that is transported to and from the site empty. Unless specifically approved by a Forest Service Fishery Biologist, the tank would be placed in a liner capable of containing 120 percent of the tanks volume. Unless otherwise agreed, the storage tank would be located outside of RCAs. Unless otherwise agreed, all other toxicants would be stored outside of RCAs and would have containment.

Contamination from petroleum products washing or dripping off vehicles at fords is possible. The road surface improvements and maintenance that reduce direct delivery of road surface runoff into streams should also reduce potential for chemical contamination. Likewise installation of an open bottom structure on North Fork Smith Creek would reduce the potential for contamination.

All drill pads would be located at least 200 feet from stream channels minimizing the likelihood of fuel spills or other contaminants from the drill pads reaching streams. In addition, the following design features would further reduce the chance of chemical contaminants reaching Coin Creek. The drilling rig itself would be placed on an impervious material (such as HDPE liner material) to retain any petroleum products. Oil absorbent pads would be on site and prior to any activities, would be placed under the drilling platform and any possible sources of fuel, oil, or hydraulic fluid leakage. Soiled pads would be disposed of according to applicable Federal and/or State requirements. Drilling fluid would be a water-based bentonite mud. Drilling fluid additives include, but are not limited to, polyacrylamide, silica, mineral or vegetable oil, and gypsum products. No additives for drilling fluids, other than those identified in the plan of operations, would be used unless they are reviewed and approved by the Forest Service. If open tanks are used for drilling fluids, oil absorbent pads would be floated on the surface during operations to absorb any petroleum-based contaminants. Settling basins at drill pads would be excavated at lowest point of pad, downslope of all potential discharge sources, and would be of a size that is sufficient to contain 120% of the maximum volume expected to be used. The drilling fluid would be discharged in a controlled manner to the excavated settling basin. The volume of drilling fluid needing to be disposed of after drilling is completed would be minimized by recycling in a closed drilling system. All mechanical equipment would be inspected by the Forest Service to ensure good working condition and determination of no visible leaks.

Road drainage improvements and installation of an open bottom structure on North Fork Smith Creek would reduce chemical contamination by a small amount in the short to long-term. The likelihood of fuel or other petrochemical spills would be minimized through the use of DOT approved tanks and appropriate containment and Forest Service approved SPCC plans. Unless otherwise agreed, toxicants would not be stored in RCAs.

Chemical Contamination of Surface Flow from Core Drilling
The potential for contamination of Coin Creek from effects of core drilling on groundwater are discountable for the following reasons: The volume of drilling fluid lost from the borehole that could enter groundwater is minimized by the drilling techniques. The risk of groundwater mixing due to cross-flow is minimized by sealing off any inflows or outflows of water. The limited potential for residual cross-flow is short-lived since the holes are promptly abandoned. The drilling additives used are non-toxic, biodegradable and certified (NSF/ANSI Standard 60) for use in domestic water supply wells. The Groundwater Resource Specialist Report (Project Record) provides a detailed discussion of drilling procedures, and potential effects to ground water.

Ella Adit Opening
Opening of the Ella adit is not likely to result in groundwater or surface water contamination as a result of acid mine drainage and/or metals leaching. The excavated collapse material is all unmineralized colluvium and there would be no additional waste rock generated. Only small channel samples would be removed from underground.

The Ella adit is presumed to be dry inside due to the lack of any surface expression of water (springs, seeps, wetland vegetation) in the vicinity of the collapsed adit mouth. Nevertheless, excavation of the collapsed material would proceed according to the following procedures designed to minimize adverse environmental effects in the unlikely event that substantial water is encountered during excavation.

A Forest Service Minerals Administrator would be on site during the opening of the Ella adit. Prior to excavating the collapsed material, a small sediment trap would be excavated on the plaza in front of the Ella adit at a location approved by Forest Service personnel. This trap would serve to retain and infiltrate stormwater and also provide a backup measure to capture any unanticipated release of adit drainage water. If, during excavation, water seepage is encountered on the working face, work would be immediately suspended and the Forest Service would be notified. A wellpoint with a shutoff valve (or similar device) would then be driven into the remaining material to act as a probe for stored water. If it is determined that a substantial volume of water is likely to be present behind the collapsed material, a sample would be taken for chemical analysis. If the water quality meets State groundwater standards, excavation would proceed to release the water in a controlled manner to the sediment trap to infiltrate. There would be no discharge to surface water. After the adit is opened, any water that is deemed necessary to be pumped out for disposal would have to meet groundwater standards. If any water to be discharged does not meet groundwater standards, operations would be suspended until an appropriate disposal method was approved by the Forest Service.

Waste Rock Usage
The use of mine waste rock from the Werdenhoff, Penn-Ida, or other sources is not likely to result in groundwater or surface water contamination as a result of acid mine drainage and/or metals leaching. A metals leachability test (Synthetic Precipitation Leaching Procedure or equivalent) and an Acid-Base Accounting test would be performed prior to use to determine the suitability of the material for use as aggregate.

Latrines and Gray Water
With the exception of the Golden Hand mine site, all latrines would be located outside of the RCAs. At the Golden Hand mine site, the toilet would be located as far away from stream channels as possible. Use of the small capacity, sealable latrines would insure that the contamination of streams

would not occur. Gray water would be disposed of outside of RCAs and therefore, would not likely reach streams.

3.4.3 Environmental Consequences Specific to Alternative C

Detailed information on the effects to all WCIs can be referenced in Appendix B.

3.4.3.1 Interstitial Sediment Deposition

Under Alternative C, project activities that may influence sediment production are the same as Alternative B, except there would be 200 fewer motor vehicle trips from the Werdenhoff to the Golden Hand Mine per season.

Interstitial Sediment Deposition Related to System Road and Temporary Road Use Outside of the FC-RONR Wilderness
Under Alternative C, project activities that may affect sediment production are the same as Alternative B. Under Alternative C there would be approximately 200 fewer motor vehicle trips from the Werdenhoff to the Golden Hand Mine per season. Sediment delivery in the temporary to short term from increased motorized travel would be offset by road improvements and maintenance. As long as maintenance occurs, road improvements would reduce sediment delivery in the long term.

Road drainage improvements would offset temporary to short-term sediment delivery from increased motorized travel and, as long as maintenance continues, result in long-term minor reductions in sediment delivery resulting from authorized use of the roads and normal erosion from the road surface (Table 3-5). Fewer motorized trips in Alternative C would result in less temporary and short term sediment delivery and turbidity, but there would be no difference in the long term reductions related to road improvements.

Interstitial Sediment Deposition in the FC-RONR Wilderness Related to Use of Temporary Road and Maintenance of Fords on Coin Creek
Under Alternative C, project activities that may affect sediment production are the same as Alternative B. Under Alternative C there would be approximately 200 fewer motor vehicle trips from the Werdenhoff to the Golden Hand Mine per season. Sediment delivery in the temporary to short term from increased motorized travel would be offset by road improvements and maintenance. As long as maintenance occurs, road improvements would reduce sediment delivery in the long term.

Drainage improvements would reduce sediment delivery minimizing temporary to short term increases in sediment delivery from increased traffic (Table 3-5), but some temporary to short term delivery would occur from ford maintenance and use, which is not captured in the WEPP model. Fewer motorized trips in Alternative C would result in less temporary and short term sediment delivery and turbidity than Alternative B.

3.4.3.2 Chemical Contamination

Under Alternative C, there is minor decreased risk of contamination from reduced fording in the FC-RONR Wilderness, otherwise project activities that may affect chemical contaminants in streams are the same as Alternative B (Section 3.4.1.2).

3.4.4 Environmental Consequences Common to Alternative B and C

Detailed information on the effects to all WCIs can be referenced in Appendix B.

3.4.4.1 Interstitial Sediment Deposition

Rehabilitation of Approaches to Road-Stream Crossings in the FC-RONR Wilderness
The road stream crossings of Coin Creek would be rehabilitated through a road prism to trail conversion. At both crossings half of the road prism would be obliterated (Chapter 2.4.4) leaving the other half to maintain the existing non-motorized trail (Forest Trail #013). Rehabilitation of the crossing and maintenance of cross drains on the trail would reduce sediment delivery over the long-term (Table 3-5), and increase RCA productivity and function.

Interstitial Sediment Deposition Related to Drill Pads, the Ella Portal, Trenches for Rock Chip Samples, and Supply Storage Area.
Slope gradient and length have been shown to be important factors influencing erosion rates (Burroughs and King 1989). Belt et al. (1992) concluded that a distance (i.e., riparian buffer) between the road and stream of 200 - 300 feet is generally effective in trapping sediment that is not channelized. Channelized sediment flows can move thousands of feet and are limited by the amount and frequency of flow (Belt et al. 1992). Under both Alternatives, drill pads, trenches for rock chip samples, and the Ella Portal, are located approximately 200 feet or more from stream channels (Figure 2-1). Non-channelized sediment flow would likely be trapped by dense ground cover (i.e., vegetation, duff, woody debris) between the disturbed areas and stream channels. In addition, the use of silt fences would further reduce the likelihood of erosion off of disturbed sites. Due to the vegetated buffer between the disturbed sites and stream channels and application of mitigations, sediment delivery to stream channels and associated effects to fish habitat from non-channelized flow is not expected. The temporary roads would be outsloped; therefore, channelized flow of sediment down borrow ditches would not be likely. Following project completion roadbeds would not be fully recontoured, but would be returned to the original width at drill pad locations. All disturbed areas would be seeded with a certified weed-free native seed mix and mulched. A previously disturbed area (Photo 3-5) of approximately 4000 square feet would be bladed to store supplies. Erosion control would be placed downhill of all disturbed soil. Delivery of sediment from the storage area is not expected because of the distance to Coin Creek and the use of erosion control. Reclamation of the project area would include recontouring drill pads to the original slope shape where this project has altered slopes and revegetation of the disturbed ground. Project design features for drill sites, rock chip sampling, the Ella Portal, and blading the storage area would likely keep sediment from entering the streams.

Photo 3-5 Disturbed Area Near Bunkhouse That Would Be Leveled and Used for Storage

Project Area Access Routes

Golden Hand Project related traffic would result in a small change in traffic counts of on average 2.7 per day of light personal vehicle (LPV) and pickup trucks with trailers and 0.06 fuel trucks per day, which equates to 105 LPV/pickup trucks and 2 fuel trucks over the 100 day operating season. The increase in Golden Hand related traffic on access routes is minor, and composed primarily of light vehicles which cause small increases in road surface erosion (Reid and Dunne 1984). Many of the roads that will be used are armored with pavement or gravel aggregate, both of which reduce road surface erosion (Burroughs and King 1989). Because increased road surface erosion will be minimal, delivery of sediment in the form of suspended sediment (i.e., turbidity) and sediment deposition will be diluted in the system and insignificant. A more detailed analysis of access route sediment effects is provided in Dixon and Zurstadt (2014)(Project Record).

Summary of Effects to ESA Listed Fish, Critical Habitat, and MIS from Interstitial Sediment Deposition

Temporary to short term increases in interstitial sediment deposition from increased motorized travel on FR #371 and #373 would be offset by reductions in sediment delivery due to road improvements and maintenance. Therefore, temporary to long term effects to ESA listed fish, Designated Critical Habitat (DCH), and MIS are expected to be slightly beneficial. Turbidity associated with fording tributaries to North Fork Smith Creek is not expected to reach North Fork Smith Creek. The open bottom structure installed on North Fork Smith Creek near the Werdenhoff would prevent turbidity from fording (Figur3-6). Turbidity from fording lower NF Smith Creek is not expected to have negative effects on ESA listed fish in North Fork Smith Creek and Smith Creek due to the short duration and small magnitude of the plume. Minimal increases in traffic along project area access routes will have insignificant temporary to short term effects from sediment delivery and turbidity.

Photo 3-6 Downstream Ford of North Fork Smith Creek

Inside the FC-RONR Wilderness, the points of sediment delivery at the road stream crossings are approximately 1 mile from where fish occur in the lower 500 meters of Coin Creek; therefore, the effects to ESA listed fish, DCH, and MIS are expected to be negligible. Similarly the effects of drainage improvements and rehabilitation of ford approaches resulting in long term reductions in sediment delivery would not have measurable effects on fish or fish habitat due to the distance from occupied habitat.

Direct effects to ESA listed fish at the fords on North Fork Smith Creek

Increased traffic (up to 600 trips) at the most downstream ford on North Fork Smith Creek (Figure 3-6 and Photo 3-6) would increase the risk of direct effects to fish ranging from disturbance of normal behavior to mortality. Westslope cutthroat trout and juvenile steelhead have been documented in North Fork Smith Creek (Table 3-). In 1994, bull trout were not detected in lower North Fork Smith Creek. In 2002, no bull trout were observed at the ford, but a bull trout was observed 650 feet below the ford near the confluence with Smith Creek. In 2004, House et al. (2005) observed 5 bull trout near the lower ford and 2 bull trout near upper fish bearing ford. In a 2011 survey at both North Fork Smith Creek fords, and 2012 survey at the lower ford, no bull trout were observed. In a 2013 electrofishing survey 3 bull trout were observed near the lower ford and no bull trout were observed near the upper ford. Based on the low number of bull trout observations, presence and spawning in or near the

fords has a low probability. Juvenile steelhead occur near the ford, but adult steelhead spawning had not been documented in North Fork Smith Creek. Westslope cutthroat trout have been observed near the ford, and spawning at the ford in the spring is possible, but unlikely due to the large size of substrate (Photo 3-6). Adult fish of all species present would likely evade fording vehicles, but juvenile fish that seek cover in the substrate and eggs are more vulnerable to being crushed. The likelihood that fish or egg mortality increases at the ford with increased use under the action Alternatives is small because adult fish would likely evade fording vehicles and the number of juveniles at the ford at any one time would likely be few to none. In addition, as per the USFWS Biological Opinion Term and Condition vehicles and equipment fording at the beginning and end of each season would do so as closely as practicable in order to minimize the number of fish that could move into the ford area between crossing.

Westslope cutthroat trout and juvenile steelhead have been observed near the ford on North Fork Smith Creek near the Werdenhoff (Figure 3-6). Installation of an open bottom structure under both Alternative B and C would prevent fording related effects to fish. Dewatering of the channel would be required for installation of the structure and stranded juvenile steelhead and westslope cutthroat trout may need to be captured and moved to downstream. Care would be taken to minimize harm to relocated fish, and based on surveys the number of fish that would need to be moved is likely to be less than 10.

3.4.4.2 Stream Flow

Under Alternative B and C, project activities that may affect stream flow include:

- Water withdrawal from Coin Creek at a rate of 0.04 cubic feet per second (CFS) or 10% of the existing flow of Coin Creek, whichever is less.
- Water delivered by gravity (no alteration of stream channel such as damming or ditching) would be contained in several 5,000 gallon capacity tanks located within the existing road prism then conveyed to drill sites through PVC pipes by pumping.

The diversion would occur during the summer period of operation and would not influence peak flows, which occur in the spring, or winter base flows. The effects to fish and fish habitat from diversion of flow during the period of operation (July-October) were analyzed using the following two approaches: 1) Examination of the percent reduction in base flows. 2) The Tennant Method which uses an examination of the reduction in flow as a percentage of average annual flow.

Examination of Base Flows
Fish occur in the lower 500 meters of Coin Creek, which is approximately 1 mile downstream of the point of diversion. Estimated base flows in Coin Creek where fish occur are as low as 0.71 Cubic Feet per Second (CFS). The lowest predicted flows for Big Creek below the confluence with Beaver Creek occur in October when flows are estimated to exceed 64.8 CFS 80 percent of the time (model estimated error 59 percent). Base flow in Beaver Creek near Big Creek has been estimated at 40 CFS (Raleigh 1994), and the lowest predicted flows (USGS model) occur in October when flows are estimated to exceed 28.1 CFS 80 percent of the time (model estimated error 59 percent).

The diversion rate from upper Coin Creek (above Forest Trail #013) would be limited to 0.04 CFS or 10 percent of the flow, whichever is less. Maintenance of ninety percent of normal stream flow contributes substantially toward the protection of fish migration, spawning and other life stages at and downstream of diversions (Orth and White 1993). At estimated low flows the diversion rate of 0.04 CFS from upper Coin Creek would leave 92 percent of the flow in upper Coin Creek, 94 percent of the flow in Coin Creek where fish occur, 99.9 percent of the flow in Beaver Creek, and 99.94 percent of the flow in Big Creek.

Tennant Method
Tennant (1976) found that habitat characteristics such as velocity, top width, depth, and discharge, change dramatically when flows are reduced to below 10 percent of average annual flow, and the magnitude of effect and rate of change decline significantly when flows are greater than 60 percent of the average annual flow. Tennant's method is used widely and often referred to as the Montana

Method. Using the USGS discharge model the estimated average annual flow for Beaver Creek and Big Creek below the Confluence with Beaver Creek are 108 CFS and 263 CFS respectively. Modeled average annual flow for Coin Creek is not reported here because the small drainage size is outside of the model range. A diversion rate of 0.04 CFS equates to 0.04 percent of the average annual flow in Beaver Creek and 0.02 percent of the average annual flow of Big Creek below Beaver Creek. The percent reduction in average annual flow is extremely small and therefore would have a minimal influence on the percent of average annual flow remaining in streams.

The Forest Service would approve the use of a waterline to be placed in Coin Creek. The rate of diversion must be measured with a flow meter approved by the Forest Service. Daily in stream flow monitoring would be performed throughout the period of operation. Flow in Coin Creek would be measured on a daily basis below the point of diversion and upstream of the tributary that joins Coin Creek downstream of FSST 013. AIMMCO would report measured withdrawal rates and daily flow monitoring to the Forest Service. If water use at the drill pad is not anticipated for more than twelve hours, the intake end of the line would be removed from the stream after each use period. The water diversion rate would be reduced if the flow at the point of measurement dropped below 0.4 CFS in order to maintain a removal of less than 10 percent of the flow.

Werdenfoff Camp
Water for activities at the Werdenfoff site would be brought in from off site, and therefore would not influence stream flows within the Analysis Area.

Summary of Stream Flow Effects
After considering the effects of diverting water from Coin Creek both as a percentage of base flow and using the Tennant Method the following conclusions were made. The diversion would result in a minor temporary to short term reduction of the base flow in Coin Creek that would not move the peak/base flow indicator for the Beaver Creek 6th HU from Functioning Acceptable to Functioning at Risk. In the short to long-term peak/base flow would return to pre-diversion flows following completion of drilling operations. In addition, the diversion would occur during the summer period of operation (July-October) and would not influence peak flows, which occur in the spring, or winter base flows. The effects to fish or fish habitat including MIS and ESA listed fish where they occur, and DCH where it occurs, in the lower 500 meters of Coin Creek, Beaver Creek below the confluence with Coin Creek, or Big Creek are expected to be minor due to the small proportion of water removed.

3.4.5 Cumulative Effects

The cumulative effects analysis area includes all of the subwatersheds upstream of the project area so that cumulative watershed effects can be examined. Subwatersheds downstream of the selected analysis area were not included because they are located in Wilderness where management related watershed effects are relatively small. Portions of the East Fork South Fork Salmon River, South Fork Salmon River, and North Fork Payette River watersheds along the access routes to the project area are also considered for cumulative effects.

Scattered mining disturbance in the upper Big Creek area dates back over 100 years. Numerous placer and lode deposits were prospected, worked, and abandoned. The Golden Hand, Velvet Quartz, Fourth of July Mines, and a few small underground prospects located primarily in the Logan Creek drainage are still active. Walker Mill site, a small milling operation, is located along Logan Creek. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

Ongoing actions in the Big Creek portion of the analysis area that may contribute to the cumulative effects of the action alternatives analyzed in this DEIS include activities on over 700 acres of privately owned land within the Big Creek portion of the analysis area. On Federal and private land ongoing actions include one guest outfitter lodge, private summer residences, historical and present mining activities, water diversions, hydropower sites, an airstrip, grazing by livestock on private land and by pack/saddle stock throughout localized areas, and a Forest Service guard station. Outfitters and guides

operate in these watersheds and are required to conform to practices to protect ESA listed fish species. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

Ongoing fuel haul activities that could overlap in time and space include the general delivery of fuel for the backcountry towns of Yellow Pine and Edwardsburg, ID. Fuel delivery for these towns occurs as needed to provide for heat, vehicles, and other miscellaneous uses. Fuel delivery by local vendors for this purpose follows State and Federal code pursuant the type of fuel and quantity being transported.

Walker mill site is a 5 acre parcel of private land along North Fork Logan Creek. There is a private residence, shop, guest cabin, and serves as a storage area for numerous items of mining and milling equipment. There are no current FS approved operations at the site.

Likely future actions include the Big Creek Wildland Urban Interface Fuels Reduction Project, the collaborative Big Creek Restoration and Access Management Project, and installation of bridges over North Fork of Smith Creek and Smith Creek, and implementation of Plans of Operations (PO) for access and exploration of mineral resources. POs in the upper Big Creek area typically involve limited motorized use of existing system or unauthorized routes for data collection purposes, but also involve exploratory core drilling, and the associated road improvements, fuel haul and other activities. The POs typically involve road surface drainage improvements, restrictions on storage and haul of hazardous substances, and other mitigations designed to minimize sediment delivery to streams, risk of fuel spills, and other resource impacts pertinent to LRMP standards and guidelines. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

Fuel haul and other traffic from the proposed Golden Meadows Exploration Project could overlap in time and space with the Golden Hand Project within the South Fork Salmon River watershed. Fuel convoys for the Golden Meadows Project would generally consist of two to four 4,000-gallon tanker trucks, depending on fuel requirements at the site and the availability of transport trucks. The trucks would be accompanied by a pilot vehicle and an emergency response truck, with road guards alerting the convoy of traffic. Convoys would normally travel on back-to-back days (one convoy each day on two consecutive days in a given week). Based on the risk assessment for the Golden Meadows Exploration Project Johnson Creek (FR 413) is the preferred route for transporting fuel in large trucks during snow-free conditions for the Golden Meadows Exploration Project because it is generally wider and further from adjacent waterways than the other roads. As discussed above fuel haul for the Golden Hand Project would be restricted to the Johnson Creek Road, therefore fuel haul, and other project access traffic, for both projects could occur simultaneously on the Warm Lake (FR 579) and Johnson Creek Road, and the road along the East Fork South Fork Salmon River (FR 412) from Yellow Pine to the Profile Summit junction. The Golden Meadows Exploration Project EA, BA, and associated Letters of Concurrence identify that some risk of spill occurs, but SOPs greatly reduce the likelihood that a spill would occur and provide for fast response and mitigation in the unlikely event that a fuel spill occurs (Golden Meadows EA, BA, LOCs on file Project Record).

Fuel haul on the Morgan Ridge is a foreseeable future project that could overlap in time and space. Fuel would be brought to the same location on Logan Creek as described in the Chapter 2, then transported on a daily basis to the work sites. The plan of operation would maintain access roads to four exploratory drill pads and drill six core holes to depths up to 1,500 feet. The Forest Service has yet to determine if the plan of operation represent a reasonable plan for the development of the mineral resource. It is expected that fuel quantities would be similar to the Golden Hand Project, but the duration of the project would likely be two seasons beginning with the summer season of 2016. The fuel haul plan for this project would make use of the same PDFs as the Golden Hand Project, unless subsequent improvements are identified and incorporated. Actual fuel needs have not been calculated at this time, but given the scope and scale of the project it could be assumed that similar to Golden Hand roughly two 4,000 gallon trips per season could be required.

Fuel haul on Big Creek Restoration and Access Management Project (BCRAMP) and Big Creek Road Plan of Operation Project are foreseeable future projects that could overlap in time and space. A plan of

operation has been submitted to the Forest Service for consideration. The plan of operation proposes to maintain and use claim access roads in the Big Creek drainage. Proposed activities include geochemical analysis and sampling, geologic mapping, and similar activities on mineral claims owned by AIMMCO. Additionally, the BCRAMP represents a collaborative effort to establish a restoration project in the Big Creek drainage that focuses on road restoration and recreational access. The proposed action would include a suite of road decommissioning, road maintenance, and National Forest System road and trail designations. Operations for these projects would not likely begin until summer season of 2016. Petroleum products would be transported from outside of the project area. Fuel delivery in excess of that transported in a small truck slip on tanks, would typically occur via a commercial vendor in up to 4,000 gallon capacity fuel trucks depending on the vendor, but most likely would arrive in smaller quantities such as 500 gallon tanks or smaller slip on truck bed tanks. Commercial vendors would utilize the Johnson Creek access route from Cascade to deliver. Storage containers with capacities of more than 200 gallons and not to exceed 1,500 gallons would be maintained in a leakproof condition and located within dikes, berms, or embankments lined with impervious material, and sufficient in size to contain 120% of the volume stored at the site. Fuel would be transported to the work site daily in DOT truck mounted tanks. The fuel haul plan for this project would make use of the same PDFs as the Golden Hand Project, unless subsequent improvements are identified and incorporated. Actual quantities needed for operations are not calculated at this time, but for the purpose of this analysis would be assumed to require approximately one 4,000 gallon trip per season.

Non-fuel haul related vehicular access to the Golden Meadows Project from Highway 55, and the towns of Cascade and McCall occurs via Forest Roads (FR) 412, 674, and 579. FR 413 and the segment of FR 412 over Lick Creek summit are closed by deep snow during the winter. FR 579, 474, and the segment of 412 from the junction of FR 674 to Yellow Pine are plowed open by Valley County. The Environmental Assessment and Biological Assessment for ESA listed fish for the Golden Meadows Exploration Project describe sediment related effects as negligible (Project Record).

Insignificant effects to surface water quality, groundwater flow or quality, and soil resources are expected as a result of the proposed action and are considered negligible and duration temporary to short term, therefore when considered in combination with other past or reasonably foreseeable actions, the cumulative effects of this action are insignificant.

Alternative A would have no direct or indirect effects on any watershed condition indicator, fish habitat, or fish populations, therefore no cumulative effects would occur.

When considered in conjunction with existing conditions and other reasonably foreseeable future actions, the cumulative effect of Alternatives B and C on WCIs are considered minor but degrading in the temporary to short term given increases in sediment delivery to Coin Creek, reduction in Coin Creek flows and beneficial to North Fork Smith Creek and Coin Creek in the long-term given road improvements, installation of an open bottom structure on North Fork Smith Creek, and rehabilitation of stream crossing approaches on Coin Creek.

Specifically for fuel haul, when considered in conjunction with existing conditions and reasonably foreseeable future actions, such as fuel haul to the Golden Meadows Exploration project area, the risk of a fuel spill during weekly fuel haul to the Golden Hand project area remains very low due to implementation of SOPs such as pilot car and spill containment requirements.

The project would not measurably alter stream temperature, would have minimal and temporary impacts on stream flow, and would maintain habitat connectivity and therefore should not have significant negative effects that are cumulative to potential climate change effects.

Climate Change

Warming stream temperatures could dramatically alter salmon and trout distribution in headwater streams (Isaak et al. 2012, Beechie et al. 2012). Ameliorating impacts to natural flow régimes and stream temperature, and restoring or maintaining connected habitats will be important factors to mitigate the effects of climate change on salmonid populations (Isaak et al. 2012; Beechie et al. 2012).

3.5 Soil Resources

This section of the document discusses the existing characteristics of soil resources, as well as the effects of the alternatives on those resources. The discussions will focus on slope stability. The analysis of direct and indirect effects to slope stability would be contained to the area of modeled potential landslide prone north of Coin Creek (Figure 3-7).

Slope Stability
Mass instability or landslides are naturally occurring disturbances that have and will continue to have an influence within the analysis area. Although landslides are naturally occurring events, human caused disturbances such as road construction, reconstruction, drill pad construction and trenching can increase the potential for and occurrence of landslides. The term "landslides," is a collective term that includes both deep-seated, geologic failures and smaller localized mass erosional events such as slumps, debris torrents, debris slides and rockfall. Three principal factors influence slope stability: soil moisture, root strength and slope gradient.

Debris torrents occurred on two unnamed tributaries to Coin Creek in 2007. These debris torrents originated in the headwater basins south of the project area and were likely caused by a high intensity rainfall event on recently burned slopes. There is no evidence of past landslides within the drilling area north of Coin Creek. Work within the project area would not affect conditions in the debris torrent source areas.

Identification of modeled landslide prone areas
The forest has developed a base GIS layer for indicating potential for landslide prone areas, expressed as a stability index, utilizing the Stability Index Mapping (SINMAP) model (Dixon et al 1999 and Pack et al 1999). The result is a spatial representation of potential instability accounting for topography and water collection. Stability indices output by SINMAP should not be interpreted as numerically precise and are most appropriately interpreted in terms of relative hazard or risk. It should also be noted that the model has not been calibrated specifically for the project area, so its best use in this case is as a screening tool to direct field investigations. In general the highest concentration of high to moderate potential landslide prone areas within the project area exists in the area north of Coin Creek (Figure 3-7).

Qualitative assessment of slope stability within areas identified as high-moderate landslide potential
Forest roads 9800, and 9900 were most likely constructed in the 1940's (personal communication, Jim Egnew). These roads extend about 0.3 and 0.1 miles across a slope that SINMAP shows has a high to moderate landslide potential. The first half of road 9800 traverses across landtype 109- Cryoplanated Uplands, which is typified as having deep sandy and loamy skeletal (high rock content) soils (Knight et al 1974). Slope gradients range from 25-55 percent. The inherent erosion hazard is low, which means that there is no appreciable hazard of erosion on undisturbed ground. Overall erosion hazards for roads on this landtype are moderate for road cuts, fills and surfaces, which means that there is sufficient resistance (most likely due to the high percentage of rock in the soil) to limited exposure of bare soil. Mass failure hazards for this landtype are: Low for slumps, Very low for debris slides, Low for dry creep, but road cuts are rated as moderate to moderately high and fill slopes are moderate. Overall debris slides can be expected every 100 years and road cuts would yield enough material from slumps to require more than annual removal of material.

The second portion of road 9800 and all of 9900 cut across the slope of a 111a-1 landtype (Weakly Dissected Glacial Trough Land) which is typified as having shallow and moderately deep skeletal sandy and loamy soils. Slope gradients range from 40-60 percent. The inherent erosion hazard is moderate-moderately high which means that unvegetated areas may yield high volumes of sediment (Knight et al 1974). Overall erosion hazards for roads on this landtype are moderate-high for road cuts and fills. In some areas cuts and fills may yield excessively high volumes of sediment. The rating is moderate-moderately low for road surfaces. Mass stability hazards for this landtype are: low for debris slides, moderate-low for slumps, and wet dry creep, moderate for cut slope hazard, and moderate-low for fill slope hazard. Cut slopes can be expected to slough enough material onto the road surface that would require seasonal removal of material.

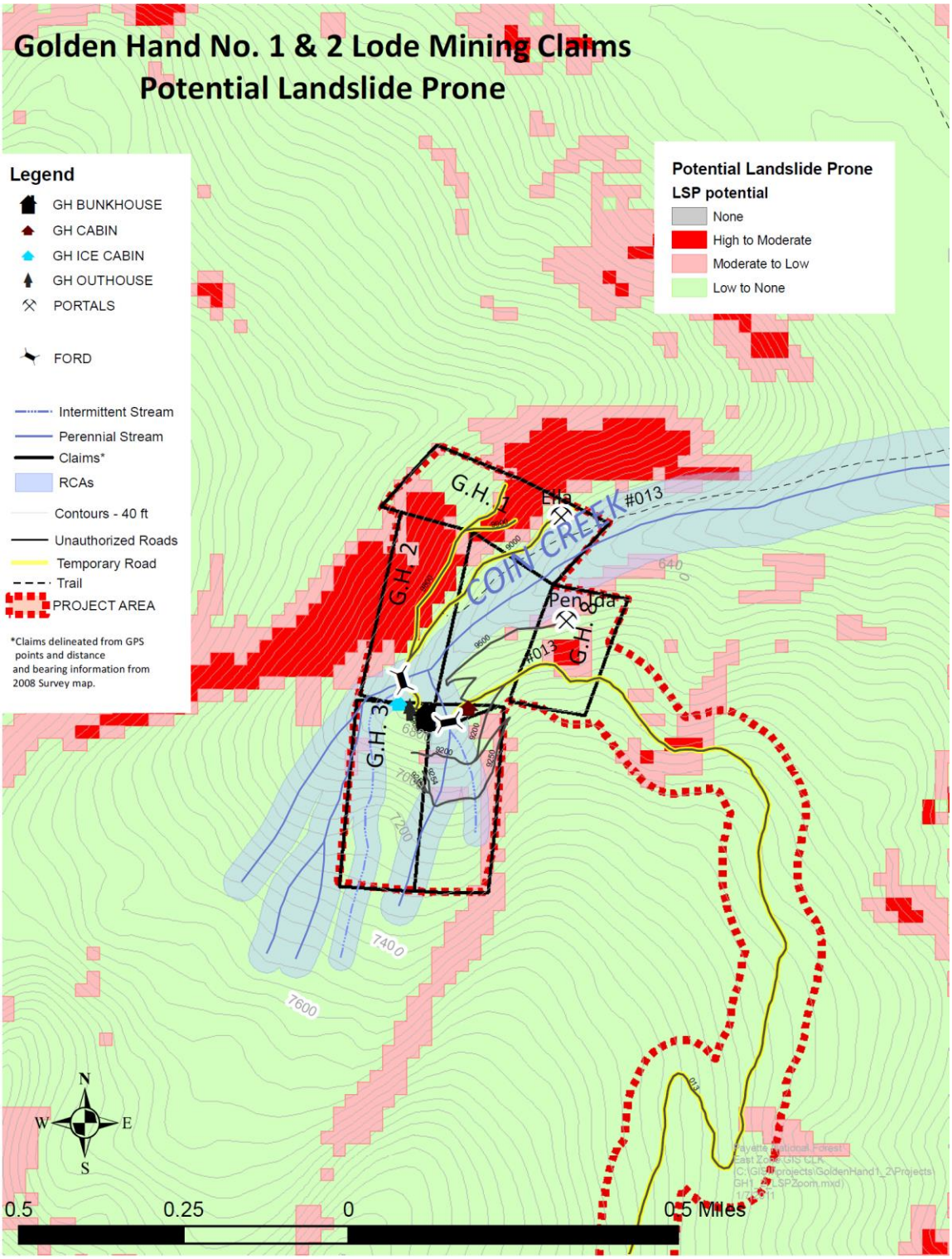


Figure 3-7. Potential Landslide Prone Areas in Golden Hand Area

These roads were walked by the interdisciplinary team in 2008 and 2010. Road 9800 has some wet areas on the road surface in the first several hundred yards where the road intercepts ground water (Photo 3-7).

Photo 3-7. Seep on FR 503739800

Other than the seeps on FR 503739800, the roads (503739000, 503739800, and 503739900) were in good shape with some minor sloughing of cut slopes, but no evidence of mass movement or surface erosion on cut, fill, or road surface and good ground cover percentages on all surfaces. Visual inspection of these roads showed that the cut slopes were stable in spite of the hazards associated with road construction on these land types noted above. This could be the influence of a southerly aspect and well-drained, rocky soils that support good vegetative ground cover on the previously disturbed ground and vigorous tree growth on the undisturbed ground.

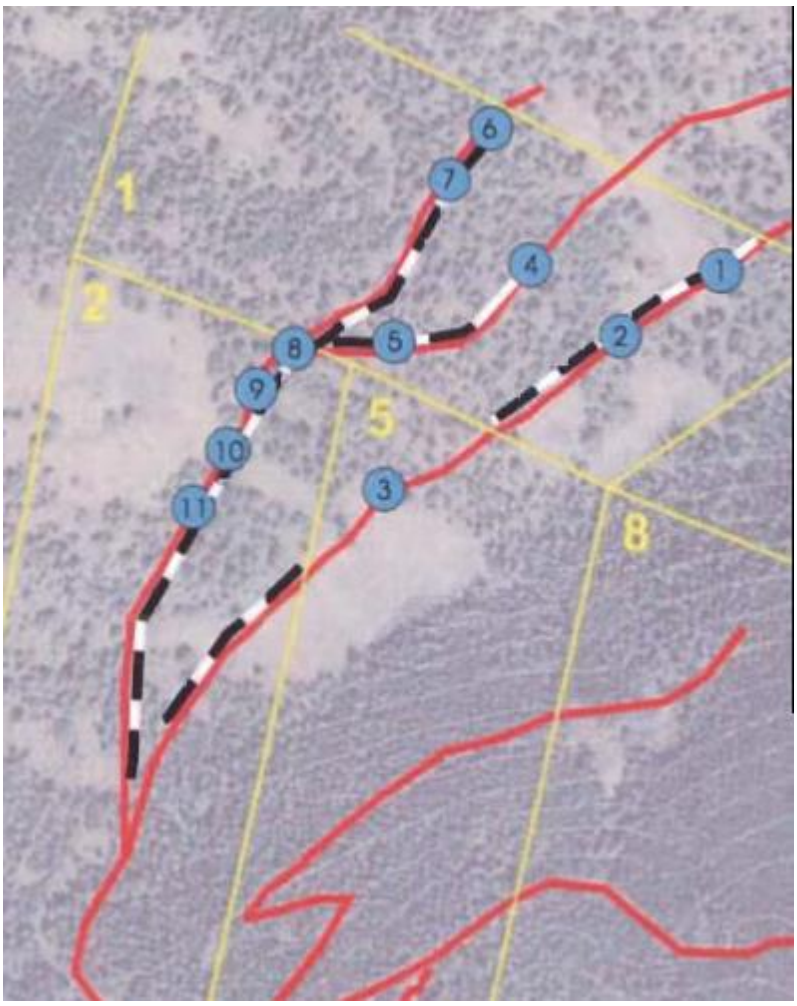


Figure 3-8. Aerial Photography View of Confirmation Activities On or Near SINMAP Modeled Landslide Prone Areas

Areas devoid of tree cover do exist in the analysis area (Figure 3-8). The bare areas are areas that have talus slopes, rocky outcrops and areas that are shallow to bedrock. Field evaluation indicated that the area mapped as having a moderate to high potential for land slide prone lacked the common characteristics found in such areas. Areas with deeper soils supported coniferous trees. The rooting strength of trees is a major factor in adding stability to slopes (USDA 2003, 2010). The areas without trees have shallow soil depth (Figure 3-8). Both areas have a high percentage (greater than 35 percent) of angular rock in the soil profile, which creates a higher internal angle of friction increasing soil stability.

3.5.1 Environmental Consequences Specific to Alternative A

This alternative does not propose any activities in the analysis area and therefore would have no direct or indirect effects on slope stability. The roads that traverse across the moderate to high probability of landslide prone would remain in place.

3.5.2 Environmental Consequences Specific to Alternative B and C

Eight drill pads would be constructed on roads 9800 and 9900 that traverse land modeled as having a high to moderate potential as being landslide prone. Each drill pad would widen a 20 foot long section of the road from its existing width (about 8 feet) to about 20 feet to create a drill pad for the equipment to operate on. Any excavated material sidecast onto the slope below the constructed pad would be placed close enough to the pad edge that it could all be retrieved for placement back into the cutslope during reclamation.

A wire-backed, metal post silt fence would be installed at the toe of the fillslope. Pad construction may include the use of timber platforms (timber sourced outside the Wilderness) if desired. Drill pads would be reclaimed after drilling was completed and before winter closure. Reclamation would include placing the excavated material back into the cutslope to match the original slope contour as much as possible. Disturbed areas would be seeded, fertilized and mulched after drilling is completed. The general field season for the activity is during the summer and fall months, but typically only lasts for four months out of the year.

In addition, a mud pit may be excavated from the road surface near each drill pad. If the pit is to be used for drilling fluid disposal (unlined), it would be located in a part of the pad which was not constructed from fill material (e.g. in the old roadbed). Three sampling trenches would also be excavated (and backfilled at the end of the operating season) in the old roadbeds.

Because these slopes did not exhibit all the elements of a landslide prone landscape the potential for mass movement is considered low to moderate. Saturation of the fill due to rain events could trigger minor slumps or channelized flow within the newly created road fill. Sediment generated by these mechanisms would be captured by the silt fence.

The high percentage of angular rock in the excavated material would reduce the likelihood of fillslope mass failures. Much of the existing slope is very close to the angle of repose of the fill material (roughly 30-35 degrees) meaning that even in localized spots of somewhat lower slope angle, the volume of material that can be placed within a retrievable distance is relatively small. The high angular rock content would also tend to create a well-drained fill not prone to saturation. Locating the mud disposal pits off fill areas would further reduce the risk of saturation if substantial infiltration of fluid from the pit should occur. It is possible that a substantial amount of fill material would need to be placed on the old road surface uphill from the drill pad. As noted, these old roadbeds are quite stable and fill placement on them would be unlikely to increase the risk of mass failure. The use of timber platforms and the excavation of trenches would not increase the risk of mass failure.

The cutslope created by excavating enough material to widen the pad to 20 feet could be as much as 20 feet high. This slope would be much steeper than the existing slope and would increase the risk of mass failure of the slope immediately above it. This increased risk is mitigated somewhat by the fact that soil saturation is not likely to be a major contributing factor. Pad construction would take place in the summer and the excavated material would be replaced during reclamation prior to winter, thus avoiding the period of soil saturation in late winter/early spring.

Although the use of the existing roadbeds in Alternatives B and C is not likely to increase the risk of landslides, the construction of drill pads would increase the risk of a cutslope mass failure during the operating season that the drill pads were in use. After reclamation the risk would return to its previous level.

Project Design Features for drilling and sump operations would reduce any impacts from mineralized rock in drill cuttings containing sulfides (Groundwater Resource Specialist Report, Project Record). Road maintenance activities would take place in colluvium that is not mineralized.

3.5.3 Cumulative Effects

The direct and indirect effects of any alternative on slope stability would be limited to the analysis area. Therefore the area used to assess cumulative effects consists of the area of modeled potential landslide prone north of Coin Creek within the FC-RONR Wilderness (Figure 3-7).

There are no past, present, ongoing, or foreseeable future projects that could affect slope stability within the analysis area. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

Since there are no past, present, ongoing, or foreseeable future projects that could affect slope stability within the analysis area, there would be no incremental or cumulative impacts.

3.6 Wildlife Resources

This section of the document discusses the existing conditions of the wildlife resources, as well as the effect of the various alternatives on those resources. Effects from proposed activities are analyzed at several scales depending on the extent of direct and indirect effects to each species. For most species the analysis area would be the 10,101 acre wildlife analysis area (Figure 3-9).

Species considered in this analysis included all threatened, endangered, proposed, candidate, sensitive, management indicator species (MIS), any additional species under specific forest plan direction, and species of interest (such as elk). Focal species[2] to be analyzed were determined by the following rationale:

- The analysis area and Krassel Ranger District are outside the current and historic range for greater sage grouse, northern Idaho ground squirrel, and Columbian sharp-tailed grouse, which were accordingly eliminated from detailed analysis. Therefore there are no direct, indirect, or cumulative effects on these species.
- Great gray owl, spotted bat, mountain quail, peregrine falcon, rocky mountain bighorn sheep, bald eagle, yellow-billed cuckoo, and common loon were eliminated from detailed analysis due to the lack of source habitat, lack of effects, and/or lack of key habitat features within the analysis area. Therefore there are no direct, indirect, or cumulative effects on these species.

American three-toed woodpecker, flammulated owl, boreal owl, fisher, northern goshawk, pileated woodpecker, Canada lynx, wolverine, gray wolf, mule deer, rocky mountain elk, Townsend's big-eared bat, and Columbia spotted frog have source habitat in the analysis area and project activities could impact individuals or habitat. Of this suite of species, boreal owl, pileated woodpecker, Canada lynx, gray wolf, Towsend's big-eared bat, and Columbia spotted frog were selected as focal species. The focal species were chosen because they represent an appropriate range of families having habitat present in the analysis area, have overlap of source habitat with eliminated species, and represent a range of habitats in the analysis area that species of the family utilize as source habitat. White-headed woodpecker, three-toed woodpecker, flammulated owl, fisher, northern goshawk, wolverine, and rocky mountain elk are discussed in detail in this Wildlife Specialist Report and the Biological Evaluation for TEPC/S wildlife species in the project record. Table 3-6 displays all species considered, the species status, associated source habitat/family, and effects determination.

[2] Focal species are those species selected during this analysis to represent other species within a source habitat family. The species were selected by evaluating the key environmental correlates and ecological functions associated with species in the family and selecting species representing those correlates and functions potentially affected by the action alternative(s).

Table 3-6 Wildlife Species Considered, Species Status, and Associated Source Habitat Suite and Family.

Source Habitat Suite	Family #	Family Name	Species Considered in this Analysis	Species Status[1]	Selected Focal Species	Effects Determination[3] for TES, R4 Sensitive and MIS Species for Alternative B and C.
Suite 1: Forest Only	1	Low Elevation, Old Forest	White-headed Woodpecker	S/MIS		NI
	2	Broad Elevation, Old Forest	American Three-toed Woodpecker	S		MI
			Boreal Owl	S	X	MI
			Fisher	S		MI
			Flammulated Owl	S		MI
			Great Gray Owl	S		NI
			Northern Goshawk	S		MI
			Pileated Woodpecker	MIS	X	MI
	3	Forest Mosaic	Canada Lynx	T	X	NLAA
			Mountain Quail	S		NI
			Wolverine	S		MI
	4	Early-seral and Lower Montane	None[2]	--		–
Suite 2: Combination of Forest and Rangeland	5	Forest and Range Mosaic	Gray Wolf	S	X	MI
			Mule Deer	--		-
			Rocky Mountain Bighorn Sheep	S		NI
			Rocky Mountain Elk	--		-
			Peregrine Falcon	S		NI
	6	Forests, Woodlands, and Montane Shrubs	None[2]	NA		-
	7	Forests, Woodlands, and Sagebrush	Spotted Bat	S		NI
			Townsend's Big-eared Bat	S	X	MI
	8	Rangeland and Early and Late-seral Forests	None[2]	NA		–
	9	Woodlands	None[2]	NA		-
Suite 3: Rangeland Only	10	Range Mosaic	None[2]	NA		-
	11	Sagebrush	Greater Sage Grouse	S		NI – Analysis area is not within the current and historic range for species.
	12	Grassland and Open-canopy	Northern Idaho Ground Squirrel	T		NE – Analysis area is not within the current and historic range for

Source Habitat Suite	Family #	Family Name	Species Considered in this Analysis	Species Status[1]	Selected Focal Species	Effects Determination[3] for TES, R4 Sensitive and MIS Species for Alternative B and C.
		Sagebrush				species.
			Columbian Sharp-Tailed Grouse	S		NI – Analysis area is not within the current and historic range for species.
Suite 4: Riverine and Non-riverine Riparian and Wetland	13	Riverine Riparian and Wetland	Bald Eagle	S		NI –
			Columbia Spotted Frog	S	X	MI
	14	Non-riverine riparian and wetland	Common Loon	S		NI

[1]Species Status: C = candidate (USFWS 2012); E = endangered (USFWS 2012); MIS = Forest Plan management indicator species (Forest Plan Appendix E); S = sensitive (USDA 2011); and T = threatened (USFWS 2012).
[2]None = no species identified because habitat is not present, or if present, would not be affected by the action alternative(s).
[3] NI = No Impact, NE = No Effect, NLAA = May Affect, Not Likely to Adversely Affect, MI = May Impact Individuals but is not likely to cause a trend to federal listing.

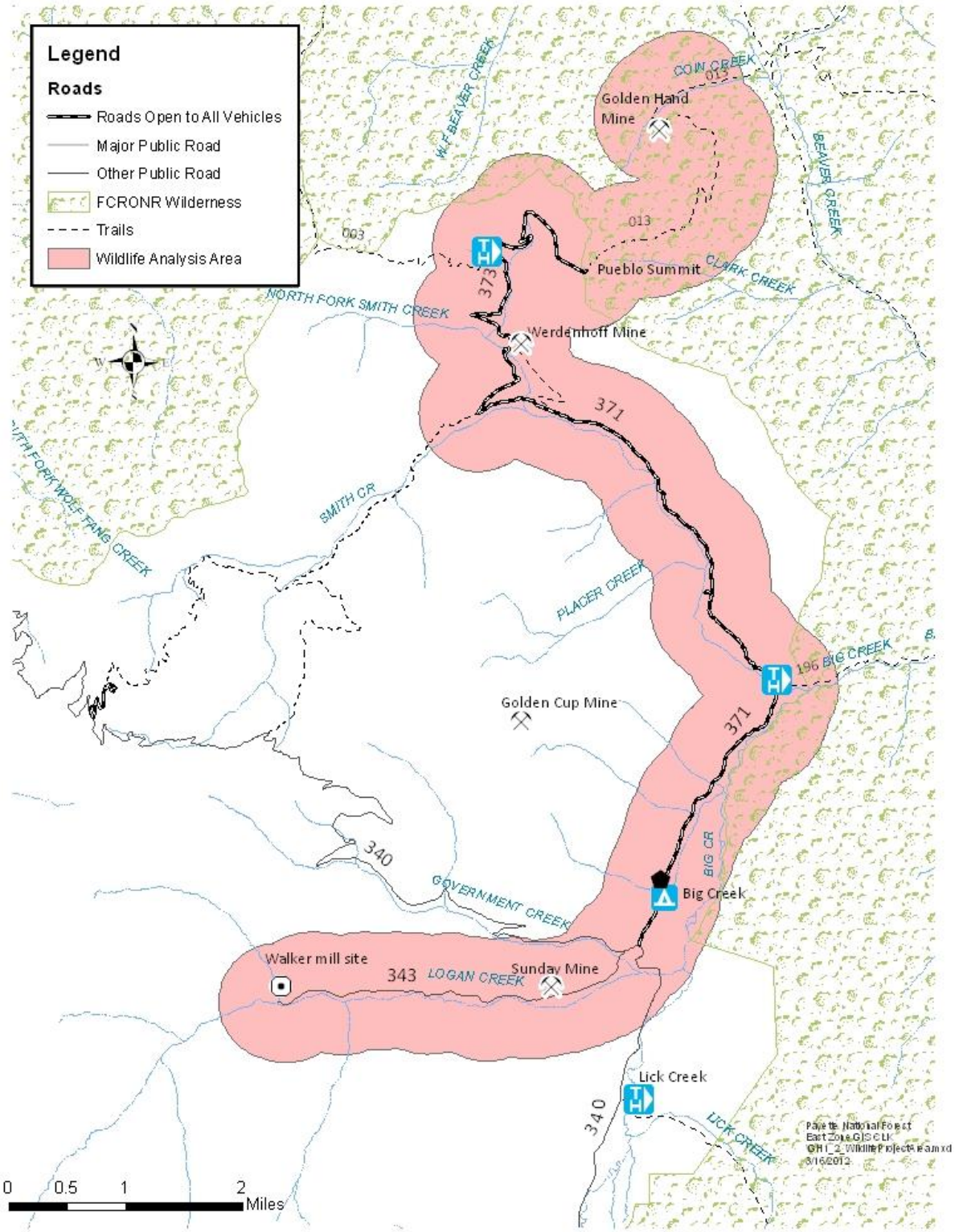


Figure 3-9 Wildlife Analysis Area

3.6.1 Boreal Owl (R4 Sensitive Species)

Source habitat for boreal owls includes old forest and unmanaged young forest stages of subalpine and montane forests and riparian woodlands (Wisdom et al 2000). Specific cover types and structural stages that provide source habitat are the old forest multi-story stages of Engelmann spruce/subalpine fir, and aspen; and the old forest single and multi-story stages of interior Douglas-fir, western larch, and lodgepole pine. Unmanaged young forest stages of all these cover types and of grand fir also serve as source habitats if suitable large diameter snags are present. Source habitats typically support abundant lichens and fungal sporocarps which provide important foods for southern red-backed voles, the principal prey of boreal owls (Hayward 1994).

On the Payette National Forest, vegetative communities that could provide source habitat conditions include PVGs 3, 4, 7, 8, 9, and 11 (Nutt et al 2008b & Hergenrider 2009). In Idaho, occupied forests are generally located at or above 5,000 feet in elevation. The elevation of the analysis area is approximately from 6,000 feet to 8300 feet and no sightings have been documented in the past. There are 2,817 acres of modeled source habitat within the 10,101 wildlife analysis area.

3.6.1.1 Environmental Consequences Specific to Alternative A

This Alternative would have no direct or indirect effect and therefore no cumulative effects on boreal owl or its habitat.

3.6.1.2 Environmental Consequences Common to Alternative B

In comparison to Alternative A (No Action), Alternative B would increase levels of noise disturbance to source habitat for this species in the temporary term. Actual ground disturbing activities would occupy a very small area. Ground disturbing activities would occur on previously disturbed ground – on existing road beds or otherwise disturbed areas composed of colder subalpine fir and Douglas-fir habitat types including lodgepole pine, subalpine fir, Douglas-fir, and Engelmann spruce tree species. These on-the-ground disturbances would occur in source habitat. Project activities may remove individual or small groups of trees or snags, but would have no meaningful change to the condition of the vegetation when viewed at the stand or activity area. Hence, the condition and amount of source habitat would not change, including nesting habitat (Section 2.4.4).

Noise from project activities could cause displacement of boreal owls. Project activities such as core drilling and road actions could create some temporary noise disturbance on any given day and this disturbance is expected to occur over an approximate 4 month period for three years. Boreal owl source habitat in the analysis area is abundant and any individuals present during project activities may be displaced in the temporary term but would be expected to return upon completion of the seasonal project activities.

3.6.1.3 Environmental Consequences Common to Alternative C

In comparison to Alternative A (No Action), Alternative C would increase levels of noise disturbance to source habitat for this species in the temporary term, but to a lesser extent than Alternative B. This slight decrease in disturbance from Alterative C is due to the approximate reduction of 200 authorized annual trips into the FC-RONR Wilderness.

All other effects are the same as Alternative B (Section 3.6.1.2).

3.6.1.4 Cumulative Effects

The direct and indirect effects of any alternative on boreal owl would primarily be limited to the analysis area. Therefore the area used to assess cumulative effects consists of the 10,101 acre analysis area (Figure 3-9).

Past activities include the original development of the Werdenhoff Millsite, which is addressed in the existing condition and analysis of alternatives. The Sunday Mine occurs in the analysis area and could have impacted trees or snags through past disturbance. While covered in the existing condition, many wildfires have occurred in the past and have altered vegetative composition.

There are several ongoing activities that could affect trees or snags and disturbance in the analysis area. The Walker Millsite occurs in the analysis area. The site could potentially reduce trees or snags through clearing and maintenance activities along with the associated noise. Firewood harvest occurs annually along roads randomly removing trees and/or snags and creating noise. Private lands, especially around Edwardsburg, continue to be developed annually to various degrees potentially affecting trees or snags and having associated noise disturbance. The Big Creek Lodge, Big Creek Guard Station, Big Creek Airstrip, and Big Creek Campground would continue to operate on an annual basis and receive maintenance. Private timber harvest, mostly for personal use, would likely continue in an ongoing fashion at unknown levels. Ongoing road and trail maintenance would continue and potentially affect roadside trees and generate noise. District and FC-RONR Wilderness weed management programs would continue to eradicate populations of noxious weeds in the analysis area usually through motorized access to the wilderness boundary. And, motorized activities associated with recreational activities, lodges, hunting, fishing, trapping, tribal endeavors, and other activities that require motorized access would continue in the analysis area. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Fuels Reduction Project occurs partially within the analysis area and represents a reasonably foreseeable project. Currently, this project is in the planning stages. A range of thinning and motorized activities could impact trees or snags; however, specifics are not currently available.

Alternative A would not result in any direct, indirect, or cumulative effects.

Alternative B and C in combination with ongoing and foreseeable future activities could incrementally increase the number of individual trees or snags felled and/or removed. However, at the stand or activity area there would likely be no meaningful change. Alternative B and C in combination with ongoing activities could incrementally add to the disturbance of boreal owls, if present. However these incremental effects would be limited to the temporary term and owls would be expected to return upon completion of the seasonal project activities. Alternative B and C <u>may impact individuals but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species</u>

3.6.2 Pileated Woodpecker (Management Indicator Species)

Pileated woodpeckers occupy dense deciduous, coniferous, or mixed forests, open woodlands, second growth forests, and parks and wooded residential areas of towns (NatureServe 2008). The species prefers habitats with tall closed canopies and high basal areas. General characteristics of habitat provide opportunities for nesting, roosting, and foraging, and include the presence of large diameter trees and snags, multiple canopy layers, decaying wood on the forest floor, and a somewhat moist environment that promotes fungal decay, and ant, termite, and beetle populations to forage upon (NatureServe 2008). Source habitats for pileated woodpeckers are typically late-seral stages of subalpine and montane community types.

On the Payette National Forest, vegetative communities that could provide source habitat conditions include PVGs 2, 3, 5, 6, 8, and 9 (Egnew et al 2009). Some PVGs are capable of providing source

habitat conditions under historical fire regimes while others do so because of altered fire regimes. Special habitat features for pileated woodpecker include large diameter (>21 inch dbh) snags and hollow live trees for nesting and roosting, and large standing dead and downed trees for foraging (USDA 2011).

Within the 10,101 acre analysis area, roughly 911 acres are considered source habitat.

Four pileated woodpecker sightings have been documented within the analysis area. A management indicator species (MIS) monitoring transect occurs within the analysis area along FR 371 (Big Creek-Smith Creek Rd.). The transect was monitored from 2004 through 2009 and pileated woodpeckers were detected along this route during monitoring surveys. Two were detected on survey in 2005 and two more were detected on survey in 2008 (NRM Wildlife 2010). This transect is scheduled to be conducted again in 2015.

3.6.2.1 Environmental Consequences Specific to Alternative A

This Alternative would have no direct or indirect effect and therefore no cumulative effects on pileated woodpecker or its habitat.

3.6.2.2 Environmental Consequences Common to Alternative B

Proposed activities may affect 911 acres of existing source habitat under this Alternative and the potential for loss of nest trees or for disturbance at an active nest site could be possible, but unlikely due to project design features for the project (Section 2.4.4). Ground disturbing activities would occur on previously disturbed ground – on existing road beds or otherwise disturbed areas composed of colder subalpine fir and Douglas-fir habitat types including lodgepole pine, subalpine fir, Douglas-fir, and Engelmann spruce tree species. These on-the-ground disturbances would occur in source habitat. Project activities may remove or move individual or small groups of trees, Coarse Woody Debris (CWD), or snags, but would have no meaningful change to the condition of the vegetation when viewed at the stand or activity area. Hence, the condition and amount of source habitat would not change, including nesting habitat (Section 2.4.4).

Noise from project activities could cause displacement of pileated woodpecker. Project activities such as core drilling and road actions could create some temporary noise disturbance on any given day and this disturbance is expected to occur over an approximate 4 month period for three years. Any individuals present during project activities may be displaced in the temporary term but would be expected to return upon completion of the seasonal project activities.

3.6.2.3 Environmental Consequences Common to Alternative C

In comparison to Alternative A (No Action), Alternative C would increase levels of noise disturbance to source habitat for this species in the temporary term, but to a lesser extent than Alternative B. This slight decrease in disturbance from Alterative C is due to the approximate reduction of 200 authorized annual trips into the FC-RONR Wilderness.

All other effects are the same as Alternative B (Section 3.6.2.2).

3.6.2.4 Cumulative Effects

The direct and indirect effects of any alternative on pileated woodpecker would primarily be limited to the analysis area. Therefore the area used to assess cumulative effects consists of the 10,101 acre analysis area (Figure 3-9).

Past activities include the original development of the Werdenhoff Millsite, which is addressed in the existing condition and analysis of alternatives. The Sunday Mine occurs in the analysis area and could have impacted trees, CWD, or snags through past disturbance. While covered in the existing condition, many wildfires have occurred in the past and have altered vegetative composition.

There are several ongoing activities that could affect trees, CWD, or snags and disturbance in the analysis area. The Walker Millsite occurs in the analysis area. The mine site potentially affects trees, CWD, or snags through clearing and maintenance activities along with the associated noise. Firewood harvest occurs annually along roads randomly removing trees, CWD, or snags and creating noise. Private lands, especially around Edwardsburg, continue to be developed annually to various degrees potentially affecting trees, CWD, or snags and having associated noise disturbance. The Big Creek Lodge, Big Creek Guard Station, Big Creek Airstrip, and Big Creek Campground would continue to operate on an annual basis and receive maintenance. Private timber harvest, mostly for personal use, would likely continue in an ongoing fashion at unknown levels. Ongoing road and trail maintenance would continue and potentially affect roadside trees/CWD and generate noise. District and FC-RONR Wilderness weed management programs would continue to eradicate populations of noxious weeds in the analysis area usually through motorized access to the wilderness boundary. And, motorized activities associated with recreational activities, lodges, hunting, fishing, trapping, tribal endeavors, and other activities that require motorized access would continue in the analysis area. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Fuels Reduction Project occurs partially within the analysis area and represents a reasonably foreseeable project. Currently, this project is in the planning stages. A range of thinning and motorized activities could impact trees, CWD, or snags; however, specifics are not currently available.

Alternative A would not result in any direct, indirect, or cumulative effects.

Alternative B and C in combination with ongoing and foreseeable future activities could incrementally increase the number of individual trees, CWD, or snags felled and/or removed. However, at the activity area or stand there would likely be no meaningful change. Alternative B and C in combination with ongoing activities could incrementally add to the disturbance of pileated woodpeckers, if present. However these incremental effects would be limited to the temporary term and pileated woodpeckers would be expected to return upon completion of the seasonal project activities.

3.6.3 Canada Lynx (Threatened)

Lynx are typically associated with large tracts of higher elevation boreal or coniferous forest that is often interspersed with rock outcrops, bogs and thickets. In Idaho, Canada lynx typically inhabit montane and subalpine coniferous forests above 4,000 feet (McKelvey et al 2000; Ruediger et al 2000). In central Idaho, primary habitat has been identified as lodgepole pine, subalpine fir, and Engelmann spruce habitat types (Ruediger et al 2000).

On the Payette National Forest, vegetative communities that could provide source habitat conditions include PVGs 3, 7, 8, 9, 10, and 11 (Hergenrider 2009). Down logs and root wads are a special habitat feature for lynx (Wisdom et al 2000; Ruggiero et al 1999; Koehler 1990) and provide important natal and maternal denning sites.

The Golden Hand Analysis Area occurs within the both the 60,156 acre Beaver Gold LAU and the 61,611 acre Upper Big Creek LAU (Figure 1-4 in Resource Specialist Report). Source habitat in the combined LAUs is currently at 120,092 acres. Approximately 5,473 acres of source habitat are currently in suitable condition within the Golden Hand Analysis Area.

Within the 10,101 acre analysis area, roughly 6,649 acres are considered source habitat capacity while 5,473 acres exhibit source habitat conditions. Due to this species' very large average home range size, the analysis area could provide a small portion of a single home range. Source habitat within the analysis area is fairly continuous, and dominated by patches with good connectivity between patches. Total existing tons/acre of coarse woody debris (i.e. downed logs) are generally at or below desired ranges for the PVGs that make up source habitat capacity. Project activities would not require or permit

removal of logs and course woody debris in the analysis area in order to preserve and promote those habitat attributes that constitute Canada lynx denning habitat.

The most recent recorded lynx observation on the PNF was a sighting of probable lynx tracks during an aerial survey for wolverine tracks in 2009 in Chamberlain Basin approximately 12 miles north and east of the analysis area. Prior to that, several lynx were observed between 1984 and 1988 in the same vicinity north and northeast of the analysis area (Terra Burns 1988). Many, but not all, of these observations were by persons with good qualifications at identification.

3.6.3.1 Environmental Consequences Specific to Alternative A

This Alternative would have no direct or indirect and therefore no cumulative effects on Canada lynx or its habitat.

3.6.3.2 Environmental Consequences Common to Alternative B

Actual ground disturbing activities would occupy a very small area. Ground disturbing activities would occur on previously disturbed ground – on existing road beds or otherwise disturbed areas composed of colder subalpine fir and Douglas-fir habitat types including lodgepole pine, subalpine fir, Douglas-fir, and Engelmann spruce tree species. Most of these on-the-ground disturbances would occur in source habitat, some of which is unsuited due to fires or other vegetative conditions. Project activities may remove or move individual or small groups of trees, CWD, or snags, but would have no meaningful change to the condition of the vegetation when viewed at the stand or activity area. Hence, the condition and amount of source habitat in the analysis area and LAU would not change, including denning habitat.

The amount of suitable lynx habitat that could be disturbed by the project is extremely small and inconsequential when considered in the context of the LAU and the average lynx home range size.

Noise from project activities is highly unlikely to cause displacement of lynx, in part because noise would be intermittent and temporary and because there are no known locations of lynx in or near the project area. Project activities such as core drilling and road actions would create some temporary noise disturbance on any given day and this disturbance is expected to occur over an approximate 4 month period for three years.

3.6.3.3 Environmental Consequences Common to Alternative C

In comparison to Alternative A (No Action), Alternative C would increase levels of noise disturbance to source habitat for this species in the temporary term, but to a lesser extent than Alternative B. This slight decrease in disturbance from Alterative C is due to the approximate reduction of 200 authorized annual trips into the FC-RONR Wilderness.

All other effects are the same as Alternative B (Section 3.6.3.2).

3.6.3.4 Cumulative Effects

The direct and indirect effects of any alternative Canada lynx would primarily be limited to the analysis area. Therefore the area used to assess cumulative effects consists of the 10,101 acre analysis area (Figure 3-9).

Past activities include the original development of the Werdenhoff Millsite, which is addressed in the existing condition and analysis of alternatives. The Sunday Mine occurs in the analysis area and could have impacted trees, CWD, or snags through past disturbance. While covered in the existing condition, many wildfires have occurred in the past and have altered vegetative composition.

There are several ongoing activities that could affect trees, CWD, or snags and disturbance in the analysis area. The Walker Millsite occurs in the analysis area. The mine site potentially affects trees, CWD, or snags through clearing and maintenance activities along with the associated noise. Firewood harvest occurs annually along roads randomly removing trees, CWD, or snags and creating noise. Private lands, especially around Edwardsburg, continue to be developed annually to various degrees potentially affecting trees, CWD, or snags and having associated noise disturbance. The Big Creek Lodge, Big Creek Guard Station, Big Creek Airstrip, and Big Creek Campground would continue to operate on an annual basis and receive maintenance. Private timber harvest, mostly for personal use, would likely continue in an ongoing fashion at unknown levels. Ongoing road and trail maintenance would continue and potentially affect roadside trees/CWD and generate noise. District and FC-RONR Wilderness weed management programs would continue to eradicate populations of noxious weeds in the analysis area usually through motorized access to the wilderness boundary. And, motorized activities associated with recreational activities, lodges, hunting, fishing, trapping, tribal endeavors, and other activities that require motorized access would continue in the analysis area. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Fuels Reduction Project occurs partially within the analysis area and represents a reasonably foreseeable project. Currently, this project is in the planning stages. A range of thinning and motorized activities could impact trees, CWD, or snags; however, specifics are not currently available.

Alternative A would not result in any direct, indirect, or cumulative effects.

Alternative B and C in combination with ongoing and foreseeable future activities could incrementally increase the number of individual trees, CWD, or snags felled and/or removed. However, at the stand or activity area there would likely be no meaningful change. Alternative B and C in combination with ongoing activities could incrementally add to the disturbance of Canada lynx, if present. However, as discussed, it is believed unlikely that lynx occupy the habitat in the analysis area. Alternative B and C <u>may affect</u>, but is <u>not likely to adversely affect</u> Canada Lynx.

3.6.4 Gray Wolf (R4 Sensitive Species)

Gray wolves utilize a wide array of forested and non-forested habitats and are considered a habitat generalist. They have large home ranges and make seasonal movements in pursuit of their primary prey (ungulates). Human factors have been the greatest source of documented mortality for wolves in Idaho (Nadeau et al 2009). Roads, trails, and their associated human use and development increase the potential for human-wolf conflict as does the presence of livestock (USDA 2011). They persist in most habitats that contain sufficient big-game (moose, elk, and deer) populations that are able to support their prey needs.

On the Payette National Forest, vegetative communities that could provide source habitat conditions include all forest, woodland, and non-forested vegetation types. All structural conditions are utilized (Nutt 2008). Key features of habitat include sufficient ungulate prey and limited human conflict.

The entire Golden Hand Analysis Area would be considered source habitat for this species.

3.6.4.1 Environmental Consequences Specific to Alternative A

This Alternative would have no direct or indirect effect on wolves or their habitat.

3.6.4.2 Environmental Consequences Common to Alternative B

Human disturbance is a key factor in the persistence of wolves within source habitat. Road density is the primary source of disturbance and can negatively affect the quality of wolf source habitat and result in human-cause disturbance or mortality. While noise disturbance would occur within the entire project analysis area and there is the potential for disturbance throughout the implementation period, activities would not occur within the critical denning period when young are immobile between March and early May (USDI 2007) as snow levels would prevent road access. This Alternative may have direct effects, through disturbance, on wolves should they be present during project activities within the analysis area. Wolves may be displaced temporarily by disturbance but would be expected to return to the area once the disturbance has stopped.

Project activities may remove individual or small groups of trees, CWD, or snags, but would not change the condition of the vegetation when viewed at the stand or activity area and therefore the amount of habitat in the analysis area.

3.6.4.3 Environmental Consequences Common to Alternative C

In comparison to Alternative A (No Action), Alternative C would increase levels of noise disturbance to source habitat for this species in the temporary term, but to a lesser extent than Alternative B. This slight decrease in disturbance from Alterative C is due to the approximate reduction of 200 authorized annual trips into the FC-RONR Wilderness.

All other effects are the same as Alternative B (Section 3.6.4.2).

3.6.4.4 Cumulative Effects

The direct and indirect effects of any alternative on gray wolf would primarily be limited to the analysis area. Therefore the area used to assess cumulative effects consists of the 10,101 acre analysis area (Figure 3-9).

Past activities include the original development of the Werdenhoff Millsite, which is addressed in the existing condition and analysis of alternatives. The Sunday Mine occurs in the analysis area and could have impacted trees, CWD, or snags through past disturbance. While covered in the existing condition, many wildfires have occurred in the past and have altered vegetative composition.

There are several ongoing activities that could affect trees, CWD, or snags and disturbance in the analysis area. The Walker Millsite occurs in the analysis area. The mine site potentially affects trees, CWD, or snags through clearing and maintenance activities along with the associated noise. Firewood harvest occurs annually along roads randomly removing trees, CWD, or snags and creating noise. Private lands, especially around Edwardsburg, continue to be developed annually to various degrees potentially affecting trees, CWD, or snags and having associated noise disturbance. The Big Creek Lodge, Big Creek Guard Station, Big Creek Airstrip, and Big Creek Campground would continue to operate on an annual basis and receive maintenance. Private timber harvest, mostly for personal use, would likely continue in an ongoing fashion at unknown levels. Ongoing road and trail maintenance would continue and potentially affect roadside trees/CWD and generate noise. District and FC-RONR Wilderness weed management programs would continue to eradicate populations of noxious weeds in the analysis area usually through motorized access to the wilderness boundary. And, motorized activities associated with recreational activities, lodges, hunting, fishing, trapping, tribal endeavors, and other activities that require motorized access would continue in the analysis area. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Fuels Reduction Project occurs partially within the analysis area and represents a reasonably foreseeable project. Currently, this project is in the planning stages. A range of thinning and motorized activities could impact trees, CWD, or snags; however, specifics are not currently available.

Alternative A would not result in any direct, indirect, or cumulative effects.

Alternative B and C in combination with ongoing and foreseeable future activities could incrementally increase the number of individual trees, CWD, or snags felled and/or removed. However, at the stand or activity area there would likely be no meaningful change. Alternative B and C in combination with ongoing activities could incrementally add to the disturbance of wolves, if present. However these incremental effects would be limited to the temporary term and wolves would be expected to return upon completion of the seasonal project activities. Alternative B and C may impact individuals but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species.

3.6.5 Townsend's Big-Eared Bat (R4 Sensitive Species)

The Townsend's big-eared bat is a year-round resident of the Interior Columbia River Basin and is considered a forest generalist within the subalpine, montane, upland woodland, and riparian woodland community groups (Wisdom et al 2000). This species uses caves, mines, and buildings for roosting where they aggregate in large colonies. Townsend's big-eared bats forage for moths in sagebrush, bitterbrush, and open ponderosa pine forests. The distribution of this species is patchy due to their specialized roosting requirements. Primary threats are related to human disturbance and loss of roost sites and hibernacula (USDA 2011).

On the Payette National Forest, vegetative communities that could provide source habitat conditions include PVGs 1, 2, 3, 4, 5, 6, and 7 and non-forest vegetation types including low sagebrush, mountain and Wyoming big sagebrush, montane shrub, and shrub-forest transition (Geier-Hayes and Nutt 2008). These types provide source habitat when located within the maximum foraging distance (15 miles) of roost locations (i.e. caves, mines, and other suitable structures). The Ella is currently caved in and does not provide habitat. There is suitable roost sites (i.e. caves, mines, and other suitable structures) within the analysis area. Mine adits located in the analysis area were found to have bats present; however, Townsend's big-eared bats were not directly identified during the surveys in the analysis area. The nearest sightings were over 10 miles from the roosting habitat located in the analysis area.

3.6.5.1 Environmental Consequences Specific to Alternative A

This Alternative would have no direct or indirect effect on Townsend's big-eared bat or their habitat and therefore no cumulative effect.

3.6.5.2 Environmental Consequences Common to Alternative B

Source habitat for Townsend's big-eared bat occurs throughout the analysis area and includes potential roosts in adits. Actual ground disturbing activities would occupy a very small area. Ground disturbing activities would occur on previously disturbed ground – on existing road beds or otherwise disturbed areas composed of colder subalpine fir and Douglas-fir habitat types including lodgepole pine, subalpine fir, Douglas-fir, and Engelmann spruce tree species. Most of these on-the-ground disturbances would occur in source habitat. Project activities may remove or move individual or small groups of trees, CWD, or snags, but would have no meaningful change to the condition of the vegetation when viewed at the stand or activity area. Hence, the condition and amount of source habitat would not change.

The Ella adit currently does not provide Townsend's big-eared bat habitat because it is caved-in. If re-opened under this alternative, project design features (Section 2.4.2.2 and Section 2.4.4) would prevent entry and subsequent disturbance of this bat species. Since project design features (Section 2.4.2.2 and Section 2.4.4) would exclude entry and colonization of the Ella Mine adit by bats, Alternative B would not create or provide any roosting habitat for the species.

Noise from project activities could cause displacement of Townsend's big-eared bat. Project

activities such as core drilling and road actions could create some temporary noise disturbance on any given day and this disturbance is expected to occur over an approximate 4 month period for three years. Any individuals present during project activities may be displaced in the temporary term but would be expected to return upon completion of the seasonal project activities.

3.6.5.3 Environmental Consequences Common to Alternative C

In comparison to Alternative A (No Action), Alternative C would increase levels of noise disturbance to source habitat for this species in the temporary term, but to a lesser extent than Alternative B. This slight decrease in disturbance from Alterative C is due to the approximate reduction of 200 authorized annual trips into the FC-RONR Wilderness.

All other effects are the same as Alternative B (Section 3.6.5.2).

3.6.5.4 Cumulative Effects

The direct and indirect effects of any alternative on Townsend's Big-eared bat would primarily be limited to the analysis area. Therefore the area used to assess cumulative effects consists of the 10,101 acre analysis area (Figure 3-9).

Past activities include the original development of the Werdenhoff Millsite, which is addressed in the existing condition and analysis of alternatives. The Sunday Mine occurs in the analysis area and could have impacted trees or snags through past disturbance. While covered in the existing condition, many wildfires have occurred in the past and have altered vegetative composition.

There are several ongoing activities that could affect trees or snags and disturbance in the analysis area. The Walker Millsite occurs in the analysis area. The mine site potentially affects trees or snags through clearing and maintenance activities along with the associated noise. Firewood harvest occurs annually along roads randomly removing trees or snags and creating noise. Private lands, especially around Edwardsburg, continue to be developed annually to various degrees potentially affecting trees or snags and having associated noise disturbance. The Big Creek Lodge, Big Creek Guard Station, Big Creek Airstrip, and Big Creek Campground would continue to operate on an annual basis and receive maintenance. Private timber harvest, mostly for personal use, would likely continue in an ongoing fashion at unknown levels. Ongoing road and trail maintenance would continue and potentially affect roadside trees and generate noise. District and FC-RONR Wilderness weed management programs would continue to eradicate populations of noxious weeds in the analysis area usually through motorized access to the wilderness boundary. And, motorized activities associated with recreational activities, lodges, hunting, fishing, trapping, tribal endeavors, and other activities that require motorized access would continue in the analysis area. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Fuels Reduction Project occurs partially within the analysis area and represents a reasonably foreseeable project. Currently, this project is in the planning stages. A range of thinning and motorized activities could impact trees or snags; however, specifics are not currently available.

Alternative A would not result in any direct, indirect, or cumulative effects.

Alternative B and C in combination with ongoing and foreseeable future activities could incrementally increase the number of individual trees or snags felled and/or removed. However, at the stand or activity area there would likely be no meaningful change. Alternative B and C in combination with ongoing activities could incrementally add to the disturbance of Townsend's big-eared bat, if present. However these incremental effects would be limited to the temporary term and Townsend's big-eared bat would be expected to return upon completion of the seasonal project activities. Since Alternatives B and C would have no direct or indirect effect to roosting habitat, Alternative B and C would have no cumulative effect to roosting habitat. Alternative B and C <u>may impact individuals but would not likely contribute to a trend toward Federal Listing or cause a loss</u>

of viability to the population or species.

3.6.6 Columbia Spotted Frog (R4 Sensitive Species)

Columbia spotted frogs are aquatic and typically occur in or near permanent bodies of water such as lakes, ponds, slow moving streams, and marshes. The frogs generally occur along the marshy edges of such sites where emergent vegetation (e.g. grasses, sedges, cattails, etc.) is fairly thick and where there is an ample amount of dead and decaying vegetation. Some occupied sites may also have a layer of algae or small vegetation (e.g. duckweed) on the surface of the water. During summer months, they may travel away from breeding sites, but are still typically associated with aquatic sites with vegetated margins (Gomez 1994). Occupied aquatic sites may be surrounded by a wide variety of terrestrial vegetation including mixed coniferous and subalpine forests, grasslands, and shrub-steppe communities. Key features of source habitat for the Columbia spotted frog include the aquatic site itself, its banks and streambank vegetation, and the conditions of the surrounding uplands.

Source habitat for this species includes overwintering, breeding, and post-breeding habitat, all of which could be associated with slow-moving portions of creeks that occur in the analysis area.

No sightings have been documented within the analysis area.

3.6.6.1 Environmental Consequences Specific to Alternative A

This Alternative would have no direct or indirect effect on Columbia spotted frog or their habitat and therefore no cumulative effect.

3.6.6.2 Environmental Consequences Common to Alternative B

Installing a box culvert/steel arch pipe, activities at fords, and water withdrawal at Coin Creek under this Alternative have the potential to impact this species or its habitat if such activities occur in the vicinity of standing water. Modification of habitat would not be expected to result in any temporary or long term impacts because the habitat would remain suitable after installation of the stream crossing structure is completed or water withdrawal is complete. Activities such as fording and armoring of fords would measurably alter habitat (Section 2.4.4). More importantly, activities at fords and water withdrawal from Coin Creek could disturb, displace, or even lead to mortality if individuals happen to be present during the activity. However, spotted frogs are quite mobile and would likely be able to move away from equipment if threatened (USDA 2011). Furthermore the slow moving water that provides source habitat is generally lacking within the analysis area and limits the areas where frogs would likely occupy. While these potential impacts could be substantial for individual frogs, even causing mortality, the overall impact to the species is expected to be minimal due to the small amount of area where water would be removed from streams, stream structures would be installed, and activities at fords and the corresponding small number of frogs potentially present in these areas.

3.6.6.3 Environmental Consequences Common to Alternative C

In comparison to Alternative A (No Action), Alternative C would increase levels of disturbance and potential impacts to individuals, but to a lesser extent than Alternative B. Alternative C would authorize approximately 200 less trips per year within the FC-RONR Wilderness and therefore likely result in fewer crossings of the two fords located within the FC-RONR Wilderness.

All other effects are the same as Alternative B (Section 3.6.6.2).

3.6.6.4 Cumulative Effects

The direct and indirect effects of any alternative on Columbia spotted fog would be limited to the analysis area. Therefore the area used to assess cumulative effects consists of the 10,101 acre

analysis area (Figure 3-9).

Past activities include the original development of the Werdenhoff Millsite, which is addressed in the existing condition and analysis of alternatives. The Sunday Mine occurs in the analysis area and could have impacted individuals through past disturbance.

There are several ongoing activities that could affect trees or snags and disturbance in the analysis area. The Walker Millsite occurs in the analysis area. The mine site potentially affects habitat and individuals through clearing and maintenance activities along with the associated noise. Firewood harvest occurs annually along roads randomly removing trees or snags, creating noise, and crossing fords. Private lands, especially around Edwardsburg, continue to be developed annually to various degrees potentially affecting habitat or individuals. The Big Creek Lodge, Big Creek Guard Station, Big Creek Airstrip, and Big Creek Campground would continue to operate on an annual basis and receive maintenance. Private timber harvest, mostly for personal use, would likely continue in an ongoing fashion at unknown levels. Ongoing road and trail maintenance would continue and potentially affect habitat and individuals at stream crossings. District and FC-RONR Wilderness weed management programs would continue to eradicate populations of noxious weeds in the analysis area usually through motorized access to the wilderness boundary. And, motorized activities associated with recreational activities, lodges, hunting, fishing, trapping, tribal endeavors, and other activities that require motorized access would continue in the analysis area. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Fuels Reduction Project occurs partially within the analysis area and represents a reasonably foreseeable project. Currently, this project is in the planning stages. A range of thinning and motorized activities could impact trees or snags; however, specifics are not currently available.

Alternative A would not result in any direct, indirect, or cumulative effects.

Alternative B and C in combination with ongoing and foreseeable future activities could incrementally increase the amount of disturbance at fords and possibly further impact individual Columbia spotted frogs if present. However these incremental effects would most likely be limited to the temporary term and result in temporary displacement. While these potential cumulative impacts could be substantial for individual frogs, even causing mortality, the overall impact to the species is expected to be minimal due to the small amount of area where water would be removed from streams, stream structures would be installed, and activities at fords and the corresponding small number of frogs potentially present in these areas. Alternative B and C <u>may impact individuals but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species.</u>

3.6.7 Wolverine (R4 Sensitive Species and Candidate)

Habitat for wolverine includes alpine tundra and subalpine and montane forests. Within forest types, all structural stages except the closed canopy stem exclusion stage provide source habitat (Wisdom et al 2000). Primary habitat during winter is mid-elevation conifer forest, while summer habitat is subalpine areas associated with high-elevation cirques (Copeland 1996). Summer use of high-elevation habitats is related to the availability of prey and den sites and possibly human avoidance. Lower elevation forests likely contain the greatest amount of ungulate carrion in winter (Copeland 1996).

Spring snow cover (April 15 to May 14) is the best overall predictor of wolverine occurrence (Aubrey et al 2007). Snow cover during the denning period is essential for successful wolverine reproduction range-wide (Magoun and Copeland 1998; Inman et al 2007c). Wolverine dens tend to be in areas of high structural diversity such as logs and boulders with deep snow (Magoun and Copeland 1998; Inman et al 2007). Reproductive females dig deep snow tunnels to reach the protective structure of logs and boulders where they produce offspring. This behavior presumably protects the vulnerable kits from predation by large carnivores, including other wolverines (Pulliainen 1968), but may also have physiological benefits for kits by buffering them from extreme cold, wind, and desiccation (Pullianen

1968). All of the areas in the lower 48 states for which good evidence of persistent wolverine populations exists contain large and well-distributed areas with deep snow cover that persists through the wolverine denning period (Aubry et al 2007).

On the Payette National Forest, source habitat is defined by areas that contain a persistent snow layer as defined by Copeland (1996). These areas typically coincide with mixed conifers at mid-elevations, and subalpine and alpine habitats at higher elevations. Special habitat features include deep persistent snow above timberline and den sites (e.g. talus slopes, boulder fields, beaver lodges, old bear dens, fallen logs, root wads of fallen trees, and large cavities). Denning habitat may be a factor limiting distribution and abundance (Copeland 1996) and wolverines may abandon dens in response to disturbance (Copeland 1996, Magoun and Copeland 1998).

On the Payette National Forest those areas that could provide source habitat conditions for wolverines include those areas covered by persistent snow cover (Copeland 1996). The Golden Hand Analysis Area contains only a small portion of the persistent snow layer as defined by Copeland (1996). This habitat is in the higher elevation portion of the analysis area near Pueblo Summit. The majority of the analysis area is considered summer (non-breeding) habitat.

No wolverine sightings have been documented within the analysis area although 2 wolverines were observed approximately 2 miles west of the analysis area in 2009.

3.6.7.1 Environmental Consequences Specific to Alternative A

This Alternative would have no direct or indirect effect on wolverine or their habitat and therefore no cumulative effect.

3.6.7.2 Environmental Consequences Common to Alternative B

Source habitat for wolverine is relatively abundant in the analysis area with a robust snow pack on most years. Actual ground disturbing activities would occupy a very small area. Ground disturbing activities would occur on previously disturbed ground – on existing road beds or otherwise disturbed areas composed of colder subalpine fir and Douglas-fir habitat types including lodgepole pine, subalpine fir, Douglas-fir, and Engelmann spruce tree species. Most of these on-the-ground disturbances would occur in source habitat. Project activities may remove or move individual or small groups of trees, CWD, or snags, but would have no meaningful change to the condition of the vegetation when viewed at the stand or activity area. Hence, the condition and amount of source habitat would not change, including denning habitat. Project activities would occur during the non-breeding time of year so breeding activities would not be disrupted.

Noise from project activities could cause displacement of wolverine. Project activities such as core drilling and road actions could create some temporary noise disturbance on any given day and this disturbance is expected to occur over an approximate 4 month period for three years. Wolverine habitat in the analysis area is abundant and any individuals present during project activities may be displaced in the temporary term but would be expected to return upon completion of the seasonal project activities.

3.6.7.3 Environmental Consequences Common to Alternative C

In comparison to Alternative A (No Action), Alternative C would increase levels of noise disturbance to source habitat for this species in the temporary term, but to a lesser extent than Alternative B. This slight decrease in disturbance from Alterative C is due to the approximate reduction of 200 authorized annual trips into the FC-RONR Wilderness.

All other effects are the same as Alternative B (Section 3.6.7.2).

3.6.7.4 Cumulative Effects

The direct and indirect effects of any alternative on wolverine would primarily be limited to the analysis area. Therefore the area used to assess cumulative effects consists of the 10,101 acre analysis area (Figure 3-9).

Past activities include the original development of the Werdenhoff Millsite, which is addressed in the existing condition and analysis of alternatives. The Sunday Mine occurs in the analysis area and could have impacted trees or snags through past disturbance. While covered in the existing condition, many wildfires have occurred in the past and have altered vegetative composition.

There are several ongoing activities that could affect trees or snags and disturbance in the analysis area. The Walker Millsite occurs in the analysis area. The mine site potentially affects trees or snags through clearing and maintenance activities along with the associated noise. Firewood harvest occurs annually along roads randomly removing trees or snags and creating noise. Private lands, especially around Edwardsburg, continue to be developed annually to various degrees potentially affecting trees or snags and having associated noise disturbance. The Big Creek Lodge, Big Creek Guard Station, Big Creek Airstrip, and Big Creek Campground would continue to operate on an annual basis and receive maintenance. Private timber harvest, mostly for personal use, would likely continue in an ongoing fashion at unknown levels. Ongoing road and trail maintenance would continue and potentially affect roadside trees and generate noise. District and FC-RONR Wilderness weed management programs would continue to eradicate populations of noxious weeds in the analysis area usually through motorized access to the wilderness boundary. And, motorized activities associated with recreational activities, lodges, hunting, fishing, trapping, tribal endeavors, and other activities that require motorized access would continue in the analysis area. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Fuels Reduction Project occurs partially within the analysis area and represents a reasonably foreseeable project. Currently, this project is in the planning stages. A range of thinning and motorized activities could impact trees or snags; however, specifics are not currently available.

Alternative A would not result in any direct, indirect, or cumulative effects.

Alternative B and C in combination with ongoing and foreseeable future activities could incrementally increase the number of individual trees or snags felled and/or removed. However, at the stand or activity area there would likely be no meaningful change. Alternative B and C in combination with ongoing activities could incrementally add to the disturbance of wolverine, if present. However these incremental effects would be limited to the temporary term and wolverine would be expected to return upon completion of the seasonal project activities. Since Alternatives would have direct or indirect effect to habitat, Alternative B and C would have no cumulative effect to habitat. Alternative B and C <u>may impact individuals but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species.</u>

3.7 Roadless Resource

This section of the document discusses the existing conditions and characteristics of the Inventoried Roadless Areas (IRAs) within the project area, as well as the effects of the various alternatives on the resource. The Project Area contains 25 acres within the Big Creek Fringe IRA, 29 acres within the Cottontail Point/Pilot Peak IRA, 102 acres within the Placer Creek IRA, 45 acres within the Secesh IRA, and 89 acres within the Smith Creek IRA, Figure 3-10. Unless noted otherwise, the analysis area would be comprised of the 1,309 acre project area.

The project area is uniquely situated in that several IRAs terminate immediately adjacent to roads in the project area. The following briefly describes each IRA:

The Big Creek Fringe IRA, discussed on pages C-168 thru C-171 of the Forest Plan FEIS, encompasses a narrow strip of land less than a mile wide between Big Creek and the Frank Church – River of No Return (FC-RONR) Wilderness on the Krassel Ranger District. Access is by road along Big Creek (FR #340 and #371), and by the trail from Big Creek into Cougar Basin (Forest Trail 004). The Secesh IRA lies directly to the west; Placer Creek IRA lies to the northwest; and the FC-RONR Wilderness forms the eastern border. The IRA is approximately 1,083 acres in size.

The Cottontail Point/Pilot Peak IRA, discussed on pages C-180 thru C-184 of the Forest Plan FEIS, is located on the McCall Ranger District, in the north central portion of the Forest. The area stretches from Marshall Mountain in the west, across the South Fork Salmon River to Pueblo Summit in the east. The FC-RONR Wilderness forms the area's north boundary. The Chimney Rock, Crystal Mountain, and Secesh IRAs lie to the south, and the Marshall Mountain Mining District lies to the west. The IRA is approximately 98,833 acres in size.

Located on the Krassel Ranger District, the Placer Creek IRA (C-232 thru C-235 of the Forest Plan FEIS) lies south of Smith Creek and east of the Big Creek Work Station. It is accessed by the Warren-Profile Gap and Big Creek Roads, and by two primitive mining roads from the south. The FC-RONR Wilderness and the Cottontail/Pilot Peak and Secesh IRAs surround the area. The IRA is approximately 6,944 acres in size.

The Secesh IRA, discussed on pages C-241 thru C-245 of the Forest Plan FEIS, lies within the McCall and Krassel Ranger Districts on the Payette NF. The area stretches across the center of the Forest, from Payette Lake on the west to Big Creek on the east. The Warren-Elk Creek Road (FR #340) on the north and the Lick Creek Road (FR #48) on the south provide boundaries and the principal vehicle access. Trails provide entry into much of the area, with some portions being accessible only by cross-country hiking. The Needles and Caton Lake IRAs lie directly to the south; the French Creek IRA lies to the west; the FC-RONR Wilderness adjoins to the east; and the Crystal Mountain, Chimney Rock, and Cottontail Point/Pilot Peak IRAs lie to the north. The IRA is approximately 248,251 acres in size.

Located on the Krassel Ranger District, the Smith Creek IRA, discussed on pages C-251 thru C-254 of the Forest Plan FEIS, lies between Smith Creek and the FC-RONR Wilderness. FR #371 and two primitive trails provide access. The Placer Creek IRA adjoins the Smith Creek IRA to the south and west. The IRA is approximately 2,285 acres in size.

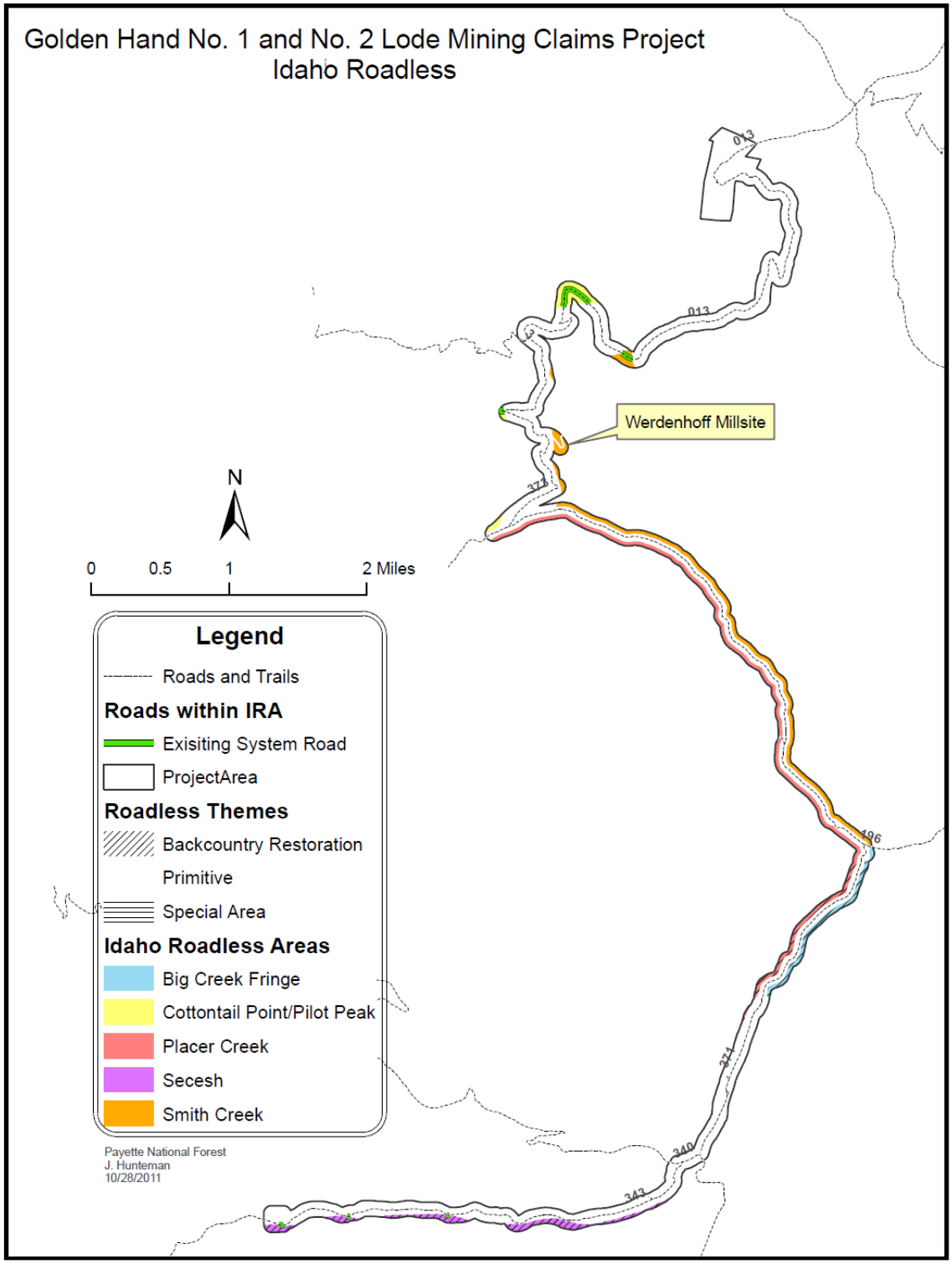


Figure 3-10 Inventoried Roadless Area within the Project Area

In 2005, the Forest Service developed a monitoring protocol for wilderness character (Landres et al., 2005) that replaces the wilderness attribute rating system. This protocol describes wilderness qualities as: Natural, Undeveloped, Untrammeled, and Opportunities for Primitive Recreation, or Solitude. These qualities are very similar to the wilderness attributes described in the wilderness attribute rating system but more closely reflect the definition of wilderness and describe its essential qualities. Table 3-7 provides a crosswalk to align the wilderness qualities from the wilderness character monitoring protocol to the wilderness attributes from the older wilderness attribute rating system analyzed in this document.

Table 3-7 Crosswalk of Wilderness Qualities to Wilderness Attributes.

Wilderness Qualities from Wilderness Character Monitoring Protocol	Wilderness Attributes from Wilderness Attribute Rating System
Untrammeled –monitors modern human activities that directly control or manipulate the components or processes of ecological systems inside wilderness	Natural Integrity
Natural –monitors both intended and unintended effects of modern people on ecological systems inside wilderness since the time the area was designated.	Natural Integrity Apparent Naturalness
Undeveloped –monitors the presence of structures, construction, habitations, and other evidence of modern human presence or occupation	Apparent Naturalness Remoteness
Outstanding opportunities for solitude or a primitive and unconfined type of recreation –monitors conditions that affect the opportunity for people to experience solitude or primitive, unconfined recreation in a wilderness setting	Solitude Opportunities for Primitive Recreation

In October 2008, the US Department of Agriculture adopted a state-specific, final rule establishing management direction for designating roadless areas in Idaho (36 CFR §294; 73 Federal Register 61456-61496). In March of 2011, the Forest Plan Special Area Themes identified in 2008 and located in the project area were administratively corrected with regard to the theme category (36 CFR §294; 76 Federal Register 17341-17343). Those areas within the project area that were designated as Forest Plan Special Area in 2008 have been changed to account for the fact that the Payette National Forest Land and Resource Management ROD (USDA 2003, 2010) did not find Big Creek eligible for Wild and Scenic River designation. Since the Forest Plan did not establish a special management area for which the theme was developed, the correction removed this erroneous classification from the Idaho Rule. Since the correction was implemented, areas formerly designated as Forest Plan Special Area in the Big Creek Fringe IRA within the project area have been changed to a Backcountry/Restoration Theme. Areas formerly designated as Forest Plan Special Area in the Smith Creek IRA within the project area have been changed to a Primitive Theme. And, approximately 3 acres formerly designated as Forest Plan Special Area of the Placer Creek IRA within the project area have been changed to a Primitive Theme, while roughly 21 acres have been changed to Backcountry/Restoration Theme.

The final rule designates 250 Idaho Roadless Areas, including those within the project area, and establishes five management themes that provide prohibitions with exceptions or conditioned permissions governing road construction, timber cutting, and discretionary mineral development. The Big Creek Fringe IRA was assigned 23 acres of a Backcountry/Restoration Theme and 2 acres of a Primitive Theme within the project area. The Cottontail Point/Pilot Peak IRA was assigned a Primitive Theme within the project area. The Placer Creek IRA was assigned 25 acres of Backcountry/Restoration Theme and 77 acres of a Primitive Theme within the project area. The Secesh IRA was assigned a Backcountry/Restoration Theme within the project area. Lastly, the Smith Creek IRA has 89 acres of a Primitive Theme within the project area.

Of the system roads that occur in the project area approximately 0.1 miles of FR #343 occurs in several small slivers within the Secesh IRA and approximately 0.5 miles of FR #373 occurs within Primitive Themes of the Cottontail Point/Pilot Peak and Smith Creek IRAs. The inclusion of these segments within a roadless area boundary appears to be a mapping error. Corrections to this mapping error would not be sought through this project.

The IRAs, in general, have a high capability for natural integrity, natural appearance, solitude, and opportunities for challenge and adventure. This is principally due to the large and generally connected areas coupled with the lack of past development, rugged terrain, and limited access points. The following discussions of the wilderness attributes are specific to the entire IRA and could vary within the analysis area due to its proximity to roads and past development:

Big Creek Fringe IRA

Natural Integrity and Appearance: There have been no major human-caused disturbances and there is only about 0.5 mile of unauthorized road within the boundaries; thus, the natural integrity appears intact and the natural appearance is high.

Opportunities for Solitude and Primitive Recreation: The area consists primarily of slopes facing the Big Creek Road. Because development (summer homes, lodge, work center, air strip) occurs along the road, and the road is a popular access point for the adjacent Wilderness area, the opportunity for solitude within the Fringe itself is low. Due to its shape (a long, narrow strip of land), the area alone provides very little opportunity for primitive recreation. The opportunities for primitive recreation become high, however, in conjunction with the adjacent FC-RONR Wilderness. The steep slopes offer challenging backpacking.

Special Features: In conjunction with the Big Creek Road, the area serves as an access point to the FC-RONR Wilderness. The portion close to Big Creek is an elk calving area.

Manageability and Boundaries: Due to the area's small size, alternative boundaries are not practical. Because the area is less than 5,000 acres, the only wilderness management opportunity would be to add the area to the existing FC-RONR Wilderness.

Cottontail Point/Pilot Peak IRA

Natural Integrity and Appearance: The natural integrity and natural appearance of the area are high, except in the heavily mined Warren Meadows area and along the border near the Salmon River, where several special uses are in effect. Associated with the mining, are an estimated 23.5 miles of unauthorized and 8.6 miles of authorized roads within the boundary. Other portions of this large area have had very little disturbance.

Opportunities for Solitude and Primitive Recreation: The limited access and rugged terrain over much of the area create a high opportunity for solitude and primitive recreation. The area is very remote from any large population centers, although local use from Warren, Secesh Meadows, and McCall is increasing.

Special Features: The South Fork Salmon River Canyon and the Wolf Fang Peak area are scenic landmarks. The South Fork Salmon River has been found suitable for Wild and Scenic River designation. There are 5.5 miles and 1,701 acres of land considered suitable for inclusion in the Wild and Scenic River System within the area. The area also provides important habitat for threatened chinook salmon, steelhead trout, and bull trout, and has many significant cultural resource sites.

Manageability and Boundaries: Forest Plan alternatives evaluated boundary options that would add portions of this area to the FC-RONR Wilderness. These changes would enhance existing wilderness by moving the boundaries to ridge tops and away from mid-slope. Existing mining activity could complicate managing this area as wilderness.

Placer Creek IRA

Natural Integrity and Appearance: The natural integrity is somewhat affected by the presence of old mining sites and mining roads that intrude into the interior of the area. There is an estimated 0.4 mile of unauthorized road within the boundary. The natural appearance is low near the surrounding and intruding roads, and fairly high away from them.

Opportunities for Solitude and Primitive Recreation: Steep, densely timbered slopes contribute to light use and moderate to high opportunities for solitude and primitive recreation. Challenging big-game hunting is available.

Special Features: A small group of unnamed mountains exceeding 8,000 feet is the area's central feature. Scenic Placer Lake sits in a small alpine basin at the head of Placer Creek.

Manageability and Boundaries: No practical boundary alternatives exist. The area is considered in its entirety in the roadless evaluation. Past, existing, and potential mining activity could complicate managing this area as wilderness.

Secesh IRA

Natural Integrity and Appearance: Although several activities have occurred along portions of the boundary, the natural integrity of the area remains high. This is a large area with relatively few road corridor or other developed incursions. The natural appearance for this area is also high, although this appearance has been modified in some areas by road intrusions and recent fires. There are an estimated 32.2 miles of unauthorized road and 2.2 miles of authorized road within the boundary. When visitors leave surrounding road corridors, they are not affected by human activity or developments.

Opportunities for Solitude and Primitive Recreation: This area has a high opportunity for solitude and for primitive recreation because of its substantial size, rugged terrain, limited access, and the lack of large population centers nearby. The roads accessing this area pass around the outer edges and intrude in only a few places. The rugged topography and climate provide many challenging and primitive recreation opportunities.

Special Features: The Secesh River and South Fork Salmon River are suitable for Wild and Scenic River designation. There are 13.9 miles of the Secesh River and 10.4 miles of the South Fork Salmon River and 4,177 acres of land associated with the Secesh River and 3,604 acres of land associated with the South Fork Salmon River considered suitable for inclusion in the Wild and Scenic River System within the area. Scenic landmarks include Slick Rock, Loon Peaks, and the South Fork Salmon River Canyon. Elk winter range occurs along the East Fork South Fork Salmon River and along the South Fork Salmon River. Research Natural Areas (RNAs) have been established at Pony Meadows and Circle End Creek. Three potential National Natural Landmarks lie within the boundaries: Slick Rock, Lick Creek Block Stream, and Rainbow Rock. There are approximately 4,330 acres of the western portion of the area that are part of the municipal watershed for the city of McCall, and an additional 714 acres in the eastern portion that are part of the Yellow Pine Water Users watershed.

Manageability and Boundaries: As mentioned above, this area is very large and relatively intact, lending itself to many boundary options. The current level of developed uses and activities is relatively low both within and around the area. The Loon Lake Trail is a highly publicized and used mountain bike trail. Mountain bike use on the Duck Lake – Twenty Mile Lakes Trail is moderately high.

Smith Creek IRA

Natural Appearance and Integrity: There is an estimated 0.3 mile of unauthorized road and 0.1 mile of authorized road within the boundary. One mining claim in the southern tip and roads along the western boundary do little to detract from the area's high natural integrity or its high natural appearance.

Opportunity for Solitude and Primitive Recreation: The opportunity for solitude is low; the area is small, so the visitor is always near a road. Primitive recreation opportunity is high in conjunction with the adjacent wilderness. No roads or maintained trails intrude, but the entire area is accessible by perimeter roads. The area offers challenging big-game hunting.

Special Features: McFadden Point is a prominent landmark.

Manageability and Boundaries: The only boundary option considered, because of the area's small size, is as an addition to the FC-RONR Wilderness. Past, present, and future mining activities could complicate managing this area as wilderness.

3.7.1 Environmental Consequences Specific to Alternative A

Apparent Naturalness/Natural Integrity – This alternative would have no direct or indirect effects on apparent naturalness or natural integrity.

Primitive Recreation/Solitude – This alternative would have no direct or indirect effects on primitive recreation/solitude. Road use would continue at roughly current levels with visitors to IRAs within the project area experiencing a loss of solitude from passing vehicles due to the close proximity of roads to the IRAs within the project area. Within the Cottontail Point/Pilot Peak, Smith Creek, and Secesh IRAs road use would occur at roughly current levels on those portions of Forest #373 and #343 that occur within the IRA.

Special Features, Special Values, or Special Places - This alternative would have no direct or indirect effects on special features, values, or places.

Wilderness Manageability and Boundaries – This alternative would have no direct or indirect effects on special features, value, or place.

3.7.2 Environmental Consequences Common to Alternative B

The impacts of project activities would be limited primarily to effects on solitude from travel associated with project activities. Within all IRAs occurring in the project area impacts of proposed activities would be a reduced feeling of solitude from proposed vehicle travel. These impacts would be limited to those periods when vehicles pass by a particular area where it can be heard. Impacts would be expected to be temporary in nature and last only for the duration of the project. No further discussion would occur relative to general travel associated with this Alternative within or adjacent to IRA's in the project area.

Road maintenance activities associated with this alternative would take place on 0.5 miles of the #373 road located within the Cottontail Point/Pilot Peak and Smith Creek IRAs; facilities at Werdenhoff for housing, staging, and processing cores would take place adjacent the Smith Creek IRA; and, the cutting of timbers could occur within IRAs. The following discussions are relative to these activities under this alternative:

Apparent Naturalness/Natural Integrity – Proposed road maintenance activities would have little effect on apparent naturalness/natural integrity outside of the disturbance from proposed road maintenance activities, which would be indicative of current road management.

The cutting of trees for timbers could impact the apparent naturalness of IRAs if cutting occurred within the boundary of an IRA. It would be unlikely that timbers would be cut in IRAs except those areas where a system or temporary road is in an IRA or immediately adjacent where timbers could be retrieved. Due to the limited nature of the tree cutting for timbers and project design features associated with the cutting of timbers, it would be expected that the projects effects would be limited to impacts of slash and stumps. The negative impacts of slash would fade quickly in the short term; however, stumps would negatively impact the apparent naturalness of the area into the long term when decomposition alleviates the impacts. While these impacts would occur, they would be somewhat tempered by the proximity of National Forest system roads and the visitor's increased tolerance for this type of activity near system roads.

Werdenhoff would be used for crew housing, processing of drill cores, and a staging area. The project does not propose improvements to any of the existing facilities that would alter the appearance. Temporary structures could include RVs, tents, and an assortment of equipment/vehicles. Because these activities would not take place within Smith Creek IRA, these temporary facilities would not impact the apparent naturalness and natural integrity within the Smith Creek IRA.

Primitive Recreation/Solitude – Road maintenance activities associated with this alternative would take place on 0.5 miles of the #373 road located within the Cottontail Point/Pilot Peak and Smith Creek IRAs; facilities at Werdenhoff for housing, staging, and processing cores would take place adjacent the Smith Creek IRA; and, the cutting of timbers could occur within IRAs. Noise and possibly dust associated with these activities would leave visitors with a reduced sense of solitude. Impacts to solitude would be expected to be temporary in nature and last only for the duration of the project.

Since activities are adjacent/just within the boundaries of the IRA and would occur on already disturbed sites, there would be negligible impacts on the primitive recreation environment when compared to the existing condition. These impacts would largely be due to the increased activity and would persist for the duration of the project until such time facilities/equipment are removed from and adjacent the IRA.

Due to the improved access, it is possible that impacts and changes to the available primitive experience and solitude would extent into the short and long terms. The proposed maintenance on FR #371 and FR #373 would allow easier access into the short and long terms. Though it would provide improved access to a primitive recreation experience, it could also reduce the sense of solitude and remoteness that currently exists due to increases in traffic possibly associated with improved access.

Special Features, Special Values, or Special Places - This alternative would have no direct or indirect effects on special features, values, or places outside of important habitat for threatened fish species and cultural resource. Effects of this project to fishery, water, soil, wildlife, and cultural resources are covered elsewhere in this document (Sections 3.4, 3.5, 3.6, and 3.12).

Wilderness Manageability and Boundaries – This alternative would have no direct or indirect effects on wilderness manageability and boundaries.

3.7.3 Environmental Consequences Common to Alternative C

The impacts of project activities would be limited primarily to effects on solitude from travel associated with project activities. Within all IRAs occurring in the project area impacts of proposed activities would be a reduced feeling of solitude from proposed vehicle travel. These impacts would be limited to those periods when vehicles pass by a particular area where it can be heard. Impacts would be expected to be temporary in nature and last only for the duration of the project. Unless otherwise noted, no further discussion would occur relative to general travel associated with this Alternative within or adjacent to IRA's in the project area.

Road maintenance activities associated with this alternative would take place on 0.5 miles of the #373 road located within the Cottontail Point/Pilot Peak and Smith Creek IRAs; facilities at Werdenhoff for housing, staging, and processing cores would take place adjacent the Smith Creek IRA; and, the cutting of timbers could occur within IRAs. The following discussions are relative to these activities under this alternative:

Apparent Naturalness/Natural Integrity – Proposed road maintenance activities would have little effect on apparent naturalness/natural integrity outside of the disturbance from proposed road maintenance activities, which would be indicative of current road management.

The cutting of trees for timbers could impact the apparent naturalness of IRAs if cutting occurred within the boundary of an IRA. It would be unlikely that timbers would be cut in IRAs except those areas where a system or temporary road is in an IRA or immediately adjacent where timbers could be retrieved. Due to the limited nature of the tree cutting for timbers and project design features associated with the cutting of timbers, it would be expected that the projects effects would be limited to impacts of slash and stumps. The negative impacts of slash would fade quickly in the short term, however stumps would negatively impact the apparent naturalness of the area into the long term when decomposition alleviates the impacts. While these impacts would occur, they

would be somewhat tempered by the proximity of system roads and the visitor's increased tolerance for this type of activity near system roads.

Werdenhoff would be used for crew housing, processing of drill cores, and a staging area. The project does not propose improvements to any of the existing facilities that would alter the appearance. Temporary structures could include RVs, tents, and an assortment of equipment/vehicles. Because these activities would not take place within Smith Creek IRA, these temporary facilities would not impact the apparent naturalness and natural integrity within the Smith Creek IRA.

Primitive Recreation/Solitude – Road maintenance activities associated with this alternative would take place on 0.5 miles of the #373 road located within the Cottontail Point/Pilot Peak and Smith Creek IRAs; facilities at Werdenhoff for housing, staging, and processing cores would take place adjacent the Smith Creek IRA; and, the cutting of timbers could occur within IRAs. Noise and possibly dust associated with these activities would leave visitors with a reduced sense of solitude. Impacts to solitude would be expected to be temporary in nature and last only for the duration of the project.

Since activities are adjacent/just within the boundaries of the IRA and would occur on already disturbed sites, there would be negligible impacts on the primitive recreation environment when compared to the existing condition. These impacts would largely be due to the increased activity and would persist for the duration of the project until such time facilities/equipment are removed from and adjacent the IRA.

Due to the improved access, it is possible that impacts and changes to the available primitive experience and solitude would extent into the short and long terms. The proposed maintenance on FR #371 and FR #373 would allow easier access into the short and long terms. Though it would provide improved access to a primitive recreation experience, it could also reduce the sense of solitude and remoteness that currently exists due to increases in traffic possibly associated with improved access.

When compared to Alternative B, Alternative C could have a slightly reduced impact on primitive recreation/solitude, due to the barring of diesel fuel transport every other day from Werdenhoff to Pueblo Summit and possibly the reduced number of trips authorized within the wilderness.

Special Features, Special Values, or Special Places - This alternative would have no direct or indirect effects on special features, values, or places outside of important habitat for threatened fish species and cultural resource. Effects of this project to fishery, water, soil, wildlife, and cultural resources are covered elsewhere in this document (Sections 3.4, 3.5, 3.6, and 3.12).

Wilderness Manageability and Boundaries – This alternative would have no direct or indirect effects on wilderness manageability and boundaries.

3.7.4 Cumulative Effects

The direct and indirect effects of any alternative on IRAs would primarily be limited to the analysis area. Therefore the area used to assess cumulative effects consists of the 1,309 acre analysis area (Figure 3-10).

Past activities include the original development of the Werdenhoff Millsite, which is addressed in the existing condition and analysis of alternatives. The Sunday Mine occurs in the analysis area and could have impacted the IRA through past disturbance and noise. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Smith Creek ATV Trail Maintenance Project is a past project that could have affected solitude in a small portion of the analysis area where the Forest Trail #194 leaves Forest Road #371, but would not overlap in time with this project. Reference **Appendix A** for additional project information and maps

related to the cumulative effects analyses completed for this project.

There are several ongoing activities that could affect IRAs in the analysis area. The Walker Millsite occurs in the analysis area. The mine site potentially impacted the IRA through past/ongoing ground disturbance and the associated traffic. Firewood harvest occurs annually along roads creating traffic, noise associated with collection, and stumps/slash. Private lands, especially around Edwardsburg, continue to be developed annually to various degrees. The Big Creek Lodge, Big Creek Guard Station, Big Creek Airstrip, and Big Creek Campground would continue to operate on an annual basis and receive maintenance along with associated traffic. Private timber harvest, mostly for personal use, would likely continue in an ongoing fashion at unknown levels. Ongoing road and trail maintenance would continue and increase ground disturbance, noise, and traffic. District and FC-RONR Wilderness weed management programs would continue to eradicate populations of noxious weeds in the analysis area usually through motorized access to the wilderness boundary. And, motorized activities associated with recreational activities, lodges, hunting, fishing, trapping, tribal endeavors, and other activities that require motorized access would continue in the analysis area. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Fuels Reduction Project occurs partially within the analysis area and represents a reasonably foreseeable project. Currently, this project is in the planning stages. A range of thinning and motorized activities could impact IRAs; however, specifics are not currently available. Any proposal would likely be consistent with the Idaho Roadless Rule. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Restoration and Access Management Project is a reasonably foreseeable future project within the analysis area and would complete a variety of activities including road decommissioning, road maintenance, and granting of FRTA easements on roads and trails in the analysis area. These activities have the potential to impact primitive recreation/solitude. The project would increase noise during implementation of maintenance and decommissioning. Any proposal would likely be consistent with the Idaho Roadless Rule. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Morgan Ridge Exploration Project and Big Creek Road Access Plan of Operation are reasonably foreseeable future projects that would authorize road use and maintenance in the analysis area. These activities have the potential to impact primitive recreation/solitude within the analysis area. The project would increase noise during implementation of maintenance. Any proposal would likely be consistent with the Idaho Roadless Rule. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Installation of a Bridge over North Fork Smith Creek is a reasonably foreseeable future project that would occur in the analysis area. This type of activity has the potential to impact solitude in adjacent IRAs, but would not occur within an IRA. No details are available for the type of structure or a description of the installation. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

Alternative A would not result in any direct, indirect, or cumulative effects.

Alternative B in combination with ongoing and foreseeable future activities could incrementally effect primitive recreation/solitude and apparent naturalness/natural integrity within IRAs in the analysis area. However, outside of impacts to solitude, ongoing and future activities would have only negligible incremental impacts in combination with this alternative. Alternative B in combination with ongoing and foreseeable future activities could incrementally increase noise impacts on solitude for the duration of the project. Alternative B would be consistent with Idaho Roadless Rule (36 CFR §294; 73 Federal Register 61456-61496 and 36 CFR §294; 76 Federal Register 17341-17343).

Alternative C in combination with ongoing and foreseeable future activities could incrementally effect primitive recreation/solitude and apparent naturalness/natural integrity within IRAs in the analysis area.

However, outside of impacts to solitude, ongoing and future activities would have only negligible incremental impacts in combination with this alternative. When compared to Alternative B, Alternative C could have a slightly reduced impact on primitive recreation/solitude, due to the barring of diesel fuel transport every other day from Werdenhoff to Pueblo Summit and possibly the reduced number of trips authorized within the wilderness. Alternative C in combination with ongoing and foreseeable future activities could incrementally increase noise impacts on solitude for the duration of the project, albeit to a potentially lesser degree than Alternative B. Alternative C would be consistent with the Idaho Roadless Rule (36 CFR §294; 73 Federal Register 61456-61496 and 36 CFR §294; 76 Federal Register 17341-17343).

3.8 Botanical Resources

This section of the document describes the existing conditions, potential habitat, and effects of the alternatives on threatened, endangered, proposed, candidate, sensitive, and Forest watch plants. The analysis area for Threatened, Endangered, Proposed Candidate, and Sensitive (TEPCS) plants includes the access route from the Big Creek Guard Station to the claim site, the proposed developments on and off claims, Coin Creek, and the area adjacent to the proposed lodging and storage facilitates. The assessment disclosed in this document was initiated following review of species identified by the U.S. Fish and Wildlife Service as threatened, endangered, proposed, or candidate species; the current and proposed Regional Forester's sensitive species list, and; the current Payette National Forest watch plants list. In addition, documented locations, records of previous field surveys, and Conservation Data Center records were reviewed during the course of this analysis.

Threatened/Endangered Species
No historical populations of any threatened or endangered plant species are known to occur on the Payette National Forest (PNF). From 1995 to 2002 the USFWS added five TEPC species to the PNF 90-Day Species List because potential habitat for these species was thought to occur on the PNF. Since that time the PNF forest botanist has surveyed, analyzed projects effects, and consulted on the threatened species Ute Ladies'-tresses, water Howellia, MacFarlane's four-o-clock, Spalding's silene and the candidate species slender moonwort. Table 3-8 lists the federally listed plants that the PNF has consulted on in the past and shows the global and state rarity ratings as well as global distributions of these species. Ute Ladies'-tresses, water Howellia, MacFarlane's four-o-clock, Spalding's silene are listed threatened by the USFWS (USDI 2012) and are ranked critically imperiled in Idaho and imperiled globally. Ute Ladies'-tresses occurs about 300 miles away from McCall in southeast Idaho near the Palisade Dam. Water Howellia occurs about 150 miles away from the PNF near Moscow in northern Idaho. Slender moonwort occurs about 100 miles away on the Sawtooth National Forest. MacFarlane's four-o-clock occurs approximately 35 miles downstream from the Forest boundary in Hells Canyon and the nearest known population of Spalding's silene occurs about 30 miles north of PNF lands near the confluence of the Snake and Salmon River.

In 2011 the U.S. Fish and Wildlife Service listed whitebark pine (*Pinus albicaulis*) as a candidate species eligible for Endangered Species Act protection and the Regional Forester listed the plant as sensitive. Habitat for whitebark pine occurs on the access road into the proposed activity site.

Table 3-8. Federally Listed USFWS Threatened and Candidate Plants (Payette National Forest)

Species Name	Common Name	USFWS Status
Botrychium lineare	Slender moonwort	Removed as candidate in 2008
Howellia aquatilus	Water howellia	Threatened
Mirabilis macfarlanei	MacFarlane's four-o-clock	Threatened
Silene spaldingii	Spalding's silene	Threatened
Spiranthes diluvialis	Ute Ladies'-tresses	Threatened
Pinus albicaulis	Whitebark Pine	Candidate

Sensitive Plant Species
The Regional Forester through direction outlined in FSM 2670 and the R4 sensitive plant handbook 2609.25 compiles the sensitive plant list for the Payette National Forest (USDA 2006 and USDA 1998). The Forest Plan (USDA 2003, 2010) reflects the State of Idaho rare plant list and contains the Regional Foresters sensitive plant species list. Table 3-9 lists both the Regional sensitive plant species and those included the Forest Plan. The Idaho Conservation Data Center (ICDC) of the Idaho Fish and Game maintains records and references of documented locations for sensitive and rare plant species on the PNF. The pre-field analysis consults these records and references to determine if known or suspected sensitive species or their habitats occur in the project area. The pre-field analysis of the proposed project area identified one candidate and six sensitive or rare plants with possible habitat in the analysis area of the

Golden Hand No. 1 and No. 2 Lode Mining Claims Project Area. Rare plant surveys focused on looking for the following rare plants; whitebark pine (Candidate Species), and the sensitive or other rare plants; Borch's stonecrop, puzzling halimolobos, Payson's milkvetch, bent flower milkvetch, Candystick and Sacajawea's bitterroot. All other sensitive or rare plant species listed in Table 3-8 and 3-9 were either out of their known range of distribution or contained no habitat in the project area. Botanical surveys conducted in 2002, 2008, and 2009 found no habitat for any of the species in Table 3-8 and 3-9, except, for whitebark pine that was found on the road accessing the project activity area.

Table 3-9. Federal, State, and Forest Service Status of Rare Plant Species with Potential or Known Habitat on the Payette National Forest.

Species Name	Common Name	Forest Service Status[1]	
		Regional Sensitive	PNF Plan
Allium madidum	swamp onion	S	S
Allium tolmiei var. *persimile*	Tolmie's onion	S	S
Allium validum	Tall Swamp Onion	N	W
Allotropa virgata	candystick	S	S
Arabis sparsiflora var. atrorubens	Sicklepad Rockcress	-	W
Astragalus paysonii	Payson's milkvetch	S	S
Astragalus vexilliflexus var. *nubilus*	bent flowered milkvetch	S	S
Botrychium lanceolatum	Lance-leaved moonwort	N	W
Botrychium lineare	Slender moonwort	S	S
Botrychium simplex	Least moonwort	S	W
Buxbaumia viridis	green bug moss	N	W
Calamagrostis tweedyi	Cascade reedgrass	S	S
Camassia cusickii	Cusick camas	S	S
Carex aboriginum	Indian Valley Sedge	N	W
Carex buxbaumii	Buxbaum's sedge	N	W
Ceanothus prostratus ssp. prostratus	Mahala-mat ceanothus	N	W
Chrysothamnus nauseosus spp. *nanus*	dwarf grey rabbitbrush	N	W
Crepis bakeri ssp. *idahoensis*.	Idaho hawksbeard	N	W
Douglasia idahoensis	Idaho Douglasia	S	S
Draba incerta	Yellowstone draba	N	W
Eatonella nivea	White eatonella	N	W
Epilobium palustre	Swamp Willow Weed	N	W
Epipactis gigantea	Giant helleborine orchid	N	W
Hackelia davisii	Davis' stickseed	N	W
Halimolobos perplexa var. perplexa	Puzzling halimolobos	S	S
Haplopappus radiates Pyrrocoma radiata	Snake River golden weed	S	S
Helodium blandowii	Blandow's helodium	N	W
Hierochloe odorata	Sweetgrass	N	W
Howellia aquatilus	Water howellia	N	W
Leptodactylon pungens ssp. *hazeliae*	Hazel's prickly phlox	S	S
Lewisia sacajaweana	Sacajawea's bitteroot	S	S
Lobaria scrobiculata	Pored lungwort	N	W
Mimulus clivicola	Bank Monkeyflower	S	S
Mirabilis macfarlanei	MacFarlane's four-o-clock	N	W
Peraphyllium ramosissimum	Squaw apple	N	W
Pilophorus acicularis	Nail lichen	N	W
Pinus albicaulis	Whitebark pine	S	-
Polystichum kruckebergii	Kruckeberg's Sword-fern	N	W

Species Name	Common Name	Forest Service Status[1]	
		Regional Sensitive	PNF Plan
Ribes wolfii	Wolf's current	N	W
Rubus bartonianus	Bartonberry	S	S
Salix glauca	gray willow	N	W
Sanicula graveolens	Sierra sanicle	N	W
Saxifraga bryophora var. *tobiasiae*	Tobias' saxifrage	S	S
Schistostega pennata	Luminous moss	N	W
Sedum borschii	Borch's stonecrop	N	W
Sedum valens	Canyon sedum		
Silene spaldingii	Spalding's silene	N	W
Spiranthes diluvialis	Ute Ladies'-tresses	N	W
Triantha occidentalis ssp. *brevistyla*	Short-style tofieldia	S	S
Trifolium douglasii	Douglas clover	N	W

[1]**Forest Service Status - S** = Region 4 Sensitive, **W** = Forest Watch plants, **N** = No current status.

Whitebark Pine
Whitebark pine (*Pinus albicaulis*) is a native, 5-needled conifer classified as a stone pine that has large dense seeds that lack wings and depends upon birds and squirrels for dispersal across the landscape. Considered a small to medium size conifer, trees grow from 40-60 feet tall at maturity. In Idaho, they typically grow at higher elevations between 6,000 and 10,000 feet in the subalpine fir zone.

Whitebark pine also occurs in Wyoming, Montana, Nevada, California, Oregon, Washington and Canada. Historically, whitebark pine dominated many of the upper subalpine plant communities of the western United States but a number of agents have reduced its natural regeneration. White pine blister rust, fire exclusion, bark beetles, animals, and fungal diseases have all reduced the ability of mature trees to reproduce. White pine blister rust is the greatest threat to whitebark pine regeneration. In blister rust-infected trees, branch die-off occurs on cone-producing branches resulting in the loss of seed production.

In July, 2011, the U. S. Fish and Wildlife Service announced that whitebark pine warranted protection under the Endangered Species Act (ESA) but that the species is precluded by the need to address other listing actions of higher priority. The Service then added the species to the candidate list of species eligible for ESA protection and annual review. Whitebark pine habitat does occur in the project area on the access road to the proposed activity area just northeast of Mosquito Ridge on trail #013 and road #373.

Borch's Stonecrop
Borch's stonecrop (*Sedum borschii*), a perennial herb of the Stonecrop family (*Crassulaceae*), grows in the mid to higher elevation mountains of the northern half of the Idaho Batholith.

Borch's sedum, a disjunct species, occurs in the northern half of the Idaho Batholith, western Montana, Seven Devils Mountains, and the eastern edge of the Columbia Plateau. Clausen (1975) noted that the plants occupy a variety of rock types on cliffs and slopes. Sties with known populations vary from open to those with a canopy of large conifers.

Project activities should not impact possible habitat for Borch's stonecrop. The pre-field analysis rated the probability of occurrence of this species as low. The closest population occurs south of Edwardsburg in the FC-RONR Wilderness. Surveys of the possible potential habitat in the project area found no Borch's stonecrop plants or definite habitat. As a perennial, the foliage of *Borch's stonecrop* remains visible during the growing season and the risk of overlooking possible populations or habitat for *Borch's stonecrop* appears very low.

Puzzling Halimolobos
Puzzling halimolobos (*Halimolobos perlexa var. perplexa*) is a short-lived perennial or biennial herb member of the mustard family (*Brassicaceae*). Puzzling halimolobos, an endemic species confined to the

Salmon River drainage, grows in unstable, gravelly or sandy slopes, road cuts, and dredge tailings composed of both quartzite and granitic substrates. The elevation range of the plant extends from 3,000-5,000 feet. Sites with known populations vary from open to ones with a canopy of large conifers.

Project activities should not impact possible habitat for puzzling halimolobos. The pre-field analysis rated the probability of occurrence of this species as low. The nearest population occurs in the main Salmon River drainage. Surveys of possible puzzling halimolobos habitat in the project area found no plants or definite habitat. As a perennial/biennial, the foliage of puzzling halimolobos remains visible during the growing season and the risk of overlooking possible populations or habitat appears very low.

Payson's Milkvetch

Payson's milkvetch (*Astragalus paysonii*) is a perennial herb of Pea family (*Fabaceae*). In Idaho, Payson's milkvetch occurs primarily in areas disturbed by natural and human processes at elevations between 4,6000- 5,800 feet. Known as an early succession species, it usually will not pioneer newly disturbed sites but is often found along road cuts and trails with exposed, sand soil and low grass/forb cover.

Payson's milkvetch is a regional endemic known only from northern and east-central Idaho and western Wyoming. Project activities should not impact possible habitat for Payson's milkvetch. The pre-field analysis rated the probability of occurrence of this species as low. The nearest population to the project area occurs in Chamberlain Basin. Surveys of the possible potential habitat in the project area found no Payson's milkvetch plants or definite habitat. As a long-lived perennial, the foliage of Payson's milkvetch remains visible during the growing season and the risk of overlooking possible populations or habitat appear very low.

Bent Flower Milkvetch

Bent flowered milkvetch (*Astragalus vexilliflexus var. vexilliflexus*) is a long-lived perennial of the pea family (*Fabaceae*). Bent flowered milkvetch, widespread in northern Great Plains and adjacent eastern Rocky Mountain front, occurs only in Idaho east of Yellow Pine in the vicinity of Monumental Summit between the South and Middle Forks of the Salmon River. The Idaho population is disjunct from the nearest population in Beaverhead County, Montana that is about 125 miles from the Idaho population. The plants grow on open rocky slopes and outcrops of shale and sandstone with elevations on the PNF ranging from 7,500-8,200 feet.

Project activities should not impact possible habitat for bent flowered milkvetch. The pre-field analysis rated the probability of occurrence of this species as low and the nearest population occurs near Yellow Pine, Idaho. Surveys of possible bent flowered milkvetch habitat in the project area found no plants or definite habitat. As a long-lived perennial, the foliage of Bent flowered milkvetch remains visible during the growing season and the risk of overlooking possible populations or habitat appears very low.

Candystick

Candystick (*Allotropa virgata*) is a member of the heath family (*Ericaceae*). The main population of candystick occurs west of the Cascade Mountains with disjunct populations occurring in central Idaho and western Montana. On the PNF numerous populations occur south of the Main Salmon River in stands of lodgepole pine with understories of grouse whortleberry and bear grass. Elevations range from 5,000-7,000 feet. Sites with known populations usually contain decomposing wood and mature lodgepole pine.

Project activities should not impact possible candystick habitat. The pre-field analysis rated the probability of occurrence of this species as low in the area where activities would occur. The nearest population occurs near Warren, Idaho. Surveys of possible Candystick habitat in the project area found no plants or definite habitat. Because the flower stalks of Candystick remain visible for two growing season and the risk of overlooking possible populations or habitat during surveys appears very low.

Sacajawea's bitterroot

Sacajawea's bitterroot is a perennial herb with deep fleshy roots. The main populations of Sacajawea's bitterroot occur in the central mountains of Idaho. On the PNF populations grow at the headwaters of Belvidere Creek. Typically the species is found at elevations from 5,500-9,500 feet near late snow banks on upper slopes and ridge tops.

Project activities should not impact possible habitat for Sacajawea's bitterroot. The pre-field analysis rated the probability of occurrence of this species as low in the area where activities would occur. Much of the rocky area within the Golden Hand proposal that would support this bitterroot has previously been disturbed or does not contain the vegetation or geologic features that would support Sacajawea's habitat.

3.8.1 Environmental Consequences Specific to Alternative A

Botanical surveys conducted in 2002, 2008, and 2009 found no habitat for any of the species in Table 3-8 and 3-9, except, for whitebark pine that was found on the road accessing the project activity area. Therefore, effects discussions would be limited to whitebark pine.

This alternative does not propose any new management activities or ground-disturbance and is not expected to have any effect on threatened, endangered, proposed, candidate, sensitive, or Forest watch plants

3.8.2 Environmental Consequences Specific to Alternative B and C

Botanical surveys conducted in 2002, 2008, and 2009 found no habitat for any of the species in Table 3-8 and 3-9, except, for whitebark pine that was found on the road accessing the project activity area. Therefore, effects discussions would be limited to whitebark pine and the action Alternatives would not have any effect on other threatened, endangered, proposed, candidate, sensitive, or Forest watch plants.

Direct effects to individual plants of white bark pine (*Pinus albicaulis*) could occur from the action Alternatives. Random and minimal disturbance from moving equipment or other project activities could directly limb or trample some saplings or seedlings of whitebark pine along the roadside. But no major activities are planned for whitebark pine habitat. Overall habitat quality for whitebark pine species would not be impacted by the action Alternatives. Current management practices for weed control should keep indirect adverse impacts from weed invasion to a minimum. No large tree removal is planned for this project and impacts to whitebark pine should not be substantial.

3.8.3 Cumulative Effects

Activities considered for the cumulative effects analysis in this section include a variety of actions. They included: recreation activities, mining, and fire management, habitat improvement projects for wildlife and fish, and recreational livestock grazing. These activities have occurred and will continue to occur within the project area that supports whitebark pine. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

Alternative A would have no direct, indirect, or cumulative effects on any threatened, endangered, proposed, candidate, sensitive, or Forest watch plants or their habitats

For Alternative B and C, these past and ongoing impacts to individual whitebark pine in combination with potential direct impacts to individuals from proposed activities could further negatively impact those individuals within the project area. These impacts would be limited to those few individuals directly impacted by the project and may or may not overlap temporarily, and would likely not be measureable in intensity.

For Alternative B and C, cumulative effects would have minimal adverse affects to individual whitebark pine and its habitat. However, the cumulative effects would not adversely affect the habitat or populations of whitebark pine, and would not contribute to a trend toward Federal listing for any sensitive species.

Alternative B and C would have <u>no effect</u> to any threatened or endangered plant species. No habitat for any threatened or endangered plant species occurs in the project analysis area.

Alternative B and C may impact individuals but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species of whitebark pine, *(Pinus albicaulisi*), a candidate and sensitive species. Alternative B and C would have no impact on any other candidate, proposed, or sensitive plant species.

3.9 Noxious Weeds

Noxious weeds are defined as a state-designated plant species that causes negative ecological and economic impacts to both agricultural and other lands within the state. Noxious weeds pose a threat to native plants, often out-competing them. Habitats for these species vary, but can generally be characterized as disturbed areas of compacted dry soils. Roads, powerline corridors, cutting units, burned areas, trails, and other areas associated with human activity, particularly motorized use, are likely locations for noxious weeds. For this project the analysis area would be comprised of the 1,309 acre project area, which comprises the area where project activities would be likely to facilitate spread of existing population or introduce new populations to the area. Field surveys in the 1,309 acre analysis area identified the presence of four small populations of noxious weeds (Figure 3-11). Two of these populations are spotted knapweed (*Centaurea maculosa*) and two are Canada thistle (*Cirsium arvense*). All populations are located along FR #371 between FR #50340 and Forest Trail #196. Although only four populations have been identified, given the existing road and trail systems, noxious weeds are likely present in other unknown locations. Other noxious weeds known to be present in adjacent drainages include creeping and tall buttercup along with houndstongue.

3.9.1Environmental Consequences Specific to Alternative A

Recreation-related introduction and distribution of noxious weeds would continue to occur adjacent to roads open to vehicles, trails open to recreational livestock and packstock, and along motorized trails in the analysis area. Noxious weed species present in the area or new introductions could increase in population size and distribution. Significant populations of plants would continue to be addressed through the District's and the FC-RONR Wilderness noxious weed program.

3.9.2 Environmental Consequences Specific to Alternative B and C

Recreation-related introduction and distribution of noxious weeds would continue to occur adjacent to roads open to vehicles, trails open to recreational livestock and packstock, and along motorized trails in the analysis area. Noxious weed species present in the area or new introductions could increase in population size and distribution. Significant populations of plants would continue to be addressed through the District's noxious weed program.

Proposed activities associated with the action Alternatives would not be expected to introduce noxious weeds into the analysis area. Design features associated with the action Alternatives (Section 2.4.4) require the cleaning of all off-road equipment potentially carrying noxious weed seeds prior to moving into the analysis area and the inspection of gravel sources for weeds. Furthermore, the action Alternatives would require the use of weed free mulches, seed, and other needed materials (Section 2.4.4). Proposed activities would provide gravel for several sections of road; however, the known gravel sources in the area are not known to contain noxious weeds at this time and would be inspected prior to sourcing.

Alternative B would allow for approximately 200 more trips into the wilderness on an annual basis; however, along FR #371 both alternatives are expected to have similar trips on average annually. Both Alternatives may contribute to the distribution of noxious weeds already present as vehicles pass along FR #371 while completing project activities. As noted above, existing noxious weed populations would be addressed through the District's and the FC-RONR Wilderness noxious weed program.

These Alternatives do not include construction of any new system roads and all authorized temporary roads would be closed to motorized traffic upon completion of use.

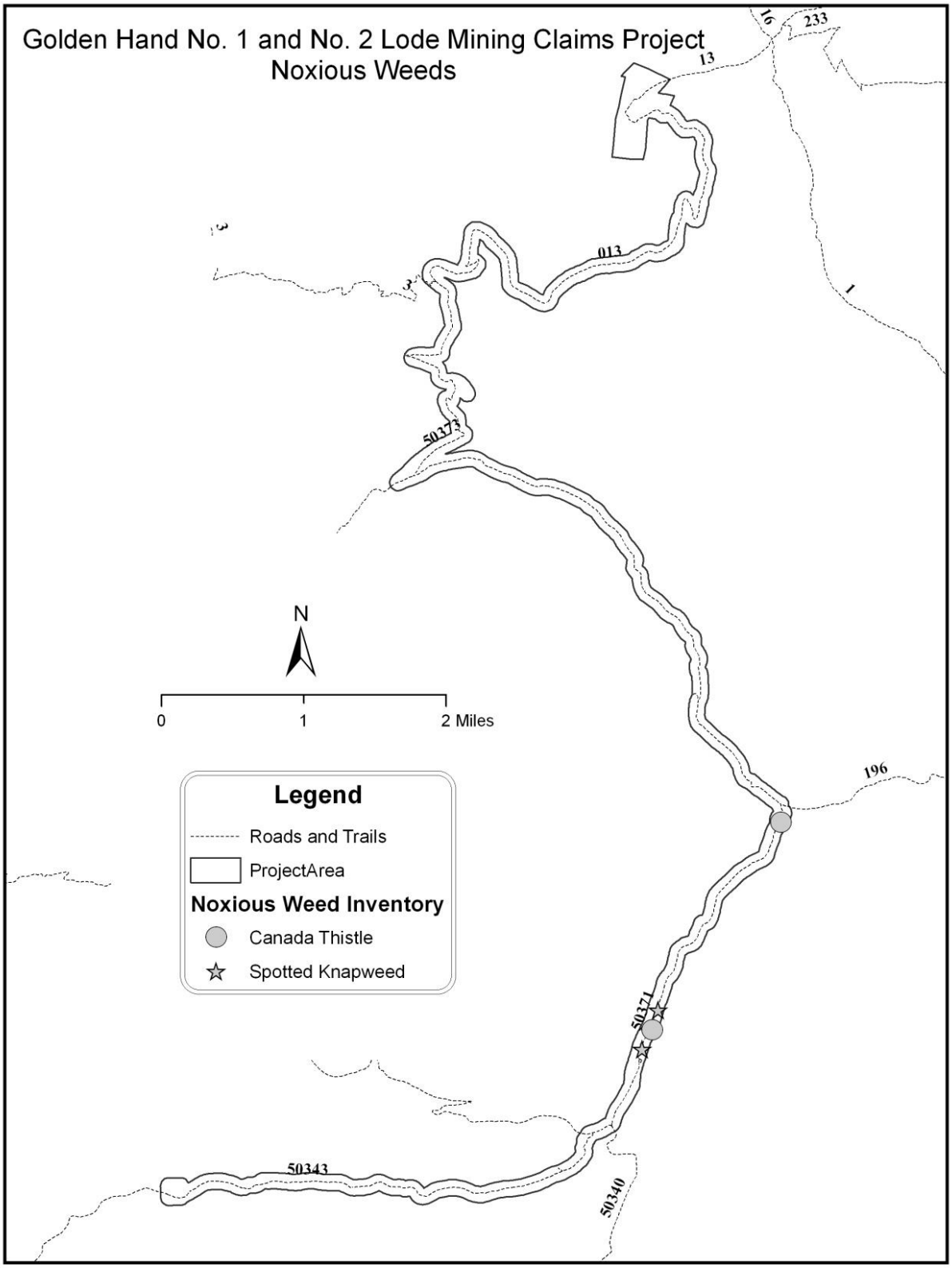


Figure 3-11 Inventoried Noxious Weed Populations

3.9.3 Cumulative Effects

The direct and indirect effects of any alternative on noxious weeds would be limited to the analysis area. Therefore the area used to assess cumulative effects consists of the 1,309 acre analysis area (Figure 3-11).

Past activities include the original development and abandonment of the Sunday Mine, Golden Hand Mine, and the Werdenhoff Millsite. However, these past activities are unlikely to have impacted noxious weed establishment or distribution based on the era of these workings.

The Smith Creek ATV Trail Maintenance Project is a past project that could have affected noxious weeds in a small portion of the analysis area where the Forest Trail #194 leaves Forest Road #371. Within the analysis area the project completed maintenance to the trail. The project incorporated Forest Plan standards for the use of weed free materials and equipment cleaning prior to entry onto the Forest. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

There are several ongoing activities that could affect noxious weeds in the analysis area. The Walker Millsite occurs in the analysis area. The mine site potentially impacts noxious weed establishment and distribution through past/ongoing ground disturbance and the associated traffic. Firewood harvest occurs annually along roads possibly introducing new populations and distributing existing populations. Private lands, especially around Edwardsburg, continue to be developed annually to various degrees. The Big Creek Lodge, Big Creek Guard Station, Big Creek Airstrip, and Big Creek Campground would continue to operate on an annual basis and receive maintenance along with traffic that could introduce new populations. And, private timber harvest, mostly for personal use, would likely continue in an ongoing fashion at unknown levels. Ongoing road and trail maintenance would continue and possibly increase the distribution of existing populations. District and FC-RONR Wilderness weed management programs would continue to eradicate populations of noxious weeds in the analysis area. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Fuels Reduction Project occurs partially within the analysis area and represents a reasonably foreseeable project. Currently, this project is in the planning stages. A range of thinning activities could impact noxious weed introduction and distribution; however, specifics are not currently available. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Restoration and Access Management Project is a reasonably foreseeable future project within the analysis area and would complete a variety of activities including road decommissioning, road maintenance, and granting of FRTA easements on roads and trails in the analysis area. These activities have the potential to impact and contribute to noxious weed introduction and spread. The project would make use of Forest Plan standards intended to reduce noxious weed establishment and spread. Planning is early and no specific details are available. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Morgan Ridge Exploration Project and Big Creek Road Access Plan of Operation are reasonably foreseeable future projects that would authorize road use and maintenance in the analysis area. Any proposal would include design feature requiring the use of weed free materials and equipment cleaning. Potential effects would likely be limited the distribution of existing populations. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Installation of a Bridge over North Fork Smith Creek is a reasonably foreseeable future project that would occur in the analysis area. This type of activity has the potential to impact and contribute to noxious weed introduction and spread. No details are available for the type of structure or a description of the installation. The project would make use of Forest Plan standards intended to reduce noxious weed establishment and spread. Reference **Appendix A** for additional project information and maps

related to the cumulative effects analyses completed for this project.

Alternative A would not result in any direct, indirect, or cumulative effects on visual quality.

Alternative B and C in combination with ongoing and foreseeable future activities could introduce some risk of introduction and spread of noxious weeds in the analysis area. Since the effects of Alternative B and C are expected to be limited to the distribution of existing populations, the incremental effect of Alternative B and C in combination with ongoing and foreseeable future projects would be the increased potential for distribution of existing populations. Significant populations of plants would continue to be addressed through the District's and the FC-RONR Wilderness noxious weed program.

3.10 Air Quality

The basic framework for controlling air pollutants is the 1970 Clean Air Act, as amended in 1990. The primary means by which this is accomplished is through the implementation of the National Ambient Air Quality Standards (NAAQS). In addition to the NAAQS, other sections or provisions of the Clean Air Act, as amended, address general conformity, prevention of significant deterioration, and visibility (i.e. regional haze). There are no mandatory Class I airsheds, maintenance areas, or nonattainment areas within the project area, therefore elements pertaining to general conformity do not specifically apply. The analysis area and those lands immediately adjacent the project area are considered Class II airsheds. Under the 1977 Clean Air Act amendments, Congress defined mandatory Class I federal areas for wilderness areas greater than 5,000 acres, but the Frank Church – River of No Return (FC-RONR) Wilderness was designated following that effort and has not since been included as a Class I airshed. Table 3-11 discloses those Class I airsheds and other important areas in the larger vicinity.

Approximately 291 acres of the 1,309 acre project area is in the FC-RONR Wilderness area, there are few emission sources in the area. Visibility is an important component of the wilderness experience. Currently, the predominate sources of emissions affecting visibility in the project area are outside the local area and are regional emission sources predominantly due to summer fires and coal fired plants. Local sources in the immediate area are limited and generally restricted to vehicle exhaust, smoke, and dust. Particulates from dust and smoke adversely affect visibility but these are generally short-term emission sources associated with disturbed areas related to fires and traffic on dirt roads. While generally a dryer environment, the standard visual ranges at Craters of the Moon over 100 miles south and east of the project area averaged 162 miles from 2000 to 2010. Within the Sawtooth National Recreation Area standard visual range averaged 155 miles from 2000 to 2010. Within the FC-RONR, standard visual range median values were 108 miles and 133 miles in summer and fall respectively from 1989 thru 1993. The poorest visibility (10th percentile) ranged from 55 miles to 75 miles in the summer and fall respectively during that same time period (Jackson 2001). The overall air quality and hence visibility of the FC-RONR occurring south and east of the project area is generally excellent with only short time impacts (Jackson 2002).

The Environmental Protection Agency (EPA) has established NAAQS for six air pollutants; carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, lead, and particulate matter. As they relate to this project, particulate matter associated with dust and emissions from unpaved roads, vehicles, and equipment are the pollutants of most concern because of potential impacts on human health and visibility. For this analysis PM-2.5, PM-10, nitrogen dioxide, and sulfur dioxide were used as indicators for analysis. The NAAQS for PM-10 (particulate matter less than 10 micrometers in aerodynamic diameter) were established in 1987 and updated in December of 2006. The NAAQS for PM-2.5 (particulate matter less than 2.5 micrometers in aerodynamic diameter) were established in 1997. Although PM-2.5 causes more severe health effects and visibility impacts than PM-10, the PM-10 standards were retained because they also have the potential to cause significant health effects. Nitrogen dioxide and sulfur dioxide standards were established in 1971 and have since been amended. According to the NAAQS, PM-10 cannot exceed 150 micrograms/cubic meter (ug/m^3) within a 24 hour period and PM-2.5 cannot exceed 35 ug/m^3 within a 24 hour period either alone or in combination with existing pollution sources. Nitrogen dioxide cannot exceed 100 parts per billion in a 1 hour period averaged over 3 years and sulfur dioxide cannot exceed 75 parts per billion in a 1 hour period averaged over 3 years. Table 3-10 displays all the NAAQS standards (EPA 2012).

An area that violates the NAAQS is designated as "nonattainment". For the purposes of regulating ambient air quality, the Idaho DEQ does not have baseline data for the affected environment. However, air quality in the project area is generally good to excellent due to the lack of urban and industrial sources and a minimum of other activities (vehicle dust and emissions) in the area that would generate pollutants. Existing sites near Idaho City, Salmon, Garden Valley, and McCall monitor PM-2.5 levels. A review of air quality monitors since 2010 revealed that on a 24 hour average only Salmon and Idaho City exceeded a PM-2.5 level of 35. A total of 33 days exceeded standards and these were almost exclusively recorded in the winter and spring months most probably associated with wood burning and stagnant air masses (IDEQ 2012). Project activities would not occur during this time frame. The yearly average over 5.5 years within the FC-RONR was 3 ug/m^3 for PM-2.5 (Jackson 2002).

Table 3-10 National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead	Primary and Secondary	Rolling 3 month average	0.15 ug/m^3	Not to be exceeded
Nitrogen Dioxide	Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
	Primary and Secondary	Annual	53 ppb	Annual Mean
Ozone	Primary and Secondary	8-hour	0.075 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particulate Pollution PM-2.5	Primary and Secondary	Annual	15 ug/m^3	annual mean, averaged over 3 years
		24-hour	35 ug/m^3	98th percentile, averaged over 3 years
Particulate Pollution PM-10	Primary and Secondary	24-hour	150 ug/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide	Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Acidic inputs from the atmosphere, mainly sulfate (SO4) and nitrate (NO3), can negatively impact aquatic and terrestrial ecosystems (EPA 2001). Their acidifying effects contribute to degradation of stream and lake water quality by lowering the Acid Neutralizing Capacity (ANC) which can be thought of as the water's natural acid buffering system. As the ANC decreases, the pH will eventually decrease and thus the acid levels will increase. The sensitivity of lakes and streams to the negative effects of acid deposition are often linked to natural watershed characteristics, most notably the bedrock geology/lithology types. These areas that receive high levels of acidic deposition and have bedrock geology with a naturally low buffering capacity may exhibit nutrient depletion and stream acidification. Sulfate is the primary component of acidic rain in the eastern U.S., while nitrogen deposition is more of a factor in acidic rain in the mid and western United States (USDA 2012). On the Salmon-Challis National Forest 68 lakes were sampled for acid deposition to determine the ANC. Of these approximately 16 show a low sensitivity (< 50 ANC), 23 are ultra-sensitive (< 75 ANC), eight are very sensitive (75-100 ANC), nine are sensitive (< 200 ANC), and 12 are non-sensitive (> 200 ANC) (Jackson 2001).

The Montana/Idaho Airshed Group, of which the Payette National Forest is a member, was formed in 1998 and yearly releases its operating guidelines for public and private land managers within Idaho. The objective of those guidelines is to coordinate prescribed burning among members to minimize smoke-related impacts to air quality; however, the group also functions as a source of data for particulate emissions in general. The Montana/Idaho Airshed Group monitors daily emissions, burning activities, and particulate matter levels with established monitoring units and certified meteorologists. The Forest Service, in cooperation with Idaho DEQ, has placed a PM-10 monitor near Garden Valley.

Class I Areas are subject to the most stringent restrictions relative to additional air pollution. The Clean Air Act established the national visibility goals of preventing any future, and the remedying of any existing, impairment of visibility in mandatory Class I Areas where impairment results from man-made air pollutants. The EPA's regional haze regulations (July 1, 1999) require that all states develop visibility plans to address regional haze impairment of Class I Areas within their state, as well as Class I Areas outside of their state that may be affected by emissions from within their state. Table 3-11 lists the Class I Areas and population centers within a 100 kilometer radius of the project area where impacts may occur.

Table 3-11 Sensitive Areas

Site	Distance from Project Area (Kilometers)	Direction from Project Area
Sawtooth Wilderness Area (Class I)	100	South
Hells Canyon Wilderness Area (Class I)	90	West
Selway-Bitterroot Wilderness (Class I)	56	North
Frank Church River of No Return Wilderness (Class II)	0	Generally North and East
City of McCall (Class II)	60	West
Yellow Pine Community (Class II)	19	South

Alternatives could produce pollutants during project implementation when emissions from road maintenance, drilling, trenching, and vehicle trips inside/outside the wilderness occur; and, from other unaccounted emissions such as wood stoves in trailers and stationary equipment exhaust. The discussion of effects documents possible emissions from the authorized trips into the FC-RONR Wilderness and estimates of possible emissions from other project activities. The approximate emissions displayed are meant to serve only as a comparison between Alternatives and would not represent an actual emission from the project activities. Actual emissions could vary depending on a host of factors including but not limited to climatic conditions and the actual equipment utilized. The number of trips into the FC-RONR Wilderness from Werdenhoff represents the primary difference between Alternatives with regard to emissions.

3.10.1 Environmental Consequences Specific to Alternative A

This alternative does not propose any activities. Therefore no direct or indirect effects on air quality are expected. Impacts from dust and vehicle/other emissions in the area associated with recreational/other activities would not change appreciably from the existing condition and would continue to contribute pollutants based on the conditions present at the time of travel. Current use levels in the area are low given the remote setting of the project area from any population source. Depending on actual usage of the analysis area, activities would continue to produce dust, nitrogen dioxide, and sulfur dioxide.

3.10.2 Environmental Consequences Specific to Alternative B

Alternative B would add approximately 771 vehicle trips annually in the project area from Werdenhoff into FC-RONR Wilderness. Trips within the wilderness account for the primary difference of emissions between alternatives. Additionally, this alternative could produce pollutants during project implementation when emissions from activities such as road maintenance, drilling, trenching, and vehicle trips inside/outside the wilderness occur; and, from other unaccounted emissions such as wood stoves in trailers and stationary equipment exhaust. Based on estimates and assumptions it was calculated that Alternative B would annually produce approximately 5,500 pounds of PM-10 particulate matter, 700 pounds of PM-2.5 particulate matter, 23,500 pounds of nitrogen dioxide, and 1,600 pounds of sulfur dioxide (Table 3-12).

Table 3-12 Alternative B and C Pollutant Inputs

Pollutant	Alternative B Emission (Lbs.)	Alternative C Emission (Lbs.)
Particulate Pollution PM-2.5	700	630
Particulate Pollution PM-10	5,500	4,900
Nitrogen Dioxide	23,500	20,100
Sulfur Dioxide	1,600	1,400

Particulates contributed to the atmosphere can be suspended and travel long distances or relatively short distances as evident by the visible dust adjacent to roads. The amount of pollutants produced,

suspended, and distributed depend heavily on environmental conditions such as moisture content of the roads, air humidity, winds, etc. Of the potential pollutants produced, all or none could be distributed depending on environmental conditions. Assuming all emissions are dispersed into the air column it would generally take little mixing to dilute emissions to low levels in the atmosphere or have any meaningful impact on the existing condition of pollutants within the air column.

While Alternative B would increase pollutants from dust, vehicle, and other emissions in the project area, it would not likely have measurable effects on air quality in any Class I Area, the FC-RONR Wilderness, or at monitoring sites, given the distance and dilution that would occur as particles and air mix over distance. Project design features (section 2.4.4) would mitigate emissions by reducing the dust impacts and maintaining pollution controls on exhaust. Impacts to the wilderness user are disclosed in Section 3.3 and would be generally limited to localized impacts from dust prior to dispersal where it is no longer perceived by the wilderness user. It would not be expected that suspended particles would have a measureable impact on overall visibility in the FC-RONR Wilderness, nor would any deposition likely have measurable increases in lake acidity.

3.10.3 Environmental Consequences Specific to Alternative C

Alternative C would add approximately 571 vehicle trips annually in the project area from Werdenhoff into FC-RONR Wilderness. Trips within the wilderness account for the primary difference of emissions between alternatives. Additionally, this alternative could produce pollutants during project implementation when emissions from activities such as road maintenance, drilling, trenching, and vehicle trips inside/outside the wilderness occur; and, from other unaccounted emissions such as wood stoves in trailers and stationary equipment exhaust. Based on estimates and assumptions it was calculated that Alternative C would annually produce approximately 4,900 pounds of PM-10 particulate matter, 630 pounds of PM-2.5 particulate matter, 20,100 pounds of nitrogen dioxide, and 1,400 pounds of sulfur dioxide (Table 3-12).

Pollutants contributed to the atmosphere can be suspended and travel long distances or relatively short distances as evident by the visible dust adjacent to roads. The amount of pollutants produced, suspended, and distributed depend heavily on environmental conditions such as moisture content of the roads, air humidity, winds, etc. Of the potential pollutants produced, all or none could be distributed depending on environmental conditions. Assuming all emissions are dispersed into the air column it would generally take little mixing to dilute emissions to low levels in the atmosphere or have any meaningful impact on the existing condition of pollutants within the air column.

While Alternative C would increase pollutants from dust, vehicle, and other emissions in the project area, it would not likely have measurable effects on air quality in any Class I Area, the FC-RONR Wilderness, or at monitoring sites, given the distance and dilution that would occur as particles and air mix over distance. Project design features (section 2.4.4) would mitigate emissions by reducing the dust impacts and maintaining pollution controls on exhaust. Impacts to the wilderness user are disclosed in Section 3.3 and would be generally limited to localized impacts from dust prior to dispersal where it is no longer perceived by the wilderness user. It would not be expected that suspended particles would have a measureable impact on overall visibility in the FC-RONR Wilderness, nor would any deposition likely have measurable increases in lake acidity.

3.10.4 Cumulative Effects

The area used to assess this project's cumulative effects on air quality consists of a 100 kilometer radius around the project area. There are no known past activities that, when combined with proposed activities, would result in a noticeable incremental effect on air quality. Present/Ongoing and Foreseeable future actions considered in this cumulative effects analysis include numerous activities over a very wide area and include, but are not limited to, other prescribed fires, wildfires, wood stoves, logging/mining/industrial activities, road construction/maintenance, vehicle emissions, recreation uses, and/or other sources of pollutants on adjacent National Forest, State, and private lands.

Alternative A does not propose any activities and therefore would have no direct, indirect, or cumulative effects on air quality.

Dust, vehicle, and other emissions that result from Alternative B and C could combine with air pollutants from other projects, including but not limited to other prescribed fires, wildfires, wood stoves, logging/mining/industrial activities, road construction/maintenance, vehicle emissions, recreation uses, and/or other sources of pollutants on the Payette National Forest, adjacent National Forest, State, and private lands. Many of these activities are largely driven by seasonal opportunities or requirements that present parameters on resource managers, landowners, and users to conduct their activities simultaneously. Even though the impacts of these activities are widely spaced over vast, complex terrain, degradation of air quality could occur at localized sites from cumulative effects.

Due principally to the increase in number of trips from Werdenhoff into the FC-RONR Wilderness, Alternative B could potentially add more pollutants than Alternative C and therefore has the potential to contribute more pollutants to cumulative impacts than Alternative C.

Air quality would continue to be monitored at sites throughout the state for daily and annual standards. Organizations such as the Montana/Idaho State Airshed Group would continue to work with agencies to manage inputs such as smoke impacts.

With relation to national and global petroleum reserves, the energy consumption associated with individual alternatives, as well as the differences between alternatives, is insignificant. Additionally, the energy consumption and thus the associated minor emissions would likely have unmeasurable and insignificant effects at a global scale on emissions or greenhouse gas.

3.11 Scenic Environment

This section of the document discusses the existing conditions and characteristics of the scenic environment within the project area, as well as the effects of the various alternatives on those resources. The analysis area used in this assessment consists of the 1,309 acre project area (Figure 3-12) as seen from sensitive viewing locations identified in the Forest Plan and others deemed appropriate for this analysis.

While most all National Forest lands can be viewed from high vista points or from aircraft, the esthetic concern varies along with the types of viewers, numbers of viewers, and the view duration. During the Forest Planning effort various visual quality objectives (VQOs) were established for seen areas. These VQOs function as indicators of allowable levels of induced change on the landscape. VQOs defined in the Forest Plan include:

Preservation (P) – This visual quality objective allows ecological changes only.

Retention (R) - Provides for management activities that are not visually evident to the casual forest visitor.

Partial Retention (PR) - Management activities may be visible but remain subordinate to the characteristic landscape.

Modification (M) - Management activities may dominate the characteristic landscape, but must concurrently use natural, established form, line, color, and texture. Activities should appear as natural occurrences when viewed in foreground or middleground distances.

Maximum Modification (MM) - Management activities may dominate the characteristic landscape, but should appear as natural occurrences when viewed in background distances.

The distance from which a landscape is viewed has an effect on how much detail, pattern, color, line, and texture a viewer sees. To capture this difference, various distance zones are established from the sensitive viewing areas:

Foreground (Fg) - That portion of a view from the observer to ¼ to ½ mile from the observer. The limit of this zone is based upon distances at which textural details can be perceived.

Middleground (Mg) - That portion of a view from ¼ or ½ mile up to three to five miles from the observer. Texture is characterized by the masses of trees in stands of uniform tree cover.

Background (Bg) - The visible terrain beyond the foreground and middleground where individual trees are not visible but are blended into the total fabric of the stand. Also, that portion of a view between three to five miles from the observer, and as far as can be seen.

A third component of visual quality relates to the degree of variety (variety class) within a visual landscape. The more distinctive the variety class, the more restrictive the visual quality objective. In contrast, those landscapes with minimal variety usually have less restrictive VQOs.

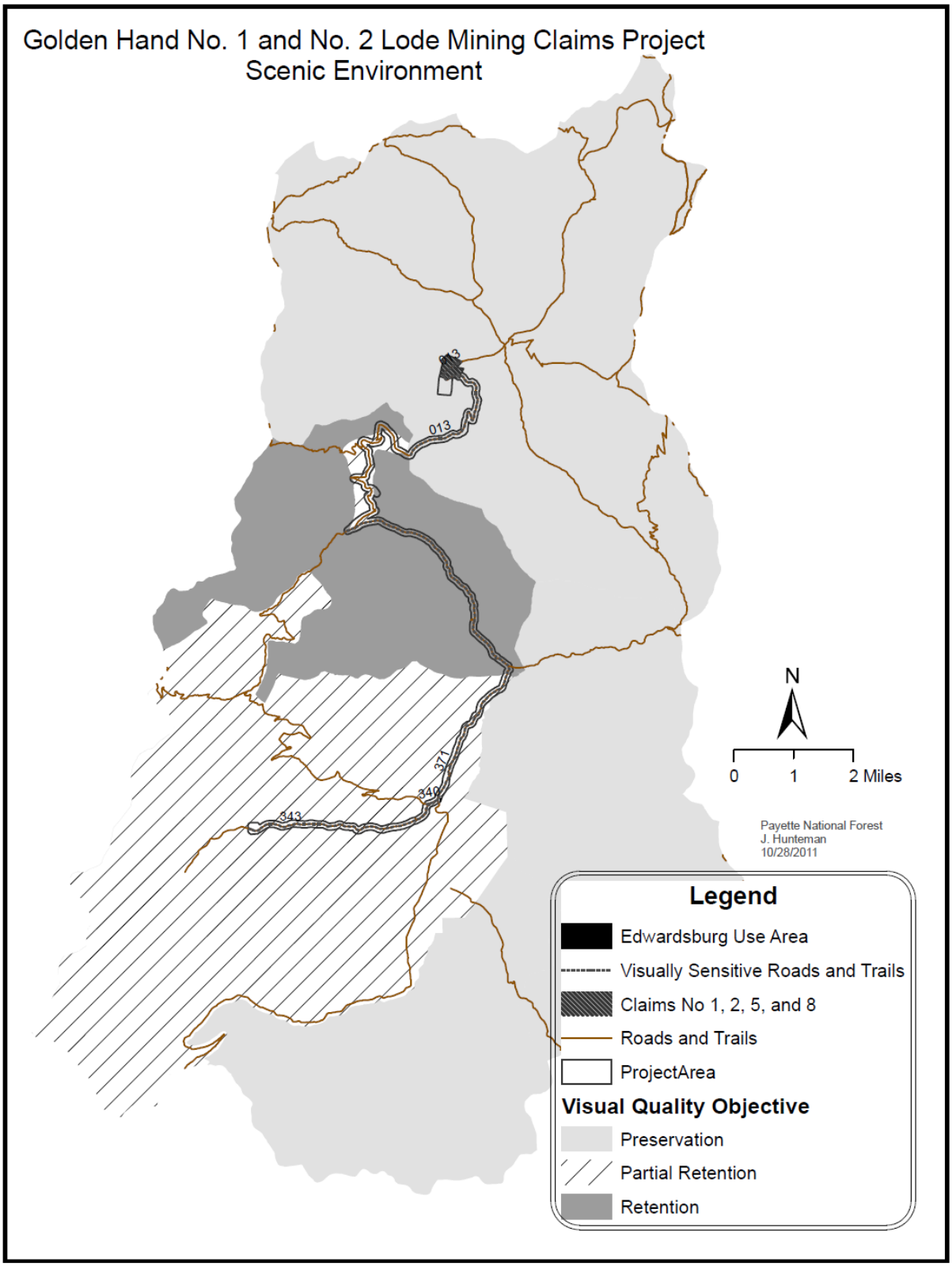


Figure 3-12 Sensitive Travel Routes and Use Areas

The 1,309 acre analysis area lies within Management Area 14 (Frank Church – River of No Return Wilderness), discussed on pages III-269 through III-274 in the Forest Plan and within Management Area 13 (Big Creek/Stibnite) discussed on pages III-257 through III-267. Page III-261 of the Forest Plan identifies visually sensitive travel routes or use areas within Management Area 13 and specifies the VQOs for those viewsheds. Management Area 14 is designated wilderness and all lands within the wilderness have a visual quality objective of Preservation, which provides the highest possible protection of scenic quality (FP III-273). For the purpose of this analysis it would be assumed that Forest Trail #013 would be visually sensitive. Additionally for the purpose of disclosing effects to the visually sensitive FC-RONR Wilderness, the analysis would also use the collection of mining claims where activities would generally occur as a sensitive use area. Table 3-13 discloses the visually sensitive travel routes or use areas that provide views into the project area, and identifies their sensitivity levels, variety classes, and VQOs provided in the Forest Plan or as defined for this analysis.

Table 3-13 Visual Quality Objectives for Sensitive Travel Routes or Use Areas

Sensitive Route or Area	Sensitivity Level	Variety Class	Primary Visual Quality Objective
Big Creek-Smith Creek Road #371	1	Common	Fg Retention
Logan Creek Road #343	2	Common	Fg Retention
Warren-Profile Gap #340	1	Common	Fg Retention
Edwardsburg Use Area	2	Common	Fg Retention
Golden Hand Claims No. 1, No. 2, No. 5, and No. 8	1	Distinctive or Common	Fg Preservation
Forest Trail #013	1	Distinctive or Common	Fg Preservation

Fg – Foreground

As might be expected, the visual condition varies from site to site depending upon the landscape and its inherent diversity along with such features as intensity of past wildfire in any particular location and past management/development. The following discussions generally describe the existing viewsheds as seen from the individual sensitive locations, and are specific to those viewing distances of concern.

Big Creek-Smith Creek Road – This road, also known as FR #371, is a travel way heading north from Edwardsburg to the Big Creek Guard Station and Airstrip then turning west and north to travel along Smith Creek. Approximately 6.9 miles of this road occur within the project area. This road is in fair travel condition to Smith Creek and offers the traveler a relatively slow speed tour of the Big Creek Area. Once along Smith Creek travel becomes more difficult and the traveler encounters very slow travel. Views in the foreground as the traveler heads north from Edwardsburg are dominated by the facilities in the Big Creek Area, including a campsite, airstrip, remnants of a lodge, and guard station. These occur in a rustic setting with views of forested landscaped interspersed with past wildfire, scree slopes, and meadows in the middle and backgrounds. As the traveler follows Smith Creek the valley becomes more incised and views in the foreground are restricted to a largely forested mixed-conifer landscape and Smith Creek, although views of scree slopes and steep meadows are evident in places. In the foreground the landscape is unaffected by past wildfires, however the casual observer could see pockets of mortality largely created by the mountain pine beetle. Project activities that would occur in this area would generally be restricted to the transport of equipment, personnel, fuel, and other supplies.

Logan Creek - This road, also known as FR #343, is a travel way accessing the Walker Millsite from the Edwardsburg area to the east. This road is largely native surface and offers the traveler a slow speed tour of the backcountry. Approximately 3.4 miles of this road occur within the project area. In this area the foreground offers views of a forested mixed-conifer landscape and Logan Creek. The foreground is unaffected by past wildfire. Project activities that would occur in this area would generally be restricted to the transport of equipment, personnel, fuel, and other supplies.

Warren-Profile Gap - This road, also known as FR #340, is a travel way accessing the Edwardsburg area from Yellowpine to the south and Warren to the west. This road is largely native surface and offers the traveler a relatively slow speed tour of the backcountry. The views in the foreground of this road in the project area are restricted to a short 0.3 mile section immediately north and west of the Edwardsburg area.

In this area the foreground offers views of a forested mixed-conifer landscape and Logan Creek. Some views of the Edwardsburg area are visible as the traveler approaches that area. The foreground is unaffected by past wildfire. Project activities that would occur in this area would generally be restricted to the transport of equipment, personnel, fuel, and other supplies.

Edwardsburg Use Area – The northwestern most tip of the Edwardsburg area is located in the project area. Views into the foreground from the area would offer a mixed conifer landscape unaffected by wildfire. Project activities that could be seen in this area would generally be restricted to the transport of equipment, personnel, fuel, and other supplies.

Golden Hand Claims No. 1, No.2, No. 5, and No. 8 – Travelers within the claims would be restricted to overland travel or travel along unauthorized roads that exist from past mining activities prior to wilderness designation. Views in the foreground would vary, but would generally be a mix of forested and open scree hillsides with signs of past mining interspersed throughout. While much of the area would be indicative of the common variety class in the foreground, the areas around the mining ruins could shape a distinctive variety class given the setting and the era of the ruins.

Forest Trail 013 – Forest Trail #013 provides access into the wilderness from the Pueblo Summit Trailhead. The traveler is restricted to foot or horse travel at a typically slow pace. Approximately 3.3 miles of this trail occur within the project area. Views in the foreground vary as the traveler proceeds through the Project Area. As the traveler leaves Pueblo Summit heading north the views are of mixed alpine forest interspersed with open areas revealing surface rock. As the traveler proceeds views become dominated by a past wildfire that left a patchwork of mortality and live trees from the 2005 event. Lastly as the traveler enters the Coin Creek drainage the forested landscape in the foreground is unaffected by wildfire and typically denser than the forest to the south. The traveler would also notice the remnants of past mining activities on the Golden Hand Claims including a bunkhouse, ice house, outhouse, and cabin. While much of the area would be indicative of the common variety class in the foreground, the areas around the mining ruins could shape a distinctive variety class given the setting and the era of the ruins.

3.11.1 Environmental Consequences Specific to Alternative A

This alternative does not propose any new management activities therefore no management-induced changes to the scenic resources would occur. Over time, the landscape appearance will slowly change. Past fires would regenerate to mature forests over time, while other areas would randomly be affected by fires. Insect populations would also alter the landscape through epidemic and endemic populations. However, it is expected the scenic environment would continue to convey visual effects similar to the current condition barring a large catastrophic fire event.

3.11.2 Environmental Consequences Specific to Alternative B

Implementation of this alternative would result in visible changes as viewed from Golden Hand Claims No. 1, No. 2, No. 5, and No. 8, along Forest Trail #013, and as viewed from FR #371, #340, and #343. The amount of that change would vary depending upon the observer's position in the landscape and the specific activity in that particular viewshed.

Since project activities in the Edwardsburg area, FR #371, FR #340, and FR #343 would generally be restricted to activities such as the transport of equipment, personnel, fuel, and other supplies, these project activities would not affect the VQOs along/within these sensitive areas. These types of activities would not alter the visual characteristics of the area, therefore it is expected that FR #343, FR #340, and the Edwardsburg area would continue to meet a visual quality objective of partial retention. Additionally, FR #371 would continue to meet the VQOs of retention and partial retention. No further discussion of direct or indirect regarding these activities to VQOs would be discussed.

In order to achieve this project's purpose and need of mineral activities in the FC-RONR Wilderness, the VQOs of preservation associated with wilderness would be reduced to an objective of maximum modification. Due to the reduction of preservation VQOs in the wilderness to accommodate mining activities, this alternative would necessitate a Forest Plan amendment to standard SCST01 to allow

activities in the wilderness.

The traveler in wilderness would expect and the designation of preservation would imply that alterations to the landscape would be dominated by natural disturbances. Human disturbance would be expected to be restricted to activities such as maintenance of trails. Other disturbances from the past would be expected to resemble past activity with no evidence of current activity and structures indicative of the era when activity occurred. Because of the setting and expectations of observers in this setting, activities that otherwise may meet a less restrictive VQO would likely be considered modification or maximum modification in the wilderness due to a heightened awareness of deviations from the natural-appearing landscape.

Big Creek-Smith Creek Road – The cutting of trees for timbers could take place along this road section. Stumps would be cut within six inches of the ground on the high side, slash would be lopped and scattered to within one foot of the ground, and 70 percent of the merchantable trees would be left in harvest areas along that portion of the road with a VQO of retention. Stumps would be cut within six inches of the ground on the high side and slash would be lopped and scattered to within one foot of the ground along that portion of the road with a VQO of partial retention. Due to the limited nature of the tree cutting for timbers and project design, the activity of cutting trees with the remaining stumps and slash would meet VQOs in the temporary term once fresh cutting and red needles gray.

Warren-Profile Gap and Logan Creek - The cutting of trees for timbers could take place along this road section. Stumps would be cut within six inches of the ground on the high side and slash would be lopped and scattered to within one foot of the ground along that portion of the road with a VQO of partial retention. Due to the limited nature of the tree cutting for timbers and project design, the activity of cutting trees with the remaining stumps and slash would meet VQOs in the temporary term once fresh cutting and red needles gray.

Edwardsburg Use Area – The cutting of trees for timbers is not expected to occur within this section, however trees could be cut immediately adjacent to this area. Stumps would be cut within six inches of the ground on the high side and slash would be lopped and scattered to within one foot of the ground along that portion of the road with a VQO of partial retention. Due to the limited nature of the tree cutting for timbers and project design, the activity of cutting trees with the remaining stumps and slash would meet VQOs in the temporary term once fresh cutting and red needles gray.

Golden Hand Claims No. 1, No. 2, No. 5, and No. 8 – Project activities that would be evident to the casual observer by creating disturbed soil could include maintenance of temporary roads, confirmation work (core drilling on 11 pads, pit-rock chip sampling, and the Ella mine opening), and needed clearing near the bunkhouse and Penn Ida mine. These activities would create a disturbed area including bare soil and would constitute clear evidence of deviation from the natural appearance in the foreground. Given the expectation of the casual observer, these activities would meet a VQO of maximum modification. Because of the ground disturbance involved with these activities, the effects would slowly fade over time as natural processes occur and the vegetation again reclaims roads and other disturbed sites to a point the disturbance again appears to be indicative the era when past mining occurred. In the short term, it would be expected that the appearance of disturbed areas would appear more natural as natural processes occur and the sites become more indicative of the current condition, however these management induced disturbances would linger as a deviation to a casual observer in the wilderness. It would be expected that in the long term, the area would again meet a VQO of preservation as the disturbed areas again appear indicative of the era when mining occurred in the FC-RONR wilderness.

Project activities that would be evident to the casual observer by placing modern/new equipment in the area could include the parking of vehicles/trailers, storage of materials, the placing of new timbers at the Ella mine, the water diversion, the installation of water pipes, and placement water storage tanks. These activities would represent a deviation from the expected landscape in the foreground. The observer would not expect to see motorized equipment, trailers, freshly hewn timbers, water storage, and new pipes within the wilderness. Project design features requiring natural or neutral colors could lessen the distance where facilities become visible and would dampen the visual impact to a slight

degree once visible. Regardless of the design features that would likely reduce impacts, these activities would only meet a VQO of maximum modification. However, these activities would be short term in nature and would only last for the duration of the project at what point infrastructure and equipment would be removed from the wilderness. Mine timbers still exposed following the caving of the mine entrance could attract the casual observer longer into the short term, until such time the timbers weather and appear more indicative of the era when past mining occurred.

Restoration and occupation of the Golden Hand bunkhouse would be evident to casual observer. The installation of such features as roofing, stove pipes, new logs, windows, and porch posts/flooring would appear evident. While these activities would be carried out in an effort to meet the setting of the building, they would appear as a deviation from the rustic and rundown appearance the observer expects of most structures in the wilderness. These activities would meet a VQO of maximum modification. These activities would largely fade in the short term as wood and metal weather and become more in tune with the area and the expectation of observers. It is expected that activities would not meet a VQO of preservation until the long term when the cabin again takes on a more 'run downed' and weathered quality that the observer would expect to see.

Lighting facilities used in conjunction with activities would be evident to the casual observer. In the wilderness the observer would expect to see a dark night, where the only evidence of human activity would be from the occasional camp fire or small flashlights. Lighting facilities designed to provide working light for operations would be unexpected and could be visible into the middleground. Design features encouraging that lights point downward could reduce the influence of light and could, depending on the observer's position, reduce the distance the light is visible. Regardless of the design feature that would likely reduce impacts, these activities would meet a VQO of maximum modification and only impact objectives while project activities take place.

Forest Trail 013 – Project activities that would be evident to the casual observer by creating disturbed soil could include maintenance of temporary roads (4.0 miles) and needed clearing near the bunkhouse. These activities would create a disturbed area including bare soil and would constitute clear evidence of deviation from the natural appearance in the foreground. Given the expectation of the casual observer, these activities would meet a VQO of maximum modification. Because of the ground disturbance involved with these activities, the effects would slowly fade over time as natural processes occur and the vegetation again reclaims roads and other disturbed sites to a point the disturbance again appears to be indicative the era when past mining occurred. In the short term, it would be expected that the appearance of disturbed areas would appear more natural as natural processes occur and the sites become more indicative of the current condition, however these management induced disturbances would linger as a deviation to a casual observer in the wilderness. It would be expected that in the long term, the area would again meet a VQO of preservation as the disturbed areas again appear indicative of the era when mining occurred in the FC-RONR wilderness.

Project activities that would be evident to the casual observer by placing modern/new equipment in the area could include the parking of vehicles/trailers, storage of materials, the water diversion, the installation of water pipes, and placement water storage tanks. These activities would represent a deviation from the expected landscape in the foreground. The observer would not expect to see motorized equipment, trailers, water storage, and new pipes within the wilderness. Project design features requiring natural or neutral colors could lessen the distance where facilities become visible and would dampen the visual impact to a slight degree. Regardless of the design features that would likely reduce impacts, these activities would meet a VQO of maximum modification. However, these activities would be short term in nature and would only last for the duration of the project at what point infrastructure and equipment would be removed from the wilderness.

Restoration and occupation of the Golden Hand bunkhouse would be evident to casual observer. The installation of such features as roofing, stove pipes, new logs, windows, and porch posts/flooring would appear evident. While these activities would be carried out in an effort to meet the setting of the building, they would appear as a deviation from the rustic and rundown appearance the observer expects of most structures in the wilderness. These activities would meet a VQO of maximum modification. These activities would largely fade in the short term as wood and metal weather and

become more in tune with the area and the expectation of observers. However, it is expected that activities would not meet a VQO of preservation until the long term when the cabin again takes on a more 'run downed' and weathered quality that the observer would expect to see.

Lighting facilities used in conjunction with activities would be evident to the casual observer. In the wilderness the observer would expect to see a dark night, where the only evidence of human activity would be from the occasional camp fire or small flashlights. Lighting facilities designed to provide working light for operations would be unexpected and could be visible into the middleground. Design features encouraging that lights point downward could reduce the influence of light and could, depending on the observer's position, reduce the distance the light is visible. Regardless of the design feature that would likely reduce impacts, these activities would meet a VQO of maximum modification and only impact objectives while project activities take place.

3.11.3 Environmental Consequences Specific to Alternative C

Implementation of this alternative would result in visible changes as viewed from Golden Hand Claims No. 1, No. 2, No. 5, and No. 8, along Forest Trail #013, and as viewed from FR #371, #340, and #343. The amount of that change would vary depending upon the observer's position in the landscape and the specific activity in that particular viewshed.

Since project activities in the Edwardsburg area, FR #371, FR #340, and FR #343 would generally be restricted to activities such as the transport of equipment, personnel, fuel, and other supplies, these project activities would not affect the VQOs along/within these sensitive areas. These types of activities would not alter the visual characteristics of the area, therefore it is expected that FR #343, FR #340, and the Edwardsburg area would continue to meet a visual quality objective of partial retention. Additionally, FR #371 would continue to meet the VQOs of retention and partial retention. No further discussion of direct or indirect regarding these activities to VQOs would be discussed.

In order to pursue this project's purpose and need of mineral activities in the FC-RONR Wilderness, the VQOs of preservation associated with wilderness were reduced to an objective of maximum modification in order to accommodate project activities. Due to the reduction of preservation VQOs in the wilderness to accommodate project activities, this alternative would necessitate a Forest Plan amendment to pursue activities in the wilderness.

The traveler in wilderness would expect and the designation of preservation would imply that alterations to the landscape would be dominated by natural disturbances. Human disturbance would be expected to be restricted to activities such as maintenance of trails. Other disturbances from the past would be expected to resemble past activity with no evidence of current activity and structures indicative of the era when activity occurred. Because of the setting and expectations of observers in this settings, activities that otherwise may meet a less restrictive VQO would likely be considered modification or maximum modification in the wilderness due to a heightened awareness of deviations from the natural-appearing landscape.

Big Creek-Smith Creek Road – The cutting of trees for timbers could take place along this road section. Stumps would be cut within six inches of the ground on the high side, slash would be lopped and scattered to within one foot of the ground, and 70 percent of the merchantable trees would left in harvest areas along that portion of the road with a VQO of retention. Stumps would be cut within six inches of the ground on the high side and slash would be lopped and scattered to within one foot of the ground along that portion of the road with a VQO of partial retention. Due to the limited nature of the tree cutting for timbers and project design, the activity of cutting trees with the remaining stumps and slash would meet VQOs in the temporary term once fresh cutting and red needles gray.

Warren-Profile Gap and Logan Creek - The cutting of trees for timbers could take place along this road section. Stumps would be cut within six inches of the ground on the high side and slash would be lopped and scattered to within one foot of the ground along that portion of the road with a VQO of partial retention. Due to the limited nature of the tree cutting for timbers and project design, the activity

of cutting trees with the remaining stumps and slash would meet VQOs in the temporary term once fresh cutting and red needles gray.

Edwardsburg Use Area – The cutting of trees for timbers is not expected to occur within this section, however trees could be cut immediately adjacent to this area. Stumps would be cut within six inches of the ground on the high side and slash would be lopped and scattered to within one foot of the ground along that portion of the road with a VQO of partial retention. Due to the limited nature of the tree cutting for timbers and project design, the activity of cutting trees with the remaining stumps and slash would meet VQOs in the temporary term once fresh cutting and red needles gray.

Golden Hand Claims No. 1, No. 2, No. 5, and No. 8 – Project activities that would be evident to the casual observer by creating disturbed soil could include maintenance of temporary roads, confirmation work (core drilling on 11 pads, pit-rock chip sampling, and the Ella mine opening), and needed clearing near the bunkhouse. These activities would create a disturbed area including bare soil and would constitute clear evidence of deviation from the natural appearance in the foreground. Given the expectation of the casual observer, these activities would meet a VQO of maximum modification. Because of the ground disturbance involved with these activities, the effects would slowly fade over time as natural processes occur and the vegetation again reclaims roads and other disturbed sites to a point the disturbance again appears to be indicative the era when past mining occurred. In the short term, it would be expected that the appearance of disturbed areas would appear more natural as natural processes occur and the sites become more indicative of the current condition, however these management induced disturbances would linger as a deviation to a casual observer in the wilderness. It would be expected that in the long term, the area would again meet a VQO of preservation as the disturbed areas again appear indicative of the era when mining occurred in the FC-RONR wilderness.

Project activities that would be evident to the casual observer by placing modern/new equipment in the area could include the parking of vehicles/trailers, storage of materials, the placing of new timbers at the Ella mine, the water diversion, the installation of water pipes, and placement water storage tanks. These activities would represent a deviation from the expected landscape in the foreground. The observer would not expect to see motorized equipment, trailers, freshly hewn timbers, water storage, and new pipes within the wilderness. Project design features requiring natural or neutral colors could lessen the distance where facilities become visible and would dampen the visual impact to a slight degree once visible. Regardless of the design features that would likely reduce impacts, these activities would only meet a VQO of maximum modification. However, these activities would be short term in nature and would only last for the duration of the project at what point infrastructure and equipment would be removed from the wilderness. Mine timbers still exposed following the caving of the mine entrance could attract the casual observer longer into the short term, until such time the timbers weather and appear more indicative of the era when past mining occurred.

Lighting facilities used in conjunction with activities would be evident to the casual observer. In the wilderness the observer would expect to see a dark night, where the only evidence of human activity would be from the occasional camp fire or small flashlights. Lighting facilities designed to provide working light for operations would be unexpected and could be visible into the middleground. Design features encouraging that lights point downward could reduce the influence of light and could, depending on the observer's position, reduce the distance the light is visible. Regardless of the design feature that would likely reduce impacts, these activities would meet a VQO of maximum modification and only impact objectives while project activities take place.

Forest Trail 013 – Project activities that would be evident to the casual observer by creating disturbed soil could include maintenance of temporary roads and needed clearing near the bunkhouse. These activities would create a disturbed area including bare soil and would constitute clear evidence of deviation from the natural appearance in the foreground. Given the expectation of the casual observer, these activities would meet a VQO of maximum modification. Because of the ground disturbance involved with these activities, the effects would slowly fade over time as natural processes occur and the vegetation again reclaims roads and other disturbed sites to a point the disturbance again appears to be indicative the era when past mining occurred. In the short term, it would be expected that the appearance of disturbed areas would appear more natural as natural processes occur and the sites

become more indicative of the current condition, however these management induced disturbances would linger as a deviation to a casual observer in the wilderness. It would be expected that in the long term, the area would again meet a VQO of preservation as the disturbed areas again appear indicative of the era when mining occurred in the FC-RONR wilderness.

Project activities that would be evident to the casual observer by placing modern/new equipment in the area could include the parking of vehicles/trailers, storage of materials, the water diversion, the installation of water pipes, and placement water storage tanks. These activities would represent a deviation from the expected landscape in the foreground. The observer would not expect to see motorized equipment, trailers, water storage, and new pipes within the wilderness. Project design features requiring natural or neutral colors could lessen the distance where facilities become visible and would dampen the visual impact to a slight degree once visible. Regardless of the design features that would likely reduce impacts, these activities would meet a VQO of maximum modification. However, these activities would be short term in nature and would only last for the duration of the project at what point infrastructure and equipment would be removed from the wilderness.

Lighting facilities used in conjunction with activities would be evident to the casual observer. In the wilderness the observer would expect to see a dark night, where the only evidence of human activity would be from the occasional camp fire or small flashlights. Lighting facilities designed to provide working light for operations would be unexpected and could be visible into the middleground. Design features encouraging that lights point downward could reduce the influence of light and could, depending on the observer's position, reduce the distance the light is visible. Regardless of the design feature that would likely reduce impacts, these activities would meet a VQO of maximum modification and only impact objectives while project activities take place.

3.11.4 Cumulative Effects

Given the lack of any direct or indirect effects on visual resources beyond the project area, the area used to assess cumulative effects was limited to the 1,309 acre analysis area.

Past activities include the original development and abandonment of the Golden Hand Mine, Werdenhoff Millsite, and the Sunday Mine. These activities are addressed as part of the existing condition, but would have impacted the visual scene from past ground disturbance and associated infrastructure.

The Smith Creek ATV Trail Maintenance Project is a past project that could have affected snags in a small portion of the analysis area where the Forest Trail #194 leaves Forest Road #371. Within the analysis area the project completed maintenance to the trail. The project was limited to clearing the trail to specified width. Most of the clearing was brushing back branches but in some cases seedling, saplings, poles, and the occasional small tree were removed including snags. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

There are several ongoing activities that could affect visual resources in the analysis area. The Walker Millsite occurs in the analysis area. The mine site impacts the visual resource through past/ongoing ground disturbance and the associated infrastructure. Firewood harvest occurs annually along roads, leaving associated slash and stumps. Private lands, especially around Edwardsburg, continue to be developed annually to various degrees. The Big Creek Lodge, Big Creek Guard Station, Big Creek Airstrip, and Big Creek Campground would continue to operate on an annual basis and receive maintenance. Private timber harvest, mostly for personal use, would likely continue in an ongoing fashion at unknown levels. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

The Big Creek Fuels Reduction Project occurs partially within the analysis area and represents a reasonably foreseeable project. Currently, this project is in the planning stages. A range of thinning activities could impact the visual resources; however, specifics are not currently available. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses

completed for this project.

The Big Creek Restoration and Access Management Project, The Morgan Ridge Exploration Project, The Big Creek Road Access Plan of Operation, and the Installation of a Bridge over North Fork Smith Creek are reasonably foreseeable future projects in the analysis area. These projects would authorize the clearing of roads and trails to specified widths. In most cases clearing would be of brush and limbs from trees, but in limited cases trees of all sizes could be removed to maintained proper clearing widths along with snags. Snags could also be removed as safety hazards in limited cases, especially on projects like bridge installations. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

Alternative A would not result in any direct, indirect, or cumulative effects on visual quality.

Alternative B and C in combination with ongoing and foreseeable future activities could introduce some degree of additional visual change. The direct and indirect effects of Alternative B and C could only be incremental outside the wilderness along Forest Roads #340, #341, and #371 where tree cutting could occur for mine timbers. Ongoing firewood cutting, Big Creek Fuels Reduction Project, Big Creek Restoration and Access Management Project, Morgan Ridge Exploration Project, Big Creek Road Access Plan of Operation, and the Installation of a Bridge over North Fork Smith Creek could incrementally increase the numbers of cut trees along these routes. Firewood cutting in the area is generally limited to the homes in the area of Edwardsburg and is generally scattered and random in nature as firewood cutters seek dead trees. Firewood permits have terms that reduce impacts to the visual resource by requiring low stumps and the slash be scattered away from roads. It would be expected that the Big Creek Fuels Reduction Project, Big Creek Restoration and Access Management Project, Morgan Ridge Exploration Project, Big Creek Road Access Plan of Operation, and the Installation of a Bridge over North Fork Smith Creek would have design features that limited impacts to the VQO of partial retention and retention. Given the scattered and random nature of firewood cutting in the area and the included/expected design features associated with firewood cutting and the Big Creek Fuels Reduction Project, Big Creek Restoration and Access Management Project, Morgan Ridge Exploration Project, Big Creek Road Access Plan of Operation, and the Installation of a Bridge over North Fork Smith Creek it would not be expected that incremental effects would result in changes outside of established VQOs of partial retention and retention as described in the Environmental Consequences section above.

As disclosed in Section 2.4.2.1 and 2.4.3.1, both Alternative B and C would require one amendment to the Forest Plan. This would be a one time, site specific, non-significant amendment that would not change overall Forest Plan goals, objectives, DFC, or associated outputs. Alternatives B and C would:

- Amend Forest Plan Standard SCST01 to allow for activities not meting Visual Quality Objectives associated with the Golden Hand No. 1 and No. 2 Lode Mining Claims Project to occur, by appending the following: "For the Golden Hand No. 1 and No. 2 Lode Mining Claims Project allow activities within that portion of the project area, approximately 291 acres within the FC-RONR Wilderness, which would not meet the Visual Quality Objective of Preservation."

With the proposed Forest Plan amendment, both Alternatives would be consistent with Forest Plan standards.

3.12 Cultural Resources

This section of the document discusses the existing conditions and characteristics of cultural resources within the project area, as well as the effects of the various alternatives on those resources. Since activities associated with alternatives that could affect cultural resources would be confined to the project area, the analysis area used in this assessment consists of the 1,309 acre project area (Figure 1-2).

The Idaho State Historic Preservation Office (hereafter referred to as SHPO) has determined the Golden Hand Mine site eligible to the National Register of Historic Places (NRHP). The SHPO advises and assists the Forest Service in identifying and preserving culturally significant properties. A cultural resource inventory was conducted in consultation with the SHPO to meet the Section 106 compliance process of the National Historic Preservation Act and its implementing regulations (36 CFR 800). Based on the inventory, the SHPO determined the Golden Hand Mine site was eligible to the NRHP as it met two criteria for nomination to the National Register: (1) The mine site is associated with events that have made a significant contribution to the broad pattern of Idaho's mining history; and (2) The mine site has yielded, or may be likely to yield, information important to the area's history (36 CFR 60).

Public comments regarding cultural resources and Tribal trust responsibilities addressed concerns such as potential threats to social, cultural, or historic areas within the project area, treaty fishing rights, and the effects of the project on other Tribal rights.

The proposed activities are located within the Big Creek drainage and in the FC-RONR Wilderness, and situated within the Nez Perce Tribe's territory as defined by the Treaty of 1855 and findings of the Indian Claims Commission Docket No.175. The Big Creek system was historically and still is very important to the life and culture of the Tribe. Tribal members have lived in and conducted subsistence and ceremonial activities in the Coin Creek/Beaver Creek area as well as the entire Big Creek drainage. The Tribe continues to exercise its treaty-reserved rights in these areas.

American Indian Rights

American Indian Tribes are afforded special rights under various federal statutes that include the NHPA, the Native American Graves Protection and Repatriation Act (NAGPRA), and the American Indian Religious Freedom Act (AIRFA). Federal guidelines direct federal agencies to consult with American Indian Tribal representatives who may have concerns about federal actions that may affect religious practices, other traditional cultural uses, as well as cultural resource sites and remains associated with American Indian ancestors. Any tribe whose aboriginal territory occurs within a project area is afforded the opportunity to voice concerns for issues governed by NHPA, NAGPRA, or AIRFA.

Federal responsibilities to consult with Indian tribes are included in Executive Orders 12875 and 13007. Executive Order 12875 calls for regular consultation with Tribal governments; and Executive Order 13007 requires consultation with Indian tribes and religious representatives on the access, use, and protection of Indian sacred sites.

The Golden Hand project area is located within ceded lands of the Nez Perce Tribe. Ceded lands are federal lands on which the federal government recognizes that a tribe has certain inherent rights conferred by treaty. In the Nez Perce Treaty of 1855, Article 3, the United States of America and the Nez Perce Tribe mutually agreed that the Nez Perce retain the right of:

> …taking fish at all usual and accustomed places in common with citizens of the Territory [of Idaho]; and of creating temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing horses and cattle…

The government's trust responsibility requires the Forest Service (and other federal agencies) to assess proposed actions for their potential to affect treaty rights and interests including American Indian cultural resources, sacred sites, and other traditional cultural properties. Where potential impacts may exist, the federal agencies must seek consultation with the Nez Perce Tribe, and must address those impacts in planning documents and final decisions.

American Indians have occupied the area of the present day FC-RONR Wilderness for thousands of years. Archaeological evidence suggests that ancient Indians (Paleo-Indians) were hunting and gathering in the Wilderness 9,000 to 10,000 years ago (Swanson and Sneed 1966; Gallagher 1975). When Euro-Americans arrived in the area in the early 19th century, the primary Tribal groups inhabiting the central Idaho mountains were the Nez Perce and the Northern Shoshone (Lowie 1909, Steward 1938).

American Indians of central Idaho relied on hunting, gathering, and fishing for their subsistence. Winter villages, associated with big game winter ranges, and access to good anadromous fishing areas, were located in the lower elevations of Big Creek and the Salmon Rivers (Liljeblad 1957). In the late spring or early summer, family units left their winter villages for higher elevations where vegetable root crops and big game could be found.

The influx of Euro-Americans into central Idaho in the early 19th century as a result of the fur trade, displaced the Indian populations. The gold rush in 1860 and later developments such as homesteading and agriculture further displaced Indian populations.

Photo 3-8. Vicinity of the Golden Hand Mine Site with Historic Building

The Nez Perce Tribe has informed the PNF that the Big Creek system was historically and still is very important to the life and culture of the Tribe. Tribal members have lived in and conducted subsistence and ceremonial activities in the Coin Creek/Beaver Creek area as well as the entire Big Creek drainage. The Tribe continues to exercise its treaty-reserved rights in these areas.

Mining History

In the late 1800's, the gold rush brought miners into central Idaho from places such as Washington, Oregon, California, and Montana. The migration of merchants, laborers, and farmers followed. Mining communities began to develop in the Big Creek area in the 1880's. During this time period, gold placer deposits were found and worked along lower Smith Creek and for approximately one mile below the confluence with Big Creek. James M. Hand claimed the Golden Hand mineral lode discovery in 1889 (Cater et al. 1973).

Gold deposits discovered in 1901 at Thunder Mountain (approximately 21 straight-line miles from the Golden Hand Mine site) renewed the public's interest in gold prospecting in the Big Creek area (Waite 1994). Prospecting continued until 1909. Most mining claims in the Big Creek area were located prior to 1910 (Cater et al. 1973). There was renewed exploration and development at the Golden Hand Mine between 1932 and 1941. The majority of the facilities, equipment, and roads in the area of the claims are from this time period (Shenon and Ross 1936).

Existing Condition

No known pre-historic sites were located in the vicinity of the Golden Hand Mine (Rossillon 1981 and Dixon 2002); however, mining history remnants from the 1890's and 1930's are considered historic and eligible to the NRHP. These mining history remnants include six structures, three mine adits, a waste rock pile, and a variety of mining-related machinery.

The July 2002 site inventory conducted by a Forest Service Cultural Resource Specialist identified six structures at the Golden Hand Mine site that were constructed in the 1930s (Shenon and Ross 1936). The main bunkhouse, latrine, food storage building, and log cabin are standing, while the mill building and tipple tower with ore bins and a crusher, are collapsed. The main bunkhouse is the most prominent feature at the site, and is a large, 2 ½ storied, milled lumber framed building (Photo 3-9). This building is located on claim No. 3. Three historic mine adits were also inventoried at the mine site along with an old road grader, boiler, and other mining-related machinery.

In addition to the historic remnants at the Golden Hand Mine site, there are cultural resource properties adjacent to the access route to the mine (FR #371 and #373) that may be potentially eligible to the NRHP. The Smith Creek Road Survey was conducted from September 12 – 15, 2011. The portion of this road from the Wilderness trailhead to its junction with the road to Pueblo Summit was constructed in 1933. The road to Pueblo Summit was constructed prior to the creation of the Forest. This area is within the historic Alton Mining District that was established in the mid-1880s. Earlier archaeological surveys recorded four sites in this area. These sites were monitored in 2011 and the site forms updated to Archaeological Survey of Idaho Site Inventory Forms. Two of these sites are eligible to the National Register of Historic Places and are within the area of potential effects. Five new sites were recorded. Two of these sites are eligible to the National Register and one is within the area of potential effects. All sites would be treated as eligible and any impacts to these properties would be avoided. Although mining-related traffic would pass by these properties, none of the properties are close enough to the road to receive any impacts from the Proposed Action or alternatives.

Photo 3-9. Bunkhouse North of Claim No's. 3 and 4 at the Golden Hand Mine Site

In 2003, a Memorandum of Agreement (MOA) with the Idaho SHPO was reached as mitigation for the use of the Golden Hand bunkhouse as an office/cafeteria and a camping area. The MOA (FS Agreement NO. 03_MU_110401230-008) included a contextual history of the Golden Hand Mine and 82 black and white photographs of site features. The MOA was completed by the Payette National Forest in 2003 and sent to the Idaho SHPO on November 12, 2003.

3.12.1 Environmental Consequences Specific to Alternative A

Under Alternative A, the existing cultural resource properties at the Golden Hand mine site would continue to be allowed to decay. Currently, the FS has no plans to restore, stabilize, or maintain the properties at the Golden Hand Mine to meet cultural resource protection standards.

There would be no change to the current condition of the area and the ability of the Nez Perce Tribe to exercise treaty rights including "…taking fish at all usual and accustomed places in common with citizens of the Territory [of Idaho]; and of creating temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing horses and cattle…"

3.12.2 Environmental Consequences Specific to Alternative B

The MOA to provide a contextual history of the Golden Hand Mine and 82 black and white photographs of site features was completed in 2003. Elsewhere, this alternative would avoid impacting eligible Historic Properties to the National Register of Historic Places. Therefore, this alternative would have no adverse effect on cultural resources.

The main bunkhouse is in poor condition and would require extensive renovation for use as an office. An estimate of the costs of renovating the bunkhouse to meet historic preservation needs has not been done, however, a building inspection was conducted in 2002 and that cost estimate for improving the structure to meet Occupational Safety and Health Administration codes has been inflated to $65,000 (Hersel and Hunteman, 2011). It is expected that there would be additional costs (in excess of $65,000) due to many factors including, but not limited to, inability to use power tools and transport cost into the area.

Alternative B would result in changes to the current condition of the immediate area in and around the mining claims as described in other resource sections. It is unknown how that might affect the ability of the Nez Perce Tribe to exercise treaty rights. Effects to fisheries are analyzed in the Fisheries Resource section (Section 3.4). Alternative B could have temporary to short term negative effects to individual steelhead, bull trout and the associated designated critical habitat (Section 3.4). Effects to Chinook salmon and designated critical habitat would likely be negligible. Installation of stream crossing structure would result in temporary to short term benefits to steelhead. However, the potential effect on the Tribe's "…taking fish at all usual and accustomed places" cannot be determined. Other impacts associated with use of the area are described in the Wilderness and Wildlife resource sections (Sections 3.3 and 3.6). Hunting opportunities are unlikely to be affected. The claim area also contains berries (primarily *Vaccinium* sp.) and possibly other vegetative resources used by the Tribe; however, the proposed activities would have negligible impacts to any vegetative resources. No pasture for livestock occurs in the area. Effects to Tribal social fabric or religious practice can only be assessed by the Nez Perce Tribe.

3.12.3 Environmental Consequences Specific to Alternative C

The MOA to provide a contextual history of the Golden Hand Mine and 82 black and white photographs of site features was completed in 2003. Elsewhere, this alternative would avoid impacting eligible Historic Properties to the National Register of Historic Places. Therefore, this alternative would have no adverse effect on cultural resources.

Alternative C would result in changes to the current condition of the immediate area in and around the mining claims as described in other resource sections. It is unknown how that might affect the ability of the Nez Perce Tribe to exercise treaty rights. Effects to fisheries are analyzed in the Fisheries Resource section (Section 3.4). Alternative C could have temporary to short term negative effects to individual steelhead, bull trout and the associated designated critical habitat (Section 3.4). Effects to Chinook salmon and designated critical habitat would likely be negligible. Installation of stream crossing structure would result in temporary to short term benefits to steelhead. However, the potential effect on the Tribe's "…taking fish at all usual and accustomed places" cannot be determined. Other impacts associated with use of the area are described in the Wilderness and Wildlife resource sections (Sections 3.3 and 3.6). Hunting opportunities are unlikely to be affected. The claim area also contains berries (primarily *Vaccinium* sp.) and possibly other vegetative resources used by the Tribe; however, the proposed activities would have negligible impacts to any vegetative resources. No pasture for livestock occurs in the area. Effects to Tribal social fabric or religious practice can only be assessed by the Nez Perce Tribe.

3.12.4 Cumulative Effects

Since the effects of proposed alternatives would be limited to the project area only, the area used to assess the cumulative effects on cultural resources consists of the 1,309 acre analysis area (Figure 1-2).

Past activities that could have affected cultural resources are discussed as part of the existing condition in this section. It is recognized that past and ongoing actions by individuals, groups, and others could have impacted the existing condition by creating the artifacts seen today and in some cases removing or altering the original artifact over time. However, it would be impossible to fully understand or quantify the true number of artifacts that exist or the full extent to which alterations or removals have occurred. Therefore, there would be no known or quantifiable past, ongoing, or foreseeable future activities within the cumulative effects area that would affect this resource. Reference **Appendix A** for additional information and maps related to the cumulative effects analyses completed for this project.

Neither of the alternatives considered in detail are expected to have any direct or indirect unmitigated effects on cultural resources, therefore no cumulative effects are anticipated. However, Alternative B would restore the bunkhouse at Golden Hand to a useable condition. The needed improvements could add incrementally to improvements or modifications to the original structure that could have been completed in the past.

3.13 Recreation Opportunity Spectrum (ROS)

This section of the document discusses the existing conditions and characteristics of the Recreation Opportunity Spectrum (ROS) classes within the project area, as well as the effects of the various alternatives on those classes. For direct and indirect effects, the analysis area for Recreation Opportunity Spectrum (ROS) would be the Golden Hand No. 1 and No. 2 Lode Mining Claims project area. Proposed activities such as motorized access into the FC-RONR Wilderness and tree removal for trees for timbers along Forest Roads along FR #371 and #373could affect Recreation Opportunity Spectrum and the desired recreation opportunities the classes represent. These activities would have no effect on ROS outside of the project area.

The Forest Plan has identified Recreation Opportunity Spectrum (ROS) settings in the watershed that allow for many kinds of recreational activities and experiences. The identified ROS categories within the analysis area include Primitive and Roaded Natural (Figure 3-13). ROS settings have been identified for both summer and winter recreation; however, given the lack of winter activities proposed for this project there would be no effects to ROS winter classes and winter classes would not be discussed further. The ROS settings for the project area are entirely.

Primitive: Approximately 291 acres of the analysis area are a Primitive ROS setting. These areas provide for primitive recreation opportunities in unroaded and non-motorized settings. Unmodified natural and natural-appearing settings dominate the physical environment. In that these areas are generally larger than 5,000 acres, they offer opportunities for solitude, remoteness, and risk, with no on-site controls or restrictions evident after entry. Encounters with other users, and signs of other users, are minimal. Prescribed fire could be used to attain a variety of resource objectives. Generally, snowmobile, ATV, and other OHV uses are inconsistent with this ROS class.

In relatively rare cases, a motorized use may be present within areas classified as Primitive. This may occur as a result of uses authorized by legislation, administrative or emergency use of motorized vehicles, a setting inconsistency, or as an anomaly whose effects are extremely limited.

Roaded Natural: Approximately 1,018 acres of the analysis area are a Roaded Natural ROS setting. These areas provide for a wide range of recreation activities that are generally focused along the primary and secondary travel routes in a natural–appearing, roaded, motorized setting. Recreation facilities are provided to facilitate recreation use. There may be a moderate to high degree of user interaction, as well as the sights and sounds of other users, depending upon the facilities provided. Seasonal or year-round recreation facilities are provided for user comfort and convenience. Although structures may be designed to accommodate numerous users, they generally convey a rustic theme and blend with the natural landscape. There may be considerable on-site user controls or restrictions. Opportunities for isolation, challenge, or risk are generally not very important, although opportunities for practicing outdoor skills may be important.

Scenic values are often emphasized. Recreation is often only one of many management objectives applied to these areas. A wide range of management activities and objectives may occur, generally being guided by the adopted visual quality objectives. Landscape modifications due to resource management activities, where evident, harmonize with the natural setting. Prescribed fire could be used to attain a variety of resource objectives.

A wide range of recreation facilities may be provided for user convenience and comfort. Developed campgrounds of varying size, complexity, and development scale could occur. There may also be a wide range of facilities and structures to support other Forest uses such as telecommunication facilities, power lines, and administrative sites.

A wide range of transportation routes can occur, from State Highways to native-surfaced, timber access roads. Cross-country snowmobile use may occur on adequate snow depth in accordance with the current travel management plan or map and travel amendments. There may be areas, trails, or roads within this ROS class where motorized use is prohibited or restricted to enhance recreation experiences or to protect public safety or resources.

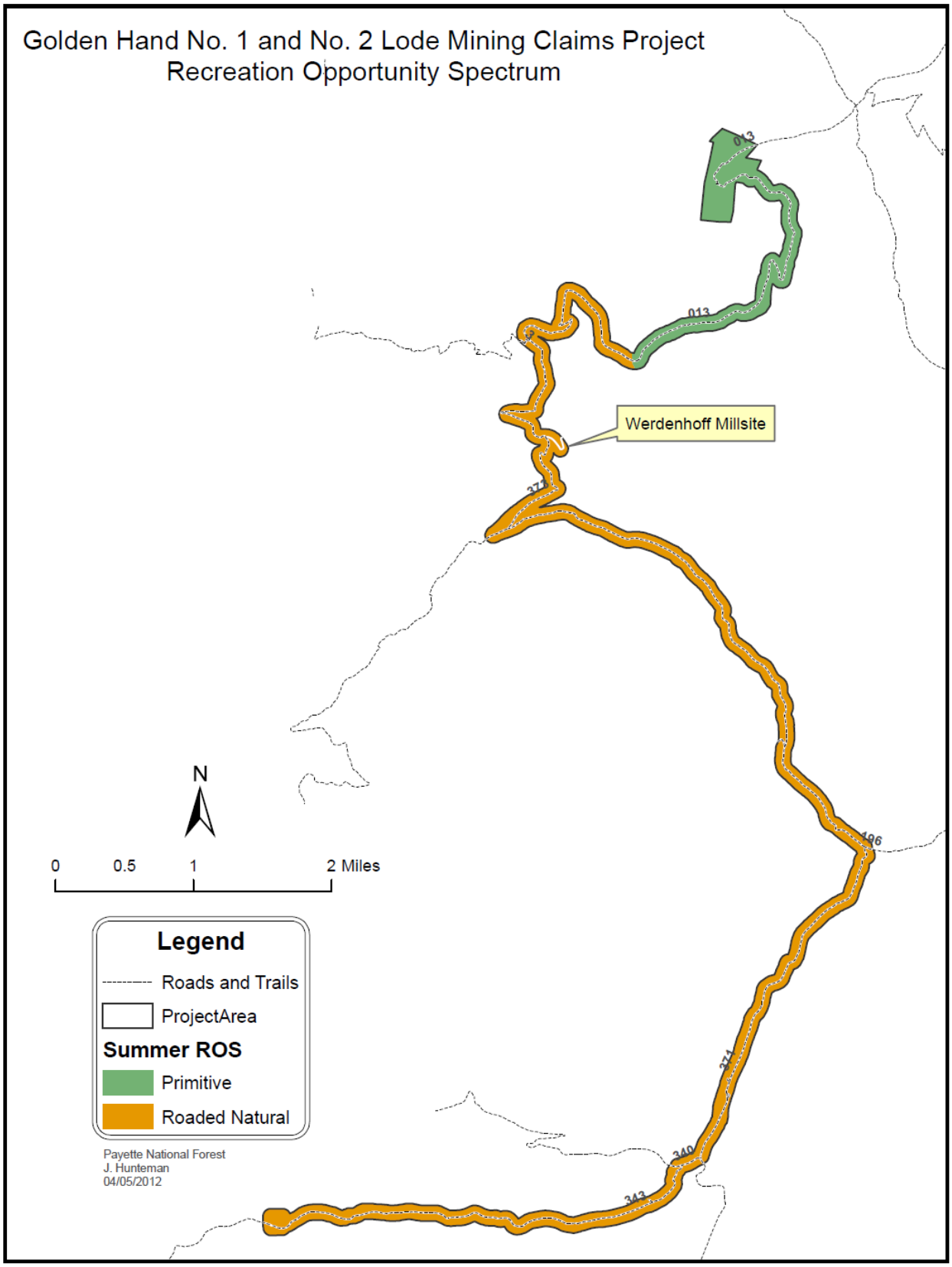


Figure 3-13 Recreation Opportunity Spectrum (ROS)

3.13.1 Environmental Consequences Specific to Alternative A

The No Action Alternative would have no known direct, indirect, or cumulative effects on ROS within the analysis area.

3.13.2 Environmental Consequences Specific to Alternative B and C

Recreation Opportunity Spectrum classifications would remain unchanged with either Alternative.

Within the FC-RONR Wilderness activities would not be consistent the ROS classification due to impacts on wilderness characteristics (Section 3.3) and increased likelihood of frequent encounters with users expecting a primitive setting. However, the activities within the primitive setting are considered to be a setting inconsistency and being conducted pursuant the 1872 Mining Law (Section 1.5). Following project activities, the portion of analysis area in a primitive ROS setting would return to conditions indicative and consistent with the setting. The area would remain classified as a primitive ROS setting.

Project activities within the roughly 1,018 acres of Roaded Natural would be consistent with the ROS setting. Activities such as, but not limited to, the staging area, road use, road maintenance/reconstruction, harvest of trees for timbers are consistent with this ROS setting. Affects to visual quality are covered in Section 3.11

3.13.3 Cumulative Effects

Since the direct and indirect affects to ROS settings are limited to inconsistencies in the primitive ROS setting portion of the analysis area, the area used to assess the cumulative effects was limited to that roughly 291 acre portion of the project area with a primitive ROS setting (Figure 3-13).

Past activities include the original development and abandonment of the Golden Hand Mine. These activities are addressed as part of the existing condition, but would have impacted a primitive ROS setting by conducting activities that would have been setting inconsistencies pursuant the 1872 Mining Law. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

Ongoing trail maintenance would continue and increase ground disturbance and increase the potential for encounters. District and FC-RONR Wilderness weed management programs would continue to eradicate populations of noxious weeds in the analysis area potentially increasing the potential for encounters with other users expecting a primitive experience. Reference **Appendix A** for additional project information and maps related to the cumulative effects analyses completed for this project.

Alternative A would not result in any direct, indirect, or cumulative effects on visual quality.

Alternative B and C in combination with past and ongoing activities could incrementally increase the number of activities considered to be a setting inconsistency pursuant the 1872 Mining Law.

3.14 Irreversible and Irretrievable Effects

For the purposes of this analysis, irreversible effects are defined as those effects resulting from a proposed activity that cannot be reversed within a reasonable period of time as perceived from a human time scale. Irretrievable effects are those effects caused by the activities that change outputs or commodities.

Wilderness – Irretrievable losses would occur to the untrammeled conditions and to Wilderness experience during and after the period of operation.

Energy - Implementation of Alternative B and C would irretrievably commit an indeterminate amount of fossil fuels in order to implement proposed activities.

3.15 Other Disclosures

Effects of Alternatives on Wetlands and Floodplains –
There are some small wetlands and floodplains in the project area, but they would not be filled under any alternative. The action alternatives would improve existing road crossings. These activities are permitted under the Corps of Engineers Nationwide Permits, Section 330.5(a). Because no drainage of wetlands would occur or floodplains would be altered, the goal and intent of Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) would be met.

For the action alternatives, direct and indirect effects to wetlands and floodplains would be minimized through the application of Project Design Features (Section 2.4.4).

Effects of Alternatives on Social Groups - The alternatives do not differ in their effects on minorities, Native American Indians, women, or Civil Liberties of any American Citizen. The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (Braille, large print, audio tape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326 - W, Whitten Building, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Effects of Alternatives on Threatened, Endangered, and Proposed Species –
This required disclosure involves wildlife, plant, fish, and habitat listed under the Endangered Species Act of 1973, as amended (ESA). Effects to species listed as regionally sensitive are disclosed in Chapter 3.

Alternative A does not propose any federal action that could affect listed species.

Alternative B and C would have <u>no effect</u> to any threatened or endangered plant species. No habitat for any threatened or endangered plant species occurs in the project analysis area (Section 3.8).

Alternative B and C would have <u>no effect</u> on Northern Idaho Ground Squirrel and <u>may affect</u>, <u>not likely to adversely affect</u> Canada Lynx (Section 3.6).

Alternative B and C could have temporary to short term negative effects to individual steelhead, bull trout and the associated designated critical habitat (Section 3.4). Installation of stream crossing structure would result in temporary to short term benefits to steelhead. Alternative B and C <u>may affect, likely to adversely affect</u> Chinook salmon, bull trout, and steelhead.

Prime Farmland, Rangeland, and Forest Land (USDA Regulation 9500-3)
There are no prime farmlands, rangelands, or forest lands located on the Payette National Forest (Forest Plan EIS, p. 3-979). Therefore no effects to prime farmland, rangeland, or forest lands would occur with implementation of any alternative.

Natural or Depletable Resource Requirements and Conservation Potential
This project has been designed to conform to applicable laws and regulations pertaining to natural or depletable resources, including minerals and energy resources. Regulations of mineral and energy activities on the National Forest, under the 1872 General Mining Law and the Mineral Leasing Act of 1920, are shared with the Bureau of Land Management.

With relation to national and global petroleum reserves, the energy consumption associated with the individual alternatives, as well as the differences between alternatives, is insignificant. Implementation of Alternative B and C would irretrievably commit an indeterminate amount of fossil fuels in order to implement proposed activities.

Environmental Justice (E.O. 12898) - Executive Order 12898 (59 Fed. Register 7629, 1994) directs federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. Based upon the analysis disclosed in this document and the project record, the proposed alternatives are in compliance with Executive Order 12898.

National Forest Management Act (NFMA)
This Act guides development and revision of National Forest Land Management Plans and contains regulations that prescribe how land and resource management planning is to be conducted on NFS lands to protect National Forest resources. The different alternatives for this project were developed to comply with NFMA, and represent varying degrees of resource protection.

Suitability for Timber Production. No timber harvest, other than salvage sales or sales to protect other multiple-use values, shall occur on lands not suited for timber production [16 U.S.C. 1604(k)].

My decision includes harvest of trees for timbers outside of the FC-RONR Wildernessand will only allow the cutting of dead trees (*EIS, Section 2.4.3 and Section 2.4.4*).

Clearcutting and Even-aged Management. Clearcutting will be used as a cutting method where it is determined to be the optimum method. Seed tree and shelterwood silvicultural prescriptions, which are designed to regenerate an even-aged stand of timber, will be used where determined to be the appropriate methods to meet the objectives and requirements in the Forest Plan [1604(g)(3)(F)(i)].

(a) *Determination that where used, clearcutting is the optimum method:*

My decision includes harvest of trees for timbers outside of the FC-RONR Wildernessand will not result in any clearcuts due to the removal of only dead trees (*EIS, Section 2.4.3 and Section 2.4.4*).

(b) *Determination that even-aged silvicultural prescriptions are appropriate to meet objectives and requirements in the Forest Plan:*

My decision includes harvest of trees for timbers outside of the FC-RONR Wilderness and will not result in any the equivalent of an even-aged silvicultural prescription due to only removing dead trees (*EIS, Section 2.4.3 and Section 2.4.4*).

Vegetation Manipulation. Vegetative manipulation of tree cover must comply with the seven requirements in 36 CFR 219.27(b).

Harvest of trees for timbers associated with my decision will be limited to the cutting of dead trees (*EIS, Section 2.4.4*). Stipulations related to vegetation manipulation at 36 CFR 219.27(b) do not apply.

Clean Water Act, The Federal Water Pollution Control Act of 1972 (PL 92-500) as amended in 1977 (PL 95-217) and 1987 (PL 100-4)
The objective of the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources. This Act establishes a non-degradation policy for all federally proposed projects to be accomplished through planning, application, and monitoring of Best Management Practices (BMPs) (Section 2.4.2.2, Section 2.4.3.2, and Section 2.4.4). Identification of BMPs is mandated by Section 319 of the Water Quality Act of 1987 (also referred to as the Clean Water Act), which states, “It is national policy that programs for the control of nonpoint sources of pollution be developed and implemented.” Additional information on BMPs is provided in Chapter 2 and the Fisheries and Watershed Resource section, Chapter 3.

Idaho Stream Channel Protection Act
In general terms, the Stream Channel Protection Act applies to any type of alteration work, including recreational dredge mining, done inside the ordinary high water marks of a continuously flowing stream.

A stream channel alteration is defined as any activity that will obstruct, diminish, destroy, alter, modify, relocate or change the natural existing shape or direction of water flow of any stream channel. This includes taking material out of the channel or placing material or structures in or across the channel where the potential exists to affect flow in the channel.

Alternative B and C would adhere to the requirements of the Idaho Stream Channel Protection Act and the 404 Permit Process of the Corp of Engineers. The goals of Executive Orders 11988 and 11990 would be met.

Central Idaho Wilderness Act (CIWA) and the Wilderness Act
The US Congress designated the FC-RONR Wilderness in 1980 with the passage of the CIWA. The CIWA mandated the development of a comprehensive wilderness management plan. The CIWA includes mining direction prohibitions for areas of the FC-RONR Wilderness but specific direction is provided in the Wilderness Act (US Congress 1964, 16 USC 1131-1136).

The Wilderness Act of 1964 (amended in 1978) was enacted by Congress to "secure for the American people, an enduring resource of wilderness for the enjoyment of present and future generations". This act was passed "in order to ensure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition..."(Section 2 [a]). The Wilderness Act contains provisions for mining that include: "Mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining or processing operations and uses reasonably incident hereto...subject to valid existing rights" (Section 4 [d-3]). Additional provisions in the Act and affects are described in the Minerals and Geology and Wilderness Resources section, Chapter 3.

The Clean Air Act, as amended in 1990
The purpose of this Act is "…to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population; to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution; to provide technical and financial assistance to State and local governments in connection with the development and execution of their air pollution prevention and control programs; and to encourage and assist the development and operation of regional air pollution prevention and control programs."

While Alternative B and C could increase pollutants from dust, vehicle, and other emissions in the project area, it would not be likely to have measurable effects on air quality in any Class I Area or at monitoring sites.

Invasive Species (E.O. 13112)
Executive Order 13112 on Invasive Species directs that federal agencies should not authorize any activities that would increase the spread of invasive species. This project includes design features to limit the spread of invasive species (Section 2.4.4) and incorporates those applicable Forest Standards (USDA 2003, 2010).

American Indian Religious Freedom Act, Executive Order 12875, Executive Order 13007, Executive Order 13175, and Native American Graves Protection and Repatriation Act
The American Indian Religious Freedom Act, Public Law No. 95-341, 92 Stat. 469 (Aug. 11, 1978) (commonly abbreviated to AIRFA), is a United States federal law and a joint resolution of Congressthat was passed in 1978. AIRFA was enacted to protect and preserve the traditional religious rights and cultural practices of American Indians, Eskimos, Aleuts, and native Hawaiians. Executive Order 13175 established a requirement for regular and meaningful consultation between federal and tribal government officials on federal policies that have tribal implications. Executive Order 12785 was enacted in order to reduce unfunded mandates upon State, local, and tribal governments; to streamline the application process for and increase the availability of waivers to State, local, and tribal governments; and to establish regular and meaningful consultation and collaboration with State, local, and tribal governments on Federal matters that significantly or uniquely affect their communities. Executive Order 13007 was enacted in order to protect and preserve Indian religious practices. The Native American Graves Protection and Repatriation Act provides a process for museums and Federal agencies to return certain Native American cultural items,

such as human remains, funerary objects, sacred objects, or objects of cultural patrimony, to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations.

A proposal of the project was presented to tribe representatives at the April 8, 2010, June 10, 2010, April 12, 2012, February 13, 2014, and December 5, 2014 Wings and Roots Meeting. Individual scoping packages were also forwarded to representatives of the Shoshone-Bannock and Nez Perce Tribes in March of 2010. The project was presented to the Shoshone – Bannock Tribe in Fort Hall on June 22, 2011 and again on September of 2013. The project was also presented at the Nez Perce Tribe and Payette National Forest Staff to Staff meeting on May 11, 2010, June 7, 2012, and December 04, 2014. A letter notifying the Nez Perce Tribe and Shoshone-Bannock Tribe of Draft EIS availability was sent on June 11, 2012. A letter notifying the Shoshone-Bannock Tribe and the Nez Perce Tribe of the comment extension was sent on August 6, 2012. The project was discussed with the Nez Perce Tribe Executive Council on April 8, 2014. Additional coordination with the Tribes will be conducted as needed or requested before a decision on this project is made to ensure that Tribes interests are considered.

Short-Term Uses Versus Long-Term Productivity
Pursuant to National Environmental Policy Act (NEPA) regulations (40 CFR 1502.16) an Environmental Impact Statement must consider the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. Short-term uses are those that generally occur on a yearly basis, such as livestock grazing as a use of the forage resource or timber harvest as a use of the wood resource. Long-term productivity refers to the capability of the land to provide market outputs and amenity values for future decades. The quality of life for future generations is linked to the capability of the land to maintain its productivity.

For this proposed project, project design features and mitigation measures built into the action alternatives ensure that long-term productivity would not be impaired by the application of short-term management practices. For some resources, such as water quality, long-term productivity is expected to increase due to the short-term project design criteria proposed by the action alternatives.

Unavoidable Adverse Environmental Impacts
Proposed activities likely would produce some minor and temporary adverse effects on some components of the environment that cannot be avoided and that would be expected to dissipate in the short and temporary term. Actions that benefit one resource or component can have at least temporary adverse effects on others. Potential adverse effects are documented by resource in this Chapter 3. The Proposed Action includes project design features and mitigation measures to avoid or reduce potential adverse environmental effects (Chapter 2). Monitoring and Evaluation Plans (Appendix C) have been designed to measure how effective the project design features and mitigation measures are in reducing potential adverse effects.

Idaho Roadless Rule
All alternatives would be consistent with the Idaho Roadless Rule (Section 3.7.4).

Facilitation of Hunting Heritage and Wildlife Conservation (E.O. 13443)
On August 16, 2007, President George Bush signed an executive order directing appropriate Federal agencies to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat (FR Vol. 72, No. 160, August 20, 2007).

The project area provides habitat for several game species including deer, elk, black bear, mountain lion, wolf, and forest grouse. The effects to wolves, deer, and elk were considered in this analysis. Mountain lion presence is largely tied to the presence of deer and maintaining deer habitat is the primary consideration for this species.

Black bears are habitat generalists. While they prefer mixed deciduous-coniferous forests with thick understories, they will utilize a variety of habitats. Special habitat features include fallen logs and debris, and standing hollow trees that provide denning sites for bears. The project would not have measurable effects on habitat.

Blue grouse, spruce grouse, and ruffed grouse may be present in the project area. Habitat use and needs vary between the species. Blue grouse are found in open coniferous forests, often with a fir component. Douglas-fir provides day roosts and the buds and needles are an important winter food. Subalpine fir, with its dense foliage, is often selected as a night roost. Ruffed grouse utilize dense forests with some deciduous trees or shrubs. Aspen is an important component of habitat. Young forests provide optimum habitat for the species. Spruce grouse occupy coniferous forests that include short needled trees (lodgepole pine, spruce-fir). *Vaccinium spp* are a common component of habitats. Key features include forest structure that provides cover (i.e., lodgepole pine prior to self pruning). All three grouse species are associated with forested habitats. The project would not have measurable effects on habitat.

Best Available Science

The conclusions disclosed in this document are based on a review of the project's record that reflects consideration of relevant scientific information and responsible opposing views where raised by internal or external sources, and the acknowledgement of incomplete or unavailable information, scientific uncertainty, and/or risk where pertinent.

Migratory Bird Treaty Act

Migratory birds occupy all source habitats found in the analysis area. All alternatives would comply with the Migratory Bird Treaty Act. This project may however result in an "unintentional take" of individuals during proposed activities. However the project complies with the U.S. Fish and Wildlife Service Director's Order #131 related to the applicability of the Migratory Bird Treaty Act to federal agencies and requirements for permits for "take". In addition, this project complies with Executive Order 13186 because the analysis meets agency obligations as defined under the January 16, 2001 Memorandum of Understanding between the Forest Service and U.S. Fish and Wildlife Service designed to complement Executive Order 13186. If new requirements or direction result from subsequent interagency memorandums of understanding pursuant to Executive Order 13186, this project would be reevaluated to ensure that it is consistent.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) / 36 CFR 228.8

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

Nothing in this document or in the approval of a Plan of Operations by the USDA Forest Service authorizes or in any way permits a release or threat of a release of hazardous substances into the environment that will require a response action or result in the incurrence of response costs. All designs, monitoring plans, and analyses required by the Plan of Operations are subject to the requirement of 36 CFR 228.8 that mining operations be conducted so as, where feasible, to minimize adverse environmental impacts on National Forest surface resources. However, the operator's compliance with such requirement in no way insulates or releases it from any liability or obligations which may arise with respect to its operations under any applicable environmental law, including but not limited to the CERCLA, 42 U.S.C. 9601 et seq. The United States reserves its rights and claims under CERCLA to seek performance of response actions and/or reimbursement of response costs that may be incurred as a result of any release or threat of a release of a hazardous substance, or any ancillary operation for the confirmation activity.

CHAPTER 4 - CONSULTATION AND COORDINATION

4.1 Introduction

This chapter includes; a list of primary preparers of the document; a summary of the scoping and public involvement efforts; and a list of agencies, organizations, and persons solicited for input; a summary of the changes made to the Draft EIS in preparation of the Final EIS; and, comments received on the Draft EIS.

4.2 List of Primary Preparers

Name, Area of Expertise, Years of Experience	Resource Area	Professional Education
Jeff Hunteman Environmental Coordinator (20)	IDT Leader, Roadless, Scenic, Noxious Weeds, Air Quality, ROS, Writer/Editor	BS Forest Management Purdue University
Caleb Zurstadt Fishery Biologist (15)	Fisheries, Watershed	MS of Science, Fisheries Science Oregon State University
Robert Ryan Wildlife Biologist (15)	Wildlife	MS Landscape Restoration Oregon State
Brian Davis Wildlife Biologist (10)	Wildlife	MS Geographic Information Systems Idaho State
Jim Egnew Geologist (30)	Minerals	BA Geology University of Montana
Clem Pope Recreation Resource Specialist(40)	Wilderness Recreation	MS Forest Recreation Management University of Idaho
James Fitzgerald Hydrologist (25)	Watershed, Soils,	BS Soils and Watershed Management Humboldt State
John Rygh Geologist (30)	Watershed, Soils, Groundwater	BS Geology University of Oregon
John Dixon Soils Scientist and Hydrologist (20)	Watershed, Soils	MS Environmental Soil Science Oregon State
Cassandra Kollenberg GIS (15)	GIS Support	MS Forestry University of Montana
Alma Hanson Botanist (30)	TES Plants, Botany	Ph.D. Botany University of Idaho
Larry Kingsbury Archeologist (30)	Cultural	MA, Cultural Resource Management Idaho State University
Eric Whiteman Archeologist (20)	Cultural	MA, Archeology
Antony Botello District Ranger (25)	Project Direction	BS, Natural Resources Recreation Management California State University

4.3 Management and Review

Name	Title
Keith Lannom	Forest Supervisor
Sue Dixon	Forest Environmental Coordinator
Ana Egnew	Forest Wildlife Biologist
Jake Strohmeyer	Forest Staff Officer
Robert Giles	Forest Staff Officer
Jane Cropp	Forest Recreation Program Manager
Dave Kennell	Forest Hydrologist
Pattie Soucek	Forest Planner
Laura Pramuk	Public Affairs Officer
Anthony Botello	District Ranger
Mike Dixon	Civil Engineer
Terry Svalberg	Air Quality Specialist
Fred Noack	Regional Environmental Coordinator
Dan Duffield	Regional Fisheries Program Manager
Lisa Machnik	Natural Resource Specialist (Wilderness)
Jim Demaagd	Mineral Examiner, CNO

4.4 Summary of Scoping, Public Involvement, Consultation, and Comments

Formal planning for this project was initiated on November 21, 2008 with a Notice of Intent to prepare an Environmental Impact Statement (EIS) appearing in the Federal Register.

On January 27, 2011, the conceptual idea of this project was discussed by representatives of the U.S. Forest Service, U.S. Fish and Wildlife Service, and NOAA Fisheries at a scheduled Level 1 Meeting. Followup meetings have been held at scheduled Level 1 Meetings on March 8, 2011, November 30, 2011, and February 22, 2012. In addition, scoping letters addressed specifically to the U.S. Fish and Wildlife Service and NOAA Fisheries representatives were mailed on March 16, 2010 soliciting comments on the Proposed Action.

A proposal of the project was presented to tribe representatives at the April 8, 2010, June 10, 2010, April 12, 2012, February 13, 2014, and December 5, 2014 Wings and Roots Meeting. Individual scoping packages were also forwarded to representatives of the Shoshone-Bannock and Nez Perce Tribes, as well as the Valley County and Idaho County Commissioners in March of 2010. The project was presented to the Shoshone – Bannock Tribe in Fort Hall on June 22, 2011 and September 11, 2013. The project was also presented at the Nez Perce Tribe and Payette National Forest Staff to Staff meeting on May 11, 2010, June 7, 2012, and December 3, 2014. A letter notifying the Nez Perce Tribe and Shoshone-Bannock Tribe of Draft EIS availability was sent on June 11, 2012. A letter notifying the Shoshone-Bannock Tribe and the Nez Perce Tribe of the comment extension was sent on August 6, 2012. The project was discussed with the Nez Perce Tribe Executive Council on April 8, 2014.

A Notice of Intent to prepare an EIS in the *Federal Register* (November 21, 2008), a scoping package describing the Proposed Action was mailed to more than 300 individuals, agencies, and/or groups on March 16, 2010. In response to these scoping efforts oral and written comments were received from in excess of 20,500 interested parties.

The Draft EIS was released for a 45-day comment period in June of 2012. A Notice of Availability of the Draft EIS appeared in the *Federal Register* on June 29, 2012. Legal notice announcing the availability of the Draft EIS appeared in *The Idaho Statesman* on June 29, 2012. The comment period was extended to August of 2012. A Notice of Availability (Amended Notices) of the Draft EIS appeared in the *Federal Register* on August 17, 2012 and extended the comment period to September 17, 2012. Legal notice announcing the extension appeared in *The Idaho Statesman* on August 17, 2012. 312 letter and 20,952 emails were sent to notifying interested parties of the availability of the Draft EIS on June 15, 2012. 312

letters and20,939 emails were sent to notify interested parties of the extension on August 6, 2012. Over 17,000 comments were received in response to these efforts.

Commenters voiced a variety of concerns including, but not limited to, potential adverse impacts on wildlife and wildlife habitat, proper bonding levels, season of operation, minimum tools needed to accomplish the project, public access, affects to historic properties, approval of off-claim drill pads, and contaminants. The planning record contains all written comments received relative to this project and discloses how the Interdisciplinary Team addressed those concerns.

4.5 List of Those Receiving Copies or Notification of the Final EIS

Agencies Receiving Notification of Availability	
Director, Planning and Review, Advisory Council on Historic Preservation Deputy Director APHIS PPD/EAD National Environmental Coordinator, NRCS Habitat Conservation Division, NOAA Fisheries NW Region U. S. Army Corps of Engineers, Northwestern Division Chief of Naval Operations (N45), Energy and Environmental Readiness Division	Northwest Power Planning Council Federal Aviation Administration Director, NEPA Policy & Compliance, DOE Federal Highway Administration Intermountain Regional Office Boise National Forest, Supervisor's Office Payette National Forest, McCall Ranger District Boise National Forest, Cascade Ranger District EPA, Boise Office USFWS, Boise, Idaho

Other	Agencies Receiving Copies and/or CDs
Roughly 21,275 individuals, agencies, Tribes, businesses, and organizations were notified of availability of the DEIS via letter or email.	Acquisitions & Serials Branch, National Agricultural Library EPA, Region 10 EIS Review Coordinator Director, Office of Envir. Policy and Compliance EPA, Office of Federal Activities

4.6 Changes Made to the Draft EIS in Preparation of the Final EIS

In addition to numerous minor edits throughout the entire document, the following highlights where generally more extensive changes were made to the Draft EIS in preparation of this Final EIS:

Section 1.8.2 of the EIS was updated to include discussion on NPDES permitting.

Section 1.8.3 of the EIS was updated to include information from the Biological Opinions submitted by USFWS and NOAA.

Section 1.8.13 was appended to the document to include discussion of the Nez Perce Treaty of 1855 and 1863, Shoshone-Bannock Tribes Fort Bridger Treaty of 1868, Shoshone-Paiute Tribes Executive Order of 1877, Treaty Between the Cayuse, Umatilla

Section 2.2 was updated to include the negotiation that occurred between the Forest Service and AIMMCO to develop the reasonable plan of operation.

Sections 2.3.5, 2.3.6, 2.3.7, 2.3.8, and 2.3.9 were appended to the EIS to discuss additional alternatives that were eliminated from detailed study.

Sections 2.4.2 and 2.4.3 were updated to better describe the Alternatives or reflect changes. Highlights include, but are not limited to: Repairs that would occur a tributary of Coin Creek, core drilling procedures, and hazardous material related to fuel delivery and storage.

Section 2.4.4 was updated and appended to add additional design features, modify existing design features, and in some cases delete unneeded design features. Design features to better protect surface resources were added or modified for Wilderness/Recreation, Air Quality, Watershed/Fisheries (transportation), Watershed/Fisheries (Fuel/Contaminants), Watershed/Fisheries (Water Withdrawal), Watershed/Fisheries (Mining Operations), Fisheries (Biological Opinion Terms and Conditions), Cultural, Wildlife, and Minerals. The following unneeded design features were eliminated from the analysis:

- Prior to discharge, the drilling fluid would be checked by Forest Service personnel for hydro-carbon contamination and AIMMCO would clean the fluid of all contaminants.
- The drilling fluid would be discharged in a controlled manner to the excavated settling basin. The inspection for contamination would be repeated after all of the fluid has ponded in the settling basin and any further contamination removed.
- If open tanks are used for drilling fluids, oil absorbent pads would be floated on the surface during operations to absorb any petroleum-based contaminants.
- Short approach inclines would be constructed at the ends of the structure to prevent water movement from road onto structure.
- Drill holes would be constructed and abandoned in accordance with the minimum well construction standards set by the Idaho Department of Water Resources.

Table 2-3 was updated to reflect fishery determinations that resulted from consultation with NOAA and USFWS.

Section 2.5.2.1 was updated to include a summary from the Minimum Requirements Decision Guide that was completed as part of this project.

Section 2.5.4 was updated to include discussion on the effects determinations for ESA listed fish species and biological opinions.

Section 3.1 was appended to better describe concerns not analyzed in detail in the EIS.

Section 3.4 was updated to better clarify the existing condition of the resource, the analysis area, and the effects anticipated from the project, including cumulative effects from fuel haul.

Section 3.5 was amended to describe the increased risk of a cutslope mass failure from drill pads.

Section 3.15 was amended to reflect fishery determinations that resulted from consultation with NOAA and USFWS.

Appendix A was amended to include or better describe foreseeable future activities.

Appendix B was appended to include to effects matrix to WCIs.

Appendix C was updated and appended to better describe existing monitoring plans and add monitoring for fishery and ground water.

Appendix D was appended to the document to describe drilling process in place for the protection of groundwater resources.

4.7 Responses to Comments Received on the Draft EIS

Over 17,000 letters/emails were received commenting on the Draft EIS. Appendix E contains photocopies of the letters/emails received and the Interdisciplinary Team's responses to those comments. The record contains all emails and letters received many of which were form letters received as part of various solicitations by groups. Form letters containing the same points of concern were not repeated in the response to comments section but the original form letters/emails are contained in the project record.

GLOSSARY

abiotic - Non-living (refers to air, rocks, soil particles, etcetera).

access management - See travel management.

activity area - The smallest logical land area where the effect that is being analyzed or monitored is expected to occur. The area may vary in size depending on the effect that is being analyzed or monitored, because some effects are quite localized and some occur across landscapes. Activity areas are to be specifically described when used in planning and project implementation documents.

- snags – The activity area for snags is the specific site affected by actions listed below, whether effects are positive or negative. Actions affecting activity areas that need to be assessed include timber harvest, site-preparation reforestation, timber stand improvement, and prescribed fire. The activity area reflects the scale at which to plan projects that provide for maintaining or improving trends in snag amounts.

- coarse woody debris – The activity area is the same as for snags above. However, this may also parallel the activity area for detrimental disturbance. See below.

- detrimental disturbance – The activity area is the specific area where proposed actions may have detrimental soil impacts, such as harvest units within a timber sale area, an individual pasture unit within a grazing allotment, or a burn block within a prescribed burn project area. Existing designated uses such as classified roads and trails, developed campgrounds, and buildings, are not considered detrimental disturbance within an activity area. See the definition for detrimental disturbance for more information.

- total soil resource commitment – Effects are generally measured across an all-inclusive activity area, like a timber sale area, a prescribed burn area, or a grazing allotment, where effects to soil commitment could occur or are occurring. Effects include both proposed actions and existing uses, such as roads (classified and non-classified), dedicated trails and landings, administrative sites, parking lots, and mine excavations. See the definition for total soil resource commitment for more information.

adfluvial fish - Fish that migrate between lake and river systems; such as land-locked kokanee salmon or some bull trout.

adverse effect - For Forest Plan revision, "adverse effect" is used in the context of the Endangered Species Act relative to effects on Threatened, Endangered, Proposed, and Candidate (TEPC) species. Definitions are from Final Endangered Species Consultation Handbook; NMFS/USFWS, 1998. They include both "likely to adversely effect" and "not likely to adversely effect". Both of these definitions are needed to clearly understand the intent of the phrase "adverse effect" when applied to Forest-wide and management area direction involving TEPC species. The definition of "take" is also included below to help clarify intent.

- Likely to adversely affect – the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial (see definition of "not likely to adversely affect"). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action is "likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. A "likely to adversely affect" determination requires the initiation of formal Section 7 consultation.

- Not likely to adversely affect – the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully detect, measure, or evaluate insignificant effects; or (2) expect discountable effects to occur.

- Take – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct [ESA §3(19)]. Harm is further defined by FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by FWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering (50 CFR § 17.3).

air pollutant - Any substance in air that could, if in high enough concentration, harm humans, animals, vegetation, or material. Air pollutants may include almost any natural or artificial matter capable of being airborne in the form of solid particles, liquid droplets, gases, or a combination of these.

air quality - The composition of air with respect to quantities of pollution therein; used most frequently in connection with "standards" of maximum acceptable pollutant concentrations.

allotment (grazing) - Area designated for the use of a certain number and kind of livestock for a prescribed period of time.

All Terrain Vehicle (ATV) - Any motorized, off-highway vehicle 50 inches or less in width, having a dry weight of 600 pounds or less that travels on three or more low-pressure tires with a seat designed to be straddled by the operator. Low-pressure tires are generally 6 inches or more in width and designed for use on wheel rim diameters of 12 inches or less, utilizing an operating pressure of 10 pounds per square inch (psi) or less.

alternative - In an Environmental Impact Statement (EIS), one of a number of possible options for responding to the purpose and need for action.

amenity - Resource use, object, feature, quality, or experience that is pleasing to the mind or senses; typically refers to resources for which monetary values are not or cannot be established, such as scenery or wilderness.

anadromous fish - Fish that hatch and rear in fresh water, migrate to the ocean, mature there, and return to fresh water to reproduce; for example, salmon and steelhead.

ancillary facilities - Auxiliary facilities or structures that do not serve the main purpose of the facility but rather provide for support needs. For example, for a hydroelectric dam, the dam, powerhouse, penstock, and spillway would not be considered ancillary facilities, but a tool storage shed would.

aquatic ecosystem - 40 CFR 230.3 - Waters of the United States that serve as habitat for interrelated and interacting communities and populations of plants and animals. FSM 2526.05 - The stream channel, lake or estuary bed, water, biotic communities and the habitat features that occur therein.

argillite- A very fine-grained sedimentary rock that is not as hard as shale.

aquatic integrity - Aquatic integrity is an assessment and comparison of existing fish habitat conditions with historical conditions that existed before Euro-American settlement. Habitat conditions are assessed to determine how their integrity and resilience may have changed due to effects from past or current human-caused (road construction, timber harvest, livestock grazing, etc.) or natural (wildfire, floods, etc.) disturbance. Conditions or values assessed include numerous habitat parameters found in Appendix B of the Forest Plan. Relative integrity ratings are assigned at the subwatershed scale and are based on the quality of habitat conditions and the presence, abundance, and distribution of key native fish species.

arterial road - A road serving a large land area and usually connecting with public highways or other Forest Service arterial roads to form an integrated network of primary travel routes. The location and standards are often determined by a demand for maximum mobility and travel efficiency rather than specific resource management service. Arterial roads are usually developed and operated for long-term land and resource management purposes and constant service.

attitudes, beliefs, and values - FSH 1909.17. Preferences, expectations, and opinions people have for forests and the management and use of particular areas. Differing values and expectations have resulted in polarized perceptions that a healthy environment requires protection of lands from human influence, or increased attention to environmental quality presents a threat to employment, economy, or life-style.

background (bg) - The visual distance zone relating to the distant part of a landscape, generally located from 3 to 5 miles to infinity from the viewer.

bankfull stage - The bankfull stage corresponds to the discharge at which channel maintenance is the most effective, that is, the discharge at which moving sediment forms or changes bends and meanders, and generally results in the average morphologic characteristics of channels. This term generally describes the elevation on the stream bank where the stream begins to flow onto a flood plain; however, not all stream channels have distinct flood plains.

batholith- A body of intrusive rock at least forty square miles in area.

bedding planes- In sedimentary rocks, the division planes which separate the individual layers.

beneficial effect - Beneficial effects are contemporaneous positive effects to resource, social, or economic conditions.

Specific to ESA and TEPC species, beneficial effects are contemporaneous positive effects without any adverse effects to the species. The appropriate conclusion when effects on listed species are expected to be beneficial would be: "Is not likely to adversely affect".

beneficial use - Any of the various uses that may be made of the water of an area, including, but not limited to: (1) agricultural water supply; (2) industrial water supply; (3) domestic water supply; (4) cold water biota; (5) primary contact recreational use; (6) secondary contact recreational use; (7) salmonid spawning, overwintering, emergence, and rearing; and (8) warm water biota.

Best Management Practices (BMPs) - Practices determined by the State of Idaho Division of Environmental Quality to be the most effective and practical means of preventing or reducing the amount of pollution generated by non-point sources.

big game - Large wild animals that are hunted for sport and food. This hunting is controlled by state wildlife agencies. Big game animals found on this Forest include deer, elk, and moose.

bighorn sheep emphasis areas - Areas identified by state wildlife agencies as being important to bighorn sheep (winter and summer habitat).

biological diversity (or biodiversity) - The variety and abundance of life and its processes. Biological diversity includes all living organisms, the genetic differences among them, and the communities and ecosystems in which they occur. Biological diversity also refers to the compositions, structures, and functions of species and habitats and their interactions.

biophysical components - Refers to biological and/or physical components in an ecosystem.

Biota - Living material. The flora and fauna of an area.

biotite-muscovite granite- An intrusive igneous rock containing both biotite and muscovite mica.

biotite phyllite- A very fine-grained metamorphic rock containing biotite mica.

broad-scale - A regional land area that may include all or parts of several states; typically millions of acres or greater. An example of a broad-scale assessment is the Interior Columbia Basin (ICB) Ecosystem Management Project.

broadcast burning - Burning forest fuels as they are, with no piling or windrowing.

browse - Twigs, leaves, and shoots of trees and shrubs that animals eat.

Burned Area Emergency Response (BAER) - A procedure used by the federal government to restore watershed conditions following large wildfires. The objective of BAER is to provide for immediate rehabilitation by stabilizing soils, and controlling water, sediment, and debris movement.

calcite- A calcium carbonate mineral.

candidate species - Plant and animal species being considered for listing as endangered or threatened, in the opinion of the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS). Category 1 candidate species are groups for which the FWS or NMFS has sufficient information to support listing proposals; category 2 candidate species are those for which available information indicates a possible problem, but that need further study to determine the need for listing.

canopy cover - Total non-overlapping cover of all trees in a vegetative unit excluding the seedling size class. Trees in the seedling size class are used to estimate canopy cover only when they represent the only structural layer on the site.

chalcopyrite- An ore mineral of copper.

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. Classified roads can include state roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service.

Clean Air Act - An Act of Congress established to protect and enhance the quality of the Nation's air through air pollution prevention and control.

Clean Water Act - An Act of Congress which establishes policy to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.

coarse filter (conservation) approach - Used to assess the conservation value of ecosystems and landscapes. The intent of this approach is to maintain and where needed restore representative ecosystems and their inherent disturbance processes in order to conserve the majority of species without the necessity of considering them individually.

coarse woody debris (CWD) - Pieces of woody material having a diameter of at least 3 inches and a length greater than 6 feet (also referred to as large woody debris, or LWD).

collector road - A road serving smaller land areas than an arterial road and usually connected to a Forest arterial road or public highway. These roads collect traffic from Forest local roads and/or terminal facilities. The location and standard are influenced by both long-term multi-resource service needs, as well as travel efficiency. These roads may be operated for either constant or intermittent service, depending on land use and resource management objectives for the area served by the facility.

common variety minerals - Minerals of sand, clay, cinders, roadside slough, fill dirt, etc., which have been specifically designated as common variety and are saleable under the discretion of the authorized officer.

components of ecosystem management - Biological diversity, physical diversity, social diversity, and economic diversity are the four components of the Southwest Idaho Ecosystem Management Framework.

composition (species) - The species that make up a plant or animal community, and their relative abundance.

connectivity - The arrangement of habitat that allows organisms and ecological processes to move across the landscape. Patches of similar habitats are either close together or connected by corridors of appropriate vegetation (or live stream channels). Opposite of fragmentation.

Sites in a landscape are "connected" if there are patterns or processes to link them in some way. These links arise either from static patterns (e.g., landforms, soil distributions, contiguous forest cover) or from dynamic processes (e.g., dispersal, fire). A particular landscape may have radically different degrees of connectivity with respect to different processes. Connectivity usually involves corridors and networks and describes how patches are connected in the landscape.

contact zone- The area of rock surrounding an intrusive body that has undergone thermal metamorphism.

controlled hunt area - An area designated by the Idaho Department of Fish and Game to manage species, usually big game such as elk or deer.

core area - A geographic area of land or water that is managed to promote and conserve specific features of biodiversity (target species, communities, or ecosystems) within the context of a broader landscape and network of core areas.

core area (for SWRA resources) - The combination of core habitat (i.e., habitat that could supply all elements for the long-term security of bull trout) and a core population (a group of one or more local bull trout populations that exist within core habitat) constitutes the basic unit for which to gauge recovery within a recovery unit. Core areas require both habitat and bull trout to function biologically, and the number (replication) and characteristics of local populations inhabiting a core area provide a relative indication of the core area's likelihood to persist. Core area boundaries are typically: (1) 4th field hydrologic units (HUs), unless evidence of natural isolation (e.g., a natural barrier or presence of a lake supporting adfluvial bull trout) supports designation of a smaller core area; (2) conservative, i.e., the largest areas likely constituting a core area are considered a single core area when doubt exists about the extent of bull trout movement and use of habitats; and (3) non-overlapping (USDI FWS 2002).

corridor (landscape) - Landscape element that connect similar patches of habitat through an area with different characteristics. For example, streamside vegetation may create a corridor of willows and hardwoods between meadows or through a conifer forest.

cover type - The current or existing vegetation of an area, described by the dominant vegetation.

critical habitat - Endangered Species Act - Designated by the FWS or NMFS, specific areas, within a geographical area occupied by a threatened or endangered species, on which are found physical or biological features essential to conservation of the species. These areas may require special management consideration or protection, and can also include specific areas outside the occupied area that are deemed essential for conservation.

critical life stages - Animal life stages associated with the time of the year when reproduction, rearing young, and over-wintering occur.

crustal extension- The pulling apart of near-surface rocks.

cultural resources - Cultural resources include sites, structures, or objects used by prehistoric and historic residents or travelers. They are non-renewable resources that tell of life-styles of prehistoric and historic people. Cultural resources within the Forests are diverse and include properties such as archaeological

ruins, pictographs, early tools, burial sites, log cabins, mining structures, guard stations, and fire lookouts.

cumulative effects - Impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

decay classes[1] (for snags and coarse woody debris):

DECAY CLASS 1[2]	Snags	Snags that have recently died, typically have little decay, and retain their bark, branches, and top.
	Logs	Logs created by trees that have recently fallen over, and still have intact or loose bark, large branches present, a round shape, little to some wood decay, and are resting above or are in contact with the ground.
DECAY CLASS 2	Snags	Snags that show some evidence of decay and have lost some of their bark and branches and often a portion of the top.
	Logs	Logs with bark partially intact to sloughing, no fine branches, large branches present, wood largely hard to soft, may be round, log may be sagging.
DECAY CLASS 3	Snags	Snags that have extensive decay, are missing the bark and most of the branches, and have a broken top.
	Logs	Bark is absent, few branches present, wood is soft and powdery (when dry), shape is round, oval, or hard to see.

[1]From Bull et al. 1997
[2]Grand fir and Douglas-fir tend to retain their bark and therefore snags and coarse wood of these species may not meet the appropriate decay class bark description.

debris flow - A spatially continuous movement of mixed soil or rock in which surfaces of shear are short-lived, closely spaced, and usually not preserved. The distribution of velocities in the displacing mass resembles that in a viscous liquid. Debris slides may become extremely rapid as the material loses cohesion, gains water, or encounters steeper slopes.

degradation - To degrade, or the act of degrading. Refer to the definition of "degrade" in this glossary.

degrade - To degrade is to measurably change a resource condition for the worse within an identified scale and time frame. Where existing conditions are within the range of desired conditions, "degrade" means to move the existing condition outside of the desired range. Where existing conditions are already outside the range of desired conditions, "degrade" means to change the existing condition to anything measurably worse. The term "degrade" can apply to any condition or condition indicator at any scale of size or time, but those scales need to be identified. This definition of "degrade" is not intended to define degradation for the State of Idaho as it applies to their Antidegradation Policy (IDAPA 16.01.02.051).

demographic - Related to the vital statistics of human populations (size, density, growth, distribution, etcetera).

denning habitat or sites - Habitat and locations used by mammals during reproduction and rearing of their young, when the young are highly dependent on adults for survival.

Desired Condition (DC) - Also called Desired Future Condition, a portrayal of the land, resource, or social and economic conditions that are expected in 50-100 years if management goals and objectives are achieved. A vision of the long-term conditions of the land.

Desired Future Condition (DFC) - Also called desired condition, a portrayal of the land, resource, or social and economic conditions that are expected in 50-100 years if management goals and objectives are achieved. A vision of the long-term conditions of the land.

detrimental soil disturbance - Detrimental soil disturbance (DD) is the alteration of natural soil characteristics that results in immediate or prolonged loss of soil productivity and soil-hydrologic conditions. At least 85 percent of an activity area should be in a non-detrimentally disturbed condition. Stated another way, no more than 15 percent of an activity area should have detrimentally disturbed soil after the management activity is completed. DD can occur from soil that has been displaced, compacted, puddled or severely burned. Determination of DD excludes existing or planned classified transportation facilities, dedicated trails, and landings, mining dumps or excavations, parking areas, developed campgrounds, and other dedicated facilities. However, the impacts of these actions are considered total soil resource commitment (TSRC - see definition in this glossary). DD is represented by any or all of the four characteristics described below.

1. *Detrimental Soil Displacement.* Areas of 1 meter by 1 meter or larger that exhibit detrimentally displaced soil as described below:

(a) The loss of either 5 cm or half of humus-enriched top soil (A horizon), whichever is less, or
(b) The exceeding of the soil loss tolerance value for the specific soil type.

2. *Detrimental Soil Compaction.* Soil compaction is generally evaluated from 5 to 30 centimeters below the mineral soil surface. Specific depths for measurement are dependent upon soil type and management activities. Detrimental soil compaction is increased soil density (weight per unit volume) and strength that hampers root growth, reduces soil aeration, and inhibits water movement. Measurements of potential detrimental soil compaction may be qualitative or quantitative. Refer to the Region 4 Soil Quality Handbook for methods related to measuring/determining soil compaction.

3. *Detrimental Soil Puddling.* Puddling is generally evaluated at the mineral soil surface. Visual indicators of detrimental puddling include clearly identifiable ruts with berms in mineral soil, or in an Oa horizon of an organic soil. Detrimental puddling may occur in conjunction with detrimental compaction. The guidelines for soil compaction are to be used when this occurs. Detrimentally puddled soils are not always detrimentally compacted. Infiltration and permeability are affected by detrimental soil puddling. Puddling can also alter local groundwater hydrology and wetland function, and provide conduits for runoff.

4. *Severely Burned Soil.* Severely burned soil applies to prescribed fire and natural fires that are managed for resource benefits. Severely burned soils are identified by ratings of fire severity and the effects to the soil. A severely burned soil is generally soil that is within a High Fire Severity burn as defined by the Forest Service Burned Area Emergency Rehabilitation Program (FSH 2509.13) and Debano et al. (1998). An example of a High Fire Severity rating is provided below. Soil humus losses, structural changes, hydrophobic characteristics and sterilization are potential effects of severely burned soil.
<u>Example of High Fire Severity Rating</u> – High soil heating, or deep ground char occurs where the duff is completely consumed and the top of the mineral soil is visibly reddish or orange on severely burned sites. Color of the soil below 1 cm is darker or charred from organic material that has heated or burned. The char layer can extend to a depth of 10 cm or more. Logs can be consumed or deeply charred, and deep ground char can occur under slash concentrations or under burned logs. Soil textures in the surface layers are changed and fusion evidenced by clinkers that can be observed locally. All shrub stems are consumed and only the charred remains or large stubs may be visible. Soil temperatures at 1 cm are greater than 250 C. Lethal temperatures for soil organisms occur down to depths of 9 to 16 cm.

Standards for detrimentally disturbed soils are to be applied to existing or planned activities that are available for multiple uses. These standards do not apply to areas with dedicated uses such as mines, ski areas, campgrounds, and administrative sites.

developed recreation - Recreation that requires facilities that in turn result in concentrated use of an area; for example, a campground or ski resort.

dike- A tabular body of igneous rock that cuts across the structure of adjacent rocks.

dike swarm- A set of numerous parallel dikes.

discountable effect - A discountable effect is one that is highly unlikely to occur. Therefore, no change to

a resource, social, or economic condition would be expected from a discountable effect. Determination of a discountable effect may be based on scientific analysis, professional judgment, experience, or logic. Specific to the ESA and effects on Threatened, Endangered, Proposed or Candidate species, the appropriate determination for discountable effects on these species would be: "Is not likely to adversely affect". Refer to the "adverse effect" definition in this glossary.

dispersed recreation - Recreation that does not occur in a developed recreation setting, such as hunting, scenic driving, or backpacking.

disturbance - Any event, such as wildfire or a timber, sale that alters the structure, composition, or function of an ecosystem.

disturbance regime - Any recurring event that influences succession, such as fire, insects, ice storms, blow down, drought, etc.

easement - A special-use authorization for a right-of-way that conveys a conditioned interest in National Forest System land, and is compensable according to its terms.

ecological integrity - In general, ecological integrity refers to the degree to which the elements of biodiversity and the processes that link them together and sustain the entire system are complete and capable of performing desired functions. Exact definitions of integrity are somewhat relative and may differ depending on the type of ecosystem being described.

ecological function - The activity or role performed by an organism or element in relation to other organisms, elements, or the environment.

ecological health - The state of an ecosystem in which ecological processes, functions and structure are adequate to maintain diversity of biotic communities commensurate with those initially found there.

ecological processes - The actions or events that link organisms (including humans) and their environment such as disturbance, successional development, nutrient cycling, productivity, and decay.

economic efficiency - Producing goods and services in areas best suited for that production based on natural biophysical advantage or an area's ability to best serve regional demands of people.

economic dependency - The degree to which a community is dependent upon National Forest resources for employment and income.

economic region - A group of communities and their surrounding rural areas that are linked together through trade.

ecosystem - A naturally occurring, self-maintained system of living and non-living interacting parts that are organized into biophysical and human dimension components that are linked by similar ecological processes, environmental features, environmental gradients and that form a cohesive and distinguishable unit.

ecosystem health - A condition where the components and functions of an ecosystem are sustained over time and where the system's capacity for self-repair is maintained, such that goals for ecosystem uses, values, and services are met.

ecosystem management - Scientifically based land and resource management that integrates ecological capabilities with social values and economic relationships, to produce, restore, or sustain ecosystem integrity and desired conditions, uses, products, values, and services over the long term.

effective ground cover - Effective ground cover consists of vegetation, litter, and rock fragments larger than three-fourths inch in diameter. It is expressed as the percentage of material, other than bare ground, covering the land surface. It may include live vegetation, standing dead vegetation, litter, cobble, gravel,

stones, and bedrock. The minimum effective ground cover, following the cessation of disturbance in an activity area, should be sufficient to prevent detrimental erosion. Minimum amounts of ground cover necessary to protect the soil from erosion are a function of soil properties, slope gradient and length, and erosivity (precipitation factor), and must be determined locally. Rock fragments, litter, and canopy might be treated independently, depending on the model used to estimate erosion hazard ratings.

elements of ecosystem management - Essential building blocks of the biophysical (i.e., historical range of variability) and human dimension (i.e., demographics; tribal) components for Southwest Idaho Ecosystem Management Framework.

eligibility - For Wild and Scenic Rivers, an evaluation of river features to determine which rivers qualify to be studied for possible addition to the WSR System. Two screening criteria are used for a river segment to be eligible for inclusion in the WSR system. The river must be free-flowing, and it must possess one or more outstandingly remarkable scenic, recreational, geological, fish and wildlife, historical, cultural, ecological, or other value.

elk site distance - Distance at which vegetation hides 90 percent of an elk from view.

emplacement- The movement of molten rock to a particular position.

encroachments - Improvements occupied or used on National Forest System lands without authorization.

encumbrance - A claim, lien, right to, liability, or interest attached to and binding real property.

endangered species - Designated by the FWS or NMFS, an animal or plant species that has been given federal protection status because it is in danger of extinction throughout all or a significant portion of its natural range.

Endangered Species Act (ESA) - An act passed by Congress in 1973 intended to protect species and subspecies of plants and animals that are of "aesthetic, ecological, educational, historical, recreational, and scientific value". It may also protect the listed species' critical habitat, the geographic area occupied by or essential to the species. The FWS (USFWS) and NMFS share authority to list endangered species, determine critical habitat, and develop species' recovery plans.

enhance - In a Recreation Opportunity Spectrum context, enhance means to address or resolve setting inconsistencies in the adopted ROS strategy classifications.

entrainment - The drawing in and transport by the flow of a fluid. For example, fish can be entrained into a canal as water is diverted into the canal, if the diversion is not screened.

entrapment - To catch in, as in a trap. For example, the entrainment of fish into a diversion canal may result in fish entrapment in the canal should they not be able to return to the stream they were diverted from.

ephemeral stream - A stream or portion of a stream that flows only in direct response to precipitation or run-off events, and that receives little or no continuous water from springs, snow, or other sources. Unlike intermittent streams, an ephemeral usually does not have a defined stream channel or banks, and its channel is at all times above the water table.

epidote- A green silicate mineral.

eradicate (noxious weeds) - To eliminate a noxious weed from a given area, including all viable seeds and vegetative propagules.

Essential Fish Habitat (EFH) - EFH is broadly defined by the Magnuson-Stevens Act as, "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". This language is

interpreted or described in the 1997 Interim Final Rule [62 Fed. Reg. 66551, Section 600.10 Definitions] -- Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include historic areas if appropriate. Substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities. Necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. "Spawning, breeding, feeding, or growth to maturity" covers a species" full life cycle. Federal agencies are required, under '305(b)(2) of the MSA and its implementing regulations (50 CFR 600 Subpart K), to consult with NMFS regarding actions that are authorized, funded, or undertaken by that agency that may adversely affect EFH).

essential habitat - Used to describe habitat of listed species under ESA, but not designated as "critical habitat". Essential habitat has all the important elements of habitat necessary to sustain a species.

exotic species - Animals or plants that have been introduced from a distant place and are non-native to the area of introduction.

exploration- The second stage in the logical progression of mining activities. It usually occurs once a geologically favorable target area, i.e., with moderate to high mineral potential, has been identified through prospecting, but subsurface information is needed to determine the presence and extent of any mineral resources and whether any of this constitutes economic reserves. Its purpose is to narrow the search for a mineral resource, better define a target, and ultimately to discover a valuable mineral deposit that can be mined, removed, and marketed at a profit. This stage is typified by the use of motorized portable ground disturbing equipment, such as truck or track mounted drill rigs and backhoes.

facies- Part of a rock body as differentiated from other parts by composition or appearance.

facility - Structures needed to support the management, protection, and utilization of the National Forests, including buildings, utility systems, bridges, dams, communication system components, and other constructed features. There are three categories of facilities: recreation, administrative, and permitted.

family - A collection of focal species that share similarities in source habitats, with the similarities arranged along major vegetative themes

fault- A fracture that has displacement of the two sides relative to each other parallel to the fracture.

fg (foreground) - The visual distance zone relating to the detailed landscape found within 0 to 0.25 to 0.5 mile from the viewer.

fine filter (conservation) **approach -** Focuses on individual species that are assumed to be inadequately protected under the coarse-filter or meso-filter conservation approach. Typcially this includes threatened or endangered species under the Endangered Species Act (ESA) or those considered Regionally sensitive by the Intermountain Regional Forester.

fine-scale - Used to define a landscape area varying in size from a 6th-field HU to a combination of 5th-field HUs, approximately 10,000 to 100,000 acres.

fire intensity - The effects of fire on the above-ground vegetation generally described in terms of mortality.

fire severity - Fire effects at and below the ground surface. Describes the impacts to organic material on the ground surface, changes to soils, and mortality of below-ground vegetative buds, roots, rhizomes, and other organisms.

floodprone area width - The area that would be expected to be covered by water if the wetted stream depth were twice bank full height, determined at the deepest part on a given transect. This width is then extrapolated over the length of the stream reach by averaging several random transects taken within the project area.

fluvial fish - Fish that migrate, but only within a river system. Bull trout that migrate into larger river systems.

fluvial granitics- Topography that has been formed from granitic parent material and altered through the erosive force of running water.

focal species - Species that represent the varying characteristics of a landscape's attributes that must be represented in the landscape (Lambeck 1997)

forage - Plant material (usually grasses, forbs, and brush) that is available for animal consumption.

forbs - Broadleaf ground vegetation with little or no woody material.

forest road or trail - As defined in 36 CFR 212.1, a trail wholly or partly within or adjacent to and serving National Forests that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

forest highway - A designated forest road under the jurisdiction of, and maintained by, a public authority that is subject to the Highway Safety Act. The planning process is a cooperative effort involving the State(s), Forest Service, and the Federal Highway Administration. The location and need for improvements for these highways depend on the relative transportation needs of the various element of the National Forest System (23 CFR 660.107). The determination of relative needs involves the analysis of access alternatives associated with Forest Service programs and general public use. The basis for access needs is established in the Forest Plan. (FSM 7740.5 and 7741.)

forest stand - A contiguous group of trees sufficiently uniform in age class distribution, composition and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit, such as mixed, pure, even-aged, and uneven-aged stands. A stand is the functional unit of silviculture reporting and record-keeping. Stand may be analogous to Activity Area. In the Intermountain Region, contiguous groups of trees smaller than 5 acres are not recorded or tracked. (Definitions, FSH 2470, 08-13-2004.)

forest transportation atlas – A display of the system of roads, trails, and airfields of an administrative unit (36 CFR 212.1).

forested stringers - Stands of forested vegetation that are long and narrow and surrounded by non-forested vegetation. Stringers often provide high value habitat for big game and other wildlife species because they are the only hiding or thermal cover in the immediate area.

forested vegetation - Refers to lands that contain at least 10 percent canopy cover by forest trees of any size, or land that formerly had forest tree cover and is presently at an early seral cover type.

forest telecommunications system - All equipment and related facilities used for the purpose of Forest communication. This includes but is not limited to radio, voice, data, and video communications.

fragmentation - The splitting or isolation of habitat into smaller patches because of human actions. Habitat can be fragmented by management activities such as timber harvest and road construction, and changes such as agricultural development, major road systems, and reservoir impoundments.

fragmented population - The splitting or isolation of populations into smaller patches because of anthropogenic or natural causes.

free flowing - Existing or flowing in a natural condition without impoundment, diversion, straightening, riprapping, or other modification in the waterway.

function - The flow and interaction of abiotic and biotic nutrients, water, energy, or species.

galena- The primary ore mineral of lead.

Gangue mineral- A nonmetallic, or nonvaluable metallic mineral associated with ore minerals.

geoclimatic setting - The geology, climate (precipitation and temperature), vegetation, and geologic processes (such as landslides or debris flows) that are characteristic of a place; places with these similar characteristics are said to have the same geoclimatic setting.

Geographic Information System (GIS) - A GIS integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.

Geomorphic Integrity (GI) - Geomorphic integrity is an assessment and comparison of existing soil-hydrologic conditions with historical conditions that existed before Euro-American settlement. Upland, riparian, and stream conditions are assessed to determine how their integrity and resilience may have changed due to effects from past or current human-caused (road construction, timber harvest, livestock grazing, etc.) or natural (wildfire, floods, etc.) disturbance. Relative integrity ratings are assessed at the subwatershed scale and based on the geomorphic resilience of streams and wetland/riparian areas, and the ability of the system to absorb and store water.

geomorphology - The study of land forms. Also, a natural physical process that is responsible for the movement and deposition of organic and inorganic materials through a watershed under the influence of gravity or water (either on a hillslope or in a stream channel).

goal - As Forest Plan management direction, a goal is a concise statement that helps describe a desired condition, or how to achieve that condition. Goals are typically expressed in broad, general terms that are timeless, in that there are no specific dates by which the goals are to be achieved. Goal statements form the basis from which objectives are developed.

goods and services - The various outputs produced by forest and rangeland renewable resources. The tangible and intangible values of which are expressed in market and non-market terms. (36 CFR 219)

granite- A light-colored, coarse-grained igneous rock

guideline - As Forest Plan management direction, a guideline is a preferred or advisable course of action generally expected to be carried out. Deviation from compliance does not require a Forest Plan amendment (as with a standard), but rationale for deviation must be documented in the project decision document.

habitat - A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or population of plants or animals.

habitat family - See family.

habitat security - The protection inherent in any situation that allows big game to remain in a defined area despite an increase in stress or disturbance associated with the hunting season or other human activity. The components of security may include, but are not limited to: vegetation, topography, road density, general accessibility, hunting season timing and duration, and land ownership. Habitat security is area specific, while hiding cover (see definition below) is site specific.

hardening - Used in the context of facility management, hardening refers to improvements, usually to the surfacing of roads, trails, campsite areas, and facility access areas, to reduce soil erosion and/or sedimentation in nearby watercourses. These improvements can include paving, gravel surfacing, or a number of other soil stabilization products and techniques.

heritage program - The Forest Service program that encompasses all aspects of cultural resource management, including both project and non-project resource inventory, evaluation, mitigation, curation, interpretation, public participation and education, protection and monitoring, and support to other resources.

hibernaculum - Winter residence, or any natural covering for protecting organisms during the winter. This term is often used for bat wintering and roosting areas, which may include caves, mine adits, or loose tree bark.

hiding cover - Vegetation capable of hiding 90 percent of an adult elk or deer from a human's view at a distance equal to or less than 200 feet.

hierarchy - A general integrated system comprising two or more levels, the higher controlling to some extent the activities of the lower levels; a series of consecutively subordinate categories forming a system of classification.

Historical Range of Variability (HRV) - The natural fluctuation of healthy ecosystem components over time. In this document, HRV refers to the range of conditions and processes that likely occurred prior to settlement of the area by people of European descent (around the mid 1800s), and that would have varied within certain limits over time.

historic property - Any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on the National Register, including artifacts, records, and material remains related to such a property or resource.

human dimensions - Refers to social and economic components of an ecosystem.

hydrologic - Refers to the properties, distribution, and effects of water. "Hydrology" is the study of water; its occurrence, circulation, distribution, properties, and reactions with the environment.

Hydrologic Unit Code (HUC) - A hierarchal coding system developed by the U.S. Geological Service to map geographic boundaries of watersheds of various sizes.

hydric - Wet or moist conditions. Can refer to a habitat characterized by, or a species adapted to wet or moist conditions, rather than mesic (moderate) or xeric (dry) conditions.

Idaho batholith- A great mass of intruded igneous rock that is primarily granite and covers much of central Idaho.

Idaho Department of Water Resources Comprehensive Water Plan - State legislation provides for the development of a comprehensive state water plan that may include protected rivers designated either as natural or recreational rivers. The legislative purpose states that selected rivers possessing outstanding fish and wildlife, recreational, aesthetic, historic, cultural, natural, or geologic values should be protected for the public benefit and enjoyment. The legislation provides that a waterway may be designated as an interim protected river prior to the preparation of the comprehensive plan for the waterway.

impinge - To strike or dash, especially with a sharp collision. For fish, impingement, or physical contact with screen material, can cause some level of injury and/or mortality. Fish impingement onto a screen face can usually be avoided with proper consideration of diversion design hydraulics. Fish screen criteria used in the Northwest specifies that approach velocity must be less than 0.4 feet per second to adequately protect salmonid fry.

indicator - In effects analysis, a way or device for measuring effects from management alternatives on a particular resource or issue.

indicated reserve- Reserves or resources for which tonnage and grade are computed partly from specific measurements, samples, or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to permit the mineral bodies to be outlined completely or the grade established throughout.

inferred reserve- Reserves or resources for which quantitative estimates are based largely on broad

knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition, of which there is geologic evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence. Estimates of inferred reserves or resources should include a statement of the specific limits within which the inferred material may lie.

infrastructure - The facilities, utilities, and transportation systems needed to meet public and administrative needs.

inner gorge - Steep valley walls that bound a stream reach. Common in areas of stream downcutting or geologic uplift. More commonly found on the costal and cascade ranges.

insignificant effect - An insignificant effect is one that cannot be detected, measured, or evaluated in any meaningful way. Therefore, no change to a resource, social, or economic condition would be expected from an insignificant effect. Determination of an insignificant effect may be based on scientific analysis, professional judgment, experience, or logic.

Specific to the ESA and effects on Threatened, Endangered, Proposed or Candidate species, an insignificant effect can never reach the scale or magnitude where a species take occurs. The appropriate effects determination for insignificant effects on these species would be: "Is not likely to adversely affect". Refer to the "adverse effect" definition in this glossary.

integrated weed management - A multi-disciplinary, ecological approach to managing weed infestations involving the deliberate selection, integration, and implementation of effective weed control measures with due consideration of economic, ecological, and sociological consequences.

interim management direction - For Wild and Scenic Rivers, the identified outstandingly remarkable values are afforded adequate protection, subject to valid existing rights. Affording adequate protection requires sound resource management decisions based on NEPA analysis. Protective management may be initiated by the administering agency as soon as eligibility is determined. Specific management prescriptions for eligible river segments provide protection to free-flowing values, river-related values, and classification impacts.

intermittent stream - A stream or portion of a stream that flows only in direct response to precipitation or seasonal run-off, and that receives little or no water from springs or other permanent sources. Unlike ephemeral streams, an intermittent has well-defined channel and banks, and it may seasonally be below the water table.

Interstitial Sediment Deposition - An index of the quantity of fine sediment (<6.3 mm) deposited in wadeable streams on the Payette National Forest; replaces the substrate embededdness watershed condition indicator in the revised Payette National Forest Land Resource Management Plan, Appendix B baseline Matrix

Intrusive- A body of igneous rock that has pushed into older rock.

Inventoried Roadless Area (IRA) or Idaho Roadless Areas- An area that:

- is larger than 5,000 acres or, if smaller, contiguous to a designated wilderness or primitive area;
- contains no improved roads maintained for travel by standard passenger-type vehicles;
- is characterized by a substantially undeveloped character; and
- has been inventoried by the Forest Service for possible inclusion in the Wilderness Preservation System.

These areas include those identified in a set of IRA maps—contained in the Forest Service Roadless Area Conservation Final EIS, Volume 2 (November 2000), and held at the National headquarters of the Forest Service—or any update, correction, or revision of those maps. Refer to Table C-5 in Appendix C to the Forest Plan Revision Final EIS for a listing of IRAs, their location, and acreage.

isolated cabin - Cabins on sites not planned or designated for recreational cabin purposes. These cabins are authorized by special-use permit.

isolated population - A population that is not connected as a result of barriers from anthropogenic or natural causes. For fish species, the migratory form is absent and the population is isolated to local streams or a small watershed.

landscape - Heterogenous land area composed of a cluster of interacting ecosystems that are repeated in similar form throughout. When defined for landscape scale assessment, the spatial extent should be large enough to allow natural disturbance processes to operate.

landscape scale assessment - An assessment done for a landscape area varying in size from a 6th-field HU to a combination of 5th-field HUs, or approximately 10,000 to 100,000 acres. This scale is synonymous with "fine-scale analysis." Ecosystem Analysis at the Watershed Scale (EAWS) occurs at this scale.

landslide - Any downslope mass movement of soil, rock, or debris.

landslide hazard - The calculated probability of slope failure (Prellwitz et al. 1994). In practical field use, it is a relative (e.g., low, moderate, or high) estimate of the potential susceptibility for landslide occurrence.

landslide prone area - An area with a tendency for rapid soil mass movements typified by shallow, non-cohesive soils on slopes where shallow translational planar landsliding phenomena is controlled by shallow groundwater flow convergence. The initiation is often associated with extremely wet periods, such as rain-on-snow events. It does not include slow soil mass movements that include deep earth-flows and rotational slumps, nor snow avalanche or rock fall areas. Translational slides have been documented as the dominant form of landslides for the majority of the Forest.

landtype - A portion of the landscape resulting from geomorphic and climatic processes with defined characteristics having predictable soil, hydrologic, engineering, productivity, and other behavior patterns.

landtype associations - A grouping of landtypes similar in general surface configuration and origin.

latite- An extrusive igneous rock having less quartz than rhyolite.

leasable minerals - Leasable minerals are normally those "soft rock minerals" related to energy resources, such as oil, gas, coal, oil shale, tar sands, etc. Some "hard rock" minerals can become leasable because of land status, i.e., acquired mineral estate.

local population - For bull trout, this is a group that spawns within a particular stream or portion of a stream system. Multiple local populations may exist within a core area. The smallest group of fish that is known to represent an interactive reproductive unit will be considered a local population. For most waters where specific information is lacking, a local population may be represented by a single headwater tributary or complex of headwater tributaries. Gene flow may occur between local populations (e.g., those within a core population), but is assumed to be infrequent compared to that among individuals within a local population (USDI FWS 2002).

locatable minerals - Locatable minerals are normally those "hard rock minerals" that are either base or precious metals, and that are open and available for appropriation under the General Mining Laws. In Idaho, locatable minerals often include gold, silver, lead, zinc, copper, antimony, cadmium, cobalt, molybdenum, etc.

log - Coarse woody debris with diameters ≥15 inches (≥12 inches for PVG 10) and lengths ≥6 feet.

long-term effects - Effects that last 15 years or longer.

macrovegetation - A unit of vegetation for analysis above the site-scale.

Magnuson-Stevens Act - Public Law 94-265, as amended through October 11, 1996. Ocean fisheries are managed under the Magnuson Fishery Conservation and Management Act of 1976 (also called the Magnuson-Stevens Act [MSA]). The Act provided NMFS legislative authority for fisheries regulation in the United States, in the area between three-miles to 200 miles offshore and established eight Regional Fishery Management Councils (Councils) that manage the harvest of the fish and shellfish resources in these waters. In 1996, the MSA was re-authorized and changed by amendments to emphasize the sustainability of the nation's fisheries and establish a new standard by requiring that fisheries be managed at maximum sustainable levels and that new approaches be taken in Essential Fish Habitat conservation.

maintain - When used in a management goal or objective for biological and physical resources, "maintain" means to stay within the range of desired conditions. The context is that resource conditions are already within their desired range, and the expectation is that management actions to achieve goals or objectives maintain resource conditions within their desired range in the planning period.

When used in a standard or guideline for biological and physical resources, "maintain" means that current conditions are neither restored or degraded, but remain essentially the same. The context is that resource conditions may or may not be in their desired range, and the expectation is that maintenance management actions do not degrade or restore current conditions.

This is an important distinction because most goal or objective management actions cannot be designed to achieve desired conditions for all resources. Specific actions are designed to achieve desired conditions for specific resources, but may simultaneously have effects on those or other resources. The intent behind "maintain" when used in a standard or guideline is to keep those effects from degrading resource conditions; i.e., moving conditions from functioning properly to functioning at risk, or making conditions measurably worse when they are currently functioning at risk or not functioning properly. See definitions for "degrade" and "restore" in this Glossary.

For Recreation, Scenic Environment, Heritage, Lands, Special Uses, and Wilderness resources, "maintain" means to continue a current or existing practice, activity, management strategy, resource condition, or level of use.

For physical improvements managed under the Roads and Facilities programs, "maintain" means to keep the road or facility in a usable condition.

For resource inventories, databases, plans, maps, or other documents related to all resources, "maintain" means to periodically update these items to reflect current conditions and/or status.

management action or activity - As identified in FSM 2527.05 - Any Federal activity including (1) acquiring, managing, and disposing of Federal lands and facilities, (2) providing federally undertaken, financed, or assisted construction or improvements, and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

An exception to this definition is fire suppression, which is considered an emergency response action rather than a management action. FSM 2671.45f, part 2(a) states, "Human safety is the highest priority for every emergency response action (see FSM 5130.3 for related direction on the wildland fire suppression policy and the priority for the safety of firefighters, other personnel, and the public)."

management area - A land area with similar management goals and a common prescription, as described in the Forest Plan.

Management Indicator Species (MIS) - Representative species whose habitat conditions or population changes are used to assess the impacts of management activities on similar species in a particular area. MIS are generally presumed to be sensitive to habitat changes.

Management Prescription Category (MPC) - Management prescriptions are defined as, "Management practices and intensity selected and scheduled for application on a specific area to attain multiple use and other goals and objectives" (36 CFR 219.3). MPCs are broad categories of management prescriptions that indicate the general management emphasis prescribed for a given area. They are based on Forest Service definitions developed at the national level, and represent management emphasis themes, ranging from Wilderness (1.0) to Concentrated Development (8.0). The national MPCs have been customized during Forest Plan revision to better fit the needs and issues of the Southwest Idaho Ecogroup Forests.

management strategies - For Forest Plan revision, this term is used to encompass both management direction and management emphasis (especially MPCs) that set the stage and sideboards for future actions or activities that may occur during the planning period. The strategies do not include any specific actions or activities, but rather focus on the general types and intensities of activities that could occur, given the management direction and prescriptions proposed under the Forest Plan alternatives.

mass stability - The susceptibility of soil masses to stress. Gravitational stresses, on slopes, changes of state (solution), and soil particles cohesion are the main factors involved (USDA Forest Service 1973).

matrix - In landscape ecology, a matrix is usually the most extensive and connected element present in a landscape. Patches and corridors are often imbedded in the matrix. The matrix may play a dominant role in the functioning of the landscape without being the most extensive landscape element. Determining the matrix in a landscape depends either on connectivity, dominance, or function. Each landscape should be evaluated individually.

matrix management - A concept that asserts biodiversity and ecological function can be sustained in working landscapes as long as attention is given to maintaining habitat across the full range of spatial scales.

Maximum Modification (MM) - Category of Visual Quality Objective (VQO) where human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

meaningful measures - A recreation, wilderness, and heritage resources management process that:

- Establishes quality standards, based on validated visitor preferences and expectations, that are used to produce desired services and facilities;
- Accounts for the costs to manage resources;
- Establishes priorities for current budgets; and
- Links recreation resources to other management responsibilities of the agency

measurable change - A measurable change is one that can be meaningfully detected, measured, or evaluated using accepted analysis or monitoring methods. A measurable change would not result from an insignificant or discountable effect.

mesic - Moderate moisture conditions. Can refer to a habitat characterized by, or a species adapted to moderate moisture conditions rather than hydric (wet) or xeric (dry) conditions.

mesofilter (conservation) approach - Used to assess the conservation value of ecosystems and landscapes that lie conceptually between the coarse-filter and fine-filter. The core idea of this approach is that by conserving representation of key habitat elements important to species but too fine to address through the coarse-filter, many species will protected without the necessity of considering them individually. Examples of mesofilter approaches include providing direction to conserve elements such as logs or snags.

metamorphic- A type of rock that has been altered in composition, texture, or internal structure by pressure, heat, or the introduction of new chemical substances.

metapopulation - A group or collection of semi-isolated subpopulations of organisms that are interconnected and interact both physically and genetically. A population comprising local populations that

are linked by migrants, allowing for recolonization of unoccupied habitat patches after local extinction events. For anadromous fish species, "metapopulation" is the population within a 3rd field HU, i.e., Snake River Evolutionarily Significant Unit.

metasediments- Partially metamorphosed sedimentary rocks.

mid-scale - An area varying in size from a U.S. Geological Survey 4th-field hydrologic unit (HU) to groups of 4th-field HUs, approximately 500,000 to 5,000,000 acres. Subbasin Review and Land Management Planning unit analyses occur at this scale.

middleground (mg) - The visual distance zone between the foreground and the background in a landscape, located from 0.25 – 0.5 mile to 3-5 miles from the viewer.

mineral entry- The filing of a mining claim on federal land to obtain the right to mine any locatable minerals it may contain. The filing for a mill site on federal land for the purpose of processing off-site locatable minerals.

mineralization- The process of mineral formation and deposition.

minimum tool- The least impactive method, equipment, device, force, regulation, practice, or use that will meet the management objective in a wilderness context.

mitigate - To avoid, minimize, reduce, eliminate, rectify, or compensate for impacts or degradation that might otherwise result from management actions.

mitigation measures - Modifications of actions that: (1) avoid impacts by not taking a certain action or parts of an action in a given area of concern; (2) minimize impacts by limiting the degree or magnitude of the actions and its implementation; (3) rectify impacts by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (5) compensate for impacts by replacing or providing substitute resources or environments.

Mixed-metal veins- Veins having gold as the primary ore mineral, and silver, copper, lead, and/or zinc as byproducts.

Modification (M) - Category of Visual Quality Objective (VQO) where human activity may dominate the characteristic landscape but must, at the same time, follow naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground.

monitoring - The process of collecting information to evaluate if objectives and anticipated results of a management plan are being realized, or if implementation is proceeding as planned.

National Environmental Policy Act (NEPA) - The National Environmental Policy Act of 1969 requires environmental analysis and public disclosure of federal actions.

National Forest System Road – A forest road other than a road which has been authorized by a legally documented right-or-way held by a State, county, or other local public road authority. The term "National Forest System road" is synonymous with the term "forest development road" as used in 23 U.S.C. 205.

National Historic Preservation Act (NHPA) - A Federal Act, passed in 1966, which established a program for the preservation of additional historic properties throughout the nation and for other purposes, including the establishment of the National Register of Historic Places, the National Historic Landmarks designation, regulations for supervision of antiquities, designation of the State Historic Preservation Offices (SHPO), guidelines for federal agency responsibilities, technical advice, and the establishment of the Advisory Council on Historic Preservation.

National Register of Historic Places (NRHP) - A list of cultural resources that have local, state, or

national significance maintained by the Secretary of the Interior.

National Wilderness Preservation System - All lands managed under the Wilderness Act and subsequent wilderness designations, irrespective of the department or agency having jurisdiction.

Nationwide Rivers Inventory (NRI) - The NRI provides a database for potential additions to the National Wild and Scenic River System. The NRI is maintained and updated by the National Park Service. Just because a segment is listed on the NRI or is on other source lists does not necessarily indicate eligibility, and conversely, absence from any such list or document does not indicate a river's ineligibility.

native species - Animals or plants that originated in the area in which they live. Species that normally live and thrive in a particular ecosystem.

natural disturbance - Any relatively discrete event in time that is not a management action or activity, that disrupts ecosystems, vegetative communities, or species populations. Natural disturbances may or may not be functioning within their historical range of variability.

natural-appearing landscape character - "Natural-appearing" refers to a visual landscape character that has resulted from a combination of geological processes, climate, disturbance events, and ecological succession.

networks - Highly interconnected features within landscapes. Network properties of connectivity are important for ensuring species dispersal, habitat colonization and hence persistence. Habitat networks are relevant when considering the movement of species and have been particularly useful for understand riparian systems.

new facilities - Facilities resulting from new construction in locations where no facilities previously existed.

new road construction - Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road. (36 CFR 212.1).

no action (alternative) - The most likely condition expected to exist if current management practices continue unchanged. The analysis of this alternative is required for federal actions under NEPA.

non-discretionary actions - Land management activities initiated from outside the National Forest Service—such as mining proposals, special-use permitted activities, or suppression tactics for life-threatening situations.

non-forested vegetation - Lands that are not capable of supporting at least 10 percent canopy cover of forest trees of any size. Land that formerly had at least 10 percent tree canopy cover and is presently in an early seral cover type is still considered forested vegetation.

noxious weed - A state-designated plant species that causes negative ecological and economic impacts to both agricultural and other lands within the state.

nutrient cycling - Circulation or exchange of elements such as nitrogen and carbon between non-living and living portions of the environment. Includes all mineral and nutrient cycles involving mammals and vegetation.

objective - As Forest Plan management direction, an objective is a concise time-specific statement of actions or results designed to help achieve goals. Objectives form the basis for project-level actions or proposals to help achieve Forest goals. The time frame for accomplishing objectives, unless otherwise stated, is generally considered to be the planning period, or the next 10 to 15 years. More specific dates are not typically used because achievement can be delayed by funding, litigation, environmental changes, and other influences beyond the Forest's control.

old forest - Old forest is a component of the Large Tree Size Class, with the following general characteristics: a variability in tree size that includes old, large trees with signs of decadence, increasing numbers of snags and coarse woody debris, canopy gaps, and understory patchiness. There are two broad types of old forest—single-storied and multi-storied. Single-storied old forest is characterized by a single canopy layer of large or old trees. These stands generally consist of widely spaced, shade-intolerant species, such as ponderosa pine and western larch, that are adapted to a nonlethal, high frequency fire regime. Multi-storied old forest is characterized by two or more canopy layers, with large or old trees in the upper canopy. These stands can include both shade-tolerant and shade-intolerant species, and are typically adapted to a mixed regime of both lethal and nonlethal fires. Because old forest characteristics have been aggregated into two basic categories, it is generally easier to identify, monitor, and compare the characteristics of these old forest types with desired vegetative conditions than it is with "old growth" (see old growth definition, below).

ore mineral- A mineral that carries the valuable metallic constituents of a deposit.

ordinary high water mark - The mark on all watercourses that will be found by examining the beds and banks and ascertaining where the presence and action of waters are so common and continuous in ordinary years as to mark upon the soil a character distinct from that of the abutting upland.

Outstandingly Remarkable Value (ORV) - In the Wild and Scenic Rivers Act, river values identified include scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values and their immediate environments. The Act does not further define outstandingly remarkable values. The Intermountain Region defines outstandingly remarkable value as, *"*Characteristic of a river segment that is judged to be a rare, unique, or exemplary feature that is significant at a regional or national scale*"*.

Partial Retention (PR) - A category of Visual Quality Objective (VQO) where human activities may be evident to the casual Forest visitor but must remain subordinate to the characteristic landscape.

patches - In landscape ecology, patches are spatial units at the landscape scale. Patches are areas surrounded by matrix, and may be connected by corridors. Patch size can affect species habitat, resource availability, competition, and recolonization. Patch shape and orientation also play an important ecological role. Interpatch distance refers to the distance between two or more patches.

patchworks - Arrangement, size and pattern of distinct, interacting patches that can be used to predict biodiversity and species persistence.

patchy habitat - Habitat that is naturally isolated from near-by pieces that are similar. Habitat that is patchy should not be referred to a being fragmented because it is not a man-induced condition.

patented - A patented mining claim is one in which the Federal Government has passed its title to the claimant, giving exclusive title to the locatable minerals and, in most cases, the surface and all resources.

pattern, or spatial pattern - The spatial arrangement of landscape elements (patches, corridors, matrix) that determines the function of a landscape as an ecological system.

perennial stream - A stream that typically maintains year-round surface flow, except possibly during extreme periods of drought. A perennial stream receives its water from springs or other permanent sources, and the water table usually stands at a higher level than the floor of the stream.

permeability- The capacity for transmitting a fluid.

pluton- A body of igneous rock that solidified beneath the earth's surface.

population - The people, wildlife, fish, or plants that inhabit and reproduce in a specific area. Also, a group of individuals of the same species occupying a defined locality during a given time that exhibit reproductive continuity from generation to generation. For anadromous fish species, this is the population within a 4th field HU.

porphyry- A rock in which large mineral crystals are contained in a finer-grained matrix.

potential classification - For Wild and Scenic Rivers, when rivers are considered for eligibility, river segments are tentatively classified either as wild, scenic, or recreational, based on the degree of access and amount of development along the river area.

potential outstandingly remarkable value assessment - For Wild and Scenic Rivers, a general look at each river, to determine if the resource values are below average, average, or above average. Rivers determined to contain at least one resource value that is above average will be evaluated in the eligibility process.

preclude - To put a barrier before; hence, to shut out; to hinder; to stop; to impede. (The Collaborative International Dictionary of English v. 0.44).

prescribed fire - Any fire ignited by management actions to meet specific objectives.

Preservation (P) - Category of Visual Quality Objective (VQO) that allows for ecological change only.

primitive - A Recreation Opportunity Spectrum classification for areas characterized by an essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted.

priority wildlife habitats - Those habitats that have most decreased or changed from historic times. They can be used to rank the need for restoration or management emphasis.

priority watershed - Governor's Bull Trout Conservation Plan (7/96) - A watershed that is either in the best condition for this species or is most recoverable with the greatest opportunity for success. Priority watersheds can be classified as follows:

Focal - highly occupied, existing protection and maintenance, cost for protection is low, chance of success is high over the short term.

Adjunct - considerable restoration may be needed, riparian and in-channel restoration stand a good chance of succeeding, good opportunity for colonizing from adjacent habitat, restoration can improve adjacent refuge populations.

Nodal - critical to sustaining existing populations within the watershed, connected and accessible to migrating populations, restoration potential is high.

Critical Contributing Area - restoration is necessary to secure functional value for associated focal, adjunct, or nodal habitats.

Lost Cause - level of effort exceeds benefits.

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.

professional judgment - Intuitive conclusions and predictions dependent upon training; interpretation of facts, information, observations, and/or personal knowledge.

promote - In the context of recommended wilderness management, to take measures that actively encourage non-conforming uses within recommended wilderness. These measures would include the development or improvement of facilities and infrastructure within recommended wilderness in support of non-conforming uses. These measures would not include actions taken to reduce safety hazards and routine maintenance of existing facilities and infrastructure.

Properly Functioning Condition (PFC) - Properly Functioning Condition means that the resource condition is within the range of desired conditions.

proposed action - A proposal made by the Forest Service or other federal agency to authorize, recommend, or implement an action to meet a specific purpose and need.

prospecting- The preliminary stage of mining activity that involves searching for outcrops or surface exposures of mineral deposits. It is usually characterized by low impact surface uses, such as driving on existing roads, hiking or riding on trails or cross country, taking of small samples by hand or with small highly portable tools, field mapping, use of portable geophysical equipment, stream sediment sampling, panning of placer samples or small scale sluicing, soil sampling, geologic reconnaissance mapping, and claim staking.

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)].

pyrite- An iron sulfide mineral.

quartz- A silicon dioxide mineral common in many rocks.

quartzite- A granular metamorphic rock consisting almost entirely of quartz.

rear - To feed and grow in a natural or artificial environment.

reasonably incident- This refers to any use of the National Forests for purposes that reflect sound practices necessary or required for the various stages of mining activities, including prospecting, mining, or processing operations. For a use to be reasonably incident, the type and level of use must be justified as being appropriate to the stage of mining activity in which the operation is legitimately engaged (i.e., prospecting, exploration, development, production, abandonment, or reclamation). In turn, the stage of mining activity with the related use must be required, justified, and appropriate, based on the nature and extent of the mineral resource present.

reclamation (mine facilities) - Reclamation can include removing facilities, equipment, and materials; recontouring disturbed areas to near pre-mining topography; isolating and neutralizing, or removing toxic or potentially toxic materials; salvage and replacement of topsoil, and/or seedbed preparation, and revegetation.

recreation residences - Cabins on National Forest System lands that normally were established in tracts and built for recreation purposes with agency approval and supervision. These cabins are authorized by special use permit and are not the primary residences of the owners.

Recreation Opportunity Spectrum (ROS) - A framework for stratifying and defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences are arranged along a continuum or spectrum divided into six classes--primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, rural, and urban.

recreational river - In the National Wild and Scenic River System, a river or river segment that is readily accessible by road or railroad, may have some development along their shorelines, and may have undergone some impoundment or diversion in the past.

Recreation Visitor Day (RVD) - Twelve hours of recreation use in any combination of persons and hours (one person for 12 hours, three persons for four hours, etc.).

reference - The range of a factor/indicator that is representative of its recent historical values prior to significant alteration of its environment resulting from unnatural disturbance. The reference could represent conditions found in a relic site or sites having little significant disturbances, but does not

necessarily represent conditions that are attainable. The purposes of references are to establish a basis for comparing what currently exists to what has existed in recent history. References can be obtained through actual data, such as paired or well-managed watersheds, or through extrapolated techniques such as modeling. Sources of information include inventory and records, general land office and territorial surveys, settlers' and explores' journals, ethnographic records, local knowledge, and newspapers.

refugia - Watersheds or large areas with minimal human disturbance, having relatively high quality water and fish habitat, or having the potential of providing high-quality water and fish habitat with the implementation of restoration efforts. These high-quality water and fish habitats are well distributed and connected within the watershed or large area to provide for both biodiversity and stable populations (Quigley and Arbelbide 1997).

representative - Conditions within landscapes that provide the biological features and historical range of variability under which ecosystems evolved. The assumption of a representative approach is that providing a wide-range of conditions will sustain the greatest percentage of the species which utilize those characteristics.

resident fish - Fish that are non-migratory and spend their entire life cycle within a given freshwater area.

resilient, resiliency - The ability of a system to absorb disturbances before changing to a state or trajectory that is entirely new to the system. The ability to absorb disturbances depends on the health of states, functions and processes that facilitate recovery. Resiliency is one of the properties that enable the system to persist in many different states of successional stages. In human communities, refers to the ability of a community to respond to externally induced changes such as larger economic or social forces.

restoration - Management actions or decisions taken to restore the desired conditions of habitats, communities, ecosystems, resources, or watersheds. For soil, water, riparian, or aquatic resources, restoration may include any one or a combination of active, passive, or conservation management strategies or approaches.

restore - For biological and physical resources, restore means to repair, re-establish, or recover ecosystem functions, processes, or components so that they are moving toward or within their range of desired conditions.

For the Recreation, Scenic Environment, Heritage, Lands, Special Uses, Wilderness, Roads and Facilities resources, restore means to use management actions to re-establish desired resource conditions.

retard attainment of desired resource conditions - When an effect resulting from a management action, individually or in combination with effects from other management actions, within a specified area and time frame, measurably slows the recovery rate of existing conditions moving toward the range of desired resource conditions.

Retention (R) - A category of Visual Quality Objective (VQO) where human activities are not evident to the casual Forest visitor.

rhyolite- An extrusive igneous rock having a similar chemical composition to granite.

riparian areas or zones - Terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated with high water tables, and soils that exhibit some wetness characteristics.

Riparian Conservation Areas (RCAs) - Portions of watersheds where riparian-dependant resources receive primary emphasis, and management activities are subject to specific goals, objectives, standards, and guidelines. RCAs include traditional riparian corridors, perennial and intermittent streams, wetlands, lakes, springs, reservoirs, and other areas where proper riparian functions and ecological processes are crucial to maintenance of the area's water, sediment, woody debris, nutrient delivery system, and associated biotic communities and habitat.

riparian ecosystems - The area of influence of the riparian ecological functions and processes that serve as a transition between terrestrial and aquatic ecosystems that includes: streams, lakes, wet areas, and adjacent vegetation communities and their associated soils which have free water at or near the surface; an ecosystem whose components are directly or indirectly attributed to the influence of water.

riparian function and ecological processes - The regulation and exchange of ecological processes and disturbances as they relate to geology, landform, climate and micro-climate, soil, water, vegetation and terrestrial and aquatic species in providing a range of habitats, their conditions and trends. Riparian functions and ecological processes can be affected by changes including among others: streambank and hillslope root strength, large wood recruitment to RCAs, nutrient input to streams, shading, water quality (sediment, nutrients, temperature) water yield and timing (including stream subsurface flow), migration barriers, vegetation composition and structure, and micro-climate (soil moisture, soil temperature, solar radiation, air temperature, relative humidity, wind speed).

Riparian Habitat Conservation Area (RHCAs) - To be used for the No Action Alternative only. As defined in Pacfish and Infish:

Fish-bearing streams - 100-year floodplain, outer edges of riparian area, to top of inner gorge, 300 feet slope distance, or two site potential tree heights, whichever is greatest.

Perennial nonfish-bearing streams - 100-year floodplain, outer reach of riparian area, to top of inner gorge, 150 feet slope distance, or one site potential tree height, whichever is greatest.

Intermittent streams (includes landslide-prone areas and wetlands less than 1 acre) - top of inner gorge, extent of landslide-prone area, outer edges of riparian area, and for key watersheds one site potential tree height or 100 feet slope distance (whichever is greatest), and for non-key watersheds half site potential tree height or 50 feet slope distance (whichever is greatest).

Ponds, lakes, and wetlands greater than 1 acre - outer edges of seasonally saturated soils, edge of riparian area, extent of any unstable soils, one site potential tree height, or 150 feet from maximum pool elevation, whichever is greatest.

risk - The danger that damage or loss will occur; for example, for landslides and other mass soil movements, risk is a measure of the socio-economic consequences (susceptibility to losses) of slope failure (Prellwitz et al. 1994).

river segment - For Wild and Scenic River studies, a portion of the river area, which has been delineated for evaluation and planning purposes,that usually breaks at a change in river character, land status, or classification.

road - A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail.

road decommissioning - Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1).

road maintenance – The upkeep of the entire forest transportation facility including surface and shoulders, parking and side areas, structures, and such traffic-control devices as are necessary for its safe and efficient utilization (36 CFR 212.1).

road maintenance level - Road maintenance is classified in terms of the following levels:

- *Maintenance level 1* - Assigned to intermittent service roads during the time they are closed to vehicular traffic. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities.
- M*aintenance level 2* - Assigned to roads open for public or permitted use by high clearance vehicles. Passenger car traffic is not a consideration.

- M*aintenance level 3* - Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.
- *Maintenance level 4* - Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Some roads may be paved and/or dust-abated.
- M*aintenance level 5* - Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally paved.

road reconstruction - Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road (36 CFR 212.1).

roads subject to the Highway Safety Act - National Forest System roads open to use by the public for standard passenger cars. This includes roads with access restricted on a seasonal basis and roads closed during extreme weather conditions or for emergencies, but which are otherwise open for general public use.

roaded natural - A Recreation Opportunity Spectrum classification for areas characterized by a predominantly natural or natural-appearing environment with moderate evidence of the sights and sounds of people. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

roadless area - See Inventoried Roadless Area.

roof- The top of a pluton.

roof pendant- A body of older rock projecting down into the top of a batholith.

rotational slides - Landslides that move along a surface of rupture that is curved and concave. Rotational slides are uncommon and occur infrequently within the Forest.

RS 2477 claim - A claim for a pre-existing road right-of-way based upon a mining law passed in 1866. The law was later repealed as a part of the Federal Land Policy and Management Act (FLPMA) of 1976.

RS 2339 claim - A claim for a pre-existing ditchline or other water transmission structure.

rural - ROS classification for areas characterized by a natural environment that has been substantially modified by development of structures, vegetative manipulation, or pastoral agricultural development. Resource modification and utilization practices may be used to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sound of humans are readily evident, and the interaction between users is 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 user densities are present away from developed sites. Facilities for intensified motorized use and parking are available.

scale - Defined in this framework as geographic extent; for example broad, mid, fine or site scale.

scenic river - In the National Wild and Scenic River System, a river or river segment that may be accessible in places by roads, but the shorelines or watersheds are largely primitive and undeveloped.

scoping - The process the Forest Service uses to determine, through public involvement, the range of issues that the planning process should address.

security cover or habitat - See habitat security.

sedimentation - The action or process of forming and depositing sediments. Stream sedimentation occurs when water velocity cannot transport the bed load and suspended matter is deposited by gravity along the streambed.

semiprimitive motorized - ROS classification for areas characterized by predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized use of primitive roads with predominantly natural surfaces and trails suitable for motorcycles is permitted.

semiprimitive nonmotorized - ROS classification for areas characterized by predominantly natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized recreation use is not permitted, but primitive roads used for other resource management activities may be present on a limited basis. Use of such roads may be restricted to minimize impacts on recreational experience opportunities or other resources.

sensitive species - A Forest Service or BLM designation, sensitive plant and animal species are selected by the Regional Forester or the BLM State Director because population viability may be a concern, as evidenced by a current or predicted downward trend in population numbers or density, or a current or predicted downward trend in habitat capability that would reduce a species' existing distribution. Sensitive species are not addressed in or covered by the Endangered Species Act.

sensitivity level - A measure of the degree of visitor sensitivity to the visual environment that is used as a component for the determination of Visual Quality Objectives under the Visual Management System. Three sensitivity levels are employed, each identifying a different level of user concern for the visual environment:

- Level 1 – Highest Sensitivity
- Level 2 – Average Sensitivity
- Level 3 – Lowest Sensitivity

sericite- A fine-grained white mica. Often occurs as a hydrothermal alteration mineral.

shear zone. An area of faulting where rock has shattered across a wide belt rather than a single plane.

short-term effects - Effects lasting from 3 to 15 years in duration.

significant cave - A cave located on federal lands that has been determined to meet the criteria in 36 CFR 290.3(c) or (d) and has been designated in accordance with 36 CFR 290.3(e). A cave considered significant may contain biotic, cultural, mineralogical, paleontologic, geologic, hydrologic, or other resources that have important values for scientific, educational or recreational purposes.

silicify- The replacement of a rock with silica.

silviculture - The care and tending of stands of trees to meet specific objectives.

site-scale - Any scale less than a broad, mid or fine scale.

snag - A standing dead tree.

soil erosion - Soil erosion is the detachment and transport of soil particles or aggregates by wind, water, or gravity. Management practices may increase soil erosion hazard when they remove ground cover and detach soil particles. .

soil mass movement or soil mass erosion - Soil mass movement is the downslope movement of earth caused by gravity. This includes but is not limited to landslides, rock falls, debris avalanches, and creep. It does not, however, include surface erosion by running water. It may be caused by natural erosional processes, or by natural disturbances (e.g., earthquakes or wildland fire) or human disturbances (e.g., mining or road construction).

soil productivity - Soil productivity includes the inherent capacity of a soil under management to support the growth of specified plants, plant communities, or a sequence of plant communities. Soil productivity may be expressed in terms of volume or weight/unit area/year, percent plant cover, or other measures of biomass accumulation.

source habitat - Source habitats are those characteristics of macrovegetation (i.e. cover types and structural stages) that contribute to stationary or positive population growth for a species in a specified area and time (Wisdom et al. 2000). Source habitat is distinguished from habitats associated with species occurrence which may or may not contribute to long term population persistence.

source habitat capacity - The extent of PVGs or covertypes capable of providing source habitat at some point in their successional development. Source habitat capacity includes areas that currently provide source habitat as well as areas that might provide source habitat in the future.

sphalerite- The primary ore mineral of zinc.

spawning - The act of fish reproduction. The mixing of the sperm of a male fish and the eggs of a female fish.

special use authorization - A permit, term permit, lease, or easement that allows occupancy or use rights or privileges on National Forest System lands (36 CFR 261.2).

special-use permit - A special-use authorization that provides permission, without conveying an interest in land, to occupy and use National Forest System lands or facilities for specific purposes, and which is both revocable and terminable.

species of concern - An unofficial status for a species whose abundance is at low levels.

species composition - The mix of species that occur within a vegetative unit. This is actually not unique to vegetation. Should vegetation be used as an example of species composition and this should say “A mix of species that occurs”?

species richness - A measure of biological diversity, referring to the number of species in a given area.

split estate - Lands where ownership of the surface estate and mineral estate has been separated.

stand - See forest stand.

standard - As Forest Plan management direction, a standard is a binding limitation placed on management actions. It must be within the authority and ability of the Forest Service to enforce. A project or action that varies from a relevant standard may not be authorized unless the Forest Plan is amended to modify, remove, or waive application of the standard.

State Historic Preservation Officer (SHPO) - A person appointed by a state’s Governor to administer the State Historic Preservation Program.

strata (minerals)- Sections of a formation that have distinctly different rock types.

stratigraphic nomenclature- Classification system for layered (sedimentary) rocks.

stream - A natural watercourse of perceptible extent, with definite beds and banks, which confines and conducts continuously or intermittently flowing water. Definite beds are defined as having a sandy or rocky bottom that results from the scouring action of water flow.

strike- The direction of the linear intersection of an inclined planar structure with a level surface.

strongholds - For fish, strongholds are watersheds that: (1) include all major life-history forms (resident, fluvial, adfluvial) that historically occurred there; (2) have numbers that are stable or increasing, with local populations at least half of their historical size; and (3) have populations with at least 5,000 individuals or 500 adults.

structure - The size and arrangement, both vertically and horizontally, of vegetation.

subbasin - A fourth field hydrologic unit that nests within the hierarchical system developed by the U.S. Geological Survey to describe watersheds. Typically 800,00 to 1,000,000 acres in size, a subbasin is smaller than a river basin (third field unit), and larger than a watershed (fifth field unit).

subpopulation - A well-defined set of interacting individuals that compose a proportion of a larger, interbreeding population.

substrate - The composition of a streambed, including mineral and organic materials.

subwatershed - An area of land that drains to a common point. A subwatershed is smaller subdivision of a watershed but is larger than a drainage or site. Subwatersheds are often synonymous with sixth-field hydrologic units, which are nested within larger watersheds (fifth-field units), and are comprised of smaller drainages, sites, and stream reaches.

subwatershed vulnerability - Subwatershed vulnerability is an assessment of a subwatershed's sensitivity to disturbance and its resiliency or natural ability for restoration. The disturbance may be human-caused and/or natural. This assessment uses several criteria, including soil erosion rates, natural sediment yields, and percentage of landslide-prone areas within the subwatershed.

succession - The replacement in time of one plant community with another. The prior plant community (or successional stage) creates conditions that are favorable for the establishment of the next stage. These changes often occur in a predictable order. More specifically, the gradual and natural progression in composition and structure of an ecosystem toward a climax condition or stage.

suitability - For Wild and Scenic Rivers, an assessment or determination as to whether eligible river segments should be recommended for inclusion in the National Wild and Scenic Rivers System by Congress or the Secretary of the Interior. Wild and Scenic River suitability involves determining the best use of the eligible river and the best method to protect the outstandingly remarkable values within the river corridor.

sustainability - The ability to maintain a desired condition or flow of benefits over time.

talus- Rock debris at the base of a cliff or slope.

temporary effects - Effects lasting from 0 to 3 years in duration.

temporary road – A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that in not a forest road or trail and that is not included in a forest transportation atlas (36 CFR 212.1)

thermal cover - Vegetation used by animals to lessen the effects of weather. For elk, thermal cover is typically a stand of conferous trees, 40 feet or taller, with an average crown closure of 70 percent or more.

tetrahedrite- An ore mineral of copper and silver.

threatened species - Designated by the FWS or NMFS; a plant or animal species given federal protection because it is likely to become endangered throughout all or a specific portion of its range within the foreseeable future.

Total Maximum Daily Load (TMDL) - TMDL is the sum of waste load allocations for point sources, non-point sources, natural background, and a margin of safety. A TMDL specifies the amount of a pollutant that needs to be reduced to meet water quality standards set by the state. TMDL is used in a process to attain water quality standards that (1) identifies water quality problems and contributing pollutant sources, (2) allocates pollution control responsibilities among sources in the watershed, and (3) provides a basis for taking actions needed to restore a water body.

Total Soil Resource Commitment (TSRC) - TSRC is the conversion of a productive site to an essentially non-productive site for a period of more than 50 years. Examples include classified or unclassified roads, inadequately restored haul roads, designated skid roads, landing areas, parking lots, mining dumps or excavations, dedicated trails (skid trails also), developed campgrounds, other dedicated facilities, and some stock driveways. Productivity on these areas ranges from 0 to 40 percent of natural.

Standards for detrimentally disturbed soils are to be applied to existing or planned activities that are available for multiple uses. These standards do not apply to areas with dedicated uses such as mines, ski areas, campgrounds, and administrative sites.

trace element- An element present in minor amounts in the earth's crust.

traditional cultural property - Traditional cultural property is defined as a property that is associated with cultural practices or beliefs or a living community that (1) are rooted in that community's history, and (2) are important in maintaining the continuing cultural identity of the community (National Register Bulletin 38)

trail – A route 50 inches or less in width or a route over 50 inches wide that is identified and manged as a trail (36 CFR 212.1).

trail vehicle - Vehicles designed for trail use, such as bicycles, snowmobiles, trail bikes, trail scooters, and all terrain vehicles (ATVs).

translational slides - Landslides where the mass displaces along a planar or undulating surface of rupture, sliding out over the original ground surface. Translational slides generally are relatively shallower than rotational slides. Translational slides frequently grade into flows or spreads. Shallow translational landsliding is the dominant type of landslide found within the Forest (Megahan et al. 1978, Clayton 1983, Dixon 2001).

transportation facility jurisdiction - The legal right to control or regulate use of a transportation facility derived from fee title, an easement, an agreement, or other similar method. While jurisdiction requires authority, it does not necessarily reflect ownership.

travel corridor - A linear strip of land defined for the present or future location of transportation facilities within its boundaries. This is a common term for wildlife biologists too. For wildlife a travel corridor is a pathway that connects patches of habitat such as migration routes for big game between winter and summer range.

travel management - The integrated planning of and providing for appropriate movement of people and products to and through National Forest System lands.

travel management atlas – An atlas that consists of a forest transportation atlas and motor vehicle use map or maps

travel management atlas – An atlas tht consists of a forest transportation atlas and a motor vehicle use map or maps (36 CFR 212.1)

tree size class - The categorization of trees for a vegetative unit to a descriptive class based on the largest trees that meet a set of criteria. Classes are Grass/Forb/Shrub/Seedling (GFSS), sapling, small, medium or large.

unauthorized road – A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas(36 CFR 212.1).

undertaking - Any project, activity, or program that can result in changes in the character or use of any historic properties located in the area of potential effects (36 CFR 800.2). The project, activity, or program must be under the direct or indirect jurisdiction of a federal agency or licensed or assisted by a federal agency.

undeveloped character - In the context of land management, an area of land retaining its primeval character and influence, without permanent improvements or human habitation, which is managed so as to preserve its natural conditions and which generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.

unroaded areas - Areas that do not contain National Forest system road.

unstable areas - Land areas that have a higher probability of increased erosion, landslides, and channel adjustment disturbances during climatic or physical events such as major storms or fires.

urban - ROS classification for areas characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are often used to enhance specific recreational activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans are predominant on the site. Large numbers of users can be expected both on the site and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.

utility corridor - A linear strip of land defined for the present or future location of utility facilities within its boundaries.

variety class - A measure of the degree of variety within a visual landscape. There are three variety classes that identify the degree of variation of the natural landscape:

- Class A - Distinctive
- Class B - Common
- Class C - Minimal

vein- A rock fissure filled with a mineral deposit; usually steep to vertical in orientation.

verification - Testifying, ascertaining, confirming, or testing the truth or accuracy of, asserting or proving to be true (Prellwitz et al. 1994).

viable population - A population that is regarded as having the estimated numbers and distribution of reproductive individuals to ensure that it will continue to exist over time and will be well distributed within a given area.

Visual Quality Objective (VQO) - Categories of acceptable landscape alteration measured in degrees of deviation from the natural-appearing landscape. The categories include Preservation, Retention, Partial Retention, Modification, and Maximum Modification.

Volcanic - Igneous rocks that have been extruded onto the earth's surface.

vulnerability - Refers to lack of animal security during the hunting season. Vulnerability can be affected by conditions such as road density, road closures, openings, and hunting pressure. Also means "Increased susceptibility to hazards." The hunting season definition seems too narrow and only applicable to species that are hunted rather than affected by humans or activities in other ways.

water quality integrity - Water quality integrity is an assessment and comparison of existing water quality conditions with historical conditions that existed before Euro-American settlement. Physical, chemical, and biological water conditions are assessed to determine how their integrity and resilience may have changed due to effects from past or current human-caused (road construction, timber harvest, livestock grazing, etc.) or natural (wildfire, floods, etc.) disturbance. Conditions or values assessed include streambank damage, sediment loads, channel modification, flow disruption, thermal changes, chemical contamination, and biological stress. Relative integrity ratings are assigned at the subwatershed scale and are based on whether any designated beneficial use is not fully supported or any condition/value is seriously degraded.

water quality limited water bodies - Denotes streams or other water bodies not meeting state Water Quality Standards. For purposes of Clean Water Act listing, these are waters that will not meet standards even with application of required effluent limitations.

watershed - Region or area drained by surface and groundwater flow in rivers, streams, or other surface channels. A smaller watershed can be wholly contained within a larger one, as watersheds are hierarchal in structure. For this document, watersheds are often synonymous with 5th field hydrologic units, which are nested within larger subbasins (4th field units), and are comprised of smaller subwatersheds (6th field units).

Watershed Condition Indicator (WCI) - WCIs are an integrated suite of aquatic (including biophysical components), riparian (including riparian –associated vegetation species), and hydrologic (including uplands) condition measures that are intended to be used at the a variety of watershed scales. They assist in determining the current condition of a watershed and should be used to help design appropriate management actions, or to alter or mitigate proposed and or ongoing actions, to move watersheds toward desired conditions. WCIs represent a diagnostic means to determine factors of current condition and assist in determining future conditions associated with implementing management actions or natural restoration over time.

wetlands - Land areas that are wet at least for part of the year, are poorly drained, and are characterized by hydrophytic vegetation, hydric soils, and wetland hydrology. Examples of wetlands include swamps, marshes, and bogs.

wilderness areas - Areas that are without developed and maintained roads, and that are substantially natural, and that Congress has designated as part of the National Wilderness Preservation System.

wildfire - An unwanted wildland fire. Wildfires can be further described by two basic categories:

(a) *characteristic,* which produce effects similar to those that occurred in the historical fire regime, or
(b) *uncharacteristic,* which produce effects much different than those in the historical fire regime.

wildland fire - Any fire not involving a home or other structure, other than prescribed fire, that occurs in the wildland.

Wildland/Urban Interface (WUI) - The line, area, or zone where structures and other human developments meet or intermingle with wildland or vegetative fuel. Interface is further delineated into the following types:

(a) *wildland/urban interface*—developed areas with residential structures where many structures border wildland on a broad front.
(b) *wildland/rural interface*—developed areas with private residential structures where developments are few in number scattered over a large area surrounded by wildland.

wild river - In the National Wild and Scenic River System, a rivers or river segment that is generally inaccessible (no roads) except by trail, with watersheds or shorelines that are essentially primitive (free of impoundments and polluted waters).

winter range - An area or areas where animals (usually ungulates such as elk, deer, bighorn sheep) concentrate due to favorable winter weather conditions. Conditions are often influenced by snow depth, and the availability or forage and thermal cover.

xeric - Dry conditions. Can refer to a habitat characterized by, or a species adapted to dry conditions, rather than hydric (wet) or mesic (moderate) moisture conditions.

ACRONYMS AND SYMBOLS

ACHP	Advisory Council on Historic Preservation
ACS	Aquatic Conservation Strategy
ADC	Animal Damage Control
AIMMCO	American Independence Mines and Minerals Company
AIRFA	American Indian Religious Freedom Act
ARPA	Archaeological Resource Protection Act
ATV	All Terrain Vehicle
BA	Biological Assessment
BE	Biological Evaluation
Bg	Background (visual quality distance)
BLM	Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion
CAA	Clean Air Act
CCC	Civilian Conservation Corps
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CIWA	Central Idaho Wilderness Act
CWA	Clean Water Act
CWD	Coarse Woody Debris
DBH	Diameter at Breast Height
DC	Desired Condition
DCH	Designated Critical Habitat
DD	Detrimental Disturbance (soils)
DEIS	Draft Environment Impact Statement
DFC	Desired Future Condition
DOT	Department of Transportation
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FACA	Federal Advisory Committee Act
FC-RONR	Frank Church – River of No Return
FEIS	Final Environmental Impact Statement
Fg	Foreground (visual quality distance)
FR	Forest Road
FSH	Forest Service Handbook
FSM	Forest Service Manual
GFSS	Grass-Forb Shrub Seedling
GI	Geomorphic Integrity
GIS	Geographic Information System
HRV	Historical Range of Variability
HU	Hydrologic Unit
HUC	Hydrologic Unit Code
IBLA	Interior Board of Land Appeals
ICB	Interior Columbia Basin
ICBEMP	Interior Columbia Basin Ecosystem Management Project
IRA	Inventoried Roadless Area or Idaho Roadless Area
IWM	Integrated Weed Management
LRMP	Land and Resource Management Plan
LTSYC	Long-Term Sustained Yield Capacity
M	Modification (visual quality category)
MBF	Thousand board feet

MFSR	Middle Fork Salmon River
Mg	Middleground (visual quality distance)
MIS	Management Indicator Species
MM	Maximum Modification (visual quality category)
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPC	Management Prescription Category
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
OHV	Off Highway Vehicle
ORV	Outstandingly Remarkable Value (for Wild and Scenic Rivers)
P	Preservation (visual quality category)
PDF	Project Design Feature
PFC	Properly Functioning Condition
PM	Particulate Matter
PNF	Payette National Forest
PR	Partial Retention (visual quality category)
PVG	Potential Vegetation Group
R	Retention (visual quality category)
RCA	Riparian Conservation Area
RHCA	Riparian Habitat Conservation Area (from Pacfish/Infish)
RMO	Riparian Management Objective
RNA	Research Natural Area
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
SFSR	South Fork Salmon River
SINMAP	Stability Index Mapping
SNRA	Sawtooth National Recreation Area
SWRA	Soil-Water-Riparian-Aquatics resources
TEPC	Threatened, endangered, proposed/petitioned, and candidate (species)
TEPCS	Threatened, endangered, proposed/petitioned, candidate, and sensitive (species)
TES	Threatened, endangered, and sensitive (species)
TMDL	Total Maximum Daily Load
TSRC	Total Soil Resource Commitment
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFWS	United States Fish and Wildlife Service
VQO	Visual Quality Objective
WARS	Watershed and Aquatic Recovery Strategy
WCI	Watershed Condition Indicator
WCS	Wildlife Conservation Strategy
WQI	Water Quality Integrity
WQLWB	Water Quality Limited Water Body
WSR	Wild and Scenic River
WUI	Wildland Urban Interface
>	Greater than
<	Less than

INDEX

A

Air Quality…….…….. 2-18, 2-30, 2-35, 3-93
Alternative A……. 2-5
Alternative B……..… 2-5
Alternative C……. 2-12

C

Cultural Resources…… 1-13, 1-15, 3-109, 3-119

D

Design Features…… 2-12, 2-17

F

Fisheries…… 1-12, 1-17, 2-34, 2-35, 3-23
……
Forest Plan Direction…….…… 1-9

G

Geology.…….....… 3-4

I

Idaho (Inventoried) Roadless Areas……...……. 2-30, 2-34, 3-73
Irreversible and Irretrievable…… 3-116
Issues…… 1-16, 2-1, 2-32
……..

L

Landslides/Landslide Prone Areas……..... 3-51

M

Management Indicator Species (MIS)…… …… 2-36, 3-31, 3-57, 3-61
Monitoring……..... 1-18
Minerals……. 3-7

N

Noxious Weeds……...…….. 2-25, 2-34, 3-89

P

Preferred Alternative……. 2-36
Proposed Action……..... 1-2, 2-5
Project Area……. 1-2
Purpose and Need…… 1-7

R

Recreation Opportunity Spectrum……..…….. 3-113
Responsible Official…… 1-8
Riparian Conservation Areas (RCAs)…… 2-10, 3-32, 3-34

S

Scenic Environment……..… 1-17, 2-11, 2-17, 2-33, 3-98
Scoping…… 1-15
Sensitive Species…….. 2-30, 2-36, 3-31, 3-60, 3-65, 3-67, 3-69, 3-70, 3-83

T

Threatened and Endangered Species…….…….. 1-12, 2-30, 2-35, 3-25, 3-63, 3-83
Temporary Roads……. 2-6, 2-13
TMDL…….……... 3-24

W

Watershed/Soils……..... 3-23, 3-51
Wetlands……..... 3-117
Wilderness……. 1-16, 2-30, 2-32, 3-13
Wildlife…… 2-30, 2-35, 2-36, 3-60

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APPENDIX A

Appendix A
Cumulative Effects: Past, Present and Reasonably Foreseeable Projects

This list was developed for those past, present, ongoing, and foreseeable future activities in Beaver Creek, Upper Big Creek, Little Marble Creek-Big Creek, Logan Creek, and Headwaters Big Creek 6th order hydrologic units. Some of the activities listed in the table may be outside the cumulative impact areas analyzed and therefore may not be considered in every resource specific analysis. Conversely, some cumulative impact analysis areas may extend well past the project area boundary and would have additional activities specified in the technical report. Table A-1, A-2, and A-3, list all potential activities that may need to be considered in resource specific cumulative effects analysis within the project area.

In the case of past activities, the impacts of any given action are difficult to impossible to individually quantify and disclose. There are many reasons for this including: inconsistent data collection methodology in earlier days, data that has become lost or missing over time, and the lack of data in the case of unplanned events (wildfire). Therefore, this analysis does not attempt to quantify specific impacts for each past activity. Rather, the most current and scientifically accurate data available was used to identify the existing conditions for each resource evaluated. It is assumed that although the incremental impacts of each past activity are not known, the existing condition is representative of those past activities. Individual resource areas would discuss, if appropriate, the incremental effects past activities may have had.

The temporal scope of analysis for cumulative effects includes past, present, and future actions and their effects on each resource. For the purpose of this analysis, the temporal scope will look approximately three years into the future, because this is the length of the proposed action. The assessment of future actions is limited to actions that are reasonably foreseeable. Sources for foreseeable future projects included the current Payette National Forest Schedule of Proposed Actions (SOPA) (January 2014 through March 2014) and the Five Year Action Plan developed for project planning of fuels and vegetation projects on the Payette National Forest.

Table A-1 – Cumulative Effects: Past Activities.

Past Action	Description	Year	Acres	Resources Affected
Wildland Fire	Wilderness Complex	1986	1,730	Fisheries, Watershed/Soils
	Hand Creek	1989	1,531	Fisheries, Watershed/Soils
	Marble Mountain	1990	175	Fisheries, Watershed/Soils
	Chicken Complex	1994	778	Fisheries, Watershed/Soils
	Little Marble	1995	437	Fisheries, Watershed/Soils
	Rock Rabbit	1998	1,699	Fisheries, Watershed/Soils
	Ramey	1999	200	Fisheries, Watershed/Soils
	Diamond Point Complex	2000	4,956	Fisheries, Watershed/Soils
	Marble Creek	2003	5,377	Fisheries, Watershed/Soils
	Missouri Ridge	2005	113	Fisheries, Watershed/Soils
	West Fork / Joe Creek	2005	14,137	Fisheries, Watershed/Soils, Wildlife
	Wolf Fang	2005	363	Fisheries, Watershed/Soils

Past Action	Description	Year	Acres	Resources Affected
Wildland Fire	Placer Creek	2006	21	Fisheries, Watershed/Soils
	Razor	2006	5	Fisheries, Watershed/Soils
	Twin Lakes	2006	55	Fisheries, Watershed/Soils
	Goat WFU	2007	280	Fisheries, Watershed/Soils
Golden Hand Mine	First development occurred on small veins on the north side of Coin Creek and approx. $1200.00 in gold was produced. Production from 1932-34 totaled 1,368 ounces of gold and 301 ounces of silver. Production ended in 1941. Since 1941 exploration and development has been limited to geologic mapping, surface and underground sampling, and construction of dozer trench on several of the Golden Hand Claims. Mining-related activities were authorized by the Forest Service until 1984. Those past authorized activities included clearing roads to allow vehicle access, recovery of gold bearing material hand tools and hand operated rocker box, cleaning out caved adits, exploratory drilling, and soil sampling. Most of the activity proposed from 1979 to 1984 was not implemented. Infrastructure on-site includes underground mine workings, mill (ruins), and a bunkhouse.	1889-1984		Cultural Resources, Noxious Weeds, Scenic Environment, Fisheries, Watershed/Soils, Minerals and Geology
New Snowbird Mine & McCrae Mill	Tungsten mine/mill with moderate production. CERCLA removal action by FS in 1998.	1954-1957		Watershed/Soils, Fisheries, Minerals and Geology
Independence Mine	One ton ore produced.	Pre - 1910		Watershed/Soils, Fisheries, Minerals and Geology
Golden Cup Mine	No production.			Watershed/Soils, Fisheries, Minerals and Geology
Sunday Mine	Around 10,000 tons of ore estimated to have been milled.	Pre-1940's		Watershed/Soils, Fisheries, Minerals and Geology, Wildlife, Noxious Weeds, Roadless, Scenic Environment
Werdenhoff Mine	Minor production.	1927-1934		Watershed/Soils, Fisheries, Minerals and Geology, Noxious Weeds, Roadless, Wildlife, Scenic

Past Action	Description	Year	Acres	Resources Affected
				Environment
Ludwig Mine	A few tons of tungsten ore produced.	1902-1930s		Watershed/Soils, Fisheries, Minerals and Geology
Moscow Mine	Minor production.	1903-late 1930's		Watershed/Soils, Fisheries, Minerals and Geology
Big Creek Bridge Construction & Ford Rehabilitation	Bridge constructed to replace the ford of Big Creek. Activities included 600 feet of new road construction to connect bridge to two existing roads, 600 feet of road decommissioned, and restored 0.45 acres of riparian area.	2011-2012		Watershed/Soils, Fisheries
Smith Creek ATV Trail Maintenance Project	Completed maintenance activities including installation of water bars, removal of failed wooden culverts, hardening of fords, and brushing of trail corridor.	2014		Watershed/Soils, Fisheries, Noxious Weeds
Logan Creek Bridge Decking Project	Installed new bridge decking.	2014		Watershed/Soils, Fisheries
Replacement of Big Creek Bridge at Jacob Ladder Flat	Valley County Road Department replaced an old bridge with a new bridge with a wider span.	2014		Watershed/Soils, Fisheries

Table A-2 – Cumulative Effects: Present and/or Ongoing Activities.

Present and/or Ongoing Action	Description	Year	Acres / Miles	Resources Affected
Road Maintenance - All Performed by Forest Service, County, Private Landowners, other members of the public.	Profile Gap Road (50340) and the road to the Big Creek Trailhead are currently maintained by the county under a cooperative agreement, both roads are on an annual or biannual maintenance schedule. Road maintenance activities include blading, slough removal, and culvert cleaning. Smith Creek and Pueblo Summit Roads have not received any maintenance for years. Assumed private landowners on private lands keep roads open and maintained to meet their needs. Smith Cr ATV trail may receive heavier maintenance than past years.	Ongoing		Watershed/Soils, Fisheries, Roads & Access Mgmt, Wildlife, Noxious Weeds, Roadless, Air Quality
Travel Management Plan – Snow Free	Travel Management Plan (Snow Free) for Krassel and McCall Ranger Districts. ROD completed in 2008. Ford of Big Creek scheduled to be bridged.	Ongoing		Watershed/Soils, Fisheries,
Water Diversion Special Use	Eight permitted water diversions	Ongoing		Watershed/Soils, Fisheries
Hydroelectric Project Special Use	Four permitted hydroelectric projects. Permitting of three residential, small-scale hydroelectric operations (0.4 to	Ongoing		Watershed/Soils, Fisheries

Present and/or Ongoing Action	Description	Year	Acres / Miles	Resources Affected
	0.9 CFS). One hydroelectric operation at Big Creek Lodge.			
Big Creek Lodge Special Use	Resort Special Use Permit. Lodge was burned and one guest cabin currently remains. Currently there are plans to construct a new lodge on the foot print of the original.	Ongoing		Watershed/Soils, Fisheries, Noxious Weeds, Wildlife, Roadless, Scenic Environment, Air Quality
Radio Service Special Use	One private mobile radio service permit with the State of Idaho.	Ongoing		None
Road Easements Special Use	Two permitted road easements	Ongoing		None
Big Creek Airstrip Operations & Maintenance Special Use	Special Use Permit with Idaho Transportation Department for operation and maintenance of grass airstrip.	Ongoing		Watershed/Soils, Noxious Weeds, Wildlife, Roadless, Scenic Environment, Air Quality
Big Creek Guard Station Operations and Maintenance	Operation of the National Forest administered site.	Ongoing		Watershed/Soils, Noxious Weeds, Wildlife, Roadless, Scenic Environment, Air Quality
Outfitter and Guide Operations	One outfitter and guide camp at the headwater of Mulligan Creek within Big Creek Lodge operating area. The entire area is part of two different outfitter and guide operations include 17, 117 acres of Big Creek Lodge operating area and 10, 811 acres of Elk Springs operating area. Activities include long term temporary camps, use of pack stock.	Ongoing		Watershed/Soils, Fisheries, Wilderness, Botanical Resources, Air Quality
Trail Maintenance	Several of these trails are maintained annually to include Chamberlain, Mosquito Ridge, Beaver Creek and Big Creek trails. Several other trails in the area are maintained bi-annually including Ramey Ridge, Pueblo Summit, and South Fork Chamberlain Creek. The other trails in the area are maintained less frequently. Trail maintenance activities include removal of downfall, constructing water bars for drainage improvement, and brush removal. Trail heads require less frequent maintenance which mainly consists of improving signage. Registration cards are collected from boxes at trailheads regularly during the accessible season.	Ongoing		Watershed/Soils, Fisheries, Wilderness, Wildlife, Botanical Resources, Noxious Weeds, Roadless, Air Quality
#001 Chamberlain		Ongoing	13.9	
#003 Mosquito Ridge		Ongoing	3.2	
#004 Cougar Basin		Ongoing	4.4	
#006 Ramey Ridge		Ongoing	5	
#007 McCalla Creek		Ongoing	0.1	
#008 Rock Rabbit		Ongoing	1.3	
#013 Pueblo Summit		Ongoing	4.1	
#014 Boulder Creek		Ongoing	3.7	
#015 Crane Meadows		Ongoing	2.8	
#016 Beaver Creek		Ongoing	5.2	
#019 S F Chamberlain Crk		Ongoing	2.1	
#065 Center Mountain		Ongoing	2.9	
#194 Smith Creek		Ongoing	4.9	
#196 Big Creek		Ongoing	3.4	
#207 Estep		Ongoing	3.8	

Present and/or Ongoing Action	Description	Year	Acres / Miles	Resources Affected
#233 Ramey Ridge Cutoff		Ongoing	2.7	
Fourth of July Mine	Approved plan of operations (1989) for small mine in the Government Creek drainage. Sporadic operation over the past 12 years.	Past and Ongoing		Watershed/Soils, Fisheries, Minerals and Geology, Air Quality
Velvet Quartz Mine	Approved plan of operation (1984). One or two person operation produces at most only a few tons of ore annually.	Past and Ongoing		Watershed/Soils, Fisheries, Minerals and Geology, Air Quality
Big Creek Airport Campground Operations and Maintenance	Operation and maintenance of National Forest campground site at the Big Creek Airport.	Ongoing		Watershed/Soils, Noxious Weeds, Roadless, Scenic Environment, Air Quality
Noxious Weed Control	Treatment of noxious weeds occurs yearly throughout the area. Treatments include chemical spraying and pulling. Main areas of treatment: Chamberlain area, Beaver Creek, and Big Creek trails, and along road access areas.	Ongoing		Watershed/Soils, Fisheries, Wildlife, Botanical Resources, Noxious Weeds, Roadless, Air Quality
Firewood Harvest	Removal of firewood for non-commercial use. Adhere to general permit requirements for the Payette National Forest	Ongoing		Watershed/Soils, Fisheries, Wildlife, Noxious Weeds, Roadless, Scenic Environment, Air Quality
Fish Habitat Sampling	Fish habitat and population sampling, and riparian area sampling is occurring annually and is multi-agency in scope.	Ongoing		Watershed/Soils, Fisheries, Wildlife, Air Quality
Subdivison and Residential Development of Private Land	Development on private lands must meet county regulations.	Ongoing		Roadless, Noxious Weeds, Scenic Environment, Wildlife, Fisheries, Watershed/Soils, Air Quality
Water Diversions / Withdrawals	Unknown amount of water diverted from water diversions on private land.	Ongoing		Fisheries, Watershed/Soils
Tourist/Guest Ranch Business	Unknown amount of tourist-related business located on private lands	Ongoing		Roadless, Air Quality
Recreational Use	Camping, hiking, backpacking, riding, fishing, hunting, sightseeing and associated activities.	Ongoing		Watershed/Soils, Fisheries, Wilderness, Wildlife, Botanical Resources, Roadless, Air Quality
Timber Harvest	Small scale harvest of trees off private land generally for personal use.	Ongoing		Noxious Weeds, Roadless, Scenic Environment, Fisheries, Wildlife, Watershed/Soils, Air Quality

Present and/or Ongoing Action	Description	Year	Acres / Miles	Resources Affected
Noxious Weed Control, Private Lands	Localized and limited on private lands. Methods probably include spraying and pulling.	Ongoing		Noxious Weeds, Roadless, Fisheries, Watershed/Soils, Air Quality
Mining on Patented Land	Campbird Mine located on private land along Logan Creek. Outside of maintenance, this mine has seen little activity in past 30 years. Walker Millsite located on private land along Logan Creek. Plan of operations approved in 1990 includes 50 ton per day ball mill and gravity milling process; a 50' by 100' by 8' deep tailings impoundment, 1000' of access road; a water transmission line, and explosives magazine. Mill is now located on private land and millsite on NFS land is reclaimed.	Past and Ongoing		Watershed/Soils, Mining, Fisheries, Wildlife, Air Quality
Legal Hunting	Hunting of legal game animals regulated by the State of Idaho.	Ongoing		Wildlife, Roadless, Air Quality
Legal Fishing	Angling of legal game animals regulated by the State of Idaho.	Ongoing		Fisheries, Roadless, Air Quality
Legal Trapping	Trapping as regulated by the State of Idaho.	Ongoing		Wildlife, Roadless, Air Quality
Tribal Subsistence and Ceremonial Activities	Nez Perce Tribe subsistence and ceremonial activities.	Ongoing		Roadless, Wildlife, Air Quality

Table A-3 – Cumulative Effects: Foreseeable Future Activities.

Foreseeable Future Action	Description	Year	Acres / Miles	Resources Affected
Big Creek Fuels Reduction Project	Create an area of reduced wildfire risk and fire severity/intensity on NFS lands around Edwardsburg and private property using commercial timber harvest, understory treatment, and prescribed burning.	2018 Est.		Watershed/Soils, Fisheries, Wildlife, Noxious Weeds, Roadless, Scenic Environment, Air Quality
Big Creek Restoration and Access Management Project	Collaborative effort to establish a restoration project in the Big Creek drainage that focuses on road restoration and recreational access. The proposed action would include a suite of road decommissioning, road maintenance, and National Forest System road and trail designations. All unauthorized and NFS system roads are currently being considered.	2016 Est.		Watershed/Soils, Fisheries, Wildlife, Noxious Weeds, Roadless, Air Quality, ROS
Morgan Ridge Exploration Project	A plan of operations has been submitted to the Forest Service for consideration. The plan of operation would maintain access roads to four exploratory drill	2016 Est.		Watershed/Soils, Fisheries, Wildlife, Noxious Weeds, Roadless, Air

Foreseeable Future Action	Description	Year	Acres / Miles	Resources Affected
	pads and drill six core holes to depths up to 1,500 feet. The Forest Service has yet to determine if the plan of operation represent a reasonable plan for the development of the mineral resource.			Quality
Big Creek Road Access Plan of Operation	A plan of operation has been submitted to the Forest Service for consideration. The plan of operation proposes to maintain and use claim access roads in the Big Creek drainage. Proposed activities include geochemical analysis and sampling, geologic mapping, and similar activities on mineral claims owned by AIMMCO. The Forest Service has yet to determine if the plan of operation represent a reasonable plan for the development of the mineral resource.	2016 Est.		Watershed/Soils, Fisheries, Wildlife, Noxious Weeds, Roadless, Air Quality
Replacement of Big Creek culvert upstream of Jacob's Ladder Flat	Valley County Road Department in partnership with USFS and NPT will replace existing undersized culvert with a bridge.	2015		Watershed/Soils, Fisheries
Installation of bridge over North Fork Smith Creek	Installation of a bridge at an existing ford.	2015		Watershed/Soils, Fisheries

Figure A-1

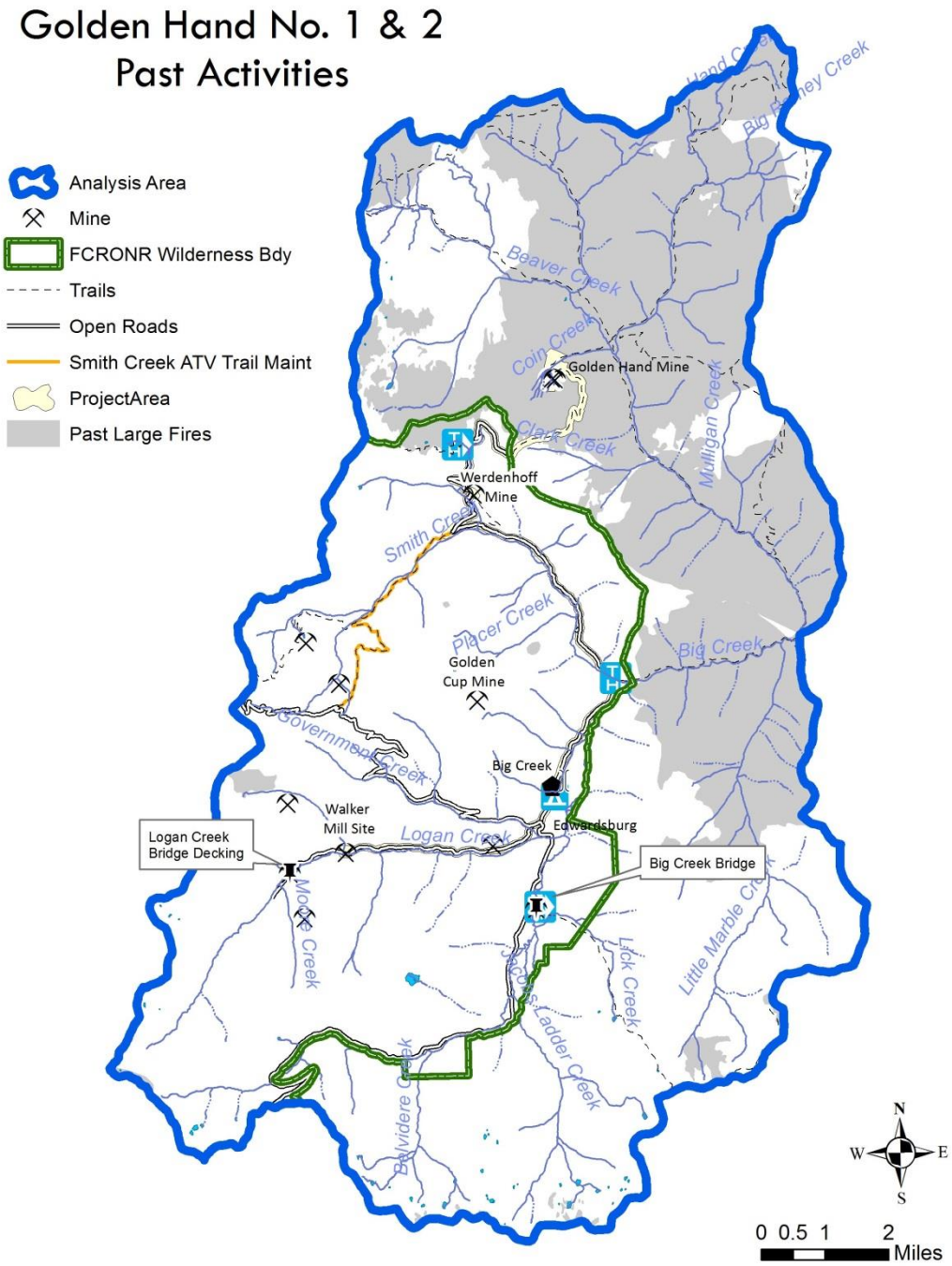
Golden Hand No. 1 & 2
Past Activities
Analysis Area
Mine
FCRONR Wilderness Bdy
Trails
Open Roads
Smith Creek ATV Trail Maint
ProjectArea
Past Large Fires
Beaver Creek
Coin Creek
Golden Hand Mine
Clark Creek
Mulligan Creek
Werdenhoff Mine
Smith Creek
Placer Creek
Golden Cup Mine
Big Creek
Government Creek
Big Creek
Walker Mill Site
Logan Creek
Edwardsburg
Logan Creek Bridge Decking
Big Creek Bridge
Moore Creek
Little Marble Creek
Lick Creek
Jacob's Ladder Creek
Belvidere Creek
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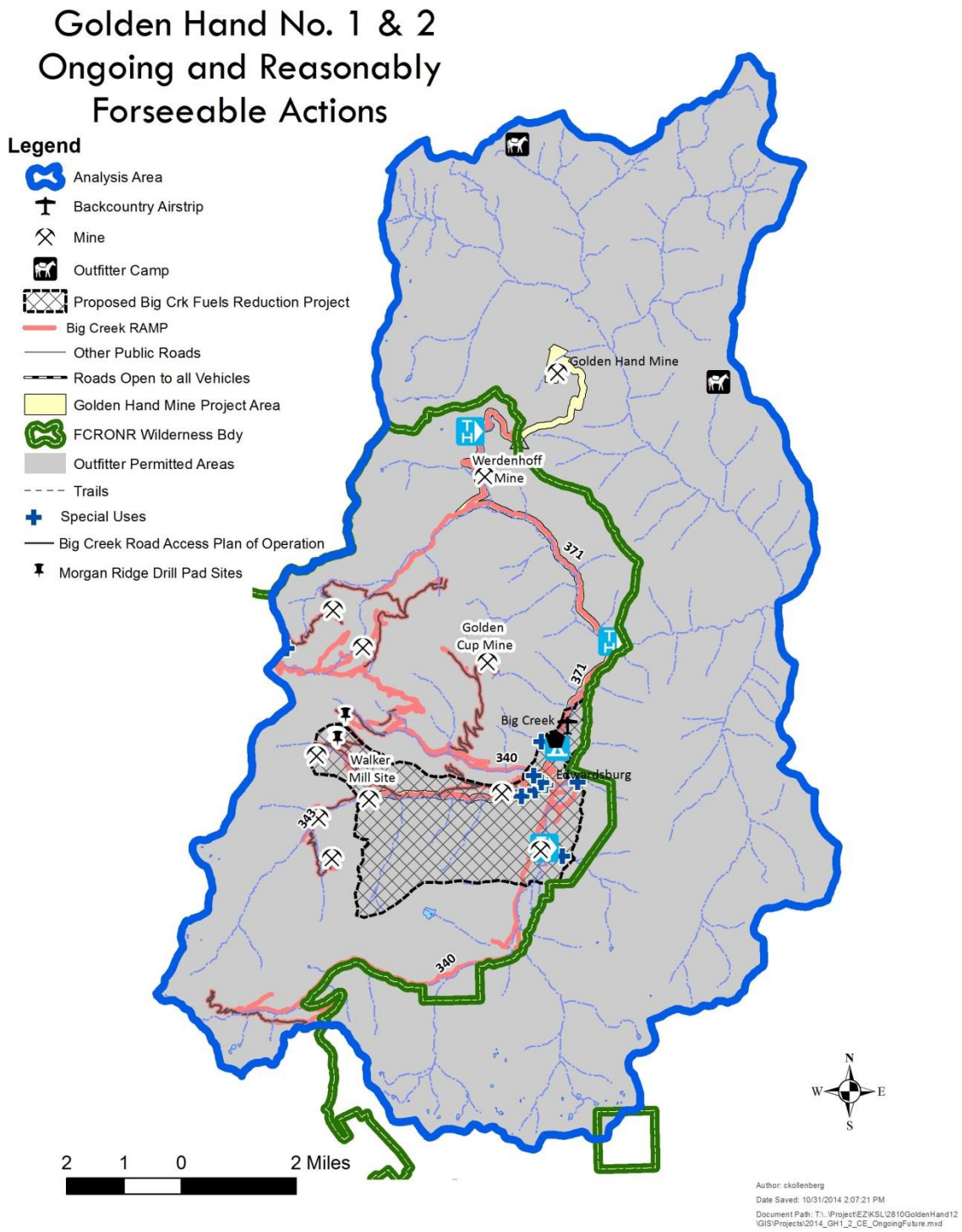
Figure A-2


Golden Hand No. 1 & 2
Ongoing and Reasonably
Forseeable Actions
Legend
Analysis Area
Backcountry Airstrip
Mine
Outfitter Camp
Proposed Big Crk Fuels Reduction Project
Big Creek RAMP
Other Public Roads
Roads Open to all Vehicles
Golden Hand Mine Project Area
FCRONR Wilderness Bdy
Outfitter Permitted Areas
Trails
Special Uses
Big Creek Road Access Plan of Operation
Morgan Ridge Drill Pad Sites
Golden Hand Mine
Werdenhoff
Mine
371
Golden
Cup Mine
371
Big Creek
340
Walker
Mill Site
Edwardsburg
343
340
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APPENDIX B

Appendix B
Soil, Water, Riparian, and Aquatic Resources
Watershed Condition Indicators

Table B-1 Environmental Baseline Matrices
Table B-2 Effects Matrices

TABLE B-1 ENVIRONMENTAL BASELINE MATRICES

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (upper Big Creek), One 6th level HU (Beaver Creek)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Local Population Character (Bull trout only)			
Local Population Size	Mean total local population size or local habitat capacity more than several thousand individuals. Adults in local population > 500. All life stages are represented within the local population.	FA PJ	Data from snorkel surveys in 1994, 1999, 2002 - 2004, and spawning surveys from 2003 - 2004 indicate that bull trout are abundant in Big Creek tributaries including Smith Creek and Beaver Creek, and that all life stages are represented (data on file PAF SO, McCall, ID; Burns et al. 2005). FR rating given because there are not enough data to determine if the total population is more than several thousand or the adult population is >500.
Growth and Survival	Local population has the resilience to recover from temporary or short-term disturbances (e.g., catastrophic events, etc.) or local population declines within 1 to 2 generations (5-10 years). The local population is characterized as increasing or stable. At least 10 years of data support this estimate.	FR PJ	There are not sufficient trend data to characterize growth and survival. **-** If "...a trend cannot be confirmed, a local population would be considered at risk until enough data is available to accurately determine its trend" (from definition of Functioning at Risk in LRMP App. B, Table B-1)
Life History Diversity and Isolation	The migratory form is present and the local populations are in close proximity to each other. Migratory corridors and rearing habitat (lake or larger river) are in good to excellent condition for the species. Neighboring local populations are large with	FA PJ	Large, presumably migratory, bull trout have been observed in upper Big Creek and tributaries to Big Creek, such as Beaver Creek and Smith Creek. The habitat is generally functioning appropriately (see Matrix entries below). Big Creek flows into a designated Wilderness area and joins the Middle Fork of the Salmon River. In general, bull trout habitat is well connected, bull trout are well distributed, and all life history strategies are likely present within the Big Creek and Middle Fork Salmon River drainage (data on file PAF Supervisors office, McCall, ID). Burns et al. 2005: "Based on the authors' observations of large bull trout, we have made the assumption that fluvial bull trout are still present in the mainstem and probably exchange genetic material with the populations documented in some tributaries that we've assumed to be predominantly resident fish.

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
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(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
	high likelihood of producing surplus individuals or straying adults that would mix with other local populations.		It appears that the full range of bull trout life histories occur in this watershed." For Monumental Creek (downstream of the analysis area), migratory corridors and rearing habitat are in good to excellent condition with the exception of where the Thunder Mtn. access road and historical mining have adversely affected the streams, and where several stream crossings may not allow fish passage at all flows and life stages (data on file at PAF SO, McCall, Idaho).
Persistence and Genetic Integrity	Connectivity is high among multiple (5 or more) local populations with at least several thousand fish each. Each of the relevant local populations has a low risk of extinction. The probability of hybridization or displacement by competitive species is low to nonexistent.	FA PJ	Brook trout were observed in upper Big Creek, and Logan Creek in 1993, and in Lick Creek in 1999. Brook trout were not detected in surveys of Logan Cr., NF Logan Cr., and Government Cr. in 2004. No brook trout have been detected in Smith Cr. Hybridization between brook trout and bull trout is likely, but the extent is unknown. (data on file PAF Supervisors office, McCall, ID; Burns et al. 2005; Raleigh 1994). Due to the large extent of suitable and occupied habitat in the Big Creek watershed, and the presence of all life history types (resident and migratory), bull trout population viability remains high relative to other areas on the PAF (Burns et al. 2005).

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (upper Big Creek), One 6th level HU (Beaver Creek)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	Baseline Condition	Discussion of Baseline and Current Condition
Water Quality			
Temperature	**Bull trout:** 7-day average maximum temperature in a reach during the following life history stages: Incubation: 2-5°C or 35.6-41.0°F Rearing: 4-12°C or 39.2-53.6°F Spawning: 4-9°C or 39.2-48.2°F Also temperatures do not exceed 15°C or 59.0°F in areas used by adults during migration (no thermal barriers) **Chinook/steelhead**: 7-day average minimum. Spawning, rearing and migration: 50-57°F (10-13.9°C)	FR D,PJ	Temperature values range from FA to FUR, but data are considered to reflect a natural temperature regime in the Big Creek drainage because except for roads in RCAs and the pasture and airstrip on McKorkle Creek, there is little evidence of management effects in these watersheds that would contribute to elevated temperatures. Given the stream elevation, topography, aspect, and riparian vegetation characteristics, the data likely reflects the natural range of variability. Little to no data during winter incubation months past September. The temperatures are summarized as seasonal maximum of 7-day average of daily maximums in degrees Celsius. Beaver at mouth (E228) 12.9 – 14.2 (2002-2008) Coin Creek at Golden Hand (E279) 7.7 (2009) Coin Creek tributary (E305) 8.3 (2009) Smith Creek at mouth (E208) 10.8-13.9 (2000, 2001, 2004, 2009) North Fork Smith Creek (E301) 10.8 (2009) Logan Creek (E123) 14.1 (1994) Logan Creek at NFk Logan (E245) 11.2 (2004) Logan Creek upper (E094) 11.3 (2009) Big Creek at McKorkle Cr (E118) 14.3 - 15.2 (2009, 2010) Big Creek at Logan Cr (E109) 15.1 – 18.0 (1994-2004, 2010) Big Creek at Jacobs Ladder Cr (E289) 10.3 - 11.9 (2009-2010) Unpublished data on file at PAF SO, McCall, ID
Intragravel Quality (in areas of spawning and incubation for anadromous fishes) **"Sediment" WCI has been replaced by new**	**Revised WCI for PAF, Nelson and Burns 2005** High intragravel quality is indicated by: (a) 5-year mean fines < 6.3 mm concentrations at depth of 28% or less with no more than two years between	See Interstitial Sediment Deposition, below	Intragravel quality data is not available for this analysis area. See Interstitial Sediment Deposition, below

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (upper Big Creek), One 6th level HU (Beaver Creek)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
indicator from Nelson and Burns 2005	28% and 36%. OR (b) 5-year mean fines < 6.3 mm concentrations at depth between 28% and 36% with a decreasing trend over at least 10 years.		
Chemical Contaminants and/or Nutrients	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients, no 303(d) water quality limited water bodies.	FA PJ	No 303d water quality limited bodies, intermittent water quality testing shows no evidence of contamination from past mining actions (Jim Egnew, Minerals, Payette NF, Personal communication)
Habitat Access			
Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows.	FR PJ, D	All culverts in the area have been inventoried using the National Inventory and Assessment Procedure (Clarkin et al. 2003). A culvert on a small tributary to NF Logan Cr. and one culvert near the headwaters of McCorkel Cr. may hinder or block passage for fish and other aquatic organisms. However, the high gradient and small stream size upstream of the culverts would not likely provide good spawning, rearing, or migration habitat for bull trout, or steelhead. There are two culverts that are barriers on Big Creek upstream of Edwardsburg, but the high stream gradient and multiple vertical falls may preclude fish from moving upstream regardless of the culverts (data on file at PAF Supervisors Office, McCall, ID). Numerous stream crossings in the analysis area are fords, which are not likely barriers to fish passage. Other barriers to fish and aquatic organisms may occur at points of diversion for water rights. There are no human caused barriers in the Beaver Creek subwatershed.

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (upper Big Creek), One 6th level HU (Beaver Creek)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Habitat Elements			
Interstitial Sediment Deposition (all listed fished in tributary systems) **"Substrate Embeddedness" WCI has been replaced by new theory in Nelson and Burns 2005**	**Revised WCI for non-granitics, such as Big Creek, PAF, Nelson and Burns 2005, Nelson et al. 2006.** Adequate interstitial space is indicated by: A five-year mean measured cobble embeddedness level of 19% or less OR A five-year mean free matrix count of 43% or more. Surface fines less than 3%	FUR D	CE = Cobble Embeddedness, FM = Free Matrix, SF = Surface Fines. CE less than 19% = FA; 19 – 25% = FR; greater than 25% = FUR FM greater than 43% = FA; 33-43% = FR; less than 33% = FUR SF less than 3% = FA; 3-6% = FR; greater than 6% = FUR. Big Creek CE 2 yr mean =12.9% **FA**; FM 2 yr mean = 44.8% **FA**; SF 2 yr mean = 2.3% **FA** Government. Creek CE 4 yr mean = 26.9% **FUR**; FM 5 yr mean = 28.1% **FUR**, SF 5 yr mean = 6.6% **FUR** Jacobs Ladder CE 5 yr mean = 20.4% **FR**; FM 5 yr mean = 48.1% **FA**, SF 5 yr mean = 2.2% **FA** Lower Logan CE 5 yr mean = 28.3% **FUR**; FM 5 yr mean = 24.8% **FUR**, SF 5 year mean = 7.8% **FUR** Upper Logan CE 3 yr mean = 23.1% **FR**; FM 3 yr mean = 31.1% **FUR**, SF 5 year mean = 3.9% **FR** Smith Creek CE 5 yr mean = 20.8% **FR**; FM 5 yr mean = 34.4% **FR**, SF 5 yr mean = 2.2% **FA** ***All 5 year mean were calculated from 1994-1997, and 2004. CE has only been measured 3 times on Govt and upper Logan Cr 1990, 1994, 2004. Big Creek has only 1 year of data, 2004.** PAF survey of Coin Creek surface fines in 2002 = 3.3% Using different sampling methodologies than used for the data reported above, House et al. (2005) report similar to higher values for cobble embeddedness in Coin Creek, Smith, and Beaver Creek. Estimates of surface fines by House et al (2005), were in Coin, Smith, and Beaver Creek were generally higher than PAF estimates.

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (upper Big Creek), One 6th level HU (Beaver Creek)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Large Woody Debris	> 20 pieces per mile, > 12 inches in diameter, > 35 feet length; and adequate sources of large woody debris for both long and short-term recruitment in RCAs.	FA D	There are > 20 pieces per mile of > 12 " diameter and > 35 ' in length LWD in upper Big Cr., Logan Cr., Government Creek, and Coin Creek (Raleigh 1994, Unpublished data on file at PAF SO (2002, 2008)). The amount of LWD is close to or exceeds the values for average counts of LWD in plutonic streams with similar avg. wetted width given in the Natural Conditions database (Overton et al. 1995; data on file at PAF Supervisors Office, McCall, ID)
Pool Frequency	**Bull trout:** Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment. Large woody debris recruitment standards for functioning appropriately (above) are met and pool frequency in a reach closely approximates: Wetted Width (ft.) / Number of Pools/Mile 0-5 39 5-10 60 10-15 48 15-20 39 20-30 23 30-35 18 35-40 10 40-65 9 65-100 4 **steelhead:** Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment.	FA D	The number of pools per mile in the smaller streams such as Logan Cr., and Government Cr, and Coin Creek exceed the desired values for bull trout and steelhead, and exceed or are close to the number of pools per mile given in the Natural Conditions database (Overton et al. 1995). Large woody debris recruitment stream temperatures and sediment are functioning appropriately. The number of pools per mile in Coin Creek and Beaver are low, but this may be due to small size of the streams especially with Coin Creek (2008 data on file PAF SO, McCall, ID). The number of pools per mile in upper Big creek (20 pools/mile, width 28 ft) is less than the desired condition for bull trout and /steelhead, but exceeds the number of pools per mile in the Natural Conditions database. Large woody debris recruitment standards are functioning appropriately; therefore that component of fish cover is adequate. Stream temperatures and sediment are functioning appropriately (data on file at PAF Supervisors Office, McCall, ID; Raleigh 1994).

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (upper Big Creek), One 6th level HU (Beaver Creek)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
	Large woody debris recruitment standards for functioning appropriately (above) are met and pool frequency in a reach closely approximates: Channel Width (ft.) / Number of Pools/Mile 0-5: 184 5-10: 96 10-15: 70 15-20: 56 20-25: 47 25-50: 26 50-75: 23 75-100: 18		
Pool Quality	Each reach has many large pools > 3.28 feet (1 meter deep). Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment.	FA D	See WCI for Pool frequency
Off-Channel Habitat	Watershed has many ponds, oxbows, backwaters, and other off-channel areas with cover; side channels are low energy areas.	FA D	There has been very little anthropogenic channel modification that would have altered the amount or condition of off-channel habitat in the Big and Marble Creek watersheds (personal observation). Therefore, off-channel habitat should be functioning appropriately. Off-channel habitat is constricted locally along developed areas in Upper Big Creek, but otherwise intact within the analysis area (GIS road layers, data on file at the PAF Supervisors Office, McCall, Idaho) (personal observation).

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (upper Big Creek), One 6th level HU (Beaver Creek)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Refugia	**Bull trout:** Habitats capable of supporting strong and significant local populations are protected and are well distributed and connected for all life stages and forms of the species. **Steelhead:** Habitat refugia exist and are adequately buffered (e.g., by intact riparian conservation areas); existing refugia are sufficient in size, number, and connectivity to maintain viable populations or sub-population	FA PJ	The habitat in the Big Creek drainage is generally functioning appropriately (refer to relevant Matrix entries) and has not been fragmented with barriers. Big Creek flows into a designated Wilderness area and joins the Middle Fork of the Salmon River where the habitat is well connected and generally reflects natural conditions. (data on file PAF Supervisors office, McCall, ID)
Channel Condition and Dynamics			

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (upper Big Creek), One 6th level HU (Beaver Creek)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Width/Max Depth Ratio	≤10	FA D	The width/maximum depth ratios in Logan Cr., NF Logan Cr., and Government Cr. are ≤10. The width/maximum depth ratio is not available for upper Big Cr..; however, the average width depth ratio for Big Cr. within the project area is 24.4 which are similar to the mean (27) and mode (20) width to max depth ratio for "B" channel, plutonic streams documented in the Natural Conditions database (Overton et al. 1995) (data on file PAF Supervisors office, McCall, ID; Raleigh 1994). Recent surveys (2003, 2008) show mean width:max depth ratios (FBase output): Smith Ck:= 8.8 Beaver Ck: = 9.2 Coin Creek (2008) = 7 There are many motorized fords on the FRD 371, 373, and trail 194, but these affect a small relative proportion of the streambanks.
Streambank Condition	>90% of any stream reach has stable banks relative to the percent of inherent stable streambanks associated with a similar unmanaged stream system.	FA D	Stream bank stability is >90% for upper Big Creek tributaries (Raleigh 1994). (data on file at the PAF Supervisors Office, McCall, Idaho) There are many motorized fords on the FRD 371, 373, and trail 194, but these affect a small relative proportion of the streambanks.
Floodplain Connectivity	Within RCAs, floodplains and wetlands are hydrologically linked to the main channel; overbank flows occur and maintain wetland/floodplain functions; and riparian vegetation succession.	FA PJ	Floodplains are constricted along some roads but otherwise intact within the analysis area (personal observation). .
Flow/Hydrology			
Change in Peak/Base Flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of	Big Creek 5th HU - FR D Beaver Creek 6th HU – FA, D	There are a number of State water rights for irrigation, domestic, culinary, and hydropower use in the analysis area. Water rights in the analysis area total 2.24 cfs. Some of these diversions withdraw more than 10% of the flow from smaller fish bearing tributaries. (data on file PAF, S.O. McCall, ID).

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(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
	a similar size, geomorphology and climatology.		There are currently no diversions on Coin Creek or Beaver Creek. Base flow in Coin Creek 0.5 cfs near Forest trail #194 crossing (Raleigh 1994; data on file PAF, SO McCall, ID). Flow near mouth of Coin Creek has been estimated at 6.25 cfs (Sept. 8, 2008), and 3.35 cfs (July 30, 2002) and as low as 0.71 cfs on September 23, 1993 by Raleigh (1994). The 0.71 cfs estimate by Raleigh (1994) could not be verified with raw data. Base flow in Beaver Creek near Big Creek has been estimated at 40 cfs (Raleigh 1994). The indicator for peak/base flows in the analysis area is considered FR for Big Creek due to the influence of the various diversions on tributaries to Big Creek, and FA for Coin and Beaver Creek (Beaver Creek 6th HU) where no diversions occur.
Drainage Network Increase	Zero or minimum change in active channel length correlated with human caused disturbance.	FR D	Roads and ATV trails on old roadbeds have changed active channel length in localized areas within upper Big Creek (GIS data on file PAF SO, McCall, ID).

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(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	Baseline Condition	Discussion of Baseline and Current Condition
Watershed Conditions			
Road Density and Location	Total road density < 0.7 miles/square mile of subwatershed, no roads within RCAs.	FUR D	

	Road Length (miles)				Road Density (mi/mi^2)					
	In Analysis Area		In RCAs[3]		In Analysis Area			In RCAs[3]		
Analysis Area 6th Hucs	**System[1]**	**Un-authorized[2]**	**System[1]**	**Un-authorized[2]**	**System[1]**	**Un-authorized[2]**	**Total**	**System[1]**	**Un-authorized[2]**	**Total**
Beaver Cr	0	4.7*	0	1.2*	0	0.1	0.1	0	0.2*	0.2
Big Cr-Little Marble Cr	2.8	2.1	1.1	0.5	0.1	0.1	0.2	0.3	0.1	0.4
Logan Creek	11.6	21.3	6.7	5.3	0.5	1.0	1.5	2.2	1.8	4.0
Smith Creek	16.1	10.1	7.6	2.7	0.8	0.5	1.3	2.4	0.8	3.3
Upper Big Creek	9.4	9.2	4.9	3.3	0.3	0.3	0.7	1.0	0.7	1.7
Overall	**39.8**	**47.3**	**20.5**	**12.8**	**0.3**	**0.3**	**0.6**	**0.9**	**0.6**	**1.5**

6th Field HUC	**Road Length (miles) with 200 ft of stream channels**		
	System[1]	**Unauthorized[2]**	**Total**
Beaver Cr	0	0.9*	0.9
Big Cr-Little Marble Cr	0.4	0.3	0.7
Logan Creek	4.8	3.4	8.2
Smith Creek	4.4	1.6	6.0
Upper Big Creek	3.2	1.9	5.1

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(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Golden Hand 1 and 2		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	Baseline Condition	Discussion of Baseline and Current Condition
			Overall 12.9 8.0 20.9 Road density is functioning at risk, but many of the roads are located within RCAs, with roads paralleling the stream channels. There are many motorized fords on the FRD 371, 373, and trail 194.
Disturbance History	< 15% ECA (entire watershed) with no concentration of disturbance in areas with landslide or landslide prone areas, and/or refugia, and/or RCAs.	FR D, PJ	ECA is 18% for the analysis area (data on file WARS database PAF SO McCall, ID). Nelson et al. 2004: " We cannot confirm that even high ECA, as estimated on the PAF to date, has any observable effect on salmonid habitat. This suggests that estimated ECA on the PAF says little about the potential for affected streams to support salmonids. We cannot determine whether there is some threshold value above which habitat conditions would be unacceptably altered…". During a field visit to the area in 2008 it was noted that the stream channels (all perennial and intermittent) had scoured out from the head waters down to where trail 013 fords the eastern most tributary and Coin Creek. Because of the high elevation of the area and the northerly aspect of the drainage the scouring was most likely caused by a high intensity rain storm on a severely burned area in the headwaters. There is a concentration of road related disturbance in some RCAs (see road density and location WCI) (GIS data on file PAF SO McCall, ID)
Riparian Conservation Areas	The riparian conservation areas within the subwatershed(s) have historic and occupied refugia for listed, sensitive or native/desired nonnative fish species which are present and provide: adequate shade, large woody debris recruitment, sediment buffering, connectivity, and habitat protection and connectivity to adequately minimize adverse effects from land management	FR D, PJ	Nearly 19 miles of streams have been inventoried in the Upper Big Cr. H.U. Of those, 86% rated "good", 14% rated "fair" based on the Pfankuch Stability Rating methodology. Fair ratings were given to tributaries of Big Cr., and Logan Creek and sections of McKorckle Cr. (Riparian inventory, 2004, on file PAF Krassel RD, McCall, ID). In the Big Creek-Beaver Cr. H.U. limited inventory indicates that the mainstem of Beaver Cr. is in good condition (Stream inventory, 2003). Personal observation of the east fork and west fork of Coin Cr show these channels have been scoured (including fords crossing both channels). Scouring is most likely due to a high intensity rain event that occurred in the summer of 2007. RCAs are not intact where roads, private in-holdings and FS administrative sites occur (i.e., FS

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Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
	activities (>80% intact). All vegetative components are within desired conditions identified in Appendix A of the Forest Plan. RCA functions and processes are intact, providing resiliency from adverse affects associated with land management activities. Conditions fully support habitat for aquatic species.		stock pasture) but otherwise intact within the analysis area (GIS data on file PAF SO, McCall, ID). **% of RCA with roads** Big Creek-Little Marble 4 Logan Creek 43 Upper Big Creek 20 Smith Creek 36 Beaver Creek 2 **Total 16** % of RCA with roads calculated by dividing the miles of road in RCA by the miles of road.
Disturbance Regime	Disturbance resulting from land management activities are negligible or temporary. Streamflow regimes are appropriate to the local geomorphology, potential vegetation and climatology resulting in appropriate high quality habitat and watershed complexity that provide refugia and rearing space for all life stages or multiple life-history forms. Ecological processes are within historical ranges.–Resiliency of habitat to recover from land management disturbances is high.	FA PJ	Management activities have not altered the disturbance regime significantly (e.g., wildfire has burned actively in surrounding areas; limited vegetation management in recent decades). There is good connectivity between high quality habitat and refugia for all life history stages. See entries above for Local Population Size, Growth and Survival, Life History Diversity and Isolation and Refugia. Roads are the most significant influence on disturbance regime, see drainage network increase WCI.

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Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Integration of Species and Habitat Conditions	Habitat quality and connectivity among local populations is high. The migratory form is present. Disturbance has not altered channel equilibrium. Fine sediments and other habitat characteristics influencing survival and growth are consistent with pristine habitat. The local population has the resilience to recover from short-term disturbance within one to two generations (5 to 10 years). The local population is fluctuating around an equilibrium or is growing.	FR D, PJ	**Bull trout** Bull trout are well distributed in Big Creek and tributaries (data on file PAF SO, McCall, ID).. Habitat connectivity appears to be good within the analysis area; some WCI's are functioning at risk. **Chinook/steelhead** Habitat connectivity appears to be good within the analysis area; some WCI's are functioning at risk. Long-term adult return and redd count data shows a declining sub population trend (57FR14653, 60FR43937, 63FR31647). **Westslope cutthroat trout** Westslope cutthroat trout are well distributed in Big Creek and tributaries (data on file PAF SO, McCall, ID). Habitat connectivity appears to be good within the analysis area; some WCI's are functioning at risk.

Table B-2 Effects Matrices

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(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)			
Management Action	Golden Hand 1 and 2 Alternative B and Alternative C		

Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Character					

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Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Size **FA**	M	-*	-*	+*	Road improvements and maintenance would help reduce road related sediment effects on habitat. Effects to local population size would be negligible at all time scales. Open bottom stream crossing structure on NF Smith Creek near the Werdenhoff site would reduce impacts to individuals. Relocation during culvert installation could adversely affect individuals. Fording lower NF Smith could adversely affect individuals but would not likely have significant effects on the local population. More vehicle trips in Alt B than Alt C would result in more potential for effects to fish at NF Smith Creek ford.
Growth and Survival **FR**	M	-	-	+	Adverse effects to individuals could occur from harassment or crushing at the lower North Fork Smith Creek ford. Adverse effects to individuals could occur from relocation of fish during installation of the pipe arch at the upper North Fork Smith Creek ford. Installation of the pipe arch will reduce long term adverse effects to individuals. Effects will not improve growth and survival enough to change the FR rating.
Life History Diversity and Isolation	M	-*	-*	+*	See discussion for local population size.

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(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)			
Management Action	Golden Hand 1 and 2 Alternative B and Alternative C		

Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
FA					
Persistence and Genetic Integrity **FA**	M	-*	-*	+*	See discussion for local population size.
Water Quality					
Temperature **FR**	M	-*	-*	None	Water withdrawal could have a minimal temporary and short term effect of stream temperature. Temporary roads will be authorized on existing roadbeds requiring very little disturbance to shade providing vegetation in the riparian area. Rehabilitation of ford approaches in the wilderness with benefit stream shade by a very small amount. Alt B effects identical to Alt C

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Core Area (Bull Trout)			
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Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Intragravel Quality (in areas of spawning and incubation for anadromous fishes) **"Sediment" WCI has been replaced by new indicator from Nelson and Burns 2005** See Interstitial Sediment Deposition, below	M	Outside Wilderness = +* Inside Wilderness = -*	Outside Wilderness = +* Inside Wilderness = -*	+*	Outside the Wilderness road surface improvements would reduce sediment delivery in the temporary and short term. Sediment delivery would be reduced in the long term as long as road improvements are maintained. Inside the Wilderness road surface improvements would minimize sediment delivery from increased use in the temporary and short term. Design features would minimize sediment delivery during ford reconstruction and use. Rehabilitation of ford approaches will reduce sediment delivery in the long term. More vehicle trips in Alt B than Alt C would result in more potential for sediment delivery.
Turbidity **FR**	M	-*	-*	+*	Turbidity caused by replacement of pipe arch will have temporary adverse effects to bull trout and steelhead, but pipe arch will reduce turbidity long term. Fording North Fork Smith Creek and tributaries, and Coin Creek will cause insignificant temporary turbidity. Repair of fords, and improvements and maintenance of roads will cause insignificant temporary turbidity, but will reduce turbidity in the long term if improvements that reduce sediment delivery are maintained. More vehicle trips in Alt B than Alt C would result in more

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Core Area (Bull Trout)			
Management Action	Golden Hand 1 and 2 Alternative B and Alternative C		

Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					potential for turbidity. **Effects will not be significant at the subwatershed scale and the FR rating will be maintained.**
Chemical Contaminants and/or Nutrients **FA**	M	-*	-*	+*	Increased motorized fording of stream will increase potential for contamination in temporary and short term. The quantities delivered from leaks are expected to have negligible effects. Fuel will be transported in DOT approved containers minimizing the chance of spills. Containment will be sufficient to handle 120 percent of hazardous material. Pipe arch on North Fork Smith Creek will result in long term reduction in contamination, but effects will be insignificant at the subwatershed scale. Toxicants will not be stored in RCAs. Core drilling not expected to significantly effects water quality in Coin Creek.
Habitat Access					
Physical Barriers **FR**	M	-*	None	None	Fish passage could be blocked for up to 1 week during installation of the pipe arch on North Fork Smith Creek.

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Core Area (Bull Trout)			
Management Action	Golden Hand 1 and 2 Alternative B and Alternative C		

Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Habitat Elements					
Interstitial Sediment Deposition **(all listed fished in tributary systems)** **"Substrate Embeddedness" WCI has been replaced by new theory in Nelson and Burns 2005** **FUR**	M	Outside Wilderness = +* Inside Wilderness = -*	Outside Wilderness = +* Inside Wilderness = -*	+*	Outside the Wilderness road surface improvements will reduce interstitial sediment deposition in the temporary and short term. Sediment deposition will be reduced in the long term as long as road improvements are maintained. Sediment deposition from installation of stream crossing structure and construction of approaches on North Fork Smith Creek will be temporary and negligible. Armoring approaches and other road improvements and maintenance will cause temporary to increases in sediment delivery, but will be minimized with BMPs. Inside the Wilderness road surface improvements will minimize sediment deposition caused by increased use in the temporary and short term. Design features will minimize sediment deposition during ford reconstruction and use. Rehabilitation of ford approaches will reduce sediment deposition in the long term by negligible amounts. More vehicle trips in Alt B than Alt C would result in more potential for sediment delivery. All effects will be insignificant at the subwatershed scale.

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(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)			
Management Action	Golden Hand 1 and 2 Alternative B and Alternative C		

Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Large Woody Debris **FA**	M	-*	-*	+*	Mitigations will prevent more than negligible effects to LWD recruitment from road maintenance. Rehabilitation of approaches to fords in Coin Creek will improve LWD recruitment long term by a minimal amount. Disturbance to vegetation from construction of approaches to North Fork Smith Creek stream crossing structure will be minor, and offset by rehabilitation of old ford approaches. Alt B effects identical to Alt C
Pool Frequency **FA**	M	-*	-*	+*	Temporary increases in sediment from roads and withdrawal of water from Coin Creek would have negligible negative temporary and short term effects. Rehabilitation would result in negligible improvements long term. More vehicle trips in Alt B than Alt C would result in more potential for sediment delivery.
Pool Quality **FA**	M	-*	-*	+*	Temporary increases in sediment from roads and withdrawal of water from Coin Creek would have negligible negative temporary and short term effects. Rehabilitation would result in negligible improvements long term. More vehicle trips in Alt B than Alt C would result in more potential for sediment delivery.
Off-Channel Habitat	M	-*	-*	none	Withdrawal of water from Coin Creek would have

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Core Area (Bull Trout)			
Management Action	Golden Hand 1 and 2 Alternative B and Alternative C		

Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
FA					negligible negative temporary and short term effects. Alt B effects identical to Alt C
Refugia **FA**	No Influence	none	none	none	No influence
Channel Condition and Dynamics					
Width/Max Depth Ratio **FA**	M	-*	-*	+*	Improvements at fords, such as armoring with rock would minimize impacts from increased motorized travel. Rehabilitation of ford approaches in Coin Creek would be a minor improvement. More vehicle trips in Alt B than Alt C would result in more potential for widening at fords.
Streambank Condition **FA**	M	-*	-*	+*	Improvements at fords, such as armoring with rock would minimize impacts from increase motorized travel. Rehabilitation of fords in Coin Creek would be a minor improvement, but not significant at the subwatershed scale. More vehicle trips in Alt B than Alt C would result in more potential for widening at fords.
Floodplain Connectivity **FA**	No Influence	none	none	none	No influence
Flow/Hydrology					
Change in Peak/Base Flows	M	(-*) Coin Cr (Beaver Cr 6th).	(-*) Coin Cr (Beaver Cr	None, flows will return to	In both Alt B and C, water withdrawal would not exceed 10 percent of base flow in Coin Creek (Beaver Creek 6th)

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Core Area (Bull Trout)			
Management Action	Golden Hand 1 and 2 Alternative B and Alternative C		

Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Big Creek – FR **Beaver Creek 6th HU - FA**		(-*) for Big Creek	6th). (-*) for Big Creek	baseline following project.	and would be less than 0.05 percent of mean annual flow in Beaver and Big Creek. Following project completion flows would immediately return to pre-diversion levels. Degrade of flow in Coin Creek would have negligible effects on fish, which occur 1 mile downstream. The diversion would occur during the summer period of operation and would not influence peak flows, which occur in the spring, or winter base flows. Alt B effects identical to Alt C
Drainage Network Increase **FR**	M	+*	+*	+*	Addition of cross drains would reduce the drainage network by routing water off of road surfaces more frequently. Alt B effects identical to Alt C
Watershed Conditions					
Road Density and Location **FUR**	M	-	-	+*	Open Road density would increase in the temporary and short term from use of abandoned road beds in the Wilderness as temporary roads. Approaches to the fords on Coin Creek would be rehabilitated after use, which would be a minor long term reduction in road density. Rehabilitation of ford approaches on Coin Creek would reduce the impacts of abandoned roads in the Wilderness over the long term. Alt B effects identical to Alt C

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Core Area (Bull Trout)			
Management Action	Golden Hand 1 and 2 Alternative B and Alternative C		

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	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Disturbance History **FUR**	M	-*	-*	+*	Open road density would increase in the temporary time frame from use of abandoned road beds in the Wilderness as temporary roads. Open road density would immediately return to pre-project levels after project completion. Approaches to the fords on Coin Creek would be rehabilitated after use, which would be a minor long term reduction in road density. Drilling would occur on abandoned roads on landslide prone slopes; however the disturbed sites would be rehabilitated after use. Use of the roads in landslide prone areas is not expected to influence the likelihood of landslides (see Soil and Watershed Specialist Report, Project Record). Rehabilitation of ford approaches on Coin Creek would reduce the impacts of abandoned roads in the Wilderness over the long term. Alt B effects identical to Alt C
Riparian Conservation Areas **FR**	M	-*	-*	+*	Open Road density in RCAs would increase in the temporary and short term from use of abandoned road beds in the Wilderness as temporary roads. Approaches to the fords on Coin Creek would be rehabilitated after use, which would be a minor long term reduction in road density. Disturbance to vegetation from construction of approaches to North Fork Smith Creek stream crossing

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (upper Big Creek), One 6th level HU (Beaver Creek)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)			
Management Action	Golden Hand 1 and 2 Alternative B and Alternative C		

Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					structure will be minimal, and offset by rehabilitation of old ford approaches
Disturbance Regime **FA**	M	-*	-*	+*	Disturbance would occur in the temporary and short term (see WCIs above). Approaches to the fords on Coin Creek would be rehabilitated after use, which would be a minor long term improvement. Rehabilitation of ford approaches on Coin Creek would reduce the impacts of abandoned roads in the Wilderness over the long term. Alt B effects identical to Alt C

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	170602060501 Upper Big 170602060503 Big Creek-Little Marble 170602060502 Logan Creek 170602060504 Smith Creek 170602060601 Beaver Creek
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (upper Big Creek), One 6th level HU (Beaver Creek)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)			
Management Action	Golden Hand 1 and 2 Alternative B and Alternative C		

Pathways & Indicators I=improve/D=degrade/M=maintain/N=no influence	Effects of the Management Action(s)				
	Effects	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Integration of Species and Habitat Conditions **FR**	M	-*	-*	+*	Some WCIs would be degraded in the temporary to short term, but rehabilitation, installation of an open bottom structure on NF Smith Creek, and other road improvements would result in minor long term improvements. More vehicle trips in Alt B than Alt C would result in more potential for effects to individual fish at fords and from sediment delivery. Any localized + or - effects to WCIs will be negligible at the subwatershed scale, and the WCI ratings will be maintained.

PAF L1 team interpretation for LRMP Appendix B, Table B3, March 25, 2004

Effect[(1)]	**Temporal effect**[(2)] Temporary/short term/long term	**Comments**
No Influence	None/none/none	"Maintain" is not an appropriate Effect determination, Maintain requires that there be at least some temporal effect
Improve	-*/+/+ [(3)] Other examples: +/+/+ +/none/none	-* indicates a negligible effect
Improve	-/+/+ Other examples: -/-/+ [(1)] combinations of + & none	Only in cases where the baseline is functioning appropriately, and is not removed from that condition to functioning at risk, or functioning at unacceptable risk. A -/-/+ is inconsistent with some Forest Plan MPCs.
Degrade	-/+/+ Other examples: -/+*/+* -/-/+ -/-/- -/none/none -/-/+* -/-*/+	Where the temporary effect removes the baseline from a functioning acceptably condition or reduces the condition of a baseline that is functioning at risk, or functioning at unacceptable risk
Maintain	-/none/none Other examples: -*/none/none -*/-*/-* -*/+*/+* +*/+*/+* +*/none/none	The first case is true, only in cases where the baseline is functioning appropriately, and is not removed from that condition to functioning at risk, or functioning at unacceptable risk. Other cases occur where the baseline condition is negligibly affected

(1)The effect may or may not indicate Forest Plan consistency. The BA author must look up and narrate that based on MPC(s) for the project area. A "-" may result in an adverse determination even with an effect of "Improve" if take is anticipated.
(2) For salmon and steelhead the BA author must narrate the duration of effect as days, weeks, etc. based on NOAA Fisheries BO T&C 1.c.2.
(3) An * always means that the effects to the listed species are negligible, discountable, etc.

APPENDIX C

Appendix C
Monitoring

Page C-2 - Minerals and Geology Monitoring
Page C-3 - Water Quality Monitoring
Page C-4 - Wilderness Monitoring (Access)
Page C-5 - Wilderness Monitoring (Social Impacts)
Page C-6 – Fishery Monitoring
Page C-8 - Water (Ground) Quality Monitoring

Minerals and Geology Monitoring

Program: Minerals and Geology

Activity, Practice, or Effect: Project monitoring and minerals administration.

Project Name: Golden Hand No. 1 and No. 2 Lode Mining Claims Project

Location: Sec 26, T22N, R9E Boise Meridian

Objectives: Ensure compliance with approved plan of operations, including the implementation of PDFs

Monitoring Type: Compliance

Parameters:

- Any material non-compliance documented. If resolved in field without written Notice of Non-compliance, provide written documentation of issue, resolution, and photographs (if applicable) for approval of FS authorized officer
- Provide daily documentation of work progress, effects, visitor conflicts

Methodology:

- Site visits
- Photo log
- Video documentation
- Report copies to District Ranger, Wilderness Program Manager, AIMMCO authorized representative

Frequency/Duration: Daily, life of project

Data storage: Forest Minerals files

Analysis: Interdisciplinary (Wilderness, Soil and Water, Fisheries, Planning)

Report: Monthly summary; Annual, after seasonal closeout

Cost: $12,000/year

Personnel: Forest Minerals and Wilderness personnel

Responsible Individual: **Minerals &** Geology Program Manager

Responsible Official: Krassel District Ranger

Prepared by: Jim Egnew, Minerals & Geology Program Manager **Date:** 02/28/2012

Water Quality Monitoring

Program: Minerals Administration/Soil and Water

Activity, Practice, or Effect: Project monitoring, Minerals management. Implementation Monitoring of Mining BMP's, and project PDFs.

Project Name: Golden Hand No. 1 and No. 2 Lode Mining Claims Project

Locations: Smith Creek and Coin Creek subwatersheds. Drill pad, trenching, and Ella adit. Forest Roads 371, 373 and Forest Trail 013.

Objectives: Determine if site-specific BMPs and PDFs identified are being implemented. Provide qualitative assessment of effectiveness.

Monitoring Type: Compliance

Parameters: Various, depending on activity being monitored.

Methodology: The parameters will be observed ocularly. The project hydrologist and minerals administrator will review the BMP's and PDFs, develop a checklist of pertinent BMP's and PDFs, and review the implementation on the ground. Monitoring would include direction in the Payette National Forest Travel Management Plan Biological Opinion concerning the need to visually observe sediment travel distances from fording.

Frequency/Duration: When on-site, during mineral administrator visits. Qualified PNF personnel would monitor all project activities during implementation; road improvement and maintenance will be monitored daily, all other activities will be monitored at least weekly if not daily

Data storage: All data will be presented and summarized in a seasonal monitoring report summary stored in hard files and in the 2550 Soil Management files.

Analysis: Field forms and photographs will be analyzed to answer the following questions:

1. Which of the BMP's and PDFs were implemented?
2. Which of the BMP's and PDFs appear to be effective at this time?
3. Which of the BMP's and PDFs need to be improved?

Report: All data will be reported yearly on the monitoring summary results table for the Payette Forest. Written reports will be retained on the Krassel Ranger District.

Cost: $2,000.00/year

Personnel: Forest Minerals and Wilderness personnel

Responsible Individual: **Minerals &** Geology Program Manager

Responsible Official: Krassel District Ranger

Prepared by: Jim Fitzgerald, Krassel/McCall Hydrologist

Date: 03/21/2011

Wilderness Monitoring (Access)

Program: Wilderness/Recreation/Trails

Activity, Practice, or Effect: Visitor Use monitoring and compliance check

Project Name: Golden Hand No. 1 and No. 2 Lode Mining Claims Project

Locations: FC-RONR Wilderness on Trail #013

Objectives: Gather visitor use data and check for compliance regarding motorized and mechanized use

Monitoring Type: Camera

Parameters: Number of visitors entering and number of vehicles

Methodology: Camera

Frequency/Duration: Each season over the life of the project.

Data storage: Krassel Ranger District files

Analysis: Change in amount of visitor use and unauthorized motorized /mechanized use

Report: Krassel District Visitor Use Data

Cost: $2500 for camera system and $1,000/year to monitor

Personnel: Forest Minerals and Wilderness personnel

Responsible Individual: Minerals & Geology Program Manager

Responsible Official: Krassel District Ranger

Prepared by: Clem Pope, Recreation and Wilderness Specialist

Date: 02/28/2012

Wilderness Monitoring (Social Impacts)

Program: Wilderness/Recreation/Trails

Activity, Practice, or Effect: Social impact monitoring

Project Name: Golden Hand No. 1 and No. 2 Lode Mining Claims Project

Location: Along Mosquito Ridge, Cow Corrals, Crane Meadows and/or Ramey Ridge

Objectives: Monitor the impacts of operations on wilderness experience by sight and sound.

Monitoring Type: On site travel

Parameters: Sights and sounds of impacts along ridges surrounding the Golden Hand

Methodology: Make observations of the effects of the visual and audible impacts while hiking along ridges surrounding project area.

Frequency/Duration: 1 trip per season for the duration of the project

Data storage: District files

Analysis: Effect to Wilderness user's experience

Report: Wilderness Impact Monitoring

Cost: $500/year

Personnel: Forest Minerals and Wilderness personnel

Responsible Individual: Minerals & Geology Program Manager

Responsible Official: Krassel District Ranger

Prepared by: Clem Pope, Recreation and Wilderness Specialist

Date: 02/28/2012

Fisheries Monitoring

Program: Fisheries monitoring

Activity, Practice, or Effect: Turbidity monitoring shall be conducted to assess the intensity and duration of the turbidity plume to ensure the extent of take is not exceeded. Turbidity monitoring shall occur during cofferdam installation and removal activities. Turbidity readings shall be collected at the following locations: (1) Upstream of the project area; and (2) 600 feet downstream of the project area. Turbidity at the downstream sample location shall be recorded every 30 minutes until the plume has dissipated. Project activities would adjusted to ensure that turbidity levels do not, at any time, reach a level of 50 NTUs for a duration of one hour. (Biological Opinion Term and Condition).

Turbidity monitoring shall be conducted to assess the extent and duration of turbidity plumes associated with fording of the lower NF Smith Creek during mobilization and demobilization of heavy equipment the first operating season. This monitoring shall occur once in NF Smith Creek, approximately 300 feet downstream of the ford. Monitoring shall be performed immediately following fording (i.e., when the plume reaches the monitoring location), and occur every 5 minutes until the plume dissipates. Background turbidity shall be collected prior to fording, and may be collected at the downstream monitoring location. The type and number of vehicles/heavy equipment fording the stream shall also be recorded. (Biological Opinion Term and Condition)

The rate of diversion must be measured with a flow meter approved by the Forest Service. In stream flows would be measured at a point about 100 meters downstream of the confluence of Coin Creek and the unnamed tributary downstream of Forest Trail #013. Flow in Coin Creek will be measured on a daily basis below the point of diversion and upstream of the tributary that joins Coin Creek downstream of FSST 013. AIMMCO will report measured withdrawal rates and daily flow monitoring to the Forest Service. The water diversion rate would be reduced if the flow at the point of measurement dropped below 0.4 cfs in order to maintain a removal of less than 10 percent of the flow. (PDFs in Biological Assessment)

Monitor revegatation efforts on disturbed areas for acceptable vegetation establishment and cover. If vegetation is not established project design would reinitiate vegetation efforts and subsequent monitoring. (Biological Opinion Term and Condition)

Road and stream channel crossing improvements will annually be inspected for the life of the project to determine if sediment delivery is occurring (Biological Opinion Term and Condition). Rutting, rilling, and turbidity plumes emanating from crossings or delivery points from roads will be used as an indicator of sediment delivery.

A Forest Service fisheries biologist or hydrologist (or Forest Service representative who will report back to the fisheries biologist) will periodically monitor project activities such as road improvements and maintenance, ford repair on Coin Creek, and water diversion from Coin Creek. (Section VII of Biological Assessment)

A Forest Service fisheries biologist will review and must approve the stream simulation design of the crossing structure on North Fork Smith Creek (Section VII of Biological Assessment).

During fish relocation for installation of stream crossing structure on North Fork Smith Creek all captured, handled, injured, and killed ESA-listed fish shall be identified, counted, and recorded (Biological Opinion Term and Condition).

Project Name: Golden Hand No. 1 and No. 2 Lode Mining Claims Project

Location: Stream fords and diversion site

Objectives: Monitor the impacts of operations on turbidity, sediment delivery, and streamflow.

Monitoring Type: Turbidity, sediment delivery, and rate of diversion

Parameters: Described above

Methodology: Described above

Frequency/Duration: Described above

Data storage: District files

Analysis: Describe if measurements exceed established thresholds.

Report: A post-project report summarizing the results of the monitoring above shall be submitted to the Forest Service by December 31 of the year in which activities were implemented. The post-project report shall also include a statement that all the terms and conditions of the Biological Opinion were successfully implemented.

Cost: Forest Service = $4,000/year, and $2,500 one-time cost for fish relocation/stream simulation oversight). AIMMCO cost unknown.

Personnel: AIMMCO and Forest Service (Annual monitoring, GS-11 Fish Bio 8 field days, 2 days for report, supplies/transportation and field per diem = total $4,000)(Fish relocation/stream simulation, GS-11 Fish Bio 4 field days, Fish Tech 2 days, supplies/transportation and field per diem = total $2,500)

Responsible Individual: AIMMCO (BO Requirements) and Forest Service (BA requirements specific to a Forest Service Biologist).

Responsible Official: Krassel District Ranger

Prepared by: Jeff Hunteman/Caleb Zurstadt

Date: 12/18/2013

Water (Ground) Quality Monitoring

Program: Minerals Administration/Soil and Water

Activity, Practice, or Effect: Implementation Monitoring of relevant data and water quality.

Project Name: Golden Hand No. 1 and No. 2 Lode Mining Claims Project

Locations: Smith Creek and Coin Creek subwatersheds. Drill pad and seeps on Forest road 503739800.

Objectives: Determine if drilling fluid losses, water entries, and borehole abandonment records are within the range of effect anticipated. Determine if changes in water quality occur over the course of a season and remain within the range of effect anticipated.

Monitoring Type: Compliance

Parameters: Various, depending on activity being monitored.

Methodology: The project hydrologist and minerals administrator will review drill data against the anticipated effects. Water quality will be collected and analyzed for contaminants of concern regulated by State or Federal code.

Frequency/Duration: Review of drilling data would occur at regular intervals throughout the drill season. Water quality sampling would take place at the beginning and end of each season's activities.

Data storage: All data will be presented and summarized in a seasonal monitoring report summary.

Analysis: The project hydrologist and minerals administrator will review drill data against the anticipated effects. Water quality will be collected and analyzed for contaminants of concern regulated by State or Federal code.

Report: All data will be reported seasonally in monitoring report summary.

Cost: $4,000.00/year

Personnel: Forest Minerals and Hydrology personnel

Responsible Individual: Minerals & Geology Program Manager

Responsible Official: Krassel District Ranger

Prepared by: John Rygh

Date: 12/13/2013

APPENDIX D

Appendix D
Drilling Procedures Related to Groundwater Resource Protection

Core drilling is a mineral exploration technique designed to recover subsurface rock samples used to determine the extent and quality of an ore deposit. The method has been in use by the mining industry for over one hundred years. Core drilling has many similarities to water well or oil and gas well drilling, but there are some important differences. Probably the most important difference that is relevant to groundwater protection is the objective of creating the borehole. A successful water, oil, or gas well is primarily designed to allow fluid to be removed for an extended period of time from an underground rock formation. A core hole is simply a conduit to remove a rock sample from underground. It has no long-term use and is plugged shortly after completion (see abandonment section). Core drilling rigs are substantially smaller than oil and gas rigs and the capacity of their mud pumps is correspondingly smaller.

A core drilling rig uses a cylindrical, diamond-studded bit (Fig. 1) to drill through rock. The hole is deepened by adding sections of pipe to the drill string. The resulting cylinder of rock (the "core") is retrieved from the bottom of the hole periodically by means of a cable and liner tube system. During drilling operations, drilling fluid or 'mud' is continuously circulated by means of pumps in a "closed loop" system. The mud is so called because it is a mixture of a naturally occurring clay (sodium bentonite) and water along with minor amounts of additives. The mud travels from the pump down the hollow center of the drill string to the bit, where it exits the drill string through radial slots in the cutting surface of the bit. It then travels up the outside of the drill string through the space created by the slightly larger diameter bit. This space between the drill string and the outside wall of the borehole is called the "annular space". The mud returns to the surface through the annular space where it runs into a tank that allows the drill cuttings to settle out and the mud is then recirculated down the borehole.

Figure 1: Diamond core drill bits.

The following is a detailed description of the drilling of a core hole and explains how the standard operational procedures (SOPs) are protective of groundwater. All of the SOPs described are designed to assure compliance with relevant regulatory standards. The primary ones pertaining to groundwater protection are:

- The Idaho Ground Water Rule (IDAPA 58.01.11)
- Idaho Rules Governing Exploration, Surface Mining Closure of Cyanidation Facilities (IDAPA 20.03.02)
- The Idaho Well Construction Standards Rule (IDAPA 37.03.09)

The Well Construction Standards Rule is indirectly applicable in that mineral exploration boreholes are not considered to be wells and therefore are not subject to the standards of the rule. However the rule does require that the construction of such boreholes meets the intent of the regulations which is "to protect the ground water resources of the state against waste and contamination", implying that the exact letter of the rule need not be strictly followed as long as the intent is met. All of the SOPs meet both the intent and the standards of the rule.

First the drill pad is prepared prior to and during the moving in of a drill rig. The site is leveled and graded to drain surface runoff to a point where the water can be managed. A small mud sump would be excavated for recirculation and ultimate disposal of drill cuttings and drilling fluid. Self-contained holding tanks may be substituted for the mud sump in some cases. Silt fencing, straw bales, and/or sediment traps are used for water management and erosion control on the pad. Petroleum products are kept in containment and spill prevention kits are available on site in order to minimize the risk of a surface spill of hazardous materials infiltrating a shallow aquifer. The drill itself is placed on an impervious material (such as HDPE liner material) to retain any petroleum products. Lubricants, such as pipe thread lubricant, are a food grade vegetable product.

Once drilling commences, the first formations to be penetrated are usually unconsolidated or semi-consolidated alluvial or colluvial material. The Golden Hand drilling area does not have any alluvial deposits; only a thin layer of regolith (including a variable thickness of colluvium) covers the bedrock and it may or may not contain any perennially saturated zones that would constitute an aquifer.

As the drill string passes through the unconsolidated surface material, it is the mud that serves to prevent inflow or outflow of significant volumes of fluid to or from the borehole. Mud has a higher density than plain water and contains large quantities of extremely fine clay particles. When drilling through an unconfined aquifer, the pressure exerted by the column of mud in the borehole (the hydrostatic head) always exceeds the water pressure in the aquifer. Because of this pressure differential, the mud can seep out of the borehole into the formation. The interconnected pores of the unconsolidated surface material act as a filter that traps the bentonite particles along with the entrained drill cuttings (sand sized particles) to form a coating on the surface of the borehole known as "filter cake"(Fig. 2, Campbell and Gray 1975). It is the filter cake that confines most of the drilling mud to the borehole. Seepage of fluid through the filter cake is discussed in the groundwater chemistry effects section.

Water can also flow into a borehole from the formation if the hydrostatic head in the aquifer exceeds that of the mud column, as could be the case with a confined aquifer. Minor gains in water similar in volume to the seepage losses through the filter cake are ignored. More substantial inflows to or outflows from the borehole are sealed off (see fluid loss/gain section).

Once the colluvium/regolith has been drilled through and the hole has penetrated sufficiently into solid bedrock, surface casing is set. Casing is a steel pipe that has a slightly larger diameter than the core drill. A casing "shoe" (essentially a hollow diamond impregnated bit) is used on the leading edge of the casing string to advance it by means of rotational drilling. The casing is advanced incrementally down the hole by using the core drill to drill a pilot hole, drilling the casing down to the bottom of the pilot hole, then repeating the process until solid bedrock is reached. This "drill-within-a-drill" method creates an annular space between the outside of the casing and the borehole wall.

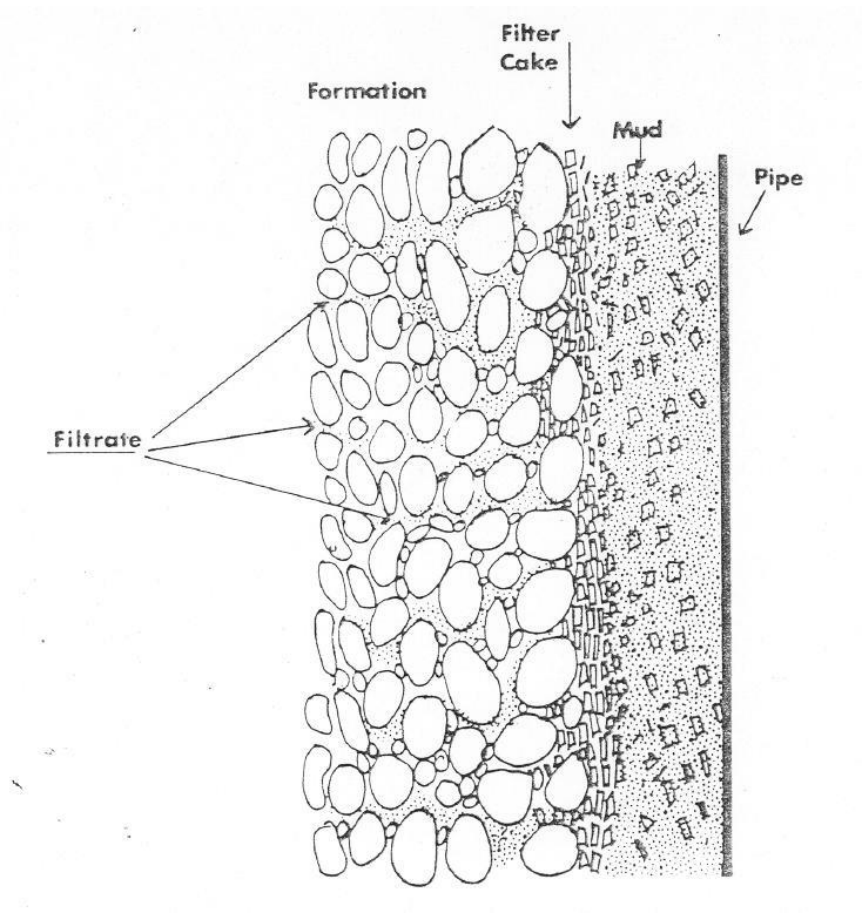

Figure 2: Formation of filter cake (Campbell and Gray 1975)

The casing is then set in place by sealing the annular space. For this project bentonite or neat cement would be used as sealants. Sealing is done by removing the drill string and pumping the grout mix down the inside of the casing. The grout is mixed (using a roughly 150% estimated volume) in a separate tank and pumped down the hole with a rubber plug behind it (between the grout and the regular mud). As the grout rises inside the annular space the casing is rotated to ensure a more even distribution of grout within the annular space and prevent the formation of any linear voids due to preferential flow paths. After the grout begins flowing at the surface from the annular space around the casing, pumping continues until the pressure spikes. This indicates that the plug is on bottom. If bentonite grout is used the top three feet filling the annular space is removed and replaced with neat cement. After the annular grout has set up, the plug is drilled out and drilling continues into bedrock. Any aquifers within the alluvial formations are now completely sealed off from each other, from surface water, and from any aquifers that may be encountered deeper in the bedrock. All mud circulation above the casing bottom takes place within the casing.

Drilling in the bedrock continues in the same manner as in the alluvium. The only difference is that bedrock permeability is controlled primarily by the aperture size and density of interconnected fractures, rather than interconnected pore space as is the case in alluvial formations. Under normal drilling conditions filter cake forms on the borehole walls in the same manner as when drilling through alluvial formations. The higher permeability fault zones and fracture zones that would be encountered in some of the proposed holes are the most likely areas to produce drilling fluid losses or gains.

Drilling Fluid Loss/Gain

Normally the development of filter cake is quite rapid, however if a zone of very high permeability and low relative pressure (e.g. a coarse gravel lens, or highly fractured bedrock) is encountered, the drilling fluid flows farther into the formation before a filter cake can form. This is referred to as "lost circulation". It is necessary to prevent substantial fluid losses to lost circulation zones (LCZs) otherwise there is an increased risk of problems such as binding of the drill string from sloughing and an inability to circulate cuttings out of the hole.

Lost circulation can be recognized by the driller who is watching the mud return flow at the top of the hole and the mud pump pressure gauge. If the flow rate drops off and the pressure drops, then lost circulation is occurring. Generally a gain or loss of 10% (approximately 25 gallons in a 1000' hole) or more of the drilling fluid alerts the driller to an inflow/outflow condition (Tim Rygg, Midas Gold Drilling Supervisor, personal communication). The speed and duration of mud loss are dependent upon the formation permeability and the pressure differential. If mud flow is still present at the surface, drilling continues and full flow often returns as the lost circulation zone is sealed.

Several mechanisms act to promote sealing in these instances of moderate circulation loss. As the drill cuttings in the mud are carried into the formation, individual particles or aggregates become stuck at points where they form bridges spanning various apertures in the flow paths. These plugs then act to filter out the even smaller bentonite particles to form localized areas of filter cake. Additionally, bentonite muds are thixotropic which means that they coagulate into a highly viscous gel when not subjected to shear stresses (e.g. pumping). Thus, when "dead zones" in the flow form within the formation they tend to gel and flow no further.

Total Loss of Returns

If a LCZ is encountered where the driller observes a strong pressure loss and a complete cessation of mud flow at the surface (referred to as a "loss of returns") then a different approach is called for. Drilling stops and mud is circulated in an effort to allow the zone to seal which is indicated by the resumption of mud flow at the surface. If the driller hasn't gotten returns back within about three minutes, they stop circulating and prepare a 25-40 gallon slug of lost circulation material (LCM) (John Eddy, T&J Drilling Foreman, personal communication). There are many types of lost circulation material available, but high-solids bentonite grouts (Holeplug®, Quik-Grout®) would primarily be used for this project. Unlike standard bentonite drilling mud which has a solids content of 10-20%, the bentonite grouts have a solids content of 70%+, which produces a highly viscous fluid with the approximate consistency of peanut butter. The LCM is prepared separately and pumped down the hole. Usually this successfully seals the LCZ.

If the lost circulation material still doesn't control fluid loss, then a variety of more aggressive methods can be used. The LCZ can be cemented and drilled through, or the existing drill string can be used as casing and cemented in through the LCZ. In the latter case, a smaller drill bit and pipe would be used inside the new casing to drill onward. This stepping down of pipe sizes can be done more than once if necessary.

Fluid Gain

If a confined aquifer is encountered where the hydraulic head exceeds that of the mud column in the borehole, water runs into the borehole from the formation. This is referred to as "making water" and can occur in both alluvial and bedrock aquifers. As noted above, minor inflows do not present a significant problem. The total volume, duration, and rate at which water flows into the borehole are governed by a number of hydraulic factors. For example, if the total water volume is small and the pressure differential is low, the water entry may be very short lived and not even noticeable. On the other hand, if there is a large volume and large pressure gradient this could result in artesian flow at the surface.

As with lost circulation, the measures taken to respond to inflows are commensurate with the severity of the flow. More substantial inflows are detected by a pressure spike in the mud system and an increase in mud flow at the surface often accompanied by a visible film of clear water on top of the mud due to incomplete mixing during travel up the hole. If sustained inflow is detected, the first step is to add barite (a high density mineral) to the mud to increase its density. This has the effect of increasing the hydrostatic pressure at the inflow zone until it exceeds the inflow pressure. At that point the flow reverses and the inflow zone behaves the same as an LCZ. Lost circulation material (LCM) is also added to the mud along with the barite in order to seal the resultant LCZ. This sealing of the inflow zone is usually effective enough that even if the mud weight is reduced back to what it was initially (with resultant reduction in hydrostatic head) the LCM is emplaced securely enough to retain somewhat higher pressure formation water.

If a water entry is severe enough to result in artesian flow at the surface, then the well is promptly abandoned as described below in the Borehole Abandonment Section. During the time it takes to abandon the hole, artesian flow at the surface is routed into the mud sump. Should there be enough flow to exceed the sump capacity; emergency measures would entail routing any overflow to portable tanks, to the ground surface in a hand dug trench, or to an area away from active waterways or wetlands with the most available obstructions to flow (e.g. embedded logs, thick grass or brush). Emergency packers are also available on all drill rigs and can be used to stem artesian flow.

Drilling Fluid Disposal

Once drilling is completed the drilling mud is pumped into the on-site sumps for disposal. Sumps are then allowed to dry out prior to capping with the native soil that was excavated to build them. The sump area along with the rest of the drill pad is then reclaimed.

Borehole Abandonment

Boreholes are promptly abandoned as required by the Idaho Rules Governing Exploration, Surface Mining, and Closure of Cyanidation Facilities (IDAPA 20.03.02) after reaching their total planned depth. Borehole abandonment would generally take place within hours of borehole completion to avoid the need to bring the drilling rig back to the site later. If the annular space of the casing has been sealed with cement (as is the case with boreholes expected to encounter artesian conditions), the casing is left in place. If the annular seal is bentonite, the temporary surface casing is removed before abandonment.

Borehole abandonment entails plugging the holes from bottom to top with a low-permeability bentonite-based grout (Benseal®) which seals off all water transmission. In order to ensure a continuous seal throughout the hole the grout is pumped down the hollow drill string starting at the bottom of the hole (Figure 3). As the hole is filled the drill string is withdrawn, but never pulled above the surface of the ascending column of grout, as this could produce voids. After the grout has risen to within approximately three feet of the ground surface and has set up, the remainder of the hole is plugged with cement. In the case of abandonment of a flowing artesian drill hole, neat cement grout is used to seal the entire borehole instead of bentonite grout.

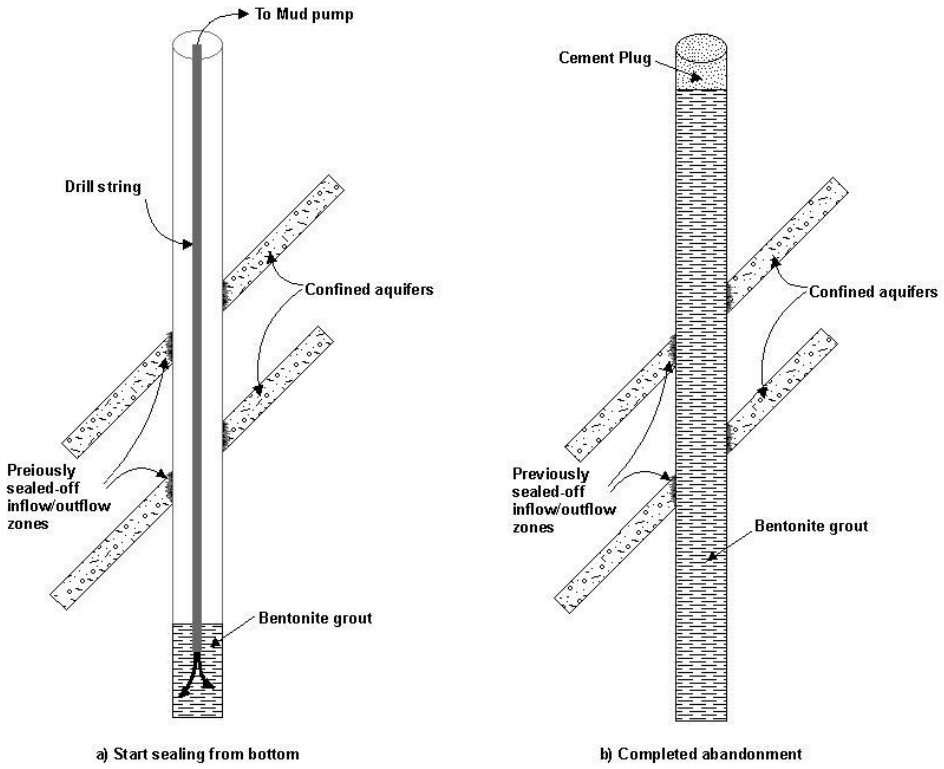

Figure 3: Borehole abandonment