Stibnite Gold Project

Special Designations Specialist Report

Prepared by:
USDA Forest Service
Payette National Forest

for:
Payette and Boise National Forests

August 2022

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Acronyms

ANFO	Ammonium Nitrate and Fuel Oil
ARPA	Archaeological Resources Protection Act
ASAOC	Administrative Settlement Agreement and Order on Consent
BNF	Boise National Forest
CFR	Code of Federal Regulations
CMP	Conceptual Mitigation Plan
EPCRA	Emergency Planning and Community Right to Know Act
FCRNRW	Frank Church River of No Return Wilderness
Forest Service	U.S. Forest Service
FSH	Forest Service Handbook
FR	National Forest System Road
GIS	Geographic Information System
IDEQ	Idaho Division of Environmental Quality
IDWR	Idaho Division of Water Resources
IRA	Inventoried Roadless Area
M	Modification
MA	Management Area
Midas Gold	Midas Gold Idaho, Inc.
MM	Maximum Modification
MPC	Management Prescription Category
National System	National WSR System
NFS	National Forest System
NFST	National Forest System Trail
NHPA	National Historic Preservation Act
ORV	Outstandingly Remarkable Value
P	Primitive
Perpetua	Perpetua Resources Idaho Inc.
PNF	Payette National Forest
PR	Partial Retention
R	Retention
RNA	Research Natural Area
ROS	Recreation Opportunity Spectrum
SCNF	Salmon-Challis National Forest

SGP	Stibnite Gold Project
SPCC	Spill Prevention, Control and Countermeasure
SWPPP	Stormwater Pollution Prevention Plan
U.S.	United States
USC	United States Code
USDA	U.S. Department of Agriculture
VQO	Visual Quality Objective
WSR	Wild and Scenic River

1.0 Introduction

The United States (U.S.) Department of Agriculture Forest Service (Forest Service) received the Stibnite Gold Project (SGP) Plan of Restoration and Operations, (Midas Gold Idaho, Inc. 2016) for review and approval in accordance with regulations at 36 Code of Federal Regulations (CFR) 228 Subpart A for the proposed Stibnite Gold Project (SGP) in central Idaho. A Revised Plan, also known as ModPRO[1], was submitted to the Forest Service in 2019 (Brown and Caldwell 2019). A further Modified Plan, also known as ModPRO2[2], was then submitted in October of 2021 (Perpetua 2021a). Midas Gold changed their name to Perpetua Resources Idaho Inc. (Perpetua[3]) in February 2021.

The SGP would consist of mining operations, including an open pit hard rock mine and associated processing facilities, located within Valley County in central Idaho on federal, state, and private lands (**Figure 1-1**). The SGP would produce gold and silver doré, and antimony concentrate, for commercial sale by Perpetua. The SGP would have a life (construction, operation, closure, and reclamation), not including post-reclamation monitoring, of approximately 20 years, with active mining and ore processing occurring over approximately 15 years.

1.1 Wilderness

Designated wilderness is any area of land designated by Congress as part of the National Wilderness Preservation System that was established by the Wilderness Act of 1964. Recommended wilderness are those areas (generally identified during the preparation or revision of Forest Land and Resource Management Plans) that the Forest Service recommends to Congress as candidates for designation as wilderness. Only Congress can designate wilderness. The analysis area for wilderness consists of the Frank Church-River of No Return Wilderness (FCRNRW) in the Payette National Forest (PNF) Management Area (MA) 14, Boise National Forest (BNF) MA 22, and a portion of the Salmon-Challis National Forest (SCNF) with Big Creek as the northern boundary and the Middle Fork Salmon River as the eastern and southern boundary. The analysis area also includes recommended wilderness within PNF MA 12 South Fork Salmon River and BNF MAs 18 Cascade Reservoir and 19 Warm Lake (**Figure 1-2**). **Table 1-1** provides the acres of FCRNRW and recommended wilderness within the analysis area for the PNF, BNF, and SCNF (Forest Service 2003a, 2010).

Table 1-1 Analysis Area Designated Wilderness and Recommended Wilderness

National Forest	FCRNRW Acres	Recommended Wilderness Acres
Payette National Forest, Krassel Ranger District	247,708	171,987
Boise National Forest[1] Cascade Ranger District	332,891	3,300
Salmon-Challis National Forest	56,223	0
Total	636,822	175,287

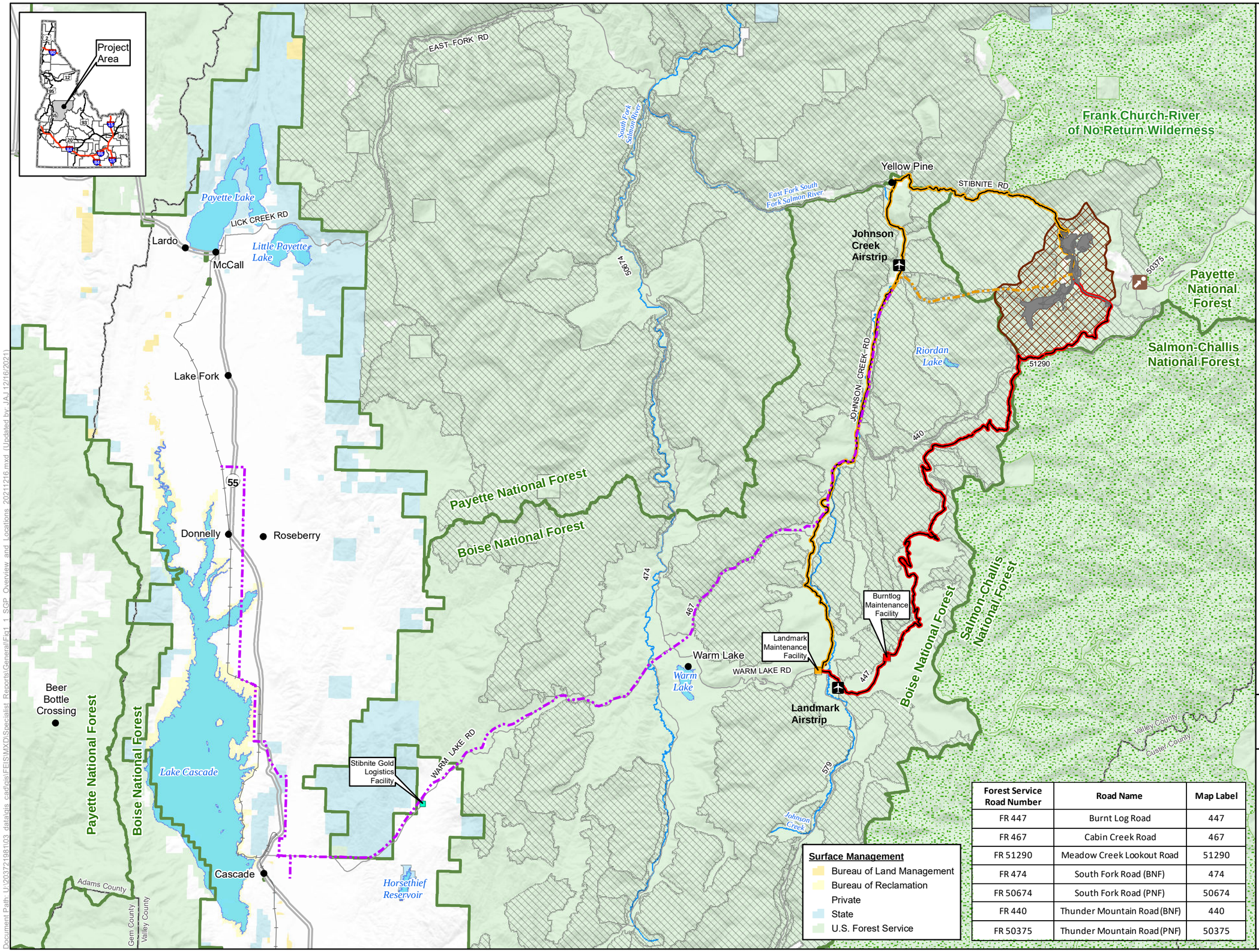
Source: Forest Service 2003a, 2003b, 2010

[1] FCRNRW acres located on the BNF were assigned to the SCNF in 1991.

[1] Associated project documents may reference the Revised Plan as the ModPRO.

[2] Associated project documents may reference the Modified Plan as the ModPRO2.

[3] Documents provided by Perpetua prior to the February 2021 name change will still be cited and referenced as Midas Gold,



LEGEND

Project Components
- SGP Features
- Operations Area Boundary

Access Roads and Trail System
- Burntlog Route *
- Johnson Creek Route

Utilities
- Upgraded Transmission Line
- New Transmission Line

Offsite Facilities
- Burntlog Maintenance Facility *
- Landmark Maintenance Facility **
- Stibnite Gold Logistics Facility

Other Features
- U.S. Forest Service
- Wilderness
- IRA and/or Forest Plan Special Area
- County
- City/Town
- Monumental Summit
- Airport/Landing Strip
- Railroad
- Highway
- Road
- Stream/River
- Lake/Reservoir

Surface Management
- Bureau of Land Management
- Bureau of Reclamation
- Private
- State
- U.S. Forest Service

Forest Service Road Number	Road Name	Map Label
FR 447	Burnt Log Road	447
FR 467	Cabin Creek Road	467
FR 51290	Meadow Creek Lookout Road	51290
FR 474	South Fork Road (BNF)	474
FR 50674	South Fork Road (PNF)	50674
FR 440	Thunder Mountain Road (BNF)	440
FR 50375	Thunder Mountain Road (PNF)	50375

* Associated with 2021 MMP only
** Associated with Johnson Creek Route Alternative only
Note:
The McCall – Stibnite Road (CR 50-412) consists of Lick Creek Road, East Fork South Fork Salmon River Road (East Fork Road) and Stibnite Road.

0 2 4 Miles
1 inch = 4 miles when printed at 11x17

Figure 1-1
SGP Overview and Location
Stibnite Gold Project
Stibnite, ID

Base Layer:
Other Data Sources: Perpetua; State of Idaho Geospatial Gateway (INSIDE Idaho); Boise National Forest; Payette National Forest

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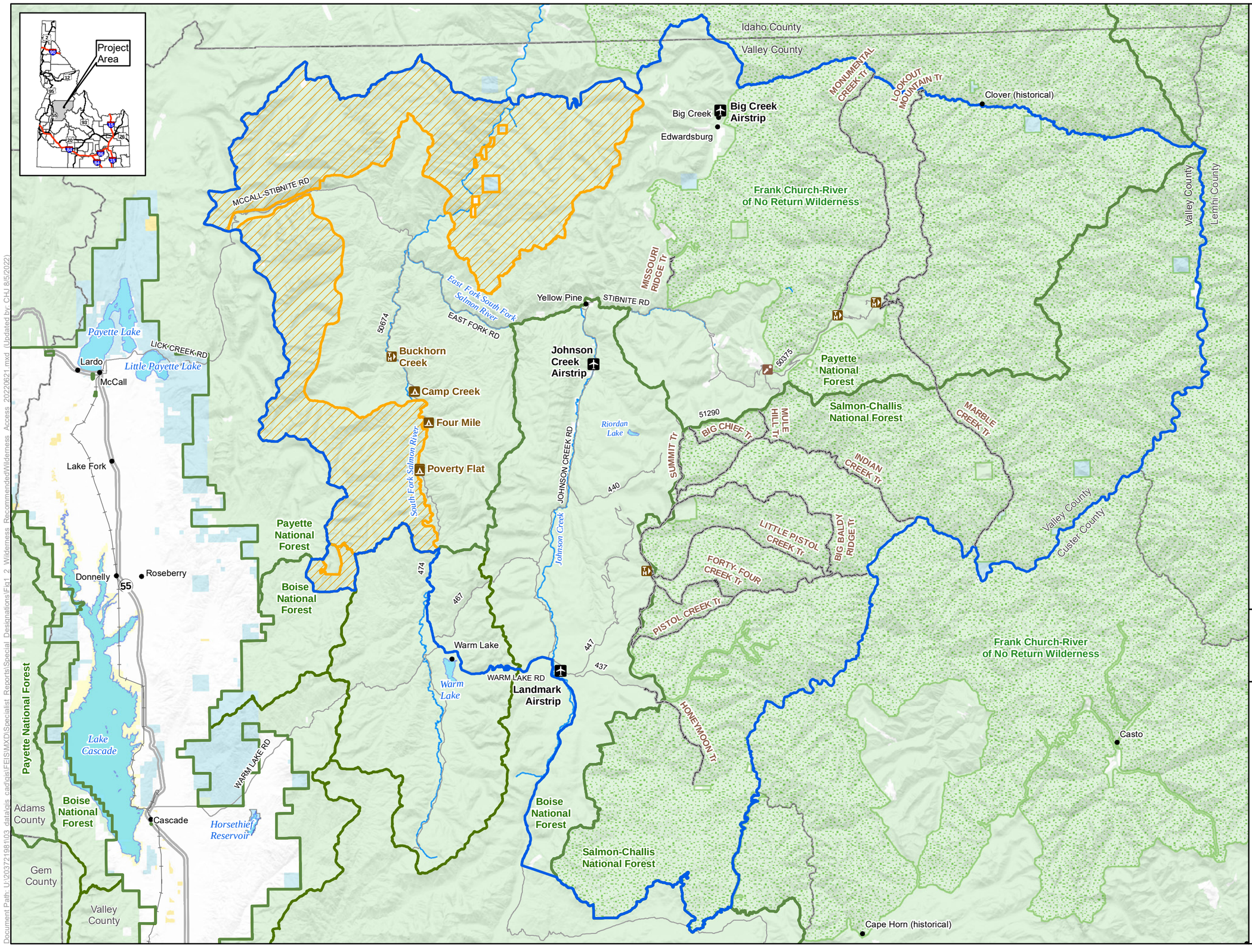


LEGEND

- Wilderness Analysis Area
- Recommended Wilderness Area
- Campground
- Trailhead

Other Layers

- U.S. Forest Service
- Wilderness
- County
- City/Town
- Monumental Summit
- Airstrip
- Highway
- Road
- Trail
- Lake/Reservoir
- Stream/River

Surface Land Management

- Bureau of Land Management
- Bureau of Reclamation
- Private
- State
- U.S. Forest Service

Note: The McCall – Stibnite Road (CR 50-412) consists of Lick Creek Road, East Fork South Fork Salmon River Road (East Fork Road) and Stibnite Road.

0 2.75 5.5 Miles

1 inch = 5.5 miles when printed at 11x17

Figure 1-2
Wilderness and Recommended Wilderness
Stibnite Gold Project
Stibnite, ID

Base Layer:
Other Data Sources: State of Idaho Geospatial Gateway (INSIDE Idaho); Boise National Forest; Payette National Forest; USGS; Perpetua

Document Path: U:\203721981\03_data\gis_ea\gis\EIS\MXD\Specialist Reports\Special Designations\Fig1_2 Wilderness Recommended\Wilderness_Access_20220624.mxd (Updated by CHJ 8/5/2022)

1.2 Wild and Scenic Rivers

Wild and Scenic Rivers (WSRs) include the study corridors for those rivers determined to be eligible and suitable for inclusion in the National WSR System (National System). The purpose of WSRs is to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition, as per the Wild and Scenic Rivers Act. The Forest Service manages river segments and their corridors that are eligible or suitable for inclusion in the National System to retain their free-flowing status; water quality; WSR classification; and outstanding resource values (ORVs) for scenery, wildlife, cultural, fish, geology, hydrology, ecological, or botanical resources, as applicable. Study corridors extend 0.25 mile on either side from the high-water mark of each eligible or suitable river segment. **Figure 1-3** shows the location of study corridors in relation to SGP components. Specific river segments and their associated study corridors within the management areas that are crossed by SGP components make up the analysis area for WSRs. The river segments that are the focus of this analysis include: Burntlog Creek (eligible - recreational), Johnson Creek (eligible - recreational), and South Fork Salmon River (suitable - recreational) (Forest Service 2003a, 2010).

1.3 Inventoried Roadless Areas

Inventoried Roadless Areas (IRAs) refer to undeveloped areas, typically exceeding 5,000 acres, that have been identified and mapped by the Forest Service. IRAs in Idaho are managed under 36 CFR 294, Subpart C - Idaho Roadless Area Management. The analysis area for direct and indirect effects on roadless resources comprises the 13 IRAs and other uninventoried roadless lands[4] within 5 miles of the SGP area (**Figure 1-4**). The discussion of roadless areas also includes the roadless portions of six Research Natural Areas (RNAs) and Forest Plan Special Areas within these 13 IRAs.

The construction and maintenance of temporary roads is not prohibited by the Idaho Roadless Rule and is consistent with 36 CFR Section 294.23(e) which states that maintenance of temporary and forest roads is permissible in Idaho Roadless Areas, and 36 CFR Section 294.21 which defines road maintenance as the ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective.

Temporary road construction and reconstruction within areas managed as Backcountry/Restoration is permissible where the Regional Forester determines a road is needed pursuant to statute, treaty, reserved or outstanding rights, or other legal duty of the United States. Temporary roads must be decommissioned upon completion of the project or expiration of the contract or permit, whichever is sooner. All of the IRAs within the analysis area have a management classification as Backcountry/Restoration, with some areas holding multiple classifications. The Backcountry/Restoration management classification for these IRAs permit temporary road construction and reconstruction, maintenance, and subsequent decommissioning, for vehicle access pertaining to authorized mining activities. The IRAs are listed in **Table 6-3** and **Table 6-4** with their management classifications and the acreage per classification type.

[4] In 1994 and 2008 the 9th Circuit Court of Appeals reaffirmed that the analysis also must encompass uninventoried roadless lands. This analysis must consider the effects on the entire "roadless expanse" (i.e., both the roadless area and any uninventoried roadless lands bounding it) (Smith versus Forest Service, 9th Cir. 1994; Lands Council v. Martin, 9th Cir. 2008).

1.4 Research Natural Areas

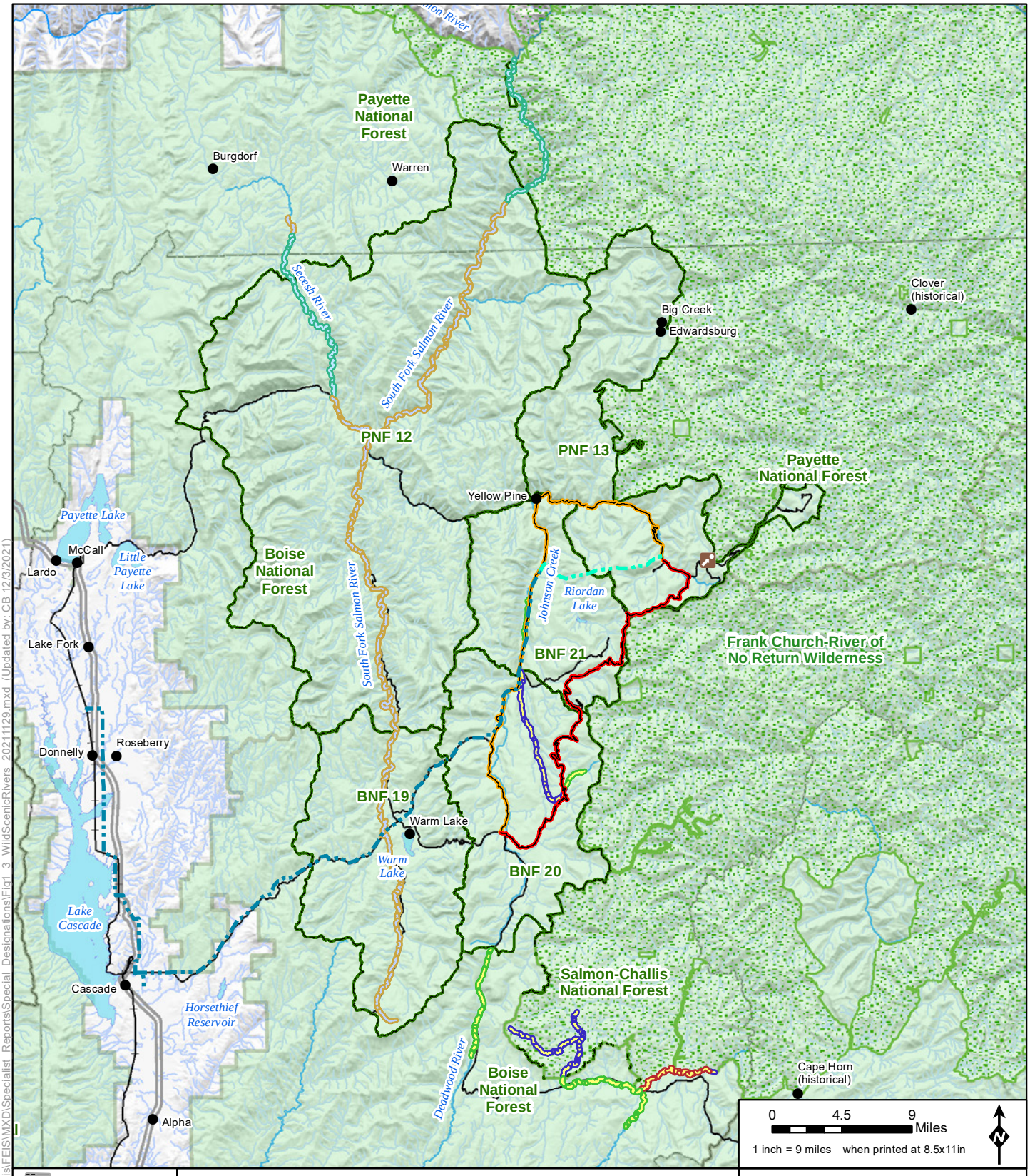
RNAs are tracts of land or water that support high quality examples of terrestrial or aquatic ecosystems, habitats, or populations of rare or endangered plant or animal species; or support unique geological study of the features. RNAs are managed in a way that allows natural processes to predominate, with minimal human intervention. The analysis area for RNAs are the RNAs that are within 5 miles of SGP facilities. There are two RNAs in the analysis area that include Belvidere Creek and Chilcoot Peak (**Figure 1-5**).

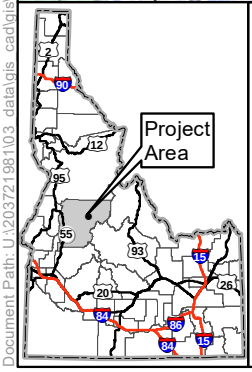
2.0 Alternatives, including the Proposed Action

The SGP 2021 Modified Mine Plan (MMP) Alternatives Report (Forest Service 2022a) contains the details of the alternatives that are being considered and fully analyzed in this report. For reader usability, the alternatives are briefly summarized here.

2.1 No Action Alternative

The No Action Alternative provides an environmental baseline for comparison of the action alternatives. Under the No Action Alternative, the mining, ore processing, and related activities under the 2021 MMP or the Johnson Creek Route Alternative would not take place. In addition, certain legacy and existing mining impacts would be addressed as directed in the 2021 Administrative Settlement Agreement and Order on Consent (ASAOC), including installation of stream diversion ditches designed to avoid contact of water with sources of contamination and removal of development rock and tailings currently impacting water quality. However, existing and approved activities (i.e., approved exploration activities and associated reclamation obligations) would continue and Perpetua would not be precluded from subsequently submitting another plan of operations pursuant to the General Mining Law of 1872.





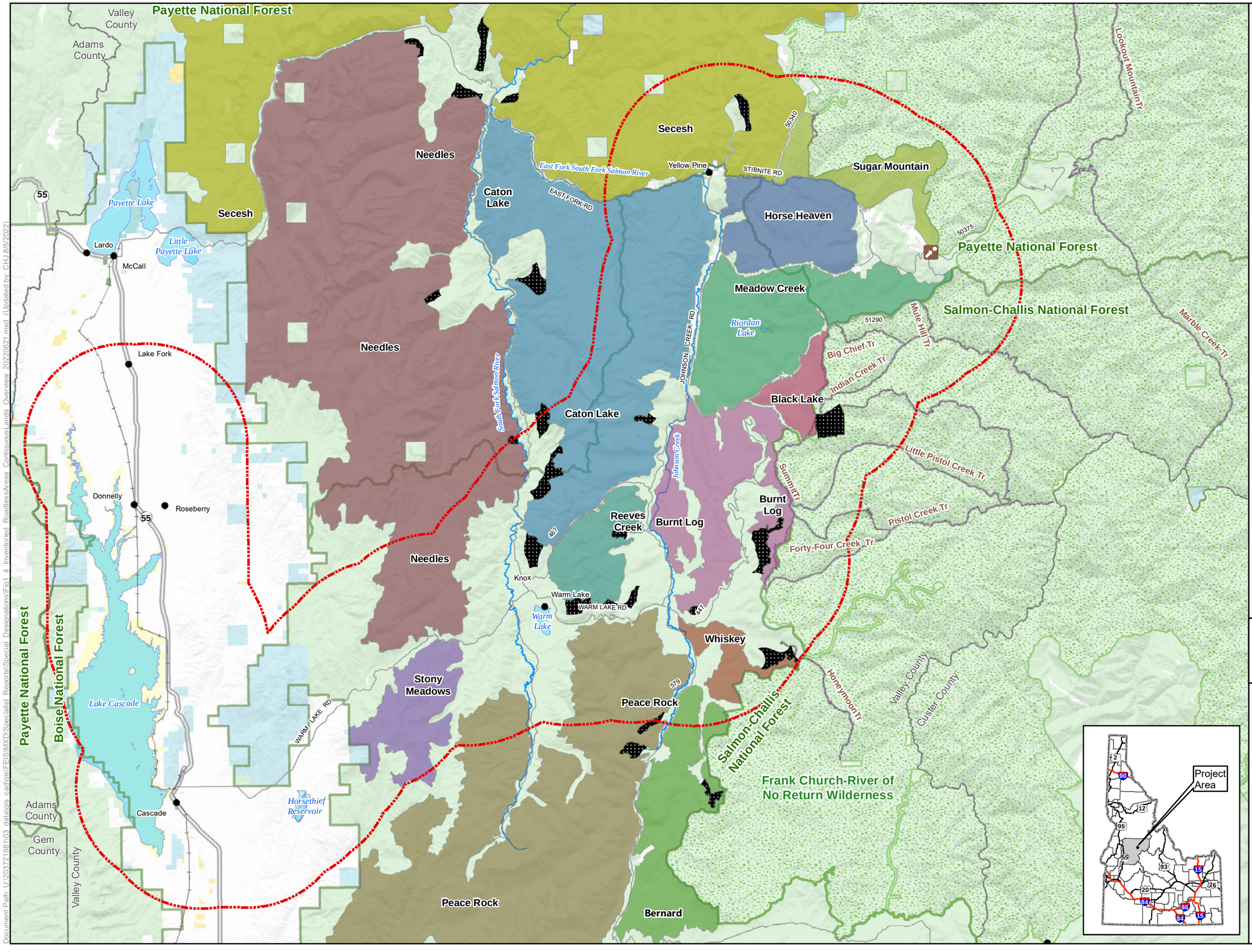
LEGEND

- USFS Management Area
- Wild_Scenic_Rivers_Clip
- Status/Classification
  - Eligible, Recreational
  - Eligible, Scenic
  - Eligible, Wild
  - Suitable, Recreational
  - Suitable, Scenic
  - Suitable, Wild
- Project Components*
  - Burntlog Route
  - Johnson Creek Route
- Utilities
  - Upgraded Transmission Line
  - New Transmission Line
- Other Features
  - U.S. Forest Service
  - Wilderness
  - County
  - City/Town
  - Monumental Summit
- Railroad
- Highway
- Road
- Stream/River
- Lake/Reservoir

*Project Components are associated with Burntog Route and Johnson Creek Route
Note: The McCall – Stibnite Road (CR 50-412) onsists of Lick Creek Road, East Fork South Fork Salmon River Road (East Fork Road) and Stibnite Road.

Figure 1-3
Wild & Scenic Rivers
Stibnite Gold Project
Stibnite, ID

Base Layer: USGS The National Map: 3D Elevation Program. USGS Earth Resources Observation & Science (EROS) Center: GMTED2010. Data refreshed January, 2020. Other Data Sources: Midas Gold; State of Idaho Geospatial Gateway (INSIDE Idaho); Boise National Forest; Payette National Forest



Note: The McCall – Stibnite Road (CR 50-412) consists of Lick Creek Road, East Fork South Fork Salmon River Road (East Fork Road) and Stibnite Road.

0 2.25 4.5 Miles

1 inch = 4.5 miles when printed at 11x17

Figure 1-4
Inventoried Roadless Areas and Lands Contiguous to Unroaded Areas
Stibnite Gold Project
Stibnite, ID

Base Layer: USFS Shaded Relief Service
Other Data Sources: Perpetua; State of Idaho Geospatial Gateway (INSIDE Idaho); USGS; Boise National Forest; Payette National Forest

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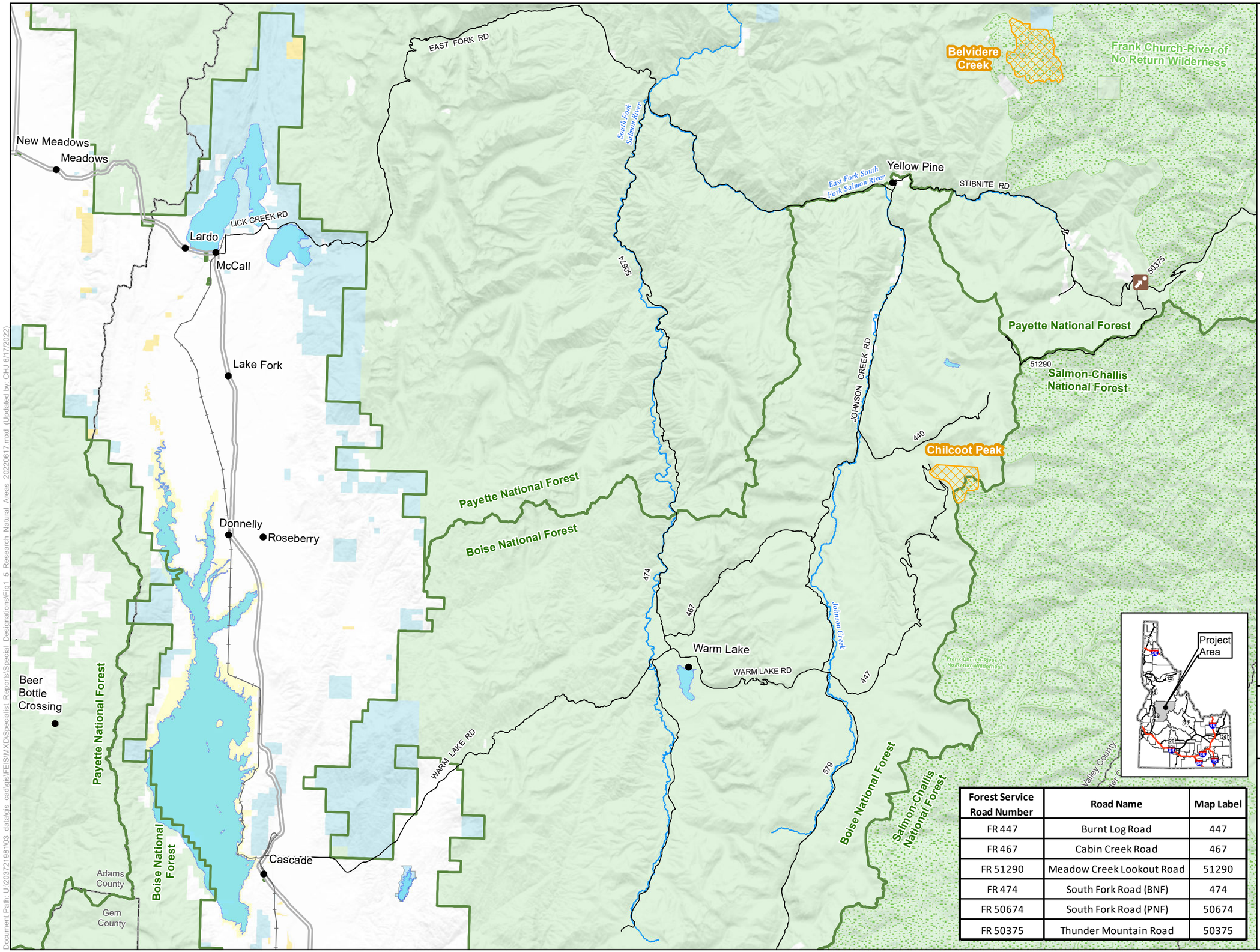


LEGEND

- Research Natural Area (Analysis Area)

Other Features

- U.S. Forest Service
- Wilderness
- County
- City/Town
- Monumental Summit
- Railroad
- Highway
- Road
- Stream/River
- Lake/Reservoir

Surface Land Management

- Bureau of Land Management
- Bureau of Reclamation
- Private
- State
- U.S. Forest Service

Forest Service Road Number	Road Name	Map Label
FR 447	Burnt Log Road	447
FR 467	Cabin Creek Road	467
FR 51290	Meadow Creek Lookout Road	51290
FR 474	South Fork Road (BNF)	474
FR 50674	South Fork Road (PNF)	50674
FR 50375	Thunder Mountain Road	50375

0 2 4 Miles

1 inch = 4 miles
when printed at 11x17

Figure 1-5
Research Natural Areas
Stibnite Gold Project
Stibnite, ID

Base Layer:
Other Data Sources: Midas Gold; State of Idaho Geospatial Gateway (INSIDE Idaho); Boise National Forest; Payette National Forest

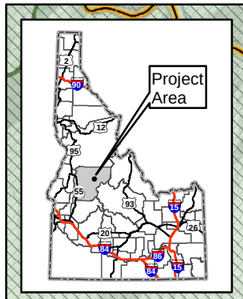
2.2 2021 MMP

The 2021 MMP is based upon Perpetua's Revised Plan (ModPRO2) and is considered the Proposed Action. The description of this alternative has been updated per the Revised Plan submitted in 2021 (Perpetua 2021a). The SGP operations footprint has been modified but would still be within the previously identified Operations Area Boundary (**Figure 2-1**).

The following mine components would be common to the action alternatives:

- Mine pit locations, areal extents, and mining and backfilling methods
- Transportation management on existing and proposed roads
- Pit dewatering, surface water management, and water treatment
- Ore processing
- Lime generation
- Tailings Storage Facility (TSF) construction and operation
- TSF Buttress construction methods
- Water supply needs and uses
- Management of mine impacted water and stormwater runoff
- Electrical transmission lines
- Stibnite Gold Logistics Facility (SGLF)
- A road maintenance facility
- Surface and underground exploration
- Stibnite Gold Project worker housing facility

For access, the 2021 MMP would utilize Warm Lake Road, Johnson Creek Road, and Stibnite Road during construction of the Burntlog Route; then once constructed, the Burntlog Route would be utilized during operations and reclamation. The actions proposed under the 2021 MMP would take place over a period of approximately 20 to 25 years, not including the long-term, post-closure environmental monitoring or potential long-term water treatment.



Surface Land Management
- Private
- U.S. Forest Service

North Security Gate
Stibnite Lake
West End Pit
Yellow Pine Pit & Backfill
Midnight Backfill
Midnight Pond
Growth Media Stockpile
Radio Communications Tower
Crusher ROM Stockpile Area
Scout ROM Stockpile Area
Process Plant Area
Substation
Explosives Facility
Cell Tower
Water Treatment Plant
Laydown
Transmission Line
Hangar Flats Pit Backfill, & Stockpiles
Truck Shop Area
TSF Embankment
TSF Buttress
TSF Impoundment
SODA Pond
Main Gate
Growth Media Stockpile
Worker Housing Facility
Radio Communications Tower
Frank Church-River of No Return Wilderness
Boise National Forest
Payette National Forest
Salmon-Challis National Forest
East Fork South Fork Salmon River
Sugar Creek
West End Creek
Hennessy Creek
Midnight Creek
Fiddle Creek
Garnet Creek
Robbin Creek
Blowout Creek
Meadow Creek
STIBNITE RD
T19NR09E
T18NR09E
T19NR10E
T18NR10E

LEGEND

Project Components *

SGP Features
- Pit Backfill
- Growth Media Stockpile
- Mining Pit
- Laydown
- Plant Site
- TSF Buttress
- TSF Liner
- Alluvial Stockpile
- Workers Housing
- Stockpile
- Explosive Facility
- Operations Area Boundary
- Patented Claim Boundary
- Tailings Pipeline
- Clean Water Diversion **
- Clean Water Diversion - Piped **
- East Fork South Fork Salmon River Tunnel ***
- Stream ****
- Pond
- Stibnite Lake
- Light Vehicle Road
- Haul Road
- Helicopter Pad

Access Roads
- Burntlog Route
- Johnson Creek Route
- Cell Tower Access Road
- Public Access Road *****

Utilities
- Transmission Line
- Substation ******
- New Cell Tower
- Existing Communication Tower

Other Features
- U.S. Forest Service
- Wilderness
- IRA and Forest Plan Special Areas
- Monumental Summit
- Road

* Project Components are associated with all Alternatives
** Some surface clean water diversions are not discernible at this figure scale (e.g., the diversions associated with the TSF/buttress north, Fiddle culvert, Midnight Outfall, Scout ROM). Please refer to Figures 2.4-14 and 2.4-15 which provide greater detail regarding the Water Management Plan and its facility/diversion locations.
*** The East Fork South Fork Salmon River Tunnel would only be utilized as a contingency to manage high flows upon completion of the restoration of the East Fork SFSR across the backfill in the Yellow Pine Pit.
**** Perennial streams are not depicted for the entire map area. Only perennial streams within the Operations Area Boundary are depicted.
***** Public Access Road associated with 2021 MMP
****** Substation locations are approximate.

0 0.35 0.7 Miles
1 inch = 0.7 miles when printed at 11x17

Figure 2-1
Mine Site Layout
Stibnite Gold Project
Stibnite, ID

Base Layer: Hillshade derived from LiDAR supplied by Midas Gold
Other Data Sources: Perpetua; State of Idaho Geospatial Gateway (INSIDE Idaho); Boise National Forest; Payette National Forest

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2.3 Johnson Creek Route Alternative

The Johnson Creek Route Alternative was developed to evaluate potential reductions in impacts to various resources. The mining portion of this alternative would be the same as under the 2021 MMP. Therefore, the primary focus of the Johnson Creek Route Alternative would be using an existing road for mine access through operations and reclamation instead of the Burntlog Route that under the 2021 MMP requires new road construction in Inventoried Roadless Areas. The Johnson Creek Route Alternative would require extensive upgrades to both Johnson Creek Road and Stibnite Road. Construction schedule for upgrading the roads and construction of the SGP would increase from 3 years to 5 years.

The action alternatives are summarized in **Table 2-1**.

Table 2-1 Action Alternatives Summary

SGP Phase	Component/ Subcomponent	2021 MMP	Johnson Creek Route Alternative
All Phases	SGP timeline	• Construction: Approximately3 years. • Operations: Approximately 15 years. • Exploration: Approximately 17 years (during construction and operations). • Reclamation: Approximately 5 years (except for the TSF which would require an additional 9 years for tailings dewatering and consolidation). • Closure/Post-Closure Water Treatment: Approximately through Mine Year 40. • Environmental Monitoring: As long as needed.	Same as 2021 MMP except: • Construction: Approximately 5 years (upgrading the existing Johnson Creek and Stibnite Roads to provide permanent mine access).
All Phases	Access Roads	Construction/Operations: • Warm lake road from State Highway (SH) 55 to Johnson Creek Route intersection (34 miles). • Johnson Creek Route for SGP access during early construction with minor improvements within the road prism. • Burntlog Route (38 miles) for SGP access during last year of construction, mining and ore processing operations, and closure and reclamation. Includes improvements of existing segments (23 miles) and road construction for new segments (15 miles). • Up to eight borrow areas developed along Burntlog Route	• Warm lake road from SH 55 to Johnson Creek Route intersection (34 miles). • Johnson Creek Route (39 miles: Johnson Creek Road 25 miles, Stibnite Road 14 miles) upgraded and used for access throughout life of mine (LOM) instead of the Burntlog Route. • Access route around the Yellow Pine pit for public access, employee access, and deliveries of supplies and equipment to the processing, warehouse, worker housing facility, and administration areas. • No improvements or construction of new segments for Burntlog Route. • Up to seven borrow sources developed along the Johnson

SGP Phase	Component/ Subcomponent	2021 MMP	Johnson Creek Route Alternative
		for materials needed for road improvements and maintenance. • Access route around the Yellow Pine pit for public access. Closure and Reclamation: • New sections of Burntlog Route to be reclaimed after the closure and reclamation period.	Creek Route for materials needed for road improvements and maintenance. Closure and Reclamation: • Improved Johnson Creek and Stibnite roads would not be reclaimed to pre-existing conditions.
All Phases	Public Access	Construction: • Temporary groomed over-snow vehicle (OSV) trail on the west side of Johnson Creek from Trout Creek to Landmark while Burntlog Route is constructed (8 miles). • OSV trail on west side of Johnson Creek from Wapiti Meadows to Trout Creek campground closed during construction (9 miles). • OSV trail from Warm Lake to Landmark closed during construction through operations (8.5 miles). • Cabin Creek Road Groomed OSV trail (11 miles). • Public roads remain open through the SGP with temporary closures as needed to accommodate construction. Operations: • Groomed OSV trail moves from west side of Johnson Creek Road to Johnson Creek Road from Landmark to Wapiti Meadows (16.7 miles). • Stibnite Road (County Road [CR] 50-412) / Thunder Mountain Road (FR 50375) closed through the SGP. • Seasonal public access through the Operations Area Boundary provided by constructing new road through Yellow Pine pit and below mine haul road to link Stibnite Road (FR 50412) to Thunder Mountain Road (FR 50375). • Public access allowed on Burntlog Route to Thunder Mountain Road (FR 50375).	Construction and Operations: Same as 2021 MMP except: • OSV trail on the west side of Johnson Creek from Wapiti Meadows to Trout Creek campground would be closed from construction through mine closure (9 miles). • Groomed OSV trail on the west side of Johnson Creek from Trout Creek to Landmark lasting from construction through mine closure. Closure and Reclamation: Same as 2021 MMP.

SGP Phase	Component/ Subcomponent	2021 MMP	Johnson Creek Route Alternative
		Closure and Reclamation: • New road constructed over the Yellow Pine Backfill (backfilled Yellow Pine pit) connecting Stibnite Road (FR 50412) to Thunder Mountain Road (FR 50375).	
Operations	Utilities – Transmission Lines	• Upgrade approximately63 miles of the existing 12.5 kilovolt (kV) and 69 kV transmission lines. • New approximate 9-mile, 138 kV line would be constructed from the Johnson Creek substation to a new substation at the mine site. • Upgrade the substations located at Oxbow Dam, Horse Flat, McCall, Lake Fork, and Warm Lake. • Reroute approximately 5.4 miles of transmission line to avoid the Thunder Mountain Estates subdivision. • Reroute approximately 0.9 miles of transmission line between Cascade and Donnelly to use an old railroad grade on private property. • Installation of approximately 3 miles of new underground distribution line along Johnson Creek Road from the Johnson Creek substation south to Wapiti Meadows.	Same as 2021 MMP.
Operations	Utilities - Communication Towers and Repeater Sites	• One cell tower located north of the Hangar Flats pit. • Locations along Burntlog Route for very high frequency (VHF) repeater sites. • Use existing access roads to repeater site locations along Burntlog Route. • Communication site at the SGLF. • Upgrades to existing communication site.	Same as 2021 MMP except: • Cell tower sites constructed and maintained using helicopter (instead of constructing access roads) for sites within IRAs managed for Backcountry/Restoration. • Locations along Johnson Creek route for repeater sites.

SGP Phase	Component/ Subcomponent	2021 MMP	Johnson Creek Route Alternative
Operations	Off-site Maintenance Facility	• SGLF located along Warm Lake Road. • Burntlog Maintenance Facility located at one of the borrow source locations 4.4 miles east of the junction of Johnson Creek Road and Warm Lake Road along the proposed Burntlog Route.	• SGLF same as 2021 MMP • Landmark Maintenance Facility located at junction of Warm Lake Road at Johnson Creek Road.
Closure and Reclamation	Access road segments	• Removal and reclamation of new road segments constructed for Burntlog Route. • Return of previously existing road segments to pre-construction width and condition.	• No removal or reclamation of pre-existing access routes.

Source: Perpetua 2021a

2.4 Applicable Environmental Design Features

The SGP must comply with all laws and regulations that apply to the proposed activities (Forest Service 2022a). Standards and guidelines in the Payette and Boise National Forest Land and Resource Management Plans (Forest Service 2003, 2010) that are designed to reduce or prevent undesirable impacts resulting from proposed management activities are incorporated into all the action alternatives by reference. In addition, best management practices outlined in the Best Management Practices for Mining in Idaho (Idaho Department of Lands 1992) would be implemented where appropriate and applicable for operations to minimize site disturbance from mining and drilling activities.

In the design of the 2021 MMP, Perpetua already considered many of the potential environmental impacts that might be caused by the SGP. This has led to an internal evaluation of project design features and operational characteristics that may have the effect of reducing and/or eliminating potential environmental impacts of the SGP. Such project-specific measures intended by a proponent to inherently reduce and/or avoid potential environmental impacts of a proposed action are referred to as environmental "design features".

Based on the application of permits and regulatory compliance requirements (Forest Service 2022a) to the project, regulatory requirements, standards and guidelines, best management practices, and likely permit conditions are listed in **Table 2-2**. The environmental design features that have been proposed and committed to by Perpetua are listed in **Table 2-3**. All of these environmental design measures have been assumed to be effective in conducting the environmental analysis presented in **Section 7.0**.

Table 2-2 Prominent Regulatory and Forest Plan Requirements for Special Designations

Description	Type	Reference
Road reconstruction and/or upgrades to NFR 51290 (Meadow Creek Lookout Road) on the ridgeline dividing Meadow Creek from the Indian Creek drainage would be restricted to 30 feet either side of the centerline of the existing alignment to prevent potential for direct impacts to the FCRNRW.	Design Feature	Design Feature developed for compliance with BNF and PNF: LSST03, LSST05

Description	Type	Reference
The Proponent will prepare a dust mitigation plan with appropriate schedule or triggers for control deemed adequate by IDEQ to achieve the level of control of 93 percent of dust (as submitted in the proponent's draft application for Permit to Construct from IDEQ). Alternatively, the proponent could employ particulate matter or opacity monitors deemed adequate by IDEQ and the Forest Service and immediately apply water or chemical dust control when PM or opacity monitors reach levels within 10 percent of the threshold determined by IDEQ.	IDEQ Permit	IDEQ Permit to Construct
Integrated weed management shall be used to maintain or restore habitats for sensitive plants and other native species of concern where they are threatened by noxious weeds or non-native invasive plants. Specific measures to reduce the potential for spread and establishment of noxious weed infestations could include, but are not limited to, determining the presence, location, and amount of noxious weed infestations in the Operations Area, developing management strategies such as, methods and frequency for treating infestations, treatment procedures and restrictions, reporting requirements, and follow-up or monitoring requirements. Herbicide applications will be by or under the direct supervision of licensed Idaho professional herbicide applicators with Aquatic Pest Control certifications and will be consistent with the Boise NF Invasive Species Management Plan and Payette NF guidance.	FP Component and Design Features	Design Feature developed for compliance with BNF and PNF: NPST11
Noxious weeds and undesirable non-native plants would be eradicated in the Operations Area Boundary, within permitted use areas, and the cut/fill slopes of roads and trails used by mine and mine facility related traffic. Where it is not practical to eradicate existing infestations, infestations would be managed to prevent seed production and spread. In areas of existing extensive infestation, mitigation for noxious weed prevention would be incorporated into road layout, design, and project alternative evaluation.	Design Feature	Design Feature developed for compliance with BNF and PNF: FRGU02, TEST10
To minimize adverse effects of noise to TEPC, MIS, or Sensitive species, where necessary and in accordance with MSHA and OSHA, the proponent could utilize actions in line with, but not limited to, the below: • Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. • When practicable, pumps, generators, and engines would be turned off when not in use. • Temporary wooden structure could be erected around portions of the drill, pumps, and heaters, with acoustic absorbent panels. These temporary structures would not be put in place if they created safety issues related to exhaust vapor build-up. • When feasible, activities such as helicopter use and blasting, could be scheduled at the same time.	Design Feature	Design Feature developed for compliance with BNF and PNF: WIST03, WIST04 TEST29

Table 2-3 Proponent Proposed Environmental Design Features for Special Designations

Description
The ore processing facility building would be enclosed.
Appropriate sound dampening and muffling equipment would be utilized to minimize noise excursion from equipment and facilities. When possible, schedule high noise activities at the same time. Monitor and maintain equipment to reduce noise related impacts.
When practicable, pumps, generators, and engines would be turned off when not in use to avoid unnecessary noise generation and reduce energy consumption.
Electric line power would be utilized during operations to eliminate diesel generator noise, except in emergency situations when grid power is down or temporary use in remote areas where it is not practical to run power lines.
Perpetua would work with Valley County to reduce speed limits and to set standards on the use of truck compression brakes, especially on steep sections of the Project access route and along areas where residences and housing are located.
Prior to mobilization of equipment onto National Forest System (NFS) lands and the Project site, all equipment would be cleaned and inspected for potential noxious weed seeds and debris, and equipment would be cleaned and inspected again prior to demobilizing off site. All access routes, drill platforms, pad locations, and sump construction sites would be inspected prior to project-related activities, and if any weed infestations are found, the sites would be treated with herbicides or manual removal prior to ground-disturbing activities.

In addition to the environmental design features listed in **Table 2-3** that are specific to Special Designations, Perpetua has proposed additional environmental measures for the SGP as described in the following documents:

- Stibnite Gold Mitigation Plan (Perpetua 2021b)
- Fisheries and Aquatic Resources Mitigation Plan (Perpetua 2021c);
- Fishway Operations and Management Plan (Perpetua 2021d); and
- Conceptual Stream and Wetland Mitigation Plan (CMP) (Tetra Tech 2021)

3.0 Relevant Laws, Regulations, and Policy

3.1 Land and Resource Management Plan

3.1.1 National Forest Land and Resource Management Plans: Wilderness

In 2003, the SCNF completed the FCRNRW Management Plan (Forest Service 2003b). Management direction in the plan is derived from the Wilderness Act and subsequent legislation that aimed to protect these special areas and preserve wilderness character (11 USC 1131). One requirement that defines Wilderness is a roadless, undeveloped condition (Forest Service 2003a, 2010).

The PNF Land and Resource Management Plan (Payette Forest Plan) and the BNF Land and Resource Management Plan (Boise Forest Plan) (Forest Service 2003a, 2010) also have standards and guidelines for designated wilderness and recommended wilderness areas. The desired condition for people visiting wilderness in the National Forest is to find outstanding opportunities for primitive and unconfined recreation, including exploration, solitude, risk, and challenge. Wilderness areas are primarily affected by

the forces of nature, with human imprint being substantially unnoticeable. For recommended wilderness areas, the Forest Service preserves the unique wilderness character of these areas until Congress acts on the Forest Service recommendation. **Figure 1-2** shows the location of the FCRNRW and recommended wilderness areas on the PNF and BNF in the analysis area.

The Payette Forest Plan and the Boise Forest Plan include management prescriptions and practices for specific areas, including designated wilderness (Management Prescription Category [MPC] 1.1) and recommended wilderness (MPC 1.2). The goal of MPC 1.1 is to "Protect wilderness values as defined in the 1964 Wilderness Act. Improve opportunities and experiences through the development of individual wilderness management plans, partnerships with permittees and user groups, and interpretive and educational opportunities."

Under MPC 1.2, actions must be designed and implemented in a manner that does not compromise wilderness values or reduce the area's potential for wilderness designation. The goal of MPC 1.2 is to manage recommended wilderness to protect wilderness values as defined in the Wilderness Act. Activities permitted in recommended wilderness must not compromise wilderness values or reduce the area's potential for wilderness designation.

3.1.2 National Forest and Resource Management Plans: WSR

Per the WSR Act, the Forest Service manages river segments and their corridors that are eligible or suitable for inclusion in the National System to retain their free-flowing status; water quality; WSR classification; and ORVs for scenery, wildlife, cultural, fish, geology, hydrology, ecological, or botanical resources, as applicable.

3.1.2.1 Forest Plan Goals, Objectives, and Desired Future Conditions Relevant to this Resource

The Payette Forest Plan and the Boise Forest Plan provide direction for managing WSRs. **Table 3-1** and **Table 3-2** list the applicable standards and guidelines under these forest plans for providing direction and assessing impacts on eligible, suitable, and designated WSRs.

Table 3-1 Forest-wide Standards and Guidelines for Eligible, Suitable, and Designated Wild and Scenic Rivers

Forest Plan	Direction	Number	Management Direction Description
PNF; BNF	Standard	WSST01	When proposed management actions may compromise the ORVs, WSR classification, or free-flowing character of an eligible WSR segment, a suitability study must be completed for that segment prior to initiating the actions.
PNF; BNF	Standard	WSST02	Assign VQOs to the classifications of eligible, suitable, and designated WSR corridors as follows: a) Preservation to a wild classification b) Retention to a scenic classification c) Partial Retention to a recreational classification
PNF; BNF	Guideline	WSGU01	Coordinate any suitability studies for eligible segments (as applicable where a river crosses jurisdictions) with: a) Idaho Department of Water Resources, b) Bureau of Land Management (BLM), or c) Other national forests

Source: Forest Service 2003a, 2010. VQOs = visual quality objectives

Table 3-2 Management Area Standards and Guidelines for Wild and Scenic Rivers

Forest Plan/MA	Direction	Number	Management Direction Description
PNF/MA 12	General Objective	1207	Work with BNF to recommend the South Fork Salmon and Secesh rivers for designation under the WSR Act.
PNF/MA 12	General Objective	1208	Manage the South Fork Salmon River and Secesh River suitable corridors to their WSR classifications, and preserve their ORVs and free-flowing status, until they are designated by Congress or released from further consideration as WSRs.
BNF/MA 19	Suitable WSRs: General Standard	1907	Manage the South Fork Salmon River to its recreational classification and preserve its free-flowing status and ORVs until it is formally designated by Congress or released from further consideration as a WSR candidate.
BNF/MA 19	Suitable WSRs: Vegetation Standard	1984	Mechanical vegetation management shall retain all large snags and at least the max number of snags in each size class. If large snags are unavailable, retain additional snags to meet at least the max number snags per acre.
PNF/MA 12; BNF/MA 19, MA 20, MA 21	Suitable WSRs: Vegetation Guideline	1908	In recreational corridors, mechanical vegetation treatments, including salvage harvest, may be used as long as ORVs are maintained within the river corridor.
PNF/MA 12; BNF/MA 19, MA 20, MA 21	Suitable WSRs: Fire Guideline	1909	Prescribed fire and wildland fire use may be used as long as ORVs are maintained within the corridor.
PNF/MA 12; BNF/MA 19, MA 20, MA 21	Suitable WSRs: Fire Guideline	1910	The full range of fire suppression strategies may be used to suppress wildfires. Emphasize tactics that minimize impacts of suppression activities on river classifications and ORVs.
BNF/MA 20	Eligible WSRs: General Standard	2001	Eligible: Manage the Burntlog Creek corridor to its assigned classifications and preserve its ORVs and free-flowing status until the river undergoes a suitability study and the study finds it suitable for designation by Congress or releases it from further consideration as a WSR.
BNF/MA 20	Eligible WSRs: Vegetation Standard	2053	Mechanical vegetation management shall retain all large snags and at least the max number of snags in each size class. If large snags are unavailable, retain additional snags to meet at least the max number snags per acre.
BNF/MA 21	Eligible WSRs: General Standard	2101	Manage the Johnson Creek corridor to its recreational classification and preserve its ORVs and free-flowing status until the river undergoes a suitability study and the study finds it suitable for designation by Congress or releases it from further consideration as a WSR.
BNF/MA 21	Eligible WSR: Vegetation Standard	2156	Mechanical vegetation management shall retain all large snags and at least the max number of snags in each size class. If large snags are unavailable, retain additional snags to meet at least the max number snags per acre.

Source: Forest Service 2003a, 2010

3.1.3 National Forest Land and Resource Management Plans: IRA

One requirement for Wilderness is a roadless, undeveloped condition. Forest-wide guidelines from the PNF and BNF applicable to the IRAs include non-conforming uses in recommended wilderness areas and review of boundaries of IRAs during project-level planning. The Idaho Roadless Rule authorized administrative corrections to maps to address clerical or typographic errors. PNF and BNF forest-wide standards for IRAs and lands contiguous to unroaded areas provide general direction that management actions may only degrade aquatic, terrestrial, and watershed resource conditions for up to 3 years, and there are standards for construction of new roads in Riparian Conservation Areas. These plans also contain direction regarding application of standards and other direction to mineral activity, focused on mitigation of effects. The Salmon-Challis National Forest (SCNF) forest-wide standard for wilderness corridors prohibits land-disturbing activities, except legal mineral exploration, development, or other mining related activity, that would degrade the wilderness characteristics.

Table 3-3 Forest-wide Standards and Guidelines for Inventoried Roadless Areas

Forest Plan	Direction	Number	Management Direction Description
PNF; BNF	Objective	WROB03	Evaluate any cases where classified roads exist within IRAs to determine whether the road's status or IRA boundary adjustments are appropriate and make any needed adjustments.
PNF; BNF	Guideline	WRGU06	Boundaries of IRAs should be reviewed and adjusted as appropriate during project-level planning for proposed development projects within or adjacent to such areas. Consider potential additions, as well as subtracting developments, when making reviews and adjustments.

Source: Forest Service 2003a, 2010

Table 3-4 Management Area Standards and Guidelines for Inventoried Roadless Areas

Forest Plan/MPC	Direction	Number	Management Direction Description
BNF/MPC 4.1c PNF/MPC 4.1c	Road Standard	0313, 0110 0102, 0214, 0421	Within Inventoried Roadless Areas (IRAs), road construction or reconstruction may only occur where needed: a) To provide access related to reserved or outstanding rights, or b) To respond to statute or treaty.
BNF/MPC 4.1c PNF/MPC 4.1c	Road Standard	0111 0103, 0215, 0422	Outside IRAs, road construction or reconstruction may only occur where needed: a) To provide access related to reserved or outstanding rights, or b) To respond to statute or treaty, or c) To provide transportation systems that support accomplishment of Management Area Recreation Resource Opportunity Spectrum objectives

Source: Forest Service 2003a, 2010

3.1.4 National Forest Land and Resource Management Plans: RNA

The 2003 Payette Forest Plan and 2010 Boise Forest Plan describe desired future conditions in RNAs. The desired condition for RNAs for both the Payette Forest Plan and the Boise Forest Plan is:

> *Research Natural Areas (RNAs) are areas where ecological processes generally prevail. They remain largely undisturbed by human uses or activities, and provide quality opportunities for non-manipulative scientific research, monitoring, observation, and study. The RNA network provides examples of representative forest habitats, shrublands, wetlands, riparian systems, grasslands, geologic formations, wildlife habitats, and aquatic communities. Management plans have been developed and implemented for all areas.*

Table 3-5 Forest-wide Standards and Guidelines for Research Natural Areas

Forest Plan	Direction	Number	Management Direction Description
PNF; BNF	Standard	MIST02	Common variety mineral activities will not be conducted on land allocation such as National Recreation Trails, Research Natural Areas, and where recreation or capital improvements preclude such activities.
PNF; BNF	Guideline	LSGU11	d) The FERC should be notified when projects are proposed for location, such as in designated Wilderness, which would be inconsistent with Forest management direction and/or the National Forest reservation. It should be recommended to the FERC that preliminary permits and licenses be denied for proposals within area recommended for Wilderness, proposed Research Natural Areas, and eligible and suitable Wild and Scenic River steam segments until appropriate studies and/or legislative processes are completed.
PNF; BNF	Objective	RNOB02	e) Consider recommending additional RNAs based on high priority needs as identified by The Representativeness Assessment of Research Natural Areas on National Forest System Lands in Idaho.

Source: Forest Service 2003a, 2010

Table 3-6 Management Area Standards and Guidelines for Research Natural Areas

Forest Plan/MA	Direction	Number	Management Direction Description
PNF/MA 2, MA 3, MA 4, MA 9, MA 10, MA 12	General Standard, Vegetation Standard	0201, 0301, 0405, 0902, 1001, 1212	Mechanical Vegetation treatments, salvage harvest, prescribed fire, and wildland fire use may only be used to maintain values for which the areas were established, or to achieve other objectives that are consistent with the RNA establishment record or management plan.
BNF/ MA 1, MA 2, MA 6, MA 7, MA 8, MA 15, MA 17, MA 18, MA 19, MA 21	General Standard, Vegetation Standard	0105, 0205, 0605, 0710, 0805, 1505, 1706, 1807, 1911, 2105	

Forest Plan/MA	Direction	Number	Management Direction Description
PNF/MA 2, MA 4, MA 9, MA10, MA 12	Road Standard	0202, 0302, 0406, 0903, 1002, 1213	Road construction or reconstruction may only occur where needed: a) To provide access related to reserved or outstanding rights, or b) To respond to statute or treaty, or c) To maintain the values for which the RNA was established.
BNF/ MA 1, MA 2, MA 6, MA 7, MA 8, MA 15, MA 17, MA 18, MA 19, MA 21	Road Standard	0107, 0206, 0606, 0711, 0806, 1506, 1707, 1808, 1912, 2106	
PNF/MA 2, MA 4, MA 9, MA 10, MA 12	Fire Guideline	0203, 0303, 0407, 0904, 1003, 1214	The full range of fire suppression strategies may be used to suppress wildfires. Fire suppression strategies and tactics should minimize impacts to the values for which the RNA was established.
BNF/ MA 1, MA 2, MA 6, MA 7, MA 8, MA 15, MA 17, MA 18, MA 19, MA 21	Fire Guideline	0108, 0207, 0607, 0712, 0807, 1507, 1708, 1809, 1913, 2107	
PNF/ MA 4	General Standard	0404	Allow non-motorized travel only in the Pony Creek RNA (Forest Trail 181) to help maintain the features for which the area was established.
PNF/ MA 9	General Objective	0901	Establish the proposed Patrick Butte Research Natural Area to preserve the identified representative features of the area for future scientific study
BNF/ MA 1	Fire Standard	0106	Prescribed fire may only be used to maintain vegetative values for which the areas were established, or to achieve other objectives that are consistent with the RNA establishment record or management plan.
BNF/ MA 17	General Objective	1705	Coordinate activities in the Dry Buck RNA with Rocky Mountain Research Station. Emphasize introduction or prescribed fire.

Source: Forest Service 2003a, 2010

3.2 Federal Laws, Regulations, and Policy

3.2.1 Wilderness Act of 1964: Wilderness

The Wilderness Act of 1964 mandates that "each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area

(Section 4(b))." As defined by section 2(c) of the Wilderness Act:

> *"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 its 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 in this Act 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 preserves its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."*

The Wilderness Act identifies five qualities of wilderness. Landres et al. (2008) defined four of these qualities:

- "Untrammeled" – wilderness is unhindered and free from modern human control or manipulation. Untrammeled areas are areas where the components or processes of ecological systems inside the wilderness are not controlled or manipulated by modern human activities. As defined by the Forest Service Manual 2320.5: "In the context of the Wilderness Act, an untrammeled area is where human influence does not impede the free play of natural forces or interfere with natural processes in the ecosystem."

- "Natural" – wilderness ecological systems are substantially free from the effects of modern civilization. According to Arthur Carhart National Wilderness Training Center (2014), preserving this quality ensures that indigenous species, patterns, and ecological processes are protected and allows us to understand and learn from natural features.

- "Undeveloped" – wilderness is substantially without permanent improvements or modern human occupation, such as the presence of structures, installations, habitations, or the use of motor vehicles, motorized equipment, or mechanical transport.

- "Outstanding opportunities" – wilderness provides opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenges. Solitude is multi-dimensional and tends to be deeply personal. Wilderness managers often define solitude by the absence of others. Primitive recreation often refers to the types of recreation that require primitive travel and self- reliance without modern conveniences (Landres et al. 2008). Unconfined recreation refers to the types of recreation where visitors experience a high degree of freedom over their own actions.

Section 2(c)(4) of the Wilderness Act says these areas "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." Some of these features, such as the presence of threatened and endangered species, also are part of the natural quality of a wilderness. Other features, such as the presence of important geological formations, cultural resources, historic sites, or paleontological localities, may be significant or integral to the wilderness area and do not fit easily into one of the other four qualities of wilderness character. Other features of value must be just as rigorously protected as the qualities of wilderness character (Arthur Carhart National Wilderness Training Center 2014).

The Forest Service Handbook (FSH) (FSH-1909.12, Chap. 7) discusses these attributes of wilderness and discusses additional attributes to be considered in evaluating potential wilderness areas. These values include the contributions of wilderness to cultural and historic preservation; opportunities for self-discovery, self-reliance, and challenge; the scenic beauty of an area; and individual and social well-being.

3.2.2 Wilderness Act of 1964: Inventoried Roadless Areas

The Wilderness Act of 1964 (16 USC 1131(note), 1131-1136) gives the statutory definition of wilderness (Section 2[c]), which helps define the evaluation process for potential wilderness in this planning process.

3.2.3 36 CFR 219.7 Special Designations: Inventoried Roadless Areas

Subpart a of 36 CFR 219.7 Special Designations describes the process for evaluating areas that may be suitable for inclusion in the National Wilderness System, which must be identified as part of the planning process, along with recommendations for wilderness designation. Inventories of lands that may be suitable for inclusion in the National Wilderness Preservation System are conducted following direction in Forest Service Handbook 1909.12—Land Management Planning Handbook, Chapter 70 Wilderness, which includes size and road improvement criteria.

3.2.4 36 CFR 293: Wilderness – Primitive Areas

Federal policy related to designated wilderness areas in the NFS can be found in 36 CFR 293. The objectives related to wilderness can be found in 36 CFR 293.2. Forest Service policy related to the management of designated wilderness lands can be found in Forest Service Manual 2320 – Wilderness Management.

3.2.5 Wild and Scenic Rivers Act (Public Law 90-542; 16 USC 1271-1287): WSR

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 United States Code [USC] 1271 et seq.), to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition. There are four steps in the WSRs process under the Act.

1. Inventory: Develop a systematic and comprehensive inventory of rivers to consider for their potential eligibility.

2. Eligibility Determination: Determine Stream eligibility under the criteria listed in the WSR Act.

3. Classification: Based on the level of development of the shoreline, waterway,and access when the river is found eligible, classify each waterway as wild, scenic, or recreational.

4. Suitability Determination: Evaluate the potential physical, biological, economic, and social effects of adding the river to the National System. A suitability study provides the basis for determining what rivers to recommend to Congress as potential additions to the National System.

As discussed in more detail below, the PNF and BNF have previously performed the first three of these steps for waterways in and around the SGP area and completed step 4 for the South Fork Salmon River.

3.2.5.1 River Management Provisions

The WSR Act requires agencies to protect rivers that they have identified as having “outstandingly remarkable values,” free-flowing condition, and associated water quality. The requirements and processes to protect these river values through coordinated federal actions are detailed in several sections of the WSR Act. Specific management prescriptions for eligible river segments include:

- Free-flowing values. Free-flowing characteristics of eligible river segments cannot be modified by stream impoundments, diversions, channelization, or rip-rapping to the extent authorized under law.

- Outstandingly Remarkable Values (ORVs). Each segment is managed to protect ORVs (subject to valid existing rights) and, to the extent practicable, such values are enhanced.

- Classification impacts. Management and development of the eligible river and its corridor cannot be modified, subject to valid existing rights, to the degree that its eligibility or classification would be affected.

3.2.5.2 Section 7 of the WSR Act

Section 7(a) of the WSR Act provides a specific standard for review of developments on or directly affecting a designated WSR river segment. Development may occur if the project "will not invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area as of the date of designation…" This standard applies to projects outside the designated river corridor but on the same river or a tributary.

A Section 7 analysis is only completed for a designated WSR; none of the streams or rivers in the analysis area are designated WSRs. Further, a Section 7 analysis is conducted for federal water resources projects (i.e., located below the ordinary high-water mark); therefore, it is not applicable to the Project.

3.2.5.3 Visual Management System

The Forest Service is directed by policy to inventory, classify, and manage lands for their scenic resource values. Scenic resources are managed through Visual Quality Objectives (VQOs) designed to provide measurable standards that direct levels of acceptable visual change (Forest Service 1974). The range of VQOs is defined as follows:

- *Preservation (P)* – Allows natural changes only.

- *Retention (R)* – Allows management activities that are not visually evident.

- *Partial Retention (PR)* – Management activities may repeat form, line, color, or texture common to the characteristic landscapes but changes in their size, amount, intensity, direction, pattern, etc. should remain visually subordinate.

- *Modification (M)* – Management activities may visually dominate the original landscape. However, alteration must borrow from naturally established form, line, color, or texture so that visual characteristics are those of natural occurrences of the surrounding area.

- *Maximum Modification (MM)* – Management activities of vegetative and land alterations form may dominate the characteristic landscape.

Per forest-wide standards and guidelines contained in the Payette Forest Plan (Forest Service 2003a) and Boise Forest Plan (Forest Service 2010), VQOs are assigned to eligible and suitable WSR segments based on their preliminary classification, as follows:

- Preservation to a wild classification,

- Retention to a scenic classification,

- Partial retention to a recreational classification.

3.2.5.4 Organic Administration Act of 1897: RNA

The general provisions of the Organic Administration Act of 1897 (16 USC 551) authorize the Secretary of Agriculture to designate RNAs. Under regulations at 7 CFR2.60(a), the Secretary has delegated this authority to the chief of the Forest Service, who, pursuant to 36 CFR 251.23, selects and establishes RNAs as part of the continuing land and resource management planning process for NFS lands (36 CFR 219.7 and Forest Service Manual [FSM] 1922).

3.2.5.5 Forest Service Manual 4000 Research and Development, Chapter 4060: RNA

Chapter 4060 of FSM 4000 provides direction for RNA management as part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on NFS lands. RNAs are managed for nonmanipulative research, observation, and study. The establishment of RNAs emerges from continuing land and resource management planning and associated environmental analyses (FSM 1920 and FSM 1950).

An establishment record, indicating the purpose of establishment and description of land and resource values, is required for each RNA. The establishment records for the RNAs restrict management activities that disturb or modify the environment; prohibit livestock grazing, prescribed fire except under a future fire management plan, fuelwood and timber cutting; and withdraw the areas from mineral entry. The establishment records direct that recreational use be monitored for undesired impacts and that recreation be restricted, if deemed necessary, based on future RNA monitoring (Forest Service 1995, 1996a-f). FSM 4063.3(5) directs that recreation be "restricted or prohibited if such use threatens or interferes with the objectives or purpose for which the [RNA] is established."

3.3 State and Local Policy

3.3.1 Central Idaho Wilderness Act: Wilderness

On July 23, 1980, the U.S. Congress passed the Central Idaho Wilderness Act, Public Law 96-312. This act created the 2,361,767-acre River of No Return Wilderness. Senator Frank Church's name was added in 1984 by Public Law 98-231 in recognition of his efforts in passing the Central Idaho Wilderness Act.

3.3.2 WSR State Regulations: WSR

No state regulations directly address eligible, suitable, or designated WSRs. The Idaho State Water Resources Board has not designated state-protected rivers in the Salmon River basin.

The Idaho Stream Channel Protection Act requires that the stream channels of the State and their environment be protected against alteration for the protection of fish and wildlife habitat, aquatic life, recreation, aesthetic beauty and water quality. As a result of the Stream Channel Protection Act, the Idaho Department of Water Resources must approve in advance any work proposed within the bed and banks of a continuously flowing stream.

3.3.3 Idaho Roadless Rule: Inventoried Roadless Areas

The Idaho Roadless Rule (36 CFR 294 Subpart C) provides state-specific direction for the conservation of IRAs in the national forest in the state of Idaho. The Idaho Roadless Rule designated 250 IRAs and established five management themes that provide prohibitions with exceptions or conditioned permissions

governing road construction, timber cutting, and mineral development (73 Federal Register 201 [61456-61496]).

4.0 Resource Issues and Indicators

4.1 Significant Issues

Significant issues are those which are used to formulate alternatives to the Proposed Action and to develop mitigation measures. No significant issues were identified for special designations.

4.2 Issues and Indicators: Wilderness

Although special designations was not identified as a significant issue, it was identified by the public, the Forest Service, and cooperating agencies as a relevant consideration. The analysis of effects on wilderness character includes the following issue and indicators:

Issue: The SGP could change the quality of wilderness character in designated or recommended wilderness areas.

Indicators:

- Distance of SGP facilities from designated or recommended wilderness.
- Distance of designated or recommended wilderness from sights and sounds of human activity.
- Change in opportunities for self-reliant recreation within designated or recommended wilderness.

4.3 Issues and Indicators: WSR

The analysis of effects to WSRs includes the following issue and indicators:

Issue: The SGP may affect WSRs.

Indicators:

- Free-flowing conditions for eligible and suitable WSR segments;
- Water quality for eligible and suitable WSR segments;
- ORVs for which eligible and suitable WSR segments are designated or nominated;
- Potential changes to classification of eligible and suitable WSR segments as Wild, Scenic, or Recreational.

4.4 Issues and Indicators: IRA

The analysis of effects to IRAs and lands contiguous to unroaded areas includes the following issue and indicators:

Issue: The SGP may impact roadless character in IRAs and lands contiguous to unroaded areas.

Indicators:

- Miles and acres of roads in IRAs or contiguous unroaded lands.
- Number and acres of SGP facilities in IRAs or contiguous unroaded lands.

4.5 Issues and Indicators: RNA

The analysis of effects to RNAs includes the following issue and indicators:

Issue: The SGP could impact research values or ecosystem conditions within RNAs.

Indicators:

- Change in vegetation community composition and structure within an RNA.
- Change in number of vehicles using roads and human activity within or immediately adjacent to an RNA.
- Changes to water quality (chemistry, temperature) or quantity within an RNA.

5.0 Methodology

5.1 Analysis Area

The analysis area for each special designation resource includes the area where effects (direct / indirect and cumulative) may be caused by the SGP activities (FSH.1909.15, 15.2a).

5.1.1 Direct/Indirect Effects Boundaries

5.1.1.1 Wilderness

The analysis area for wilderness consists of the FCRNRW in the PNF MA 14, BNF MA 22, and a portion of the SCNF with Big Creek as the northern boundary and the Middle Fork Salmon River as the eastern and southern boundary. The analysis area also includes recommended wilderness within PNF MA 12 South Fork Salmon River and BNF MAs 18 Cascade Reservoir and 19 Warm Lake (**Figure 1-2**).

5.1.1.2 WSR

The analysis area for WSRs includes the study corridors for those rivers determined to be eligible and suitable for inclusion in the National System that intersect with the SGP area and the management areas associated with these waterways. Study corridors extend 0.25 mile on either side from the high-water mark of each eligible or suitable river segment. **Figure 1-3** shows the location of study corridors, which are the analysis area, in relation to SGP components. Specific river segments that are crossed by SGP components and are the focus of this analysis include: Burntlog Creek (eligible), Johnson Creek (eligible), and South Fork Salmon River (suitable) (Forest Service 2003a, 2010).

5.1.1.3 IRA

The analysis area for direct and indirect effects on roadless resources comprises the 13 IRAs and other uninventoried roadless lands within 5 miles of the SGP area (**Figure 1-4**).

5.1.1.4 RNA

The analysis area for RNAs are the RNAs that are within 5 miles of SGP facilities. There are two RNAs in the analysis area that include Belvidere Creek and Chilcoot Peak (**Figure 1-5**).

5.1.2 Cumulative Effects Boundaries

5.1.2.1 Wilderness

For untrammeled, natural, undeveloped, and solitude, remoteness, and primitive recreation opportunities quality of wilderness character, the analysis area for cumulative effects includes NFS lands and projects in the Krassel and McCall Ranger Districts.

5.1.2.2 WSR

The cumulative effects analysis area for WSRs includes all federally managed land and actions in the South Fork Salmon River watershed, and includes any action that could affect other eligible, suitable, or designated WSR waterways in the watershed. In addition to the three waterways discussed above, the Secesh River is in the South Fork Salmon River watershed and is considered suitable for inclusion in the National WSR System. The upper and lower portions of the Secesh River are classified as Recreational, and the central portion, between NFS Trail (NFST) 080 and the Lick Creek Road portion of McCall-Stibnite Road (CR 50-412), is classified as Wild.

5.1.2.3 IRA

The cumulative effects analysis area for IRAs is the same as the direct and indirect effects boundary.

5.1.2.4 RNA

The analysis area for cumulative effects to RNAs includes the two RNAs.

5.1.3 Analysis Area Methodology

5.1.3.1 Wilderness

Potential impacts on designated wilderness and recommended wilderness areas were evaluated based on the five qualities of wilderness character, as described below, which include untrammeled; natural; undeveloped; opportunities for solitude or primitive and unconfined recreation; and other features of value.

Impacts on the five qualities of wilderness character were analyzed using resource databases, including trailhead registrations, Geographic Information System (GIS) spatial analyses, scientific literature reviews, and information and analysis documented in reports prepared for the SGP. Effects on the qualities of wilderness character are quantified where possible.

5.1.3.2 WSR

WSRs were analyzed using resources including GIS spatial analyses, scientific literature reviews, and information and analysis documented in reports prepared for the SGP.

5.1.3.3 IRA

Inventoried roadless areas were analyzed using resource databases, including PNF and BNF monitoring and survey information, GIS spatial analyses, scientific literature reviews, and information and analysis documented in reports prepared for the SGP. Effects on roadless character within the roadless expanse can be temporary, short-term, or long-term. Temporary effects are less than one year, and short-term effects are expected to last three years. Long-term effects would be those that last beyond 3 years and up to 20 years (through closure and reclamation). Permanent effects to IRAs and lands contiguous to unroaded areas would exist indefinitely.

The analysis of effects on roadless character focuses on the following roadless area characteristics, which are described in **Table 6-7**, Wilderness Attributes and Corresponding Roadless Area Characteristics, Inventoried Roadless Areas, Existing Conditions.

- Naturalness;
- Undeveloped character;
- Outstanding opportunities for solitude and primitive types of recreation;
- Special features and values; and
- Manageability.

5.1.3.4 RNA

RNAs were analyzed using resource databases including invasive plant species surveys, GIS spatial analyses, scientific literature reviews, and information and analysis documented in reports prepared for the SGP. The establishment records for the RNAs and monitoring reports include a plant list, the forest types, and habitat within the RNA. However, complete botanical survey information for the two RNAs in the analysis area is unavailable.

6.0 Affected Environment

6.1 Existing Condition

6.1.1 Wilderness

The FCRNRW covers over 2 million acres in central Idaho (**Figure 1-2**) and is the largest contiguous wilderness in the continental 48 states and the largest in the NFS. As the largest block of primitive and undeveloped land outside Alaska, this wilderness is of national importance (Forest Service 2003b). Recommended wilderness in the analysis area includes areas within the PNF and BNF east of McCall and north of Warm Lake. The FCRNRW and recommended wilderness areas include seven general land types: 1) lower river canyon lands; 2) upper river canyon lands; 3) rolling basin lands; 4) low relief fluvial lands; 5) steep volcanic lands; 6) steep granitic fluvial lands; and 7) glaciated lands. Elevations in the FCRNRW and recommended wilderness range from less than 2,000 feet in the lower river canyon bottoms to over 10,000 feet on higher mountain peaks (Forest Service 2009).

The existing conditions of wilderness within the analysis area relative to the five qualities of wilderness identified in the Wilderness Act (untrammeled, natural, undeveloped, opportunities for solitude or primitive and unconfined recreation, and other features of value) are discussed in the following sections.

6.1.1.1 Untrammeled

The FCRNRW and recommended wilderness within the analysis area consist of large expanses where natural forces provide a wide and constantly changing variety of habitats and conditions. Natural ecological processes prevail, and many areas are unmanipulated by human activities. Wilderness character in the FCRNRW is affected by its variety of uses; however, wilderness retains a wild, uncontrolled nature that is indicative of its untrammeled character. Ecological processes, such as fires, floods, native species, and predator-prey relationships prevail (natural character).

The FCRNRW is actively managed for control of non-native invasive plant species to help maintain native plant communities. Non-native invasive plants have the potential to damage biological diversity and naturally functioning ecosystems. The FCRNRW Noxious Weed Treatments Final Supplemental Environmental Impact Statement (Forest Service 2007a) identifies invasive weed sites along Big Creek and the Middle Fork Salmon River. Implementation of the Forest Service's noxious/invasive weed management program in the FCRNRW includes the use of herbicides and restoration of weed sites to a native plant community. The Valley County weed program identifies the presence of 18 noxious weeds and non-native invasive plant species in the FCRNRW and recommended wilderness areas. These include spotted knapweed, oxeye daisy, Canada thistle, and rush skeleton weed (Valley County 2019).

6.1.1.2 Natural

Natural ecological systems inside the FCRNRW and recommended wilderness have been, and continue to be, affected by conditions and actions beyond the wilderness boundary. For example, threatened or endangered mammals, birds, fish, flowering plants, and insects are found in the FCRNRW and recommended wilderness areas that have been affected by human actions outside of wilderness. The tributaries to the East Fork and the Middle Fork of the Salmon River provide natural conditions that range from good to excellent in terms of water quality for domestic use, recreational use, and wildlife in the wilderness. Water quality is functioning at risk in localized areas due to sedimentation impacts from historical livestock grazing, compounded by naturally high sediment rates. Existing surface water quality in the analysis area is discussed in the Surface Water Quality Specialist Report (Forest Service 2022b).

Indigenous plant and animal species and habitat are an integral part of the natural quality of wilderness. In the FCRNRW and recommended wilderness areas, vegetation communities vary from ponderosa pine/bluebunch wheatgrass or Idaho fescue and Douglas fir/ninebark or snowberry at lower elevations to subalpine fir types at higher elevations. Habitat alterations due to fires in the wilderness have created brush fields, lodgepole pine stands, snag patches, and variations in species and age classes of vegetation (Forest Service 2003b; Herron and Freeman 2008). Following a fire, especially in areas that burned with high intensity, the potential for noxious/invasive weed invasion increases (Brooks and Lusk 2008). Weed managers in the FCRNRW have observed the spread of noxious/invasive weeds into burned areas, especially adjacent to existing weed sites (Forest Service 2007a).

Terrestrial habitat is at or near natural functioning condition. Levels of disturbance and fragmentation are very low (Forest Service 2010). Non-native wildlife species, which were introduced into the wilderness prior to designation, include chukar partridge and gray (Hungarian) partridge. The FCRNRW provides habitat for native resident and anadromous fish species. California golden trout and Arctic grayling have been introduced into some lakes and streams (Herron and Freeman 2008).

The "airshed" associated with the FCRNRW consists of areas both directly above the wilderness, as well as areas above lands adjacent to its boundary. The FCRNRW is designated as a Class II airshed. Management of air quality in the FCRNRW includes monitoring to ensure that outside influences are not

degrading the air quality beyond the Clean Air Act Class II standards. Existing air quality conditions and Class II standards are discussed in the Air Quality Specialist Report (Forest Service 2022c).

6.1.1.3 Undeveloped

Human development in the FCRNRW and recommended wilderness is mostly associated with visitor use, such as trailheads and backcountry airstrips. Aircraft use is prevalent during the late spring and summer months; during winter, backcountry flights are generally associated with flights into established airstrips, including those on private inholdings. Along the western wilderness boundary of the FCRNRW, access roads are dirt roads with high elevation passes that are closed by snow during the winter. Access roads to the FCRNRW and recommended wilderness areas also are dirt roads, except for the South Fork Salmon River Road (National Forest System Road [FR] 50674), which is a single-lane road with an asphalt paved surface (**Tables 6-1** and **6-2**).

Table 6-1 Access Roads and Trailheads for the FCRNRW in the Analysis Area

National Forest and Ranger District	National Forest System Roads (FR)	Trailheads
Payette National Forest Krassel Ranger District	Big Creek-Smith Creek Road (FR 50371) Meadow Creek Lookout Road (FR 51290) Thunder Mountain Road (FR 50375) Lick Creek portion of McCall-Stibnite Road (County Road [CR] 50-142)	Big Creek/Smith Creek, Lick Creek, Monumental, Lookout Mountain
Boise National Forest Cascade Ranger District	Artillery Dome Road (FR 447e) Springfield Mine Road (FR 440a)	Pistol Lake, Snowshoe Summit, North Fork, Sulfur Creek, Elk Creek

Source: Forest Service 2003a, 2010

Table 6-2 Access Roads and Trailheads for the Recommended Wilderness in the Analysis Area

National Forest and Ranger District	National Forest System Roads (FR)	Trailheads
Payette National Forest Krassel Ranger District	South Fork Salmon River Road (FR 50674) Zena Creek Road (FR 50361)	Blackmare Creek, Buckhorn Creek, Cow Creek, Fitsum Creek
Boise National Forest Cascade Ranger District	South Fork Salmon River Road (FR 50474) Gold Fork Meadow Road (FR 497.1)	North Fork, Gold Fork, South Fork

Source: Forest Service 2019a

Additional human development in the FCRNRW includes a very high frequency repeater site at Artillery Dome, Forest Service guard stations and patrol cabins, Big Creek and Indian Creek public airstrips, and private airstrips.

6.1.1.4 Opportunities for Solitude or Primitive and Unconfined Recreation

The FCRNRW and recommended wilderness areas provide a wide variety of user opportunities for exploration, solitude, natural environment, risk, challenge, and primitive and unconfined recreation. Visitors use outfitter and guide services in the FCRNRW and recommended wilderness areas to take part in hiking, horseback riding, hunting, fishing, floating, and rafting.

Opportunities for solitude are affected by concentrated patterns of use in certain seasons along with the presence of access roads, trailheads, and structures associated with administrative sites. Opportunities for primitive and unconfined recreation are seasonally affected in high-use areas. In areas away from access roads, trailheads, administrative sites, and other areas of concentrated use, the FCRNRW and the recommended wilderness areas offer outstanding opportunities for solitude and primitive and unconfined recreation. These areas also provide outstanding opportunities for solitude and primitive and unconfined recreation during winter.

6.1.1.5 Other Features of Value

The FCRNRW and recommended wilderness areas also preserve "ecological, geological, or other features of scientific, educational, scenic, or historic value," as identified in section 2(c) of the Wilderness Act. This quality captures important elements of the wilderness, such as cultural or paleontological resources, that may not be covered in the other four qualities.

6.1.2 Wild and Scenic Rivers

Eligibility studies for the analysis area streams and rivers have been conducted (BNF Forest Plan Appendix D; PNF Forest Plan Appendix D). Rivers in the PNF, BNF, and nearby Sawtooth National Forest were evaluated in 1997 in order to determine their eligibility for inclusion in the National System (Forest Service 2010). The 1997 WSR study evaluated 889 streams and identified 45 with potential ORVs. These 45 streams were segmented and assigned preliminary classifications of recreational, scenic, or wild.

The analysis area for WSRs includes three of the streams identified as eligible during the 1997 study including the South Fork Salmon River, Burntlog Creek, and Johnson Creek. A suitability study for the South Fork Salmon River was performed as part of the Payette Forest Plan in 2003, and the South Fork Salmon River was determined to be suitable (Forest Service 2003a). These waterbodies and their ORVs are discussed below. The SGP would intersect WSR corridors at the proposed access roads and utility corridors.

6.1.2.1 South Fork Salmon River

The South Fork Salmon River runs for 86 miles from its headwaters in the BNF, through the PNF, to its confluence with the Salmon River. A combined suitability study of the PNF and BNF concluded that the South Fork Salmon River is suitable for WSR designation. **Figure 6-1** shows the intersection of the suitable South Fork Salmon River corridor and the existing transmission line and Warm Lake Road crossing of the river. This is where the SGP transmission line upgrade intersects the South Fork Salmon River.

This river segment is in BNF MA 19 Warm Lake. In that management area, the river is an estimated 27.5 miles long, with an estimated river corridor area of 8,100 acres.

The river has a preliminary WSR classification of recreational. Recreational segments have a designated VQO of partial retention. The South Fork Salmon River is recognized for the following ORVs (Forest Service 2003a):

- **Recreation:** As a major tributary to the WSR-designated Salmon River, the river supports whitewater recreation opportunities from around the nation.

BNF MA 19
Boise National
Forest

474

467

Warm Lake
Substation

Warm Lake

South Fork Salmon River

Warm
Lake

WARM LAKE RD

WARM LAKE RD

Tule
Lake

474

Project
Area

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LEGEND

1/4 Mile Buffer of South Fork Salmon River

Wild And Scenic Rivers

Status/Classification

Suitable, Recreational

Project Components

Access Roads and Trail System

Groomed OSV Route

Utilities

Upgraded Powerline

Existing Substation*

Other Features

U.S. Forest Service

USFS Management Area

County

City/Town

Railroad

Highway

Road

Stream/River

Lake/Reservoir

* Substation locations are approximate

0 0.25 0.5 Miles

1 inch = 0.5 miles
when printed at 11x17

N

Figure 6-1
South Fork Salmon River Suitable Wild and Scenic River
Stibnite Gold Project
Stibnite, ID

Base Layer:
Other Data Sources: Midas Gold; USGS; State of Idaho Geospatial Gateway (INSIDE Idaho) ; Boise National Forest; Payette National Forest

- **Scenic:** The river is a Level 1 visually sensitive route. Level 1 applies to areas where significant public use occurs and where visual quality is of high concern to typical users. Examples of such routes may include recreational lakes and rivers that provide a high level of scenic quality.
- **Geological:** There are outstanding geological features through the river corridor.
- **Cultural:** The river is a significant area for Native American interests; it contains cultural and historic properties, and the river is a major fishery for the Nez Perce Tribe and Shoshone-Bannock Tribes.
- **Botanical:** Populations of rare plants and plant communities exist along the river corridor.
- **Fisheries:** The river is one of three drainages in Idaho supporting wild native steelhead; bull trout are found in all reaches; the river supports bull trout and westslope cutthroat spawning, rearing, and migration habitat; and supports prime populations of federally listed anadromous fish species.

South Fork Salmon River Road (FR 50674/474) is an asphalt road that parallels the South Fork Salmon River. It is plowed in winter and open to highway-legal vehicles. Currently, South Fork Salmon River Road provides the only winter vehicle access to the village of Yellow Pine and the connecting road (Stibnite Road portion of McCall-Stibnite Road [CR 50-412]) to the SGP. This road is compatible with the recreational classification of the river. Annual average daily traffic information has not been compiled on the South Fork Salmon River Road for the SGP.

Detailed baseline data for existing water quality where the SGP components intersect the South Fork Salmon River at Warm Lake Road (CR 10-579) have not been compiled. The Idaho Department of Environmental Quality (IDEQ) has designated total maximum daily load targets for sediment on the South Fork Salmon River (IDEQ 2011).

6.1.2.2 Burntlog Creek

Burntlog Creek, located in MA 20 Upper Johnson Creek, is eligible for inclusion in the National System from its headwaters to its confluence with Johnson Creek. Burntlog Creek has an ORV for fish (Forest Service 2010), as it is a Pacfish/Infish priority watershed that supports spawning and rearing habitat for wild Chinook salmon, steelhead, cutthroat trout, redband trout, and bull trout. From its headwaters to the crossing of Burnt Log Road (FR 447), Burntlog Creek is eligible as a recreational river. Downstream of Burnt Log Road it is eligible as a wild river. **Figure 6-2** shows its location. The VQO for the recreational segment is partial retention. The VQO for the wild segment is preservation.

Burnt Log Road crosses Burntlog Creek and several of its tributaries. It separates the recreational segment upstream of the road from the wild segment downstream. As discussed in the Access and Transportation Specialist Report (Forest Service 2022d), it is a one-lane native surfaced road maintained to Forest Service maintenance level 3 (i.e., usable by prudent driver in a passenger car). The road includes turnouts and is infrequently groomed as a snowmobile route in winter. Burnt Log Road includes a culvert crossing at Burntlog Creek; traffic counts along the beginning of Burnt Log Road (where it joins Warm Lake Road [CR 10-579]) showed an annual average daily traffic volume of 27 vehicles (summer).

From downstream of the Burnt Log Road crossing to its confluence with Johnson Creek, the waterway has a preliminary classification as wild. The estimated 10.9-mile wild segment has a river corridor area of 3,475 acres. This segment also is in the Burntlog Inventoried Roadless Area (Forest Service 2010). There are no utility rights-of-way located in the Burntlog Creek corridor.

The upper segment of Burntlog Creek, from its headwaters to where it crosses Burnt Log Road, has a preliminary classification of recreational. The approximately 1.9-mile recreational segment has a river corridor area of 615 acres.

Detailed baseline information on existing water quality in Burntlog Creek has not been compiled for the SGP. IDEQ has evaluated beneficial uses for the creek, rating it 2.67 on a scale where a score of 3 or higher indicates that it fully supports macroinvertebrate, fish, and aquatic habitat functioning (IDEQ 2011).

6.1.2.3 Johnson Creek

An approximately 2.9-mile segment of Johnson Creek located in BNF MA 21 is eligible for inclusion in the National System, with a preliminary classification of recreational. **Figure 6-3** shows its location. The VQO for Recreational WSR segments is partial retention.

This reach of Johnson Creek is eligible for WSR status because of its ORV for cultural (heritage) resources. There are numerous known historic and prehistoric sites along Johnson Creek (both in and outside of the eligible corridor); those that are eligible for listing on the National Register of Historic Places are historic properties (Forest Service 2022e). Any historic properties located within the 2.9-mile eligible corridor would contribute to its Heritage ORV (Forest Service 2010).

The existing Idaho Power Company Line 328 (transmission line) was built to service the Stibnite Mine during World War II and is recognized as a contributing Heritage resource under which Johnson Creek is eligible (Forest Service 2013). This transmission line would be replaced with a higher-capacity line as part of the SGP.

Johnson Creek Road (CR 10-413) parallels the eligible recreational segment of Johnson Creek. The road is native surfaced and is plowed from the village of Yellow Pine south to Wapiti Meadow Ranch for winter travel. It is groomed for snowmobile use from Wapiti Meadow Ranch to Landmark in winter. Traffic counts showed an annual average daily traffic of 57 vehicles for the summer (Forest Service 2022a).

The IDEQ lists Johnson Creek on its 303(d) list of impaired waters, due to temperature (IDEQ 2011). Summer temperatures on Johnson Creek routinely exceed the 10-degree Celsius (50-degrees Fahrenheit) guideline for bull trout spawning.

6.1.3 Inventoried Roadless Areas

The analysis area contains portions of 13 IRAs identified in the Idaho Roadless Rule. The management themes in the 2008 Idaho Roadless Rule beginning from most to least restrictive are: Wild Land Recreation; Special Areas of Historic or Tribal Significance; Primitive; Backcountry/Restoration; and General Forest, Range, and Grassland. The themes provide an array of permitted and prohibited activities regarding timber cutting, sale, or removal; road construction and reconstruction; and mineral activities. A sixth designation, Forest Plan Special Areas, was used to identify areas managed by forest plans for specific uses, such as WSRs, RNAs, or other specific purposes identified in forest plans. These areas are managed under the Payette Forest Plan (Forest Service 2003a) and Boise Forest Plan (Forest Service 2010); the Idaho Roadless Rule does not apply to these areas (Forest Service 2008a, 2008b).

BNF MA 21
Boise National
Forest

PNF MA 12
Payette National
Forest

BNF MA 19
Boise National
Forest

Frank-Church-River of
No Return Wilderness

Salmon-Challis
National Forest

BNF MA 20
Boise National
Forest

JOHNSON CREEK RD

440

467

447

WARM LAKE RD

Burntlog Creek

Johnson Creek

Wild Segment

Recreational
Segment

Thunderbolt
Tap
Substation

Burntlog
Maintenance
Facility

Landmark
Maintenance
Facility

Project
Area

LEGEND

- Burntlog Watershed
- 1/4 Mile Buffer of Burntlog Creek

Wild And Scenic Rivers

Status/Classification

- Eligible, Recreational
- Eligible, Wild

Project Components *

- Burntlog Route
- Groomed OSV Route
- Burntlog Route Borrow Source

Offsite Facilities

- Perpetua Offsite Facilities

Utilities

- Upgraded Powerline
- New Substation**

Other Features

- U.S. Forest Service
- Wilderness
- USFS Management Area
- County
- City/Town
- Railroad
- Highway
- Road
- Stream/River

*Project Components are associated with Burntlog Route

** Substation locations are approximate

0 0.65 1.3 Miles

1 inch = 1.3 miles
when printed at 11x17

Figure 6-2
Burntlog Creek Eligible Wild and Scenic River Stibnite Gold Project Stibnite, ID

Base Layer:
Other Data Sources: State of Idaho Geospatial Gateway (INSIDE Idaho); Boise National Forest; Payette National Forest; Midas Gold; USGS

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Johnson Creek Substation

PNF MA 12
Payette National Forest

BNF MA 21
Boise National Forest

BNF MA 21
Boise National Forest

PNF MA 13
Payette National Forest

BNF MA 20
Boise National Forest

Caton Lake

Rainbow Lake

Shell Rock Lake

Riordan Lake

Johnson Creek

JOHNSON CREEK RD

STIBNITE RD

440

Project Area

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LEGEND

1/4 Mile Buffer of Johnson Creek

Wild And Scenic Rivers

Status/Classification

- Eligible, Recreational
- Eligible, Wild

Project Components *

Access Roads and Trail System

- Burntlog Route
- OSV Trail

Utilities

- New Powerline
- Upgraded Powerline
- New Substation**

Other Features

- U.S. Forest Service
- USFS Management Area
- County
- City/Town
- Railroad
- Road
- Stream/River
- Lake/Reservoir

*Project Components are associated with Burnt Log and Johnson Creek Routes

** Substation locations are approximate

0 0.4 0.8 Miles

1 inch = 0.85 miles when printed at 11x17

N

Figure 6-3
Johnson Creek Eligible Wild and Scenic River
Stibnite Gold Project
Stibnite, ID

Base Layer:
Other Data Sources: Midas Gold; USGS; Boise National Forest; Payette National Forest; State of Idaho Geospatial Gateway (INSIDE Idaho)

Table 6-3 and **Table 6-4** display the acreages in the Idaho Roadless Rule management classifications for the portions of the 13 IRAs managed by the PNF and BNF, respectively.

Table 6-3 Management Classifications of PNF IRAs

Roadless Area Name	Primitive Acres	Wild Land Recreation Acres	Forest Plan Special Area Acres	Backcountry Restoration Acres	Total Acres
Caton Lake	0	0	2,049	43,377	45,426
Horse Heaven	0	0	0	13,446	13,446
Meadow Creek	0	0	0	8,007	8,007
Needles	7,022	90,230	2,534	31,493	131,279
Secesh	7,720	110,255	10,545	119,568	248,088
Sugar Mountain	0	0	0	10,340	10,340
Total	14,742	200,485	15,128	226,231	456,586

Source: Forest Service 2003a, 2008a

Table 6-4 Management Classifications of BNF IRAs

Roadless Area Name	Primitive Acres	Forest Plan Special Area Acres	Backcountry Restoration Acres	General Forest, Rangeland, and Grassland Acres	Total Acres
Bernard	0	469	20,422	0	20,891
Black Lake	0	82	5,253	0	5,335
Burnt Log	0	3,837	19,862	0	23,699
Caton Lake	0	177	29,396	9,531	39,104
Horse Heaven	0	0	2,180	2,121	4,301
Meadow Creek	0	149	12,874	8,258	21,281
Needles	5,857	1,185	19,493	56	29,894
Peace Rock	137,429	7,096	47,209	0	191,734
Reeves Creek	0		10,542	0	10,542
Stony Meadows	6,401		7,150	0	13,551
Whiskey	0		4,970	0	4,970
Total	149,687	12,995	179,351	19,966	365,302

Source: Forest Service 2010, 2008a

Table 6-5 lists the IRA management areas and MPCs as administered by the PNF or BNF. The IRAs in the analysis area include 1,841 acres recommended for wilderness inclusion (MPC 1.2) in the Payette Forest Plan (Forest Service 2003a). MPCs for both PNF and BNF are described as follows:

1.2 – Wilderness Inclusion

2.2 – Research Natural Area

3.1 – Passive Restoration and Maintenance of Aquatic, Terrestrial, and Hydrologic Resources

3.2 – Active Restoration and Maintenance of Aquatic, Terrestrial, andHydrologic Resources

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

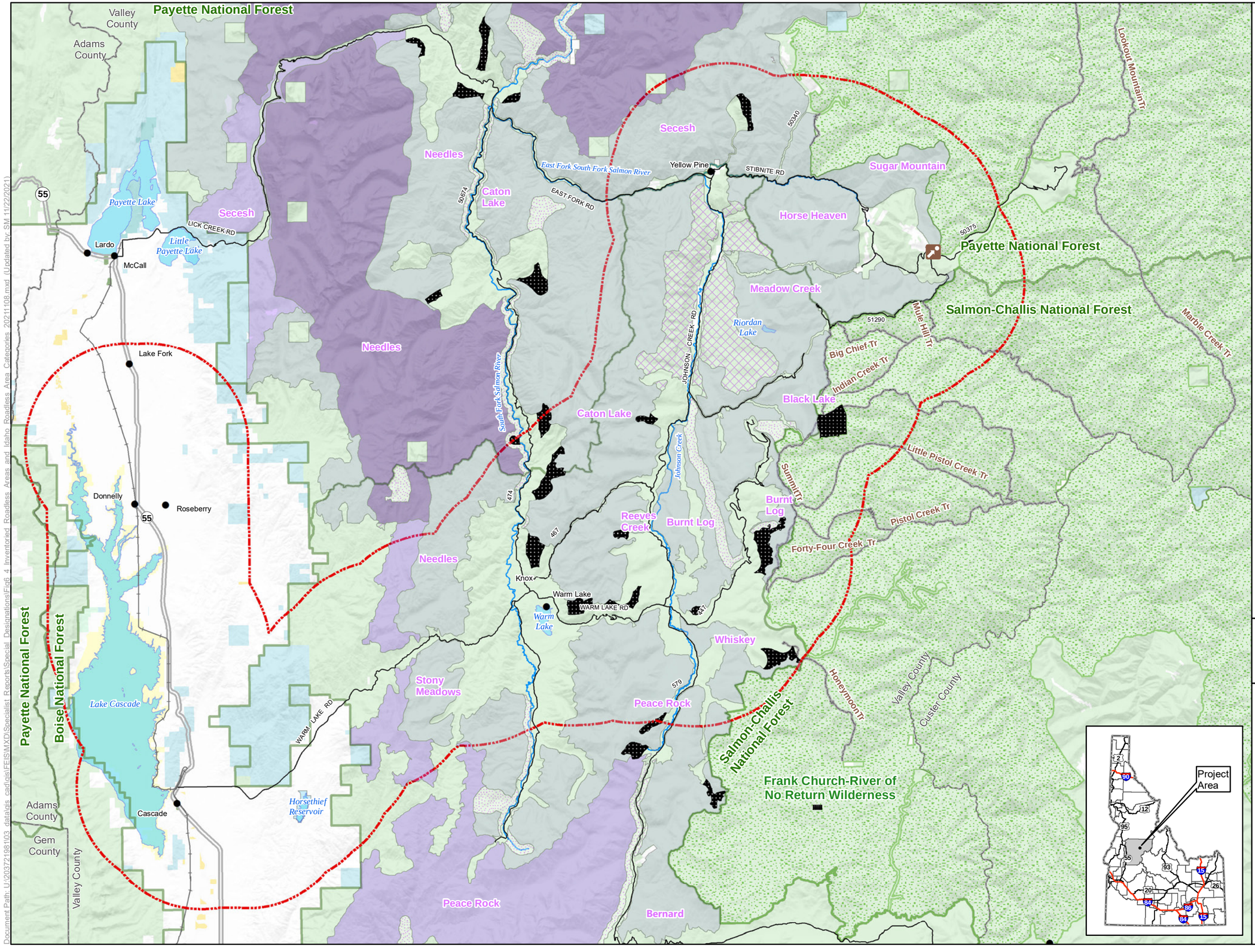
4.2 – Roaded Recreation Emphasis5.1 – Restoration and Maintenance Emphasis within Forested Landscapes

Table 6-5 Management Areas and Management Prescription Categories for IRAs in the Analysis Area

Forest Area and MA	MPC 1.2 Acres	MPC 2.2 Acres	MPC 3.1 Acres	MPC 3.2 Aces	MPC 5.1 Acres	MPC 4.1c Acres
Payette National Forest MA 13 Big Creek/Stibnite	0	0	37,308	8,021	0	0
Payette National Forest MA 12 South Fork Salmon River	1,841	0	7,392	9,036	0	0
Boise National Forest MA 18 Cascade Reservoir	0	0	0	0	0	3,058
Boise National Forest MA 13 Deadwood River	0	0	30	0	0	0
Boise National Forest MA 21 Lower Johnson Creek	0	808	9,738	25,234	20,177	0
Boise National Forest MA 17 North Fork Payette River	0	0	0	0	0	5,336
Boise National Forest MA 20 Upper Johnson Creek	0	0	52,547	5	0	0
Boise National Forest MA 15 Upper Middle Fork Payette River	0	0	0	0	5	1,659
Boise National Forest MA 19 Warm Lake	0	0	80	37,868	0	0
Total	1,841	808	107,095	80,164	20,182	10,053

Source: Forest Service 2003a, 2010

The lands contiguous to unroaded areas are areas with acreages of less than 5,000 acres and are adjacent to an IRA or the FCRNRW boundary (Forest Service 2010). **Table 6-6** lists the MPCs for the approximately 9,361 acres of lands in the analysis area that are contiguous to unroaded areas administered by the BNF or the SCNF shown on **Figure 6-4**. Lands contiguous to unroaded areas include 882 acres recommended for wilderness inclusion in the Boise Forest Plan (Forest Service 2010) and 1,084 managed as Wilderness Corridor under the 1987 Salmon-Challis Forest Plan.



LEGEND

- Analysis Area
- Contiguous Unroaded Lands

Idaho Roadless Area Category

- Wild Land Recreation (WLR)
- Primitive (P)
- Backcountry Restoration (BCR)
- General Forest, Rangeland, and Grassland (GFRG)
- Forest Plan Special Area (FPSA)

Other Features

- U.S. Forest Service
- Wilderness
- County
- City/Town
- Monumental Summit
- Railroad
- Highway
- Road
- Trails
- Stream/River
- Lake/Reservoir

Note: The McCall – Stibnite Road (CR 50-412) consists of Lick Creek Road, East Fork South Fork Salmon River Road (East Fork Road) and Stibnite Road.

0 2.25 4.5 Miles

1 inch = 4.5 miles when printed at 11x17

Figure 6-4 Inventoried Roadless Areas and Idaho Roadless Area Categories Stibnite Gold Project Stibnite, ID

Base Layer: USFS Shaded Relief Service
Other Data Sources: Midas Gold; State of Idaho Geospatial Gateway (INSIDE Idaho); USGS; Boise National Forest; Payette National Forest

Document Path: U:\2037\21981\63_data\gis_cad\gis\FEIS\MXD\Specialist_Reports\Special_Designations\Fig6_4_Inventoried_Roadless_Areas_and_Idaho_Roadless_Area_Categories_20211108.mxd (Updated by SM 11/22/2021)

Table 6-6 Management Areas and Management Prescription Categories for Lands Contiguous to Unroaded Areas in the Analysis Area

Forest Area and MA	MPC 1.2 Acres	MPC 3.1 Acres	MPC 3.2 Acre	MPC 4.2 Acres	MPC 5.1 Acres	Wilderness Corridor Acres
Boise National Forest MA 17 North Fork Payette River	0	0	0	0	112	0
Boise National Forest MA 19 Warm Lake	0	0	2,954	592	0	0
Boise National Forest MA 20 Upper Johnson Creek	0	192	2,518	0	0	0
Payette National Forest MA 12 South Fork Salmon River	882	0	2,248	0	0	0
Salmon-Challis National Forest MA 24	0	0	0	0	0	1,084
Total	882	192	7,720	592	112	1,084

Source: Forest Service 1987, 2003, 2010

FSH 1909.12, 72.1 discusses the five wilderness attributes identified in the Wilderness Act of 1964. These five wilderness attributes are used to describe the existing conditions in the IRAs and the lands contiguous to unroaded areas (FSH 1909.12-2015 (72.1). An in-depth description of the condition of each of the roadless areas in the forest and the condition and character of each of the areas is further described in the Final Environmental Impact Statement for the Idaho Final Roadless Rule (Forest Service 2008a).

Table 6-7 displays how roadless characteristics are incorporated into the analysis of the effect for wilderness attributes for roadless expanse, which includes the IRAs and the lands contiguous to unroaded areas.

Table 6-7 Wilderness Attributes and Corresponding Roadless Area Characteristics

Wilderness Attributes	Roadless Area Characteristic
Natural: Extent to which the area's ecological systems are substantially free from the effects of modern civilization and generally appear to have been affected primarily by forces of nature.	• High quality or undisturbed soil, water, and air • Sources of public drinking water • Diversity of plant and animal communities • Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land
Undeveloped: Degree to which the area is without permanent improvements or human habitation.	• Reference Landscapes • Natural appearing landscapes with high scenic quality

Wilderness Attributes	Roadless Area Characteristic
Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation **Solitude:** Opportunity to experience isolation from the sights, sounds, and presence of others from the development and evidence of humans. **Primitive and unconfined recreation:** Opportunity to experience isolation from the evidence of humans, to feel a part of nature, to have a vastness of scale, and a degree of challenge and risk while using outdoor skills	• Primitive, semi-primitive non-motorized, semi-primitive motorized recreation opportunity spectrum (ROS) classes of dispersed recreation
Special Features: Unique and/or special geological, biological, ecological, cultural, or scenic features.	• Traditional cultural properties and sacred sites • Other locally identified unique characteristics
Manageability: Ability of the Forest Service to manage an area to meet size criteria and the elements of wilderness.	No criteria[1]

Table Based on FSH 1909.12 (72.1); Landres et al. 2008

[1] Idaho Roadless Areas typically exceed 5,000 acres to meet the minimum criteria for consideration for inclusion in the National Wilderness Preservation System.

6.1.3.1 Natural Integrity and Appearance

The natural integrity and appearance of the 13 IRAs and lands contiguous to unroaded areas (roadless expanse) are generally undisturbed from natural conditions and unaffected by human development, which is substantially unnoticeable. However, there are an estimated 32.5 miles of unauthorized roads in the IRA analysis area.

The natural appearance in the roadless expanse has been influenced by past mining activities, road intrusions, and telephone (i.e., utility) infrastructure corridors. **Table 6-8** contains a description of the natural integrity and appearance of the 13 IRAs and contiguous lands. There are an estimated 5.4 miles of designated NFS roads and 531 miles of trails that allow motorized use in the roadless expanse. During winter, there are groomed over-snow vehicle routes on roads adjacent to the boundary of the roadless expanse.

Table 6-8 IRAs and Land Contiguous to Unroaded Areas Natural Integrity and Appearance

Roadless Area Name	Natural Integrity and Appearance
Bernard	There is approximately 0.1 mile of NFS road in the IRA and historic mining sites have been located along the Deadwood River. There are 21 mining claims in the IRA.
Black Lake Includes 793 acres of contiguous lands	The integrity of the area has been affected in some locations by historic mining activity.
Burnt Log Includes 1,087 acres of contiguous lands	There are approximately 12 miles of NFS roads and 14 miles of trails open to motorized use in the IRA.
Caton Lake Includes 2,979 acres of contiguous lands	There are approximately 40 miles of trails open to motorized use in the IRA, and there are an estimated 1.25 miles of unauthorized roads within the IRA.
Horse Heaven	There is approximately 0.2 mile of unauthorized NFS road and 40 miles of trails open to motorized use in the IRA. Scattered mining claims occur within the IRA and past mining is evident in portions of the IRA.

Roadless Area Name	Natural Integrity and Appearance
Meadow Creek	There are an estimated 15 miles of trails open to motorized use and 2.9 miles of NFS roads within the IRA. Surrounding and intruding roads, a telephone infrastructure corridor, and scattered historic mining-related disturbance detract from the natural integrity in some portions of the area.
Needles Includes 2,327 acres of contiguous lands	There are an estimated 132 miles of trails open to motorized use and 0.1 mile of NFS roads within the IRA. There also are an estimated 30 miles of unauthorized roads in the IRA.
Peace Rock Includes 1,363 acres of contiguous lands	There are approximately 131 miles of trails open to motorized use and 0.3 mile of NFS roads within the IRA. During winter, there is a groomed over-snow vehicle route along the north and east side of the IRA.
Reeves Creek Includes 788 acres of contiguous lands	There is approximately 0.2 mile of NFS road and 20 mining claims within the IRA.
Secech Includes 275 acres of contiguous lands	There are an estimated 0.8 mile of NFS roads and Valley County roads within the IRA and 194 miles of trails open to motorized use. Past mining activity occurred in Ruby and Willow Basket creeks and around Secesh Meadows.
Stony Meadows Includes 112 acres of contiguous lands	There are approximately 5.4 miles of trails open to motorized use, and, during the winter, there is a plowed road on the north side of the IRA and a groomed snowmobile trail along the east side.
Sugar Mountain	An estimated 1.1 miles of unauthorized roads are within the IRA, and 1 mile of the trail is open to motorized use.
Whiskey Includes 588 acres of contiguous lands	There are 1.5 miles of trails open to motorized use and approximately 0.2 mile of NFS roads in the IRA.

Source: Forest Service 2008a

The specific miles for roads and trails are from Final Idaho Roadless Area Environmental Impact Statement Volume 4 Appendix C Boise, Payette, and Sawtooth.

6.1.3.2 Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation

The 13 IRAs, including the adjacent unroaded areas, provide recreation opportunities, such as camping, canoeing, cross-country skiing, fishing, hiking, hunting, picnicking, and wildlife viewing. The outstanding opportunities for solitude or primitive and unconfined recreation vary throughout the roadless expanse. Outstanding opportunities for solitude are high in areas of the roadless expanse due to the topography, vegetation, and distance to large population centers. Opportunities for solitude are good in the Meadow Creek IRA around Riordan Lake, which is sheltered by extensive vegetation and small draws. However, in the areas where the roadless expanse is adjacent to heavily used access roads and trails that allow motorized use, the outstanding opportunities for solitude are limited. Opportunities for solitude are limited in some areas due to the loss of vegetative screening from past wildfires. In areas of the roadless expanse that are narrower than 1 mile, the irregular and complex shape limits opportunities for solitude.

The topography and climate in the roadless expanse provide opportunities for primitive and challenging recreational activities. Except for motorcycle or all-terrain vehicle recreation, most existing recreation use is of a primitive type (e.g., hiking, backpacking, stock use and trail riding, big and small game hunting, and primitive recreation). Locations where the roadless expanse is narrow, and there are cherry-stemmed road exclusions, limit opportunities for primitive recreation.

The physical setting of the Recreational Opportunity Spectrum (ROS) class is defined by the absence or presence of human sights and sounds, physical size of an area, and the amount of environmental modification caused by human activity (Forest Service 1982; Johnson et al. 2005). The Recreation Specialist Report (Forest Service 2022f) discusses summer and winter ROS classes in more detail.

Tables 6-9 and **6-10** provide estimates of the physical setting ROS acres in the roadless expanse during summer and winter. During summer, 129,437 acres of the roadless expanse in the analysis area meet the semi-primitive non-motorized setting and provide visitors a high probability of getting away from the sights and sounds of other people. A total of 45,000 acres of the roadless expanse meet the semi-primitive motorized setting during summer, providing visitors with a moderate probability of getting away from sights and sounds of other people.

Table 6-9 IRAs and Lands Contiguous to Unroaded Areas Summer ROS

Roadless Area Name	Rural Acres	Roaded Natural Acres	Semi-Primitive Motorized Acres	Semi-Primitive Non-Motorized Acres
Bernard	701	1,119	0	233
Black Lake Includes 1,084 acres of contiguous lands	0	3,367	315	3,821
Burnt Log Includes 1,087 acres of contiguous lands	618	11,771	5,040	7,357
Caton Lake Includes 854 acres of contiguous lands	2,280	5,339	5,361	37,891
Horse Heaven	2,737	1,559	713	12,738
Meadow Creek	296	7,702	7,219	13,996
Needles Includes 66 acres of contiguous lands	1,276	1,517	4,940	11,449
Peace Rock Includes 60 acres of contiguous lands	2,149	1,835	7,565	8,788
Reeves Creek Includes 2,021 acres of contiguous lands	620	4,032	143	7,767
Secech Includes 401 acres of contiguous lands	4,218	2,181	10,374	10,468
Stony Meadows	1,781	2,866	1,930	6,693
Sugar Mountain	2,456	1,472	551	5,861
Whiskey Includes 612 acres of contiguous lands	792	1,537	849	2,375
Total	19,924	46,297	45,000	129,437

Source: Forest Service 2003a, 2008a

During winter, 140,991 acres of the roadless expanse in the analysis area meet the semi-primitive non-motorized setting and 40 acres meet the primitive setting. These areas provide visitors with a high probability of getting away from the sights and sounds of other people. There are 11,496 acres of the roadless expanse that meet the semi-primitive motorized groomed setting and 85,244 acres that meet the semi-primitive motorized setting during winter, providing visitors with a moderate probability of getting away from sights and sounds of other people.

Table 6-10 IRAs and Lands Contiguous to Unroaded Areas Winter ROS

Roadless Area Name	Rural Acres	Roaded Natural Acres	Semi- Primitive Motorized Acres	Semi- Primitive Motorized Groomed Acres	Semi- Primitive Non- Motorized Acres	Primitive Acres
Bernard	0	0	1,517	1,205	536	0
Black Lake Includes 1,084 acres of contiguous lands	0	0	2,598	0	3,821	0
Burnt Log Includes 1,087 acres of contiguous lands	0	0	15,827	3,935	8,958	0
Caton Lake Includes 854 acres of contiguous lands	2,971	0	6,517	938	41,383	0
Horse Heaven	539	2,460	3,549	0	11,200	0
Meadow Creek	1,110	100	14,423	599	13,580	0
Needles Includes 66 acres of contiguous lands	1,274	0	5,876	0	12,032	0
Peace Rock Includes 60 acres of contiguous lands	0	0	10,233	2,169	10,103	0
Reeves Creek Includes 2,021 acres of contiguous lands	519	0	4,131	267	7,767	0
Secech Includes 401 acres of contiguous lands	1,455	1,018	10,759	0	14,009	0
Stony Meadows	795	0	5,756	981	6,729	0
Sugar Mountain	0	1,535	274	0	8,491	40
Whiskey Includes 612 acres of contiguous lands	0	0	3,784	1,402	2,382	0
Total	8,663	5,113	85,244	11,496	140,991	40

Source: Forest Service 2003a, 2008a

6.1.3.3 Special Features

In each of the 13 IRAs, there are locally identified unique characteristics and values. These special features include areas valued for their scientific qualities, scenic qualities, or other notable distinct features. **Table 6-11** describes special features identified for the IRAs in the analysis area, including areas where habitat modeling indicates special status plant species occur, as shown in the Vegetation Specialist Report (Forest Service 2022g).

Table 6-11 IRAs and Lands Contiguous to Unroaded Areas Special Features

Roadless Area Name	Special Features
Bernard	No special features identified.
Black Lake Includes 793 acres of contiguous lands	A total of 82 acres of the 1,290-acre Chilcoot Peak RNA are in this IRA. Habitat modeling indicates 19 special status plant species may be found in this area.
Burnt Log Includes 1,087 acres of contiguous lands	A total of 700 acres of the 1,290-acre Chilcoot Peak RNA are in this IRA. A total of 3,100 acres of the Burnt Log Creek corridor, which is eligible for WSR designation, bisects the IRA. Habitat modeling indicates 22 special status plant species may be found in this area.
Caton Lake Includes 2,979 acres of contiguous lands	Caton Lake and other alpine lakes are special features, along with the 1,100-acre Phoebe Meadows RNA. Habitat modeling indicates 18 special status plant species may be found in this area.
Horse Heaven	An elk security area, which is analogous to elk winter range, lies in the north end of the IRA. Habitat modeling indicates 28 special status plant species may be found in this area.
Meadow Creek	Riordan Lake, Meadow Creek Lookout, and about 100 acres of the Johnson Creek WSR eligible corridor are special features in this IRA. Habitat modeling indicates 25 special status plant species may be found in this area.
Needles Includes 2,327 acres of contiguous lands	The Needles geologic formation, a scenic landmark, and the 985-acre Needles RNA are in the IRA. Habitat modeling indicates three special status plant species may be found within this area.
Peace Rock Includes 1,363 acres of contiguous lands	About 1,300 acres of Back Creek RNA are located in the IRA. Habitat modeling indicates four special status plant species may be found in this area.
Reeves Creek	Habitat modeling indicates 22 special status plant species may be found in the area.
Secech Includes 275 acres of contiguous lands	Elk winter range occurs along the East Fork South Fork Salmon River and along the South Fork Salmon River in this IRA, and 1,464 acres include the Circle End Creek RNA. Approximately 700 acres are part of the Yellow Pine Water Users watershed. Habitat modeling indicates 17 special status plant species may be found in this area.
Stony Meadows Includes 112 acres of contiguous lands	Curtis Lake is a high elevation lake of special interest. Habitat modeling indicates two special status plant species may be found in this area.
Sugar Mountain	Sugar Mountain and Missouri Ridge are prominent landmarks. A big game migration route passes near Sugar Mountain. Habitat modeling indicates 15 special status plant species may be found in this area.
Whiskey	Habitat modeling indicates 11 special status plant species may be found in this area.

Source: AECOM 2020a; Forest Service 2008a

6.1.3.4 Manageability

Manageability refers to the ability to manage an area to maintain roadless characteristics. A total of 2,723 acres in the analysis area of Needles and Secesh IRAs are recommended for wilderness in the Payette Forest Plan (Forest Service 2003a) and Boise Forest Plan (Forest Service 2010). Areas of the roadless expanse with complex and irregular boundaries from intersecting roads or private lands and small IRA areas make it more difficult to define and administer the area to maintain roadless characteristics. In addition, boundaries for parts of IRAs in the roadless expanse are difficult to identify on the ground and difficult to administer due to their remoteness. **Table 6-12** describes the manageability of the roadless expanse for each of the 13 IRAs and the contiguous unroaded area.

Table 6-12 IRAs and Lands Contiguous to Unroaded Areas Manageability

Roadless Area Name	Manageability
Bernard Includes 306 acres of contiguous lands	Bernard IRA has some very complex and irregular boundaries due to the long exclusion of the road along Sulphur Creek.
Black Lake Includes 1,084 acres of contiguous lands	Black Lake IRA is less than 5,000 acres.
Burnt Log Includes 909 acres of contiguous lands	Burnt Log IRA has very complex and irregular boundaries.
Caton Lake Includes 989 acres of contiguous lands	Caton Lake IRA is relatively intact with defined boundaries.
Horse Heaven	Mining development inclusions complicate managing the area.
Meadow Creek	Portions of Meadow Creek IRA have easily defined boundaries.
Needles Includes 1,506 acres of contiguous lands	The Needles IRA has some irregular boundaries.
Peace Rock Includes 645 acres of contiguous lands	Peace Rock IRA has very complex and irregular boundaries.
Reeves Creek Includes 2,021 acres of contiguous lands	Reeves Creek IRA has some irregular boundaries.
Secech Includes 1,110 acres of contiguous lands	Secesh IRA is relatively intact with defined boundaries.
Stony Meadows	Stoney Meadows IRA has some irregular boundaries.
Sugar Mountain	Sugar Mountain IRA has boundaries that may be difficult to manage due to past or future mining activity.
Whiskey Includes 613 acres of contiguous lands	Whiskey IRA has very complex and irregular boundaries.

Source: Forest Service 2003a, 2008a, 2019b

6.1.4 RNA

The system of RNAs was established with the goal of allowing natural processes to occur without the influence of human activity. RNAs preserve natural features and plant communities for research and educational purposes. The objectives of RNAs are:

- to provide baseline areas against which the effects of human activities in similar environments can be measured;
- to provide sites for study of natural processes in undisturbed ecosystems; and
- to provide gene pool preserves for plant and animal species (Rust 1998).

RNAs contribute to a national network of ecological areas dedicated to research, education, and the maintenance of biological diversity. These conditions are ordinarily achieved by allowing natural, physical, and biological processes to prevail without human intervention. RNAs that are representative of common ecosystems in natural conditions serve as baseline or reference areas. The two RNAs in the analysis area provide on-site and extension educational opportunities (**Table 6-13**).

Table 6-13 Research Natural Areas in the Analysis Area

RNA	Forest	Management Area	Acres	Elevation in Feet
Belvidere Creek	PNF	MA 14 Frank Church River of No Return Wilderness	2,920	6,200–9,273
Chilcoot Peak	BNF	MA 21 Lower Johnson Creek	1,294	7,250–8,998

Source: Forest Service 2017

[1] Size for each RNA is based on GIS data from the PNF and BNF.

The following list is a summary of the resources for which each of the two RNAs were established. Complete descriptions of the RNAs are found in the establishment records (Forest Service 1995, 1996a-f). Fire is an ecosystem process within these RNAs and is consistent with the values for which they are established. No formal studies have been conducted documenting if characteristic versus uncharacteristic fire has occurred; the evidence is based on field observations and indicates primarily characteristic fire behavior.

- Belvidere Creek RNA was established to preserve high elevation subalpine fir habitat types, outstanding aquatic features with associated wetland plant communities, and a unique and scenic geomorphic setting. This RNA encompasses an entire watershed that was glacially sculptured during the Pleistocene. A complex system of tributaries makes up the headwaters of Belvidere Creek, including nine cirque and paternoster (chain of lakes) lakes. The tributaries coalesce as they enter the straight, U-shaped lower valley. A small area of mountain big sagebrush/Idaho fescue habitat type occurs in the lower valley below an avalanche chute. Whitebark pine-subalpine fir habitat types and open scree slopes occur on the upper elevation ridges. Fire rings and trace amounts of litter in the western portion of the RNA show minimal evidence of recreation use. Fire and avalanches function as ecosystem processes in this RNA, consistent with its boundaries being within the FCRNRW. There is no evidence of non-native plants. Overall, no major changes in the extent of cover types have been confirmed since RNA establishment.
- Chilcoot Peak RNA was established to preserve diverse subalpine forest habitats, including subalpine fir, Douglas-fir, and whitebark pine (*Pinus albicaulis*) habitat types. The glaciated

basins below Chilcoot Peak support an unusually diverse assemblage of wetland and aquatic associations, including a high elevation lake, raised ponds with sphagnum, wet meadows, and gentle- to steep-gradient stream reaches. This RNA encompasses three subalpine, glaciated basins and intervening ridgeline habitats. The basins contain an unusually diverse assemblage of wetland and aquatic associations. Aquatic types include a lake, raised ponds with sphagnum, and low- to steep-gradient streams. The raised ponds are dominated by water lily (*Nuphar polysepalum*). Wetland associations are dominated by coniferous tree, shrub, and graminoid species, often occurring on sphagnum. Engelmann spruce (*Picea engelmannii*) occurs as small islands on the sphagnum mats, with Labrador tea (*Ledum glandulosum*) and western blueberry (*Vaccinium occidentale*) in the understory. Shrub communities include those dominated by Sitka alder (*Alnus sinuata*) and undergreen willow (*Salix commutata*). Graminoid associations include water sedge (Carex aquatilis), beaked sedge (*Carex rostrata*), and few-flowered spike-rush (*Eleocharis pauciflora*). Dry subalpine fir and whitebark pine (*Pinus albicaulis*) associations dominate the uplands, with inclusions of cliff, talus, and rock outcrop habitats around Chilcoot Peak. The Forest Service's 2013 monitoring report indicates that access by pickup is possible on FR 447 until the switchback near the northwest corner of block 26; the road is passable with an ATV to the northwest corner of the RNA. A 2019 monitoring report indicates that FR 447 was impassable due to downed trees so access was by foot. It also indicated that fire has occurred in the RNA (2007) and regeneration is occurring. Whitebark pine is present. Wetlands and the sphagnum bog were unaffected by the fires. There was slight evidence of tree cutting on the boundary, probably related to the 2007 fire. There is no other evidence of non-native plants, recreation use, or other indicators of human presence. The 2020 Buck Fire did burn a section of the Chilcoot Peak RNA but has not yet been assessed.

7.0 Environmental Consequences

7.1 Impact Definitions

The impacts definitions for intensity, duration (FSH 1909.15, 152b), and context are provided in **Table 7-1.**

Table 7-1 Impact Definitions

Attribute	Term	Description
Intensity	Negligible	Impacts would result in a change in current conditions that would be too small to be physically measured using normal methods or would not be perceptible. There is no noticeable effect on the natural or baseline setting. There are no required changes in management or utilization of the resource.
Intensity	Minor	Impacts would result in a change in current conditions that would be just measurable with normal methods or barely perceptible. The change may affect individuals of a population or a small portion of a resource, but it would not result in a modification in the overall population, or the value or productivity of the resource. There are no required changes in management or utilization of the resource.
Intensity	Moderate	Impacts would result in an easily measurable change in current conditions that is readily noticeable. The change affects a large percentage of a population, or portion of a resource which may lead to modification or loss in viability, value, or productivity in the overall population or resource. There are some required changes in management or utilization of the resource.

Attribute	Term	Description
Intensity	Major	Impacts are considered significant. Impacts would result in a large, measurable change in current conditions that is easily recognized. The change affects a majority of a resource or individuals of a population, which leads to significant modification in the overall population, or the value or productivity of the resource. This impact may not be in compliance with applicable regulatory standards or impact thresholds, requiring large changes in management or utilization of the resource.
Duration	Temporary	Impacts that are anticipated to last no longer than 1 year.
Duration	Short-Term	Impacts that are anticipated to begin and end within the first 3 years during the construction phase.
Duration	Long-Term	Impacts lasting beyond 3 years to the end of mine operations and through reclamation, approximately 20 years.
Duration	Permanent	Impacts that would remain after reclamation is completed.
Context	Localized	Impacts would occur within the analysis area or the general vicinity of the Operations Area Boundary.
Context	Regional	Impacts would extend beyond the Operations Area Boundary and local area boundaries.

Intensity is the severity or levels of magnitude of an impact.
Duration is the length of time an effect would occur.
Context is the effect(s) of an action that must be analyzed within a framework, or within physical or conceptual limits)

7.2 Direct and Indirect Effects

7.2.1 Wilderness

The analysis of effects on recommended or designated wilderness includes a qualitative analysis of the effects on the five qualities of wilderness character (**Section 3.2.1**) from the construction, operation, and closure and reclamation of the SGP.

The following analysis of effects on designated wilderness (i.e., the FCRNRW) and recommended wilderness areas are considered in the overall context of wilderness character within the analysis area. Elements of this context include:

- There would be no changes to non-conforming uses within the FCRNRW or recommended wilderness areas.
- No structures or surface disturbing activities from the SGP would occur within a designated wilderness or recommended wilderness areas.
- The Forest Service would not enact new management restrictions on visitor behavior within the wilderness analysis area.
- Opportunities for solitude within wilderness or recommended wilderness areas are available when visitation numbers are low and are affected by potential increasesin visitation to the wilderness and associated sights or sounds of human activity and development.
- Other features, such as soundscapes and dark skies, are included in the evaluationof the other four qualities of wilderness character.

- SGP activities undertaken outside of the wilderness boundary are not designed with the intention of influencing populations or ecological functions within the wilderness or recommended wilderness.
- No facilities would be constructed within the FCRNRW or recommended wilderness areas. There would be no changes to the numbers of structures or developments within the FCRNRW or recommended wilderness areas or changes to the number of inholdings.
- The levels of administrative and non-emergency use of motor vehicles, motorized equipment, or mechanical transport within wilderness or recommended wilderness areas would continue along present trends.

Potential effects on the five qualities of wilderness character could occur during all phases (construction, operations, closure and reclamation) of the SGP. The duration of effects on wilderness character considered includes temporary, short-term, or long-term. Temporary effects are those lasting a few hours to a few months, such as encountering others in the wilderness. Short-term effects are those that are expected to last more than a few months and up to 3 years. The duration of long-term effects on wilderness qualities of untrammeled, natural, undeveloped, and opportunities for solitude or primitive and unconfined recreation would be 3 or more years and up to 20 years through closure and reclamation. Other features of value, the fifth wilderness character, is included within the discussions for the other four wilderness qualities of untrammeled, natural, undeveloped, and opportunities for solitude or primitive and unconfined recreation.

7.2.1.1 No Action Alternative

The use and character of the FCRNRW and recommended wilderness areas would continue as projected in the Frank Church-River of No Return Wilderness Plan and the Payette and Boise Forest Plans. Under the No Action Alternative, none of the approved exploration or planned ASAOC activities would be conducted within the FCRNRW boundary or recommended wilderness boundaries. There would be no measurable effects under the No Action Alternative on the five qualities of wilderness character in the FCRNRW or recommended wilderness areas.

7.2.1.2 2021 MMP

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

- Mine site facilities;
- Access roads; and
- New transmission line.

There is a measurable effect on designated wilderness and recommended wilderness areas at the following locations:

Burntlog Route, Riordan Creek Segment – A 5.3-mile segment of the Burntlog Route would be routed high up in the Riordan Creek drainage, where it would cross Riordan Creek north of Black Lake.

Public Access through the SGP – Public access through the SGP from Stibnite Road (CR 50-412) to Thunder Mountain Road (FR 50375) during mining operations would be provided by constructing a 12-

foot-wide gravel road to connect Stibnite Road to Thunder Mountain Road. The route would be open to all vehicles year-round.

Limestone Processing – Lime and crushed limestone would be produced on-site from mining a limestone formation in the West End pit.

Untrammeled

While no structures or facilities would be developed inside the FCRNRW, the untrammeled quality of wilderness character could be impacted by the SGP facilities and access roads. Construction, operation, and closure and reclamation could change soundscapes or natural dark sky conditions in the FCRNRW. The extent where the SGP facilities and access roads could change soundscapes or natural dark sky conditions is influenced by topography and weather.

Noise from SGP activities, an increase in human activity, or additional traffic on roads could change wildlife species natural distribution within the FCRNRW. The disturbance to wildlife species along or near the Johnson Creek Route would be short-term. Once construction of Burntlog Route is complete, traffic on the Stibnite Road portion of McCall-Stibnite Road (County Road [CR] 50-412) (Stibnite Road) could return to existing annual average daily traffic (AADT) of 39 vehicles. Sound from mechanical equipment at the SGP and daily Burntlog Route maintenance could change natural wildlife species distribution in the Big Chief drainage within the FCRNRW. Constructing Burntlog Route close to the FCRNRW boundary (i.e., along Riordan Creek) could increase areas where noise and lights from vehicles could be audible and visible within the Big Chief Creek drainage. During the 3 years of construction and 15 years of operation, the natural distribution of wildlife species in the FCRNRW in habitats adjacent to the Johnson Creek Route (during construction) and Burntlog Route could change (Idaho Department of Fish and Gamee 2019). Noise from blasting at the SGP would attenuate to the threshold of 55 dBA at 2.2 miles on distance alone but accounting for topography and atmospheric absorption, would attenuate to 55 dBA approximately 0.78 mile from the source (Forest Service 2022h). Blasting noise at the mine would be intermittent during the 15 years of mine operation. Noise from Burntlog Route summer maintenance would attenuate to the threshold of 55 dBA at approximately 0.42 miles based on distance alone and noise from Burntlog Route winter maintenance would attenuate to the threshold of 55 dBA approximately 0.54 mile from the source of activity. However, accounting for ground absorption and atmospheric absorption, noise from summer road maintenance would attenuate to 55 dBA approximately 0.22 mile away and noise from winter road maintenance would attenuate to 55 dBA approximately 0.27 mile from the source of activity. Burntlog Route maintenance and associated noise would be limited to between 7:00 a.m. and 10:00 p.m. Topography, and to a lesser extent vegetation, between the FCRNRW and blasting in the open pits and mine operation would reduce the distance noise from these activities are audible (Brüel and Kjaer 2000). The ridge between Burntlog Route cut and fill slopes and the FCRNRW boundary would influence noise intensity and block where headlights from vehicles on Burntlog Route could be visible within the FCRNRW. See the Noise Specialist Report (Forest Service 2022h) for more detailed information regarding noise levels from the SGP and the Burntlog Route.

Lights used during mine construction, operation, and closure could result in skyglow, changing natural dark sky conditions. There could be temporary impacts on night sky conditions from construction lights at the SGP and vehicle headlights. Once construction in an area is completed, mine lights in localized areas would no longer be needed. Lights from vehicles on Burntlog Route would be visible within the upper elevations of Big Chief Creek within the FCRNRW. Topography and vegetation could block or filter lights, reducing the area where lights are visible (Larkin 1996). The extent of change to natural dark skies from lights during mine operation and vehicle headlights on Burntlog Route is unknown. Environmental

design features (**Section 2.4**) to shield lights would reduce the area where mine operation lights change natural dark skies.

Human activity at the SGP would increase to accommodate the mine's year-round 24-hour a day operation schedule. Increasing human activity at the SGP and from the potential public use of Burntlog Route could alter wildlife species migration into habitats in the FCRNRW. The use of Burntlog Route could increase the number of people recreating and hunting in wildlife habitats adjacent to or in the FCRNRW. Increased human activity could change wildlife distribution. The extent wildlife distribution would change is influenced by the type of activity, vegetation, and species (Taylor and Knight 2003; Wisdom et al. 2018).

The untrammeled quality of wilderness character would be impacted when noise and lights change wildlife species distribution and behaviors. Noise from mine activities, vehicles on Burntlog Route, and changes to natural dark skies during construction, operation, and closure and reclamation activities could result in a long-term change in wildlife species natural distribution. The duration could be short-term as some individuals of wildlife populations become habituated to noise, lights, and human activity.

Noise from recontouring slopes during the decommissioning of the Burntlog Route and returning Meadow Creek Lookout Road (National Forest System Road [FR] 51290) to the existing width could be audible within the Big Chief Creek drainage. Noise from recontouring slopes, removing buildings at the SGP, and Burntlog Route decommissioning would attenuate to the threshold of 55 dBA approximately 0.57 miles from the source of activity based on distance along. Accounting for topography and atmospheric absorption, noise would attenuate to 55 dBA approximately 0.28 mile from the activity (Forest Service 2022h). Noise from recontouring slopes or decommissioning Burntlog Route would be temporary. These activities would be completed within a few days or weeks in a specific area, and, as activities ended, wildlife species distribution could return to pre-disturbance conditions. The duration of changes to wildlife species distribution after closure and reclamation activities cease would depend on species sensitivity to disturbance.

Although no structures or facilities would be developed inside the FCRNRW or recommended wilderness areas, there would be minor to moderate and short to long-term impacts, depending on the location of the impacts, to the untrammeled quality of wilderness character as described above by associated noise and lights from the SGP.

Natural

Plants

During construction, the 65 mine-related vehicles per day using Johnson Creek Route could transport non-native plant species. Non-native plant species transported on vehicles could become established and spread into the FCRNRW. Removing vegetation and disturbance of soils during the construction of Burntlog Route could also spread non-native plant species (Forest Service 2019b). Constructing the Burntlog Route close to the FCRNRW boundary could increase the potential for non-native plants to become established within the FCRNRW. Within the headwaters of Riordan Creek, Burntlog Route cut and fill slopes would be approximately 100 feet from the FCRNRW boundary. This approximately 5.3-mile-long segment of Burntlog Route would be downslope of the FCRNRW boundary. This shorter distance between disturbed areas and the wilderness could increase the risk of non-native plant species spreading into the FCRNRW. The public access road through the SGP could indirectly increase recreation use in the FCRNRW. Vegetation established during the interim reclamation of disturbed areas could

reduce opportunities for invasive species to establish (Foltz 2012; Gornish et al. 2016; Romme et al. 2003).

During the 15 years of mine operation, approximately 50 mine vehicles per day, on average, would use the Burntlog Route. This traffic and daily maintenance activities also could disperse non-native plant species or remove vegetation along the roadside. During the decommissioning of Burntlog Route, surface disturbance and removal of vegetation established during interim reclamation could provide opportunities for non-native plant species to become established and spread. In addition, equipment used during decommissioning could disperse non-native plant species. Reclamation could impact the "natural" quality of wilderness character if the non-native annual plant species included in the seed mix spread into the FCRNRW (Morris and Schupp 2009). Reclamation of disturbed areas, which involve revegetation on NFS lands, would be done according to Payette or Boise Forest Plan Standards and in coordination with a Forest botanist.

During Burntlog Route construction, operation, and closure and reclamation, dust and sediment could be deposited on vegetation within the FCRNRW. Dust and sediment deposition in areas of the FCRNRW adjacent to Burntlog Route could change vegetation community composition within the FCRNRW. The amount of dust and sediment deposited would be influenced by weather conditions, road maintenance, vehicle speed, and road surface. Limiting mine traffic to a 25-mile per hour speed limit (**Section 2.4**), could reduce the amount of dust generated. However, recreation traffic may not follow posted speed limits and speeds could be higher, which is associated with a higher amount of fugitive dust generated. The extent of dust and sediment deposition is unknown; however, the changes in vegetation would result in a long-term impact on the natural quality of wilderness character within the FCRNRW. Impacts on vegetation are discussed in the Vegetation Specialist Report (Forest Service 2022g).

Burntlog Route would be open to public use during the 15 years of mine operation and 5 years of mine closure and reclamation (Rew et al. 2018). Recreation use could increase in areas of the FCRNRW accessed from trailheads along Burntlog Route. Due to mine construction and operation, recreation use could increase in recommended wilderness areas if forest visitors avoid areas of FCRNRW. Recreation equipment and vehicles could disperse non-native plant species seeds (Pickering et al. 2010; Taylor et al. 2012; Rew et al. 2018). Indirectly, the natural quality of wilderness character in the FCRNRW and recommended wilderness areas could be impacted if recreation use spreads non-native plant species.

The public access road through the SGP would be open to all vehicles year-round. Public use is expected to be seasonal because the destination areas for the public are generally inaccessible between December and May. Forest visitors could access public lands beyond the SGP and adjacent to Monumental Summit from the village of Yellow Pine. Recreation equipment and vehicles could disperse non-native plant species. The potential increase in recreation use under the 2021 MMP either on Burntlog Route or the public access road is unknown. Where established, non-native plant species would have a long-term effect on vegetation communities within the FCRNRW. Applicable design features (**Section 2.4**) would be implemented to reduce the potential for non-native plant species to spread. The natural quality of wilderness character could decrease within the Big Chief Creek drainage.

The design feature of inspecting vehicles at the SGLF prior to use and conducting monitoring surveys for 3 years after a disturbed area is seeded or planted would increase the potential for non-native plant species to be detected and treated. Surveys and implementing treatments decrease the potential for non-native plant species to spread into the FCRNRW. The effectiveness of the applicable design features would vary depending on site conditions, invasive plant species characteristics, when surveys are conducted, and the size of the area needing treatment (Pearson et al. 2016).

In the long-term, the introduction of non-native plant species could change the composition of native plant communities. The potential for non-native plant species to spread depends on the specific characteristics and local site conditions (Zouhar 2003). Surveys and implementing treatments as described in the Frank Church-River of No Return Noxious Weed Prevention Plan and the Integrated Weed Management program for the Payette National Forest (PNF) and Boise National Forest (BNF) would reduce the potential for non-native plant species to spread. The extent non-native plant species could spread and the duration these species could persist in native plant communities is unknown. The natural quality of wilderness character would be impacted if non-native plant species became established within the FCRNRW or recommended wilderness areas.

Fish and Wildlife

During construction, operation, and closure and reclamation of the Burntlog Route, vegetation removal and excavation of soil and rock could increase sediment load into Big Chief Creek tributaries and affect fish and aquatic habitat. Erosion control measures, such as sediment fencing, ditch checks, and other measures, would reduce erosion from the road into the tributaries. There could be a long-term risk to fish and aquatic habitats from the accidental spill of material, such as fuel or mine processing chemicals, where Burntlog Route crosses a Big Chief drainage tributary. The extent of impacts to aquatic habitat would be from the site of the spill downstream to the point of dilution. The measures included in the Spill Prevention, Control, and Countermeasure Plan would reduce the potential for a spill to reach downstream waters. The Fisheries Specialist Report (Forest Service 2022i) provides additional information.

In the short-term, the SGP would result in an estimated 104 AADT, from the 65 mine-related vehicles, on Johnson Creek Route during the first 2 years of construction. Based on the estimated traffic volumes and vehicle mix, and typical vehicle speeds of 25 mph, estimated average hourly noise levels from SGP-related traffic during the construction phase would be 48 dBA L_{EQ} at 50 feet from the roadway; this would be below the impact threshold level of 55 dBA. Noise from traffic on Johnson Creek Route could change wildlife migration in Tamarack Creek drainage during the first 2 years of SGP construction. Noise from an individual vehicle would be temporary; however, between 5:00 am and 7:00 pm, when most vehicles would use Johnson Creek Route, there would be approximately five mine-related vehicles per hour. Based on the estimated traffic volumes and vehicle mix, and assuming typical vehicle speed of 25 mph and 10 percent of AADT traffic volume at peak hours conditions, estimated average hourly noise levels from SGP-related traffic on the Burntlog Route during the operations phase would be 49 dBA L_{EQ}. This would be below the threshold of 55 dBA. Noise and the number of vehicles on Burntlog Route could change wildlife distribution in Big Chief drainage. Less mine-related traffic and the proximity of Burntlog Route to the FCRNRW could indirectly increase recreation use of the area. Constructing Burntlog Route close to the ridge on the FCRNRW boundary could increase dispersed recreation use, both in areas adjacent to the FCRNRW and within Big Chief Creek drainage within the FCRNRW. If recreation use in the FCRNRW increases, the duration, and extent where wildlife distribution changes, either from vehicles or increased human activity, could increase. The extent where big game and sensitive wildlife species habitats within the FCRNRW are avoided by wildlife could increase. Traffic and plowing on Stibnite Road from the village of Yellow Pine to the SGP, when audible, could change wildlife distribution in Tamarack Creek drainage. The extent where habitat within the FCRNRW could be avoided is unknown. The natural quality of wilderness character could decrease within the Big Chief Creek drainage. Sound from mine traffic during the mine closure and reclamation also would be audible within the FCRNRW; however, with fewer mine vehicles using Burntlog Route, the daily duration of traffic sound could be less than during operation. Topography, weather, and natural sounds influence the distance noise can be heard. Noise impacts are discussed in the Noise Specialist Report (Forest Service 2022h).

Noise from the daily Burntlog Route maintenance could disturb wildlife and change their natural distribution. The extent of wildlife distribution changes is influenced by wildlife species sensitivity to noise, number of vehicles, and duration of human activity. Burntlog Route, which would be open to public use when other routes into the area are not available, could increase disturbance to wildlife species as the public could use the road at any time of day. Individuals in wildlife populations could become habituated to Burntlog Route noise and traffic during the 15 years of operation and 5 years of mine closure and reclamation. In the long-term, vehicles on Burntlog Route would likely change the distribution of species in the FCRNRW.

During the 2 years of Burntlog Route decommissioning and reclamation after mine closure, noise and human activity could disturb big game and sensitive wildlife species within the FCRNRW. As discussed under Untrammeled above, noise from these activities noise would attenuate to 55 dBA approximately 0.28 mile from the activity (Forest Service 2022h). Recontouring slopes, spreading growth media, and seeding areas would be conducted in May through November. Noise impacts from decommissioning Burntlog Route would last for a few weeks while decommissioning activities are conducted in a specific location. Once human activity and noise from decommissioning cease, habitat use in the FCRNRW by big game and disturbance-sensitive wildlife would return over time to natural distributions.

The extent within the FCRNRW where wildlife could be disturbed or areas where wildlife would avoid is unknown. Lights from mine operation and vehicle lights on Burntlog Route could be visible within the upper elevations of Big Chief Creek within the FCRNRW. Noise and lights could disturb sensitive wildlife species. However, over time, some individuals could become habituated to noise, lights, and human activity. The natural quality of wilderness character would be impacted where wildlife distribution changes within the FCRNRW.

A new transmission line would be constructed from the new Johnson Creek substation to the SGP. Raptors could use the new line structures as perches, which can expose them to electrocution risks (Eccleston and Harness 2018). Raptor species with home ranges that include portions of the FCRNRW, or recommended wilderness areas could perch and forage from transmission line structures. There could be raptor mortality from electrocution or collisions with transmission line structures, indirectly reducing the number of raptors in the FCRNRW or recommended wilderness areas. As part of the SGP, the transmission line structures would be designed and constructed to meet the Avian Power Line Interaction Committee (APLIC) recommended raptor-protection recommendations (**Section 2.4**) to reduce the potential for electrocution and to limit raptor perching. Power structures designed with APLIC recommended raptor-protection would reduce the risk of raptor mortality. The natural quality of wilderness character would be impacted if there was a decline in raptor populations from mortality caused by the transmission line, although this is not anticipated from the SGP.

Air and Water

The SGP would result in emissions listed in **Table 7-2** that could affect air quality in the FCRNRW. The predicted emissions of pollutants from within the Operations Area Boundary into the FCRNRW, as discussed in the Air Quality Specialist Report (Forest Service 2022c), including ozone precursors (e.g., nitrogen oxides and volatile organic compounds) would be below the National Ambient Air Quality Standards (NAAQS) thresholds. The potential deposition of nitrogen, mercury, and sulfur in the FCRNRW also were predicted to be below analysis thresholds outside the Operations Area Boundary. **Figure 1-1** shows the Operations Area Boundary and the boundary of the FCRNRW.

Table 7-2 Air Quality Analysis Modeled Pollutants Outside the Operations Area Boundary

Pollutant	Below NAAQS
Hg (mercury)	Yes
CO (carbon monoxide)	Yes
NO_X (Nitrogen oxides)	Yes
NO_2 (Nitrogen dioxide)	Yes
SO_X (Sulfur oxides)	Yes
SO_2 (Sulfur dioxide)	Yes
PM_{10} (particulate matter less than 10-micron diameter)	Yes
$PM_{2.5}$ (particulate matter less than 2.5-micron diameter)	Yes
TSP (Total suspended particulate)	Yes
HAP (hazardous air pollutant)	Yes
VOC (volatile organic compounds)	Yes

Source: Air Sciences 2018
NAAQS = National Ambient Air Quality Standards

The predicted regional haze from SGP operations to a distance outside the Operations Area Boundary of 31 miles, which includes portions of the FCRNRW, would be less than a 5 percent change in current conditions. Visibility of the landscape within the FCRNRW within 31 miles of the Operations Area Boundary would not be impaired.

Plumes from emissions sources during mine operation could be visible within the FCRNRW; however, when and where the plume is visible depends on topography, weather conditions, and time of day. The SGP emission sources would be in a valley, and the intervening topography would influence the plume's visibility within the FCRNRW. In the long-term, the natural quality of wilderness character within the FCRNRW would be impacted where and when plumes from emissions are visible likely to negligible to minor levels.

The mining and hauling of limestone and operation of the lime generation plant would increase air emissions in the analysis area. Emissions from the on-site generation of lime and the increased number of propane deliveries could increase sulfur dioxide emissions. However, emissions would be below NAAQS thresholds. SGP impacts to air quality, including haze and plumes, would be long-term and negligible to minor.

The potential exists for increased runoff, erosion, and sedimentation from vegetation removal and surface disturbance, which could result in increased sediment load in streams. SGP facilities would be constructed and operated in watersheds that do not contain tributaries that enter the FCRNRW. Widening approximately 1.3 miles of Meadow Creek Lookout Road (FR 51290) for construction of the Burntlog Route would remove vegetation and disturb soils within 170 300 feet from the FCRNRW boundary. Where vegetation would be removed, and surface disturbance is upgradient to the FCRNRW boundary, sediment could be deposited into headwater tributaries to Big Chief Creek. Sediment deposition in streams within 300 feet of Burntlog Route could increase relative to existing conditions (Watson 2000). The amount of sediment that could be deposited is influenced by slopes, soil, surface roughness, and vegetation. Stormwater pollution protection measures and interim reclamation would reduce the potential for sediment deposition into Big Chief Creek tributaries within the FCRNRW. Interim reclamation would establish vegetation cover indirectly reducing erosion. In the short-term, the natural quality of wilderness

character within the FCRNRW could be impacted if SGP activities along Burntlog Route resulted in increased sediment deposition in the headwater tributaries. The 5.3 miles of Burntlog Route in the Riordan Creek drainage would be located within 100 feet of the FCRNRW boundary. Although this road segment would be close to the wilderness boundary, a ridge separates it from streams in the FCRNRW. Surface water flow and sediment from this section of Burntlog Route would not deposit to headwater tributaries within the FCRNRW.

The reduction in mine traffic during operations on Burntlog Route to 50 vehicles per day on average could reduce the amount of dust generated; however, there could be an increase in vehicles from public recreation. Dust abatement mitigation measures on Burntlog Route would decrease the generation of fugitive dust from vehicles, although some dust deposition could occur on plants within the FCRNRW.

Ecological Processes

Under the 2021 MMP, widening approximately 21 miles of existing roads (Meadow Creek Lookout Road [FR 51290], Thunder Mountain Road (FR 50375), and Burnt Log Road [FR 447]) could indirectly increase recreation use within the FCRNRW as a result of improved access. The connection of Burntlog Route to Meadow Creek Lookout Road (FR 51290) could indirectly increase recreation use and duration of recreation activities within areas of the FCRNRW accessed from these roads. If recreation use increased, people and pack animals could compact soils, indirectly increasing erosion potential on portions of trails within the FCRNRW. The intensity of the effect on ecological processes from increased recreation use within the FCRNRW is influenced by site conditions, vegetation, and the duration of use at a specific site.

The number and size of vehicles using Burntlog Route for mine operation and closure and reclamation could result in wilderness visitors avoiding areas of the FCRNRW and this avoidance could indirectly increase recreation use in recommended wilderness areas or other areas of the FCRNRW, such as Big Creek. The increase in recreation use could result in areas where human influence impedes the free play of natural forces or interferes with natural processes in localized areas of the FCRNRW and recommended wilderness areas. Depending upon the magnitude, there could be long-term local changes in ecological processes within the FCRNRW and recommended wilderness areas. The natural quality of wilderness character could be impacted where there are changes in ecological processes.

The public access road would be open to all vehicles year-round. Forest visitors would have motorized access to public lands beyond the SGP and adjacent to Monumental Summit from the village of Yellow Pine. Public access road use through the SGP is expected to be seasonal due to snow cover between December and May, or later in the year. During the 15 years of operation, mine-related traffic on the Burntlog Route would be 50 AADT. Recreation equipment and vehicles could disperse non-native plant species. The potential increase in recreation use under the 2021 MMP, either on Burntlog Route or the public access road through the SGP, is unknown. If recreation use in areas of the FCRNRW adjacent to the Burntlog Route increased, there could be a loss of natural ecological processes where non-native plant species become established, and wildlife is disturbed.

Undeveloped

Under the 2021 MMP, no structures would be constructed, or SGP-related mechanical transport used, within the FCRNRW or recommended wilderness areas. Changes in Valley County road maintenance or groomed over-snow vehicle routes would not include roads or routes within or adjacent to recommended wilderness areas. The construction, operation, and closure and reclamation of SGP facilities would not change existing infrastructure within the FCRNRW or recommended wilderness areas. The undeveloped

quality of wilderness character would remain unchanged relative to existing conditions within the FCRNRW and the recommended wilderness areas.

Solitude, Remoteness, and Primitive Recreation Opportunities

The opportunities for solitude, remoteness, and primitive recreation within the FCRNRW and recommended wilderness areas could be indirectly affected by mining facilities and access roads outside of the FCRNRW and changes in wilderness visitation. Weather, topography, and vegetation influence the distance sounds would be audible and lights visible within the FCRNRW.

Under the 2021 MMP, the public access road through the SGP and construction of the Burntlog Route could increase recreation use within the FCRNRW. During the 15 years of operation, the public access road usage is expected to be seasonal because the destination areas for the public are generally inaccessible between December and May due to snow cover, with some areas such as Monumental Summit not accessible until June or early July. Forest visitors would have motorized access to public lands beyond the SGP and adjacent to Monumental Summit from the village of Yellow Pine. The public access road could increase the number of wilderness visitors by providing another access route to it. Forest visitors seeking solitude in Monumental Creek and Big Chief Creek may need to venture farther into the FCRNRW. The location of the Burntlog Route close to the FCRNRW boundary could indirectly increase recreation use. Because the distance between the Burntlog Route within the Riordan Creek drainage and the wilderness boundary would be minimal, there would be an increase in the areas where the sounds and lights would be audible or visible within the FCRNRW. Increases in recreation use and areas where noise and lights from human activity would be audible or visible would reduce the area with opportunities for solitude, remoteness, and primitive recreation. Traffic and plowing on Stibnite Road from the village of Yellow Pine to the SGP, when audible, would reduce opportunities for solitude in Tamarack Creek drainage. During construction, operations, and closure and reclamation there would be less area within the FCRNRW or recommended wilderness areas where solitude, remoteness, and primitive recreation opportunities quality of wilderness character would be available. These impacts would be long term, negligible to moderate, and localized.

Noise from mine related vehicles on the Johnson Creek Route during construction could decrease remoteness and increase the evidence of humans in Tamarack Creek drainage adjacent to the road. The Burntlog Route would decrease remoteness and increase the evidence of humans within Big Chief Creek drainage during construction, operation, and closure and reclamation. Burntlog Route cut and fill slopes, repeater site access roads, and mine operation lighting could be visible to wilderness visitors within Big Chief drainage, Summit trail, and at higher elevations within the FCRNRW. Sounds from the construction, operation, and daily maintenance of Burntlog Route also could be audible in these areas. As the visitor ventures further into the FCRNRW, the effects on solitude, remoteness, and primitive recreation opportunities could lessen. Where visible, cut and fill slopes and changes in vegetation structure could detract from the wilderness visitors experience within close proximity to the FCRNRW boundary.

During decommissioning and reclamation of the Burntlog Route, the duration of sound from recontouring slopes and seeding areas would be temporary, as activities would be completed within a few days or weeks at any given location. While the cut and fill slopes would be seeded during reclamation, the change in vegetation structure could be visible from areas within the FCRNRW for decades.

The duration would be greatest in areas where cut slopes remain after decommissioning Burntlog Route or where trees are removed during construction.

The Burntlog Route would change motorized access to several trailheads/trails leading into the FCRNRW. Indirectly, the Burntlog Route could increase the number of wilderness visitors and the duration of recreation in the FCRNRW. The potential for recreation use to increase is unknown; however, once constructed, the public could use Burntlog Route for approximately 20 years. Visitor encounters at trailheads/trails within the analysis area of the FCRNRW wilderness could increase due to the widening of Burnt Log Road (FR 447) and Meadow Creek Lookout Road (FR 51290) as part of the Burntlog Route. Some of the 500 mine workers could visit areas of the FCRNRW adjacent to the approximately 8,000-acre Operations Area Boundary shown on **Figure 1-1**.

The number and size of vehicles transporting supplies to the SGP on the Johnson Creek Road and the Burntlog Route could deter some visitors from the FCRNRW. The number of vehicles and delays due to construction and maintenance activities could indirectly increase recreation use in recommended wilderness areas or other areas of the FCRNRW. During construction, operations, and closure and reclamation, wilderness visitors would need to travel further into the FCRNRW or recommended wilderness areas to attain solitude, remoteness, and primitive recreation opportunities.

7.2.1.3 Johnson Creek Route Alternative

Under the Johnson Creek Route Alternative, the construction of mine facilities and the new transmission line would be the same as the 2021 MMP. The differences between the 2021 MMP and the Johnson Creek Route Alternative where there is a measurable effect on designated wilderness and recommended wilderness areas include:

- **Johnson Creek Road –** Under the Johnson Creek Route Alternative, access to the SGP would be via the Johnson Creek Road, and the SGP's construction phase would be 5 years, 2 years longer than the 2021 MMP. During the construction phase, the Stibnite Road section of McCall-Stibnite Road (CR 50-412) from the village of Yellow Pine to the SGP would require daily temporary road closures from 10:00 AM to 4:00 PM, and temporary closures of Johnson Creek Road during road maintenance activities also could be necessary during the 15 years of mine operation (Parametrix 2018a). The Johnson Creek Road (CR 10-413) also could be closed for 1 year during construction (Access and Transportation Specialist Report – Construction; Forest Service 2022d).
- **Radio repeater site construction** – Radio repeater sites in IRAs would be constructed using helicopters.

Untrammeled

Under the Johnson Creek Route Alternative, mine operation, off-site facilities, and the new transmission line would have the same impact on the untrammeled quality of wilderness character as those described for the 2021 MMP. The Burntlog Route would not be constructed; therefore, the effects from the Burntlog Route would not exist. Because the Burntlog Route would not be constructed, the maintenance facility would be located at Landmark nearer Johnson Creek Road. The potential changes to soundscapes, natural dark skies, and natural wildlife distribution within the FCRNRW from the SGP operation and closure and reclamation phases would be the same as those described under the 2021 MMP. Sky glow visible within the FCRNRW during operation would be the same as the 2021 MMP.

Using the Johnson Creek Route for mine access would require improvements to Johnson Creek Road and widening/reconstructing Stibnite Road from the village of Yellow Pine to the SGP. The duration of the mine construction phase would increase to 5 years (instead of 3 years). Under the Johnson Creek Route Alternative, the number of vehicles on Stibnite Road as part of the Johnson Creek Route would increase to 102 AADT during mine construction and 87 AADT during mine operation. Traffic volumes on Stibnite

Road would be approximately 2.6 times the existing AADT of 39 vehicles. Construction and road maintenance on the Johnson Creek Route could reduce the number of forest and wilderness visitors in areas of the FCRNRW where access is from Stibnite Road or Thunder Mountain Road and increase recreation use in recommended wilderness areas near these roads. After mine closure, improvements to Stibnite Road could increase recreation use in Tamarack Creek drainage of the FCRNRW if road conditions influence wilderness visitors.

The disturbance of wildlife species from dispersing into or from habitats adjacent to Johnson Creek Route could be a long-term effect. The volume of traffic during mine construction and operation could change the natural distribution of wildlife within the Tamarack Creek drainage (Idaho Department of Fish and Game 2019). The extent of effects on wildlife distribution would be less because the Burntlog Route would not be constructed or used. However, the intensity of the effect on wildlife distribution within Tamarack Creek could be greater because there would be increased traffic for about 20 years during construction and operation. Under the Johnson Creek Route Alternative, the untrammeled quality of wilderness character could be impacted in the Tamarack Creek drainage of the FCRNRW. Impacts would be long-term, negligible to minor, and localized.

Natural

Plants

Under the Johnson Creek Route Alternative, the Burntlog Route would not be constructed; therefore, there would be no effects to plant species or composition in this area.

Using Johnson Creek Route as the mine access road could reduce motorized recreation use on Thunder Mountain Road and Meadow Creek Lookout Road. Delays on the public access road through the SGP and the increase in size and number of mine-related vehicles on Johnson Creek Route could decrease recreation use within the FCRNRW. Decreased recreation use could indirectly reduce the risk of non-native plant species becoming established within the FCRNRW. During mine closure and reclamation, surface disturbance from recontouring slopes, seeding and planting areas disturbed by mine facilities, and stream relocation would be 1 mile or more from the FCRNRW boundary. The distance between areas disturbed during recontouring and areas where the seed mix includes non-native annual plant species would decrease the potential for changes to vegetation communities within the FCRNRW. Reclamation of disturbed areas, which involve revegetation on NFS lands, would be done according to Payette or Boise Forest Plan Standards and in coordination with a Forest botanist. This could help retain the existing vegetation conditions within the FCRNRW. The natural quality of wilderness character within the FCRNRW could be the same as existing conditions.

However, if recreation use in recommended wilderness areas near the South Fork Salmon River increases, the spread of non- native plant species also could increase. Mine related traffic on the Johnson Creek Route could result in forest visitors avoiding areas of the FCRNRW accessed from trailheads along Stibnite Road, such as Missouri Ridge. This could indirectly increase recreation use in recommended wilderness areas and other trails in the FCRNRW. Changes in recreation use could increase the potential for non-native plant species to spread into recommended wilderness areas or other areas of the FCRNRW. Surveys and implementing treatments, as described in the Integrated Weed Management program for the PNF and BNF, would reduce the potential for non-native plant species to spread. The natural quality of wilderness character within the recommended wilderness areas would be impacted if there was an increase in non-native plant species populations. Impacts would be long-term, negligible to minor, and localized.

Fish and Wildlife

Under the Johnson Creek Route Alternative, there could be a long-term risk to fish and aquatic habitats from the accidental spill of material, such as fuel or mine processing chemicals, where the Johnson Creek Route is adjacent to or crosses streams (e.g., Johnson Creek, East Fork SFSR). If a spill occurred and material entered a stream, there could be injury or mortality of fish and aquatic species, which could indirectly alter species distribution in portions of the FCRNRW Tamarack Creek drainage. The extent an accidental spill could affect aquatic species or fish habitat is unknown. The measures included in the Spill Prevention, Control, and Countermeasure Plan would reduce the extent of a spill in adjacent streams. The Fisheries Specialist Report (Forest Service 2022i) provides additional information.

Using Johnson Creek Route as the mine access road could reduce motorized recreation use on Thunder Mountain Road (FR 50375) and Meadow Creek Lookout Road (FR 51290). Delays on the public access road through the SGP and the increase in size and number of mine-related vehicles on Johnson Creek Route could decrease recreation use within the FCRNRW. Decreased recreation use could reduce the disturbance of big game and sensitive wildlife species within the Monumental Creek and Big Chief Creek drainages within the FCRNRW. During mine closure and reclamation, surface disturbance from recontouring slopes, seeding, and planting areas disturbed at the SGP would be 1 mile or more from the FCRNRW boundary. The distance from the noise generated during mine closure activities and the FCRNRW boundary would reduce disturbance to big game species and sensitive wildlife within the Big Chief Creek drainage.

The increased number of vehicles on Stibnite Road during mine construction and operation could change the natural distribution of wildlife within the Tamarack Creek drainage (Idaho Department of Fish and Game 2019). The long-term effect on big game species could include reduced habitat quality and changes in the natural distribution of wildlife species within the Tamarack Creek drainage. The natural quality of wilderness character would be impacted in the areas where wildlife species change their migration patterns.

However, the volume of traffic and potential delays along Johnson Creek Route could result in forest visitors avoiding FCRNRW trailheads accessed from Stibnite Road. Indirectly, recreation use in recommended wilderness areas and other areas of the FCRNRW could increase. Changes in recreation use could increase disturbance of big game and sensitive wildlife species in recommended wilderness areas or other areas of the FCRNRW. The natural quality of wilderness character would be impacted in recommended wilderness areas where wildlife species change their migration patterns. Impacts would be long-term, negligible to minor, and localized.

Air and Water

The effects on air and water within the FCRNRW and recommended wilderness from mine construction and operation emissions would be the same as the 2021 MMP. Although the Burntlog Route would not be constructed, there would be similar construction emissions for the road improvements along the Johnson Creek Route. The rate of sediment deposition into streams within the FCRNRW and recommended wilderness areas would be the same as existing conditions. Streams crossed by the Johnson Creek Route do not flow into the FCRNRW or the recommended wilderness areas.

Ecological Processes

Using the Johnson Creek Route as the mine access road could reduce motorized recreation use on Thunder Mountain Road and Meadow Creek Lookout Road. Timing restrictions during the construction phase and road maintenance activities could deter wilderness visits to areas of the FCRNRW accessed

from Monumental Creek. Decreased recreation use could reduce the potential for non-native plant species to be introduced from recreation equipment and vehicles (Rew et al. 2018). In the long-term, ecological processes within the FCRNRW would be the same as existing trends. The natural quality of wilderness character for ecological processes within the FCRNRW would be the same as existing conditions.

Indirectly, the volume and size of mine related traffic on Johnson Creek Route could indirectly increase recreation use in recommended wilderness areas. If recreation use in recommended wilderness areas increases due to forest visitors avoiding areas of the FCRNRW accessed from Johnson Creek Route, there could be an increase in the dispersal of non-native plant species. In the long-term, ecological processes would change in areas where non-native plant species become established. The number of forest visitors who might avoid areas of the FCRNRW accessed from Johnson Creek Route is unknown. The natural quality of wilderness character would be impacted in recommended wilderness areas where non-native plant species become established.

Undeveloped

Under the Johnson Creek Route Alternative, no structures would be constructed, or SGP-related mechanical transport used within the FCRNRW or recommended wilderness areas. The undeveloped quality of wilderness character would remain unchanged relative to existing conditions within the FCRNRW and the recommended wilderness areas.

Solitude, Remoteness, and Primitive Recreation Opportunities

The 102 to 87 AADT and potential delays on Johnson Creek Route during the construction and operation phases could decrease recreation use in the FCRNRW. Public access would be allowed through the SGP under the Johnson Creek Route Alternative via a 12-foot gravel road that connects Stibnite Road to Thunder Mountain Road. During mine construction and operation, public access roads through the SGP would be temporarily closed during mining activities that are public safety hazards (e.g., high wall scaling, blasting). When the public access roads are closed due to mine operations, forest and wilderness visitors would not be able to use Thunder Mountain Road to drive to Monumental or Lookout Mountain trailheads. During mine construction, public access roads and indirectly Thunder Mountain Road could be closed for 2 to 3 months.

Helicopters used to construct and maintain cell towers or repeater sites located within IRAs could be audible in the FCRNRW. Helicopters would be used for a few hours during the day during construction and maintenance. Noise from helicopters could be audible in the Big Chief drainage and would temporarily reduce opportunities for solitude, sense of isolation, and remoteness from sights and sounds of human activities.

During the 15 years of mine operation, public access roads could be closed for periods of five days to one month. Indirectly, this could increase recreation use in other areas of the FCRNRW and recommended wilderness areas. If recreation use increases, wilderness visitors would need to travel further into the FCRNRW or recommended wilderness areas to attain solitude, remoteness, and primitive recreation opportunities. The extent where roads adjacent to the FCRNRW boundary would be visible or audible would be the same as existing conditions. Impacts would be long-term, negligible to minor, and localized.

7.2.2 Wild and Scenic Rivers

The following analysis of effects associated with WSR is considered within the overall context of the WSR Act of 1969 and Forest Service policy regarding implementation of the WSR Act. Specifically, the

analysis considers direct and indirect effects to rivers identified as eligible or suitable for inclusion in the National WSR System and one designated WSR.

7.2.2.1 No Action Alternative

Under the No Action Alternative, there would be no SGP-related surface mining or ore processing to extract gold, silver, and antimony, and no underground exploration or sampling or related operations and facilities on NFS lands. Planned ASAOC activities would still be implemented.

Current uses by Perpetua on patented mine/millsite claims, and on the PNF and BNF would continue. Concurrent uses of NFS lands include mineral exploration, and dispersed and developed recreation, such as pleasure driving, hunting, off-highway-vehicle use, camping, hiking, snowmobiling, bird watching, target shooting, firewood cutting, and other forms of recreation. Private businesses, such as outfitter and guide services, operate on the Forests through special use permits. Traditional cultural uses of the SGP area would continue, including hunting, fishing, and the collection of plants for basket-making, food, and medicinal uses. Access to public land in the area would continue as governed by law, regulation, policy, and existing and future landownership constraints, the latter of which may include denial of access over private land.

Under the No Action Alternative there would be no new or upgraded access roads. Current access to the area, via Johnson Creek Road and Stibnite Road, would remain. No additional SGP-related traffic would occur along Johnson Creek, and winter plowing of the currently-unplowed section would not occur. Existing road access to Recreational river segments would not change, and existing effects to Wild segments would continue, including ongoing noise and sediment impacts from existing summer use. Burnt Log Road would not be widened and extended, and traffic on this road near Burntlog Creek would remain largely recreational. No winter plowing of the road would occur, and snowmobiles would continue to use it.

There would be no changes to the existing transmission lines and no new segment of transmission line constructed. No additional clearing of vegetation along the existing transmission line corridor would occur. The existing transmission line along Johnson Creek, which is eligible for the National Register of Historic Places, would not be upgraded and would continue to contribute to the Heritage ORV for which this segment is recognized.

7.2.2.2 2021 MMP

Existing or new mining activity on a Forest Service-identified Wild, Scenic, and Recreational eligible or suitable river segment are subject to regulations in 36 CFR part 228 and must be conducted in a manner that minimizes surface disturbance, sedimentation, pollution, and visual impairment (FSH 1909.12, Chapter 84.3).

The following activities under the 2021 MMP have the potential to intersect with eligible or suitable WSRs, as discussed in the sections below.

During construction, operation, and closure and reclamation, mine-related traffic would access the SGP from State Highway 55, north of the town of Cascade, via Warm Lake Road (CR 10- 579). This route crosses the South Fork Salmon River.

During construction, access to the SGP from Warm Lake Road would be via Johnson Creek Road (CR 10-413) to the village of Yellow Pine, and from Yellow Pine to the SGP via the Stibnite Road portion of McCall-Stibnite Road (CR 50-412) (i.e., the Johnson Creek Route) until the Burntlog Route is complete.

The Johnson Creek Road travels along and adjacent to Johnson Creek and has multiple crossings of this stream. During operations and closure/reclamation, mine-related traffic would use the Burntlog Route.

Burnt Log Road (FR 447) crosses the WSR-eligible Burntlog Creek and its tributaries. The road would change from a summer-only route with primarily recreational traffic to year-round use involving plowing, de-icing, and serving heavy industrial vehicles. Rock, gravel, and sand required to construct and maintain the road surface would be quarried from locations along the route. During mine operations, these borrow (quarry) sites would be used to stockpile soil/cleared vegetation for use in eventual reclamation. Mine closure and reclamation traffic would continue to use the Burntlog Route during these activities, and the new road segments would be decommissioned at completion of closure and reclamation activities. Any additional access to the SGP post-closure would be via the Johnson Creek Road or other existing routes.

The 2021 MMP would require construction activities at existing substations, the construction of new substations, the upgrading of an existing transmission line along the WSR-eligible segment of Johnson Creek, and the construction of a new transmission line between a new Johnson Creek substation and a SGP substation. The transmission line ROW would be widened to 100 feet from 70 feet, and vegetation would be cleared and maintained in this area as needed. The upgraded transmission line also would cross the eligible South Fork Salmon River at Warm Lake Road as it currently does.

Under the 2021 MMP, the Burntlog Maintenance Facility would be located along Burnt Log Road (FR 447) approximately 4.4 miles east of the junction of Johnson Creek Road (CR 10-413) and Warm Lake Road (CR 10-579). This location is near Peanut Creek in the Burntlog Creek watershed. The Burntlog Maintenance Facility would be located in part of a new borrow site that would be excavated for gravel for the Burntlog Route road improvements. Following excavation, the maintenance facility would serve as a base for equipment and materials stockpiles needed for winter plowing and sanding of the Burntlog Route.

Construction

The 2021 MMP construction activities include widening Burnt Log Road; mining gravel, sand, and rock at several borrow sources along the Burntlog Route for use in road surfacing; placing construction camps along Burntlog Route; and the construction of new segments of road from its current terminus to the SGP. Soil and cleared vegetation from road widening would be salvaged and stored within borrow sources once they have been quarried.

Construction also would entail upgrading the existing transmission line to increase capacity. The utility corridor ROW would be widened from 70 feet to 100 feet. Tall trees in this corridor would be cleared as needed. New or widened access spur roads to the transmission line would be required in some locations. The Burntlog Maintenance Facility would be constructed as well.

Burntlog Creek

Impacts to Free-flowing Conditions of Eligible, Suitable, and Designated WSRs

Construction activities would result in short-term, negligible, and localized impacts to the free-flowing condition as a result of culvert and bridge replacement on Burnt Log Road under the 2021 MMP. There would be no impact to the free-flowing characteristics of Burntlog Creek.

Impacts to Water Quality of Eligible, Suitable, and Designated WSR.

The 2021 MMP includes widening and resurfacing Burnt Log Road through the Burntlog Creek watershed (approximately 13.75 miles of roadway). Widening would entail the excavation (or blasting) of

uphill cut slopes and construction of downhill fill slopes. Three bridges would be replaced within the watershed, at Burntlog Creek, East Fork Burntlog Creek, and a tributary to East Fork Burntlog Creek. Remaining stream and drainage crossings would be via culverts. Because the roadway would be widened, existing culverts would be removed and replaced.

Up to three borrow sources in the Burntlog watershed have been identified, two for rock to be used during road construction, and one for sand to be used for road maintenance during operations.

Traffic by heavy construction vehicles and equipment would occur throughout the road and SGP construction periods. The Motorized Mixed-Use Analysis Report (DJ&A, PC 2017) anticipates an addition of 65 vehicles per day on the Burntlog Route during construction, with 69 percent of those anticipated to be heavy vehicles.

As there are currently no buildings or operations in the Burntlog Creek watershed, the addition of the Burntlog Maintenance Facility would likely have an incremental increased effect on stormwater runoff, potential leaks or spills of automotive fluids, and sedimentation of dust from on-site road sanding material storage and vehicle travel over gravel surfaces. However, the facility would change less than 0.1 percent of the watershed to industrial use from forestry use, so any effects on water quality, ORVs, or the Wild classification of Burntlog Creek are likely to be negligible.

During Burntlog Route construction, the potential also exists for increased runoff, erosion, and sedimentation as a result of localized vegetation removal and excavation of soil, rock, and sediment, which could result in increased sediment load in streams. Expected permit stipulations from the Idaho Department of Water Resources (IDWR) and IDEQ would require that:

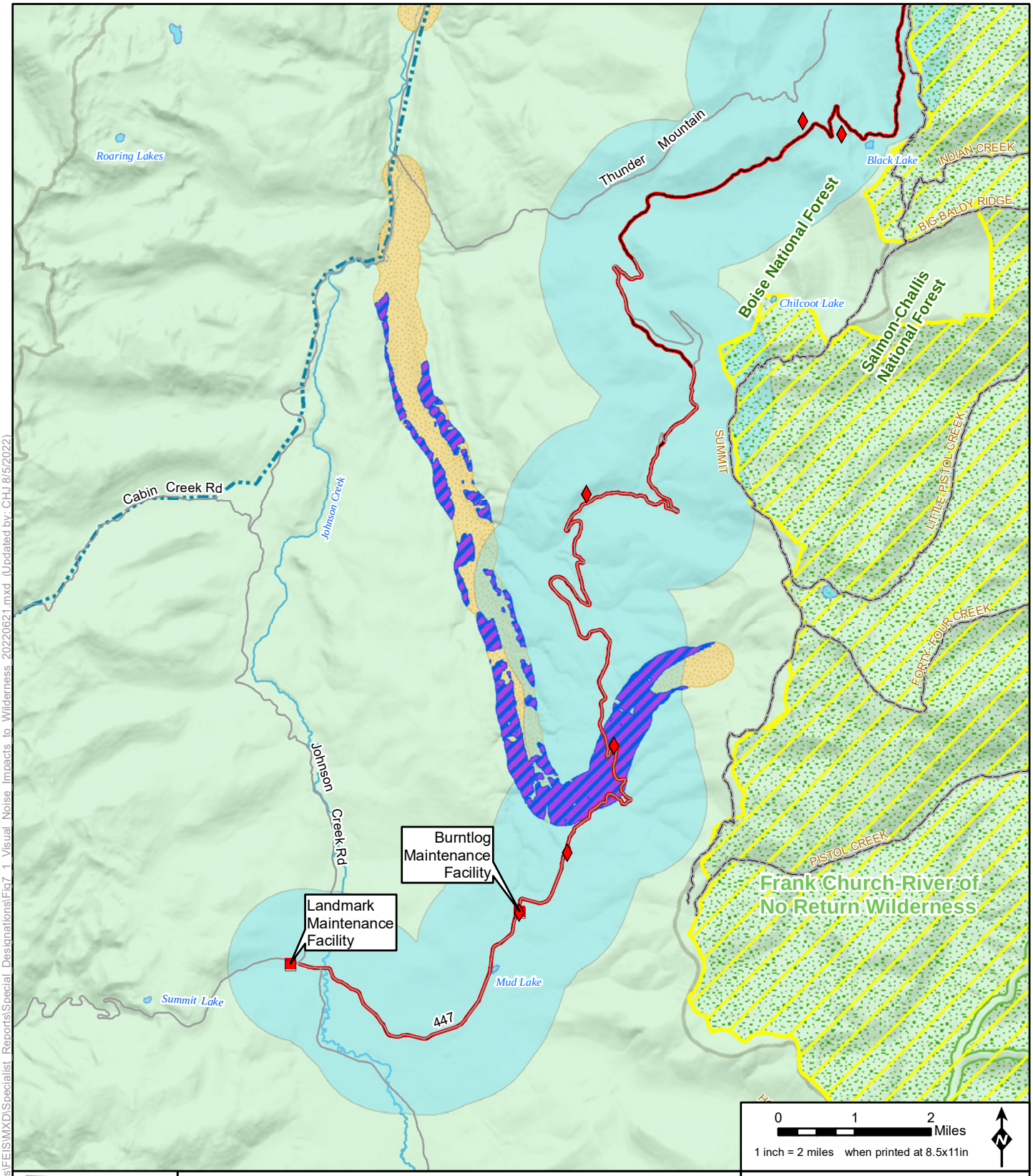
- Streambank vegetation be protected except where its removal is necessary;
- New cut or fill slopes not protected with some form of riprap be seeded and planted with native vegetation to prevent erosion;
- Use of temporary erosion and sediment control Best Management Practices (BMPs) associated with a stormwater pollution prevention plan (SWPPP); and
- That all construction activities be conducted per Idaho environmental anti-degradation policies, including IDEQ water quality regulations and applicable federal regulations.

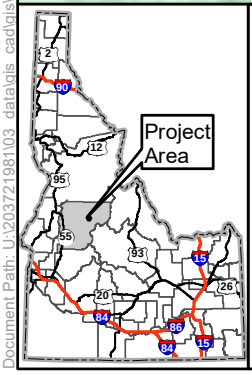
Impacts to ORVs for which Eligible, Suitable, and Designated WSRs are Recognized

During construction, replacement of culverts at stream crossings along the Burnt Log Road has the potential to temporarily impact fish passage, increase sedimentation, and alter primary productivity. Use of typical BMPs during installation of stream crossing structures, including seasonal timing of installation based on known fish use (including overwintering of fish) and temporary bypass design during installation, would minimize the potential for temporary effects to fish passage if used during periods of the year when passage is most critical (e.g., spawning periods for salmon and juvenile outmigration). With implementation of required BMPs, impacts would be temporary, negligible, and localized.

Impacts to the Preliminary Wild, Scenic, or Recreational Classification for Eligible and Suitable WSRs

Figure 7-1 shows the estimated range of noise and visual impacts of the 2021 MMP along the Burntlog Route. Roadway widening would be generally consistent with the visual quality objective of Preservation (Wild segment) and Partial Retention (Recreational segment).





LEGEND

Project Components*
- Burntlog Route
- Burntlog Route Borrow Source

Utilities
- Upgraded Transmission Line

Offsite Facilities
- Perpetua Offsite Facilities
- Wilderness Analysis

Impacts to Wilderness
- Burntlog WSR Corridor Visual Impacts
- Burntlog WSR Corridor Noise Impacts
- Burntlog Creek WSR Corridors
- Burntlog Road New Construction/Operation/Reclamation Noise Impacts (1 Mile)

Other Features
- U.S. Forest Service
- Wilderness
- County
- City/Town
- Highway
- Road
- Stream/River
- Lake/Reservoir

*Project Components are associated with Burntlog Route

Note: The McCall – Stibnite Road (CR 50-412) onsists of Lick Creek Road, East Fork South Fork Salmon River Road (East Fork Road) and Stibnite Road.

Figure 7-1
Visual and Noise Impacts to Wilderness from Burntlog Road
Stibnite Gold Project
Stibnite, ID

Base Layer: USGS The National Map: 3D Elevation Program. USGS Earth Resources Observation & Science (EROS) Center: GMTED2010. Data refreshed January, 2020. Other Data Sources:Perpetua; State of Idaho Geospatial Gateway (INSIDE Idaho); Boise National Forest; Payette National Forest

Document Path: U:\2023721981103 data\gis cad\gis\FEIS\MXD\Specialist Reports\Special Designations\Fig7_1 Visual Noise Impacts to Wilderness 20220621.mxd (Updated by CHJ 8/5/2022)

These impacts are likely to be most pronounced during construction of the route, as noise would be generated by quarrying, slope excavation, roadway widening, and other construction activities in addition to the noise of the trucks and equipment using the road to access the SGP. During widening of the road, noise levels would attenuate to the threshold of 55 dBA approximately 0.57 mile from the source of activity based on distance alone. Accounting for ground absorption and atmospheric absorption, noise from access road construction would attenuate to 55 dBA approximately 0.28 mile from the source of activity. Road construction and associated noise would be limited to daytime hours (between 7:00 a.m. and 10:00 p.m.) and roadway construction noise would dominate the noise environment within about 2,000 feet of the road. Downstream of the Burntlog Route, Burntlog Creek has a preliminary classification of Wild. Noise is expected to temporarily adversely affect approximately 880 acres of the WSR corridor, and visual impacts would be noticeable from approximately 600 acres of the corridor.

The segment upstream of Burntlog Route has a preliminary classification of Recreational. Noise impacts during construction would temporarily affect approximately 720 acres in this segment and visual impacts would affect approximately 1,140 acres. As one of the potential borrow areas is located adjacent to the road crossing of Burntlog Creek and partially within the WSR corridor, recreation access to this portion of the waterway could be adversely affected.

Due to increased ROW width, approximately 28.6 acres of additional utility ROW would be located within the Wild segment of the Burntlog Creek WSR corridor at its confluence with Johnson Creek. However, at this location the existing utility corridor and transmission line are not visible from Burntlog Creek itself (Forest Service 2013) and changes to it would not affect the preliminary classification of Wild.

Johnson Creek

Impacts to Free-Flowing Conditions of Eligible, Suitable, and Designated WSRs

Construction activities would not impact the free-flowing condition of Johnson Creek, as there would be no impoundment, diversion, or other water resource projects within this waterbody as a result of the 2021 MMP. There would be no impact to the free-flowing characteristics of Johnson Creek.

Impacts to Water Quality of Eligible, Suitable, and Designated WSRs

The transmission line corridor parallels the eligible Recreational segment of Johnson Creek. The existing ROW would increase from 70 to 100 feet, which increases the ROW area within the Johnson Creek eligible corridor by approximately 73.3 acres. If additional vegetation such as trees require clearing for construction or transmission line safety, this could result in an adverse impact to water quality from vegetation clearance. Decreased shade can increase water temperatures in the creek, and reduced vegetation cover can increase sedimentation rates. Upgrade of the transmission line would include new spur roads that also could increase sediment runoff. Vehicle use on spur roads or along the ROW corridor could result in potential impacts from oil or gas spills. During construction, sedimentation from construction sites could increase in the short term. As discussed in the Surface Water and Groundwater Quality Specialist Report (Forest Service 2022b), expected permit stipulations from IDWR and IDEQ would require the use of erosion and sediment control BMPs associated with a SWPPP. All activities would be conducted in accordance with Idaho environmental anti-degradation policies, including IDEQ water quality regulations and applicable federal regulations. ROW clearing would be for the purpose of maintaining low height vegetation during operations and would not entail clearing and grubbing to bare soil. Consequently, the vegetation root structure within soils would be retained, reducing erosion potential compared to bare soil. With implementation of required BMPs, impacts to water quality would be short

term, negligible to minor, and localized during construction and long term, negligible to minor and localized during operations and closure and reclamation.

Impacts to ORVs for which Eligible, Suitable, and Designated WSRs are Recognized

The existing transmission line parallels Johnson Creek and its ROW overlaps with the creek and WSR study corridor. Construction of the upgraded transmission line would involve subsurface excavation to set poles. Accessing the existing transmission line for upgrades and maintenance would require truck traffic that could damage heritage resources along the transmission line upgrade route. However, avoidance of historic properties (i.e., National Register eligible heritage resources) would be implemented, or mitigation required prior to construction activities (Forest Service 2022e). The transmission line itself is an eligible historic property and part of the heritage ORV of this segment of river, however, maintenance and upgrade of the transmission line are part of the nature of the infrastructure and therefore would not be considered an adverse effect to the historic property.

During construction, mine-related traffic would access the SGP using Johnson Creek Road (CR 10-413). No road alignment modification or widening of Johnson Creek Road would occur under the 2021 MMP. Because no roadwork would occur outside of the existing ROW, no physical impacts to heritage resources (artifacts or sites) would occur. Increased mine traffic on Johnson Creek Road next to the eligible segment could have noise and visual impacts to the area, although this would not physically impact heritage resources. Impacts to heritage resources would be negligible to major (if a historic property cannot be avoided by construction), localized, and long-term (Forest Service 2022e).

Short-term indirect effects to the recreation setting could result from increased traffic related to mine construction (approximately 65 AADT during construction). These impacts would be short term (approximately 3 years), as mine-related traffic under the 2021 MMP would be diverted to the Burntlog Route during operations and closure/reclamation.

Impacts to the Preliminary Wild, Scenic, or Recreational Classification for Eligible and Suitable WSRs

During construction, traffic noise levels along Johnson Creek would rise by 2 dBA day-night noise level as discussed in the Noise Specialist Report (Forest Service 2022h). On average this increase is not detectable, and so would not likely adversely impact the Recreational designation of Johnson Creek. Recreation access would not be impacted under long-term operational conditions.

South Fork Salmon River

Impacts to free-Flowing Conditions of Eligible, Suitable, and Designated WSRs

Construction activities would not impact the free-flowing condition of the South Fork Salmon River (or the East Fork SFSR tributary of the South Fork Salmon River), as there would be no impoundment, diversion, or other water resource activities within this waterbody as a result of the 2021 MMP. There would be no impact to the free-flowing characteristics of the South Fork Salmon River.

Impacts to Water Quality of Eligible, Suitable, and Designated WSRs

The transmission line corridor crosses the eligible South Fork Salmon River at Warm Lake Road. Widening the ROW from 70 to 100 feet would increase the ROW by 17.4 acres within the South Fork Salmon River WSR study corridor. This acreage includes the waterway itself. Although some loss of shading or temporary sediment increases during vegetation clearance or line construction would occur, any effects to water quality would likely be too small to measure because of this waterway's large watershed and large flow volume. As discussed in the Surface Water and Groundwater Quality Specialist Report (Forest Service 2022b), expected permit stipulations from the IDWR and IDEQ would ensure that

streambank vegetation would be protected except where its removal is absolutely necessary; that new cut or fill slopes not protected with some form of riprap would be seeded and planted with native vegetation to prevent erosion; use of temporary erosion and sediment control BMPs associated with a SWPPP; and that all activities would be conducted in accordance with Idaho environmental anti-degradation policies, including IDEQ water quality regulations and applicable federal regulations. With implementation of required BMPs, impacts to water quality would be short term, negligible to minor, and localized during construction and long term, negligible to minor, and localized during operations and closure and reclamation.

Impacts to ORVs for which Eligible, Suitable, and Designated WSRs are Recognized

During construction, temporary, negligible to minor, and localized impacts would occur to recreation ORVs for the South Fork Salmon River through:

- Temporary impacts to recreational access by construction-related access restrictions; or
- Access delay, noise, or visual impacts in the vicinity of the existing transmission line crossing.

Recreation access would be restored following transmission line construction, and, therefore, no long-term impacts to recreation ORVs are anticipated.

Construction activities related to vegetation clearing in the transmission line ROW and replacement of conductors and support structures would cause short-term, negligible to minor, and localized impacts to scenery ORVs, as discussed in the Scenic Resources Specialist Report (Forest Service 2022j). Long-term impacts to scenery ORVs at the crossing could result from vegetation clearing within the expanded ROW and the larger, taller utility poles. Direct impacts would be of limited geographic extent and associated with the existing disturbance of the crossing of Warm Lake Road over the South Fork Salmon River. Therefore, long-term direct impacts to scenery ORVs would be minor.

There would be no construction impacts to geological, cultural, botanical, and fisheries ORVs.

Impacts to the Wild, Scenic, or Recreational Classification for Eligible and Suitable WSRs

Construction activities could briefly limit recreational access to the Recreational South Fork Salmon River during widening of the transmission line ROW where it crosses the river at Warm Lake Road. Impacts would be temporary, negligible to minor, and localized and would not affect the Recreational classification.

Operations

As described below, activities at the SGP during the operations phase would not directly or indirectly affect eligible or suitable WSR segments on the South Fork Salmon River, Burntlog Creek, or Johnson Creek.

Under the 2021 MMP, the Burntlog Maintenance Facility would be located along Burnt Log Road (FR 447) approximately 4.4 miles east of the junction of Johnson Creek Road (CR 10-413) and Warm Lake Road (CR 10-579) and would house road maintenance and snow removal equipment.

Upon completion of the Burntlog Route, all mine-related operational traffic would use that route. The nexus of access roads to eligible and suitable WSR segments is as follows:

- All mine access routes cross the suitable segment of the South Fork Salmon River on Warm Lake Road.

- Burnt Log Road crosses the eligible segment of Burntlog Creek and divides the upper Recreational portion from the lower Wild portion.

Burntlog Creek

Impacts to Free-Flowing Conditions of Eligible and Suitable WSRs

Impacts to free-flowing conditions of Burntlog Creek would continue due to the presence of culverts and bridge crossings along the Burntlog Route. Stream crossings would be designed to minimize potential impacts on surface water hydrology, water quality, and fish passage. The Forest Service would require stream crossings to be designed to accommodate a 100-year flood recurrence interval, unless site-specific analysis using calculated risk tools or another method determines a more appropriate recurrence interval. Additionally, Perpetua would be required to comply with specific design requirements as part of the IDWR Stream Channel Alteration Permit, such as line of approach, minimum bridge clearance and minimum culvert size per length, and anchoring on steep slopes. These permit-related design requirements, use of BMPs, and required maintenance activities would allow natural streamflow and minimize impacts to free-flowing condition. There would be no impact to free-flowing conditions of Burntlog Creek during operations.

Impacts to Water Quality of Eligible, Suitable, and Designated WSRs

Under the 2021 MMP, Burnt Log Road would be widened and mine-related traffic on it would increase. Approximately 70 acres of the Burntlog Creek watershed would be affected by road widening cut and fill activities. Approximately 10 of those acres would be within the eligible WSR corridor. The road would be plowed and sanded during winter months (currently it is not plowed or sanded). The road would be re-surfaced with sub-base material topped by gravel. The culvert at the Burntlog Creek crossing would be replaced. A borrow pit (gravel extraction) would be within the eligible WSR corridor, on the east side of the current road crossing of Burntlog Creek (**Figure 7-1**).

Traffic on Burnt Log Road would increase from approximately 27 vehicles per day (summer months only and primarily recreation-related vehicles) to an average of 87 vehicles per day, year-round, with approximately 38 percent of those being heavy vehicles or equipment.

As described above under Construction, increased acreage of gravel roads and increased heavy vehicle traffic is associated with increases in sediment load delivery to streams (Reid and Dunne 1984). Forest roads can accelerate erosion and sediment delivery to streams and have been identified as the primary contributor of sediments to stream channels in managed watersheds (Trombulak and Frissell 2000). Roads are often chronic sources of sediment delivery from cut-slopes, ditch-lines, and running (i.e., driving) surfaces, and act as potential sites for accelerated mass movements (e.g., mud slides). Roads also intercept subsurface flows, concentrate flows in ditch lines and through culverts and bridges, and act as direct conduits for sediment delivery to stream channels (Beschta 1978).

For operation and use of the Burntlog Route, standard erosion control measures, such as silt fencing, ditch checks, and other measures, would be installed and maintained to minimize the potential for erosion and sedimentation. Numerous small (15- to 60-inch) drainage culverts would be installed along the Burntlog Route to reduce rutting and shunt water out of ditches and off the road prism. The road would be maintained as a hardened road surface with gravel surfacing to allow for all-weather use of the road. Impacts would be long term, minor, and localized.

Impacts to ORVs for which Eligible, Suitable, and Designated WSRs are Recognized

Burntlog Creek has an ORV for fish. If year-round heavy vehicle use and winter plowing/sanding of the Burntlog Route during mine operations increases sedimentation rates to Burntlog Creek, this could adversely affect fish spawning habitat in the creek. The SGP may cause changes in fish habitat in the analysis area that may affect aquatic species, including federally listed fish species and aquatic habitat and Management Indicator Species downstream of the SGP area. The SGP may affect fish species by degrading water quality in waterways adjacent to access roads. Fish populations may be impacted through the establishment of fish access upstream of the Yellow Pine pit and fish health may be impacted if any hazardous material spills occur at the SGP or along the access roads (Forest Service 2022i) and are not immediately contained.

Impacts to the Preliminary Wild, Scenic, or Recreational Classification for Eligible and Suitable WSRs

As discussed above under Construction, heavy vehicle mine traffic on the Burntlog Route would be more visible from the eligible Wild portion of Burntlog Creek than the current traffic levels on the existing Burnt Log Road.

Noise levels during mine operations along the Burntlog Route from road maintenance and use would increase by about 10-12 dBA (at about 2,000 feet distance from the road) and would be particularly noticeable in winter due to plowing and winter traffic, which does not currently occur. Noise impacts could adversely impact the overall wild character of the eligible Wild segment of Burntlog Creek.

The 2021 MMP includes a borrow site that would be located partially within the Burntlog Creek WSR corridor, at the crossing of Burnt Log Road. Sand and gravel excavated from this burrow site and other quarries would be stockpiled at the borrow site for use during winter maintenance. This may inhibit recreational access to the Recreational portion of Burntlog Creek, as the location of the quarry and stockpile site would be located at the only road access point to the Recreational section of the creek.

Johnson Creek

Impacts to Free-flowing Conditions of Eligible and Suitable WSRs

No impacts to the free-flowing conditions of Johnson Creek are anticipated during operations as no impoundments or diversions are anticipated to occur.

Impacts to Water Quality of Eligible, Suitable, and Designated WSRs

As discussed in the Access and Transportation Specialist Report, traffic during operations on the native-surfaced/gravel Johnson Creek Road would return to non-mine related traffic as mine traffic would shift to the Burntlog Route. The road would not be plowed for winter use once the Burntlog Route was complete. Impacts to water quality in Johnson Creek during operations would be long term and negligible (Forest Service 2022b).

Impacts to ORVs for which Eligible, Suitable, and Designated WSRs are Recognized

There would be no effect to the Heritage ORV on the eligible segment of Johnson Creek from operations, as SGP operations traffic would use the Burntlog Route.

Impacts to the Preliminary Wild, Scenic, or Recreational Classification for Eligible and Suitable WSRs

Although traffic along Johnson Creek Road would potentially increase over current conditions during mine operations if vendors utilize that road rather than the Burntlog Route, this increase in traffic would

not change access to the eligible corridor. Consequently, there would be no impact to the preliminary classification of Recreational for this segment of Johnson Creek.

South Fork Salmon River

Impacts to Free-flowing Conditions of Eligible and Suitable WSRs

No impacts to the free-flowing conditions of the South Fork Salmon River are anticipated during operations as no impoundments or diversions would occur.

Impacts to Water Quality of Eligible, Suitable, and Designated WSRs

No impacts to water quality in the suitable South Fork Salmon River would occur from implementation of the 2021 MMP, as no SGP activities likely to cause such impacts would occur in this location.

Impacts to ORVs for which Eligible, Suitable, and Designated WSRs are Recognized

No access road upgrades are proposed for Warm Lake Road (where it crosses the South Fork Salmon River); therefore, no impacts to ORVs (ORVs for recreation, scenery, geological, cultural, botanical, and fisheries resources) for which the South Fork Salmon River is recognized would result from this component of the 2021 MMP.

Impacts to the Preliminary Wild, Scenic, or Recreational Classification for Eligible and Suitable WSRs

Recreational classification is compatible with roadway access to or along Recreational WSR waterways. The 2021 MMP would not alter access to the suitable segment of the South Fork Salmon River, so there would be no impacts to its preliminary classification of Recreation.

Closure and Reclamation

Closure activities at the SGP would have the same effects to the South Fork Salmon River, Johnson Creek, and Burntlog Creek as activities during operations.

During closure and reclamation of the SGP, the Burntlog Route would remain the main access route, and closure and reclamation of the new portion of the roadway would be among the last activities to take place. According to the Reclamation and Closure Plan (Perpetua 2021), grades on the Burnt Log Road would remain as constructed for the SGP, but roadway widths would be returned to pre-SGP widths by removing fill slopes and recontouring cut slopes. Quarries in the borrow sites built along the road would be reclaimed.

Reclamation would entail grading and scarification along the outside edges of the road, followed by seeding. Approximately 30 acres of ground adjoining existing roads would be reclaimed.

Where no indicator is listed below, there would be no impacts from closure activities for that indicator.

Burntlog Creek

Impacts to Water Quality of Eligible, Suitable, and Designated WSRs

Recontouring slopes along the roadway would entail earth-disturbing activities with the potential to increase sedimentation rates, similar to what was discussed under Construction. Use of temporary erosion and sediment control BMPs associated with a SWPPP would reduce potential for erosion and sedimentation. If the slopes are successfully revegetated and stabilized, the erosion and sediment impacts to Burntlog Creek would be short term, negligible, and localized.

Impacts to ORVs for which Eligible, Suitable, And Designated WSRs are Recognized

Burntlog Creek has an ORV for fish. Spawning habitat is adversely affected by increased sedimentation in creek beds. Use of temporary erosion and sediment control BMPs associated with implementation of a SWPPP would reduce potential for erosion and sedimentation. If the re-contoured slopes are successfully stabilized, this effect would be short term, negligible, and localized.

Impacts to the Preliminary Wild, Scenic, or Recreational Classification for Eligible and Suitable WSRs

As discussed under Construction, earthwork and slope re-contouring activities performed during decommissioning/narrowing of the Burntlog Route would generate short-term, minor, and localized visual and noise impacts to the eligible Burntlog Creek WSR corridor. During closure, the use of heavy equipment along the road and reclamation of borrow sites may result in short-term restrictions on access to the eligible Recreational segment of Burntlog Creek.

Johnson Creek

No impacts to the eligible Johnson Creek are anticipated from closure and reclamation activities.

South Fork Salmon River

No impacts to the suitable South Fork Salmon River are anticipated from closure and reclamation activities.

7.2.2.3 Johnson Creek Route Alternative

Under the Johnson Creek Route Alternative, actions related to the SGP and the utility corridor would have the same effects as described under the 2021 MMP. Effects of access roads would differ for Johnson Creek, Burntlog Creek, and the Burntlog Maintenance Facility. Effects to the South Fork Salmon River would be the same as described for the 2021 MMP.

Burntlog Creek

The Johnson Creek Route Alternative would have no direct impacts to the eligible Burntlog Creek WSR, as the access route to the mine would not utilize Burnt Log Road. No road widening, bridge and culvert replacement, slope excavation/blasting, or quarrying of sand and gravel would occur in the Burntlog Creek watershed. Under the Johnson Creek Route Alternative, the aforementioned Burntlog Maintenance Facility would be relocated and called the Landmark Maintenance Facility. The Landmark Maintenance Facility would be located where Warm Lake Road crosses Johnson Creek (upstream from the eligible Recreational segment) and would house road maintenance and snow removal equipment. The existing Burnt Log Road would not be plowed and sanded during winter and would not have dust suppressant applied during summer. Traffic on the road would remain primarily recreational and seasonal. The amount of traffic may increase over current conditions if recreationists seek alternate areas away from the SGP for their recreation activities but would likely be less than traffic projections associated with mining activity and would not include heavy industrial vehicles and equipment. The Johnson Creek Route Alternative would have no effects to water flow or quality, ORVs, or classification for Burntlog Creek.

Johnson Creek

Johnson Creek Road (CR 10-413) would be part of the mine access route under the Johnson Creek Route Alternative. Increased traffic would occur along this route, which parallels the eligible segment of Johnson Creek.

Impacts to Free-flowing Characteristics of Eligible and Suitable WSRs

Construction activities could result in short-term impacts to the free-flowing condition of Johnson Creek as a result of culvert replacement on Johnson Creek Road. Operations-related impacts would be similar to current conditions, with free-flowing conditions modified by culverts. As described under 2021 MMP - Construction, permit-related design requirements, use of BMPs, and required maintenance activities would maintain natural streamflow and minimize impacts to free-flowing condition.

Impacts to Water Quality of Eligible, Suitable, and Designated WSRs

Heavy construction vehicles and equipment traffic would occur throughout construction, operation, and closure and reclamation phases. Increases in heavy vehicle traffic are associated with increases in sediment delivery load to streams (Reid and Dunne 1984). Sedimentation could adversely affect water quality and fish spawning habitat. In general, increases in sedimentation are expected from:

- Travel-generated dust and sedimentation due to the change in road use from seasonal, primarily recreational or 4x4 vehicle use, to year-round use by heavy equipment.
- Application of de-icers or sand for traction during winter months.

Impacts to ORVs for which Eligible, Suitable, and Designated WSRs are Recognized

Johnson Creek has a Heritage ORV, primarily related to the area's history of mining. Construction activities on the Johnson Creek Route could directly disturb historic properties (i.e., heritage resources eligible for the National Register of Historic Places) along this segment. Further, increased mine traffic on Johnson Creek Road next to the eligible segment could have noise and visual impacts to the area, although this would not physically impact heritage resources. Impacts to heritage resources would be negligible to major (if a historic property cannot be avoided by construction), localized, and long-term (Forest Service 2022e).

Impacts to the Preliminary Wild, Scenic, or Recreational Classification for Eligible and Suitable WSRs

Although traffic along Johnson Creek Road would increase over current conditions during mine operations, this increase in traffic would not change access to the eligible corridor. Consequently, there would be no impact to the preliminary classification of Recreational for this segment of Johnson Creek.

7.2.3 Inventoried Roadless Areas

The following analysis of effects associated with IRAs is considered within the context of undeveloped lands under Forest Service administration within Valley County.

Elements of this context include roadless area characteristics based on the Forest Service Handbook 1909.12 (72.1), which include:

- The biophysical resources in roadless areas include high quality or undisturbed soil, water, and air. Diverse plant and animal communities provide habitat for threatened, endangered, proposed, candidate, and sensitive species, which are dependent on large, undisturbed areas of land.
- The absence of structures and evidence of human occupation and activities in roadless areas provide natural appearing landscapes with high scenic quality. Roadless areas and lands contiguous to unroaded areas provide opportunities for primitive, semi- primitive non-motorized, and semi-primitive motorized ROS classes of dispersed recreation.

- Roadless areas and lands contiguous to unroaded areas provide outstanding opportunities for solitude and primitive recreation.
- Roadless areas contain traditional cultural properties, sacred sites, and other locally identified unique characteristics.
- Roadless area boundaries influence the ability of the Forest Service to meet size criteria and elements of roadless area characteristics.
- Estimated noise from SGP activities does not consider the effects of topography or weather. Therefore, the noise impacts presented in the analysis may be more extensive than what forest visitors and wildlife would actually experience.
- Manageability is a measure of the Forest Service's ability to manage for wilderness character.

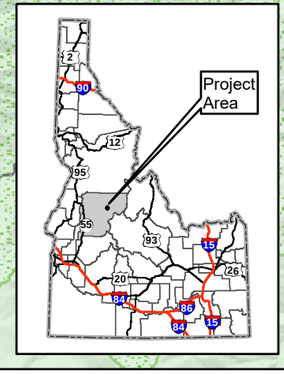
Table 7-3 identifies the direct impacts to IRAs that would occur under each action alternative and **Figure 7-2** shows the location of the action alternative components within the IRAs in the analysis area.

Table 7-3 Direct Effects to Inventoried Roadless Areas (Acres/Miles) Under Each Action Alternative

IRA Name/ (Total IRA Acreage)	SGP Component	2021 MMP Acres/(Miles)	Johnson Creek Route Alternative Acres/(Miles)
Bernard (20,891)	None	N/A	N/A
Black Lake (5,335)	Access roads	80.9 / (7.2)	0
Burnt Log (23,699)	Access roads	39.1 / (1.5)	0
Caton Lake (84,530)	Utilities	0.8 / (0)	0.8 / (0)
Horse Heaven (17,747)	Mine site (Acres only)	79.3	79.3
Horse Heaven (17,747)	Utilities	34.0 / (2.5)	34.0 / (2.5)
Meadow Creek (29,288)	Mine site (Acres only)	348.7	348.7
Meadow Creek (29,288)	Access Roads	86.1 / (5.0)	5.1
Meadow Creek (29,288)	Utilities	3.4 / (0.5)	3.4 / (0.5)
Needles (161,173)	None	N/A	N/A
Peace Rock (191,734)	None	N/A	N/A
Reeves Creek (10,542)	Utilities	1.2 / (0.1)	1.2 / (0.1)
Secesh (248,088)	None	N/A	N/A
Stony Meadows (13,551)	None	N/A	N/A
Sugar Mountain (10,340)	None	N/A	N/A
Whiskey (4,970)	None	N/A	N/A
Total		**673.5 / (16.8)**	**472.5 / (3.1)**

N/A = not applicable

Secesh
East Fork South Fork Salmon River
Yellow Pine
STIBNITE RD
50340
Sugar Mountain
EAST FORK RD
Horse Heaven
50375
Payette National Forest
Caton Lake
Meadow Creek
Riordan Lake
CREEK RD
51290
Mule Hill Tr
Salmon-Challis National Forest
Big Chief Tr
Indian Creek Tr
Needles
South Fork Salmon River
JOHNSON
Black Lake
Johnson Creek
Little Pistol Creek Tr
SummitTr
Burnt Log
Pistol Creek Tr
467
Reeves Creek
Forty-Four Creek Tr
Knox
Warm Lake
WARM LAKE RD
Warm Lake
Burnt Log Maintenance Facility
447
Landmark Maintenance Facility
Whiskey
Stony Meadows
County



LEGEND

Project Components *
- SGP Features
- Burntlog Route
- Burntlog Route Borrow Source
- Perpetua Offsite Facilities

Utilities
- New Substation
- Existing Substation
- Upgraded Transmission Line
- New Transmission Line

RoadlessAreas
- Black Lake
- Burnt Log
- Caton Lake
- Horse Heaven
- Meadow Creek
- Needles
- Reeves Creek
- Secesh
- Stony Meadows
- Sugar Mountain
- Whiskey
- Contiguous Unroaded Lands

Other Features
- U.S. Forest Service
- Wilderness
- County
- City/Town
- Monumental Summit
- Road
- Trails
- Stream/River
- Lake/Reservoir

Note: The McCall – Stibnite Road (CR 50-412) consists of Lick Creek Road, East Fork South Fork Salmon River Road (East Fork Road) and Stibnite Road.

0 1.35 2.7 Miles

1 inch = 2.7 miles when printed at 11x17

N

Figure 7-2
Project Components and Inventoried Roadless Areas
Stibnite Gold Project
Stibnite, ID

Base Layer: USFS Shaded Relief Service
Other Data Sources: Perpetua; State of Idaho Geospatial Gateway (INSIDE Idaho); USGS; Boise National Forest; Payette National Forest

Document Path: U:\2023\21981\03_data\gis_cad\gis\FEIS\MXD\Specialist_Reports\Special_Designations\Fig7_2_Inventoried_Roadless_Areas_and_Idaho_Roadless_Area_Categories_20220621.mxd (Updated by CHU 8/5/2022)

7.2.3.1 No Action Alternative

Under the No Action Alternative, approved mineral exploration adjacent to, but not within, Meadow Creek, Horse Heaven, and Sugar Mountain IRAs would continue. Planned and approved ASAOC activities would also still be conducted. As such, the roadless character within the 13 IRAs would be the same as existing conditions.

7.2.3.2 2021 MMP

Construction, operation, and closure and reclamation of the SGP could affect the wilderness attributes of naturalness; undeveloped character; outstanding opportunities for solitude and primitive types of recreation; special features and values; and manageability (**Table 6-7**) which inform impacts to roadless area characteristics. A detailed evaluation of the impacts of SGP activities on roadless area characteristics by phase is included in the SGP Effects on Roadless Character (AECOM 2020b) report. Following is a summary of the analysis.

Naturalness

As discussed in **Section 6.1.3**, the 13 IRAs and lands contiguous to unroaded areas within the analysis area contain large areas of undisturbed habitat and support diverse plant communities. Air, water, and soil quality in the IRAs also are considered high quality. As shown in **Table 7-3**, construction and operation of the SGP under the 2021 MMP would directly impact Meadow Creek, Horse Heaven, Black Lake, Burnt Log, Caton Lake, and Reeves Creek IRAs. Construction and operation of mine facilities, the Burntlog Route, and the new segment of transmission line would remove vegetation, alter topography, and modify

fish and wildlife habitat within IRAs. A segment of the Burntlog Route would be in the Riordan Creek drainage, where it would cross Riordan Creek north of Black Lake, where human activity and noise from construction could disturb wildlife species that use Black Lake and the associated riparian areas along Riordan Creek.

Plants

Approximately 740 acres of vegetation would be removed within six IRAs. Vegetation removal and construction traffic could spread non-native plant species within IRAs during the 3 years of construction. Maintaining the new transmission line, SGP facilities, and Burntlog Route during the 15 years of mine operation would increase the opportunities for non-native plant species distribution. Areas within IRAs where non-native plant species become established would alter vegetation composition and change the natural ecological processes. The applicant would inspect vehicles at the SGLF prior to use and survey disturbed areas and treat invasive plant species for 3 years after a disturbed area is seeded or planted. These measures would decrease the potential for non-native plant spread. Surveys and implementing treatments described in the Integrated Weed Management program for the PNF and BNF would reduce the potential for non-native plant species to spread. During the 5 years of mine closure and reclamation, recontouring slopes and seeding disturbed areas would reclaim vegetation in the impacted IRAs; however, plant communities would be less diverse relative to existing conditions. The Vegetation Specialist Report (Forest Service 2022g) provides additional information on vegetation communities and botanical resources.

Construction of the Burntlog Route, repeater site access roads, and the new segment of transmission line would impact and result in the fill of wetlands in Burnt Log, Black Lake, Meadow Creek, and Horse Heaven IRAs. Construction of the TSF and TSF Buttress at the SGP would permanently affect slope and valley wetlands in the Meadow Creek drainage, including wetlands and riparian vegetation within the

Meadow Creek IRA. The Wetlands and Riparian Resources Specialist Report (Forest Service 2022k) contains additional information about potential impacts on wetlands and riparian areas.

During the 15 years of operation under the 2021 MMP, with the limestone processing at the SGP, the number of mine vehicles on Burntlog Route would be 50 AADT. Reducing the amount of mine related traffic could reduce the transport of non-native plant species within the Burnt Log, Black Lake, and the eastern part of Meadow Creek IRAs. Maintaining vegetation in the new transmission line segment and use of access roads would permanently change plant succession within the Horse Heaven and Meadow Creek IRAs. Vehicles used to maintain the transmission line could transport non-native plant species.

Fish and Wildlife

Diverting Meadow Creek into a channel and construction of a TSF embankment would reduce aquatic habitat complexity and aquatic habitat connectivity within Horse Heaven and Meadow Creek IRAs. The Fisheries Specialist Report (Forest Service 2022i) provides additional information about potential effects on fish habitat during construction.

A 5.3-mile segment of Burntlog Route would be near the ridge between the upper elevations of Riordan Creek and the FCRNRW. Human activity and noise during construction and operations could disturb wildlife species near Black Lake and the associated riparian areas along Riordan Creek. Maintaining vegetation in the new segment of transmission line and use of access roads would permanently change wildlife within small portions of the Horse Heaven and Meadow Creek IRAs. The Wildlife and Wildlife Habitat Specialist Report (Forest Service 2022l) provides additional information regarding wildlife habitats.

The approximately 0.8-mile East Fork SFSR tunnel with fish passage could remove a barrier to fish passage and improve aquatic species habitat connectivity. Increases in fish habitat connectivity in the East Fork SFSR stream segments above Yellow Pine pit could improve fish species distribution in Sugar Creek drainage. The extent and intensity of the increase would vary depending on fish species and other water quality parameters. In the long-term, if aquatic habitat connectivity increased, the natural quality of roadless character could improve in the Sugar Mountain IRA.

During construction, operation, and closure and reclamation of access roads, vegetation removal and excavation of soil and rock could increase sediment load in sections of streams within Sugar Creek, Burnt Log, Black Lake, Meadow Creek, and Horse Heaven IRAs. Fish habitat connectivity would be temporarily disrupted during the installation or removal of culverts on access roads within these five IRAs. Erosion control measures, such as sediment fencing, ditch checks, and other measures, would reduce erosion from the road into streams.

Vegetation including habitat for Canada lynx and wolverine removed within the Meadow Creek, Horse Heaven, Black Lake, and Burnt Log IRAs would alter wildlife habitat by reducing cover and changing habitat quality. The lack of vegetation cover in addition to the newly constructed retaining walls for access roads could change wildlife movement and distribution (Montgomery et al. 2012). During mine operation, vegetation would continue to be removed as the TSF facility is expanded. A 6-foot-tall wildlife fence would surround the TSF. Creation of the TSF and TSF Buttress would remove wildlife habitat and could change wildlife species distribution in the Meadow Creek and Horse Heaven IRAs. The Wildlife and Wildlife Habitat Specialist Report (Forest Service 2022l) provides additional information.

Construction and operations noise, lights, and human activity could displace wildlife species from habitat within IRAs and lands contiguous to unroaded areas during the three years of construction. Some wildlife

species could temporarily avoid habitat if noise from construction activities is greater than ambient levels (Robinson et al. 2010; Trombulak and Frissell 2000). As described in the Noise Specialist Report, SGP-related noise levels are predicted from noise generated by major SGP-related noise sources. Estimated average hourly noise levels from SGP-related traffic on the Burntlog Route during the operations phase would be 49 dBA $L_{EQ,}$ below the threshold of 55 dBA (Forest Service 2022h).

During mine closure and reclamation activities, approximately 5 years, the wildlife security fencing around the TSF and other areas would be removed. As vegetation becomes established, and human activity decreases, wildlife distribution for some species could return to existing conditions.

Soil, Water, and Air

Construction of SGP facilities would result in soil resource commitments and detrimental disturbance of soil resources within IRAs. Interim reclamation and environmental design features could reduce the potential loss of soil resources. The Soils and Reclamation Cover Materials Specialist Report (Forest Service 2022m), provides additional information on the commitment of soil resources. Growth media from Burntlog Route construction would be stockpiled and stored in borrow source sites and in windrows at the top of fill slopes. Long-term storage of growth media also could reduce mycorrhizal activity and a loss of soil viability. During closure and reclamation, growth media would be spread and areas reseeded within the TSF and backfills in the Meadow Creek and Horse Heaven IRAs and along the Burntlog Route within the Meadow Creek, Burnt Log, and Black Lake IRAs. Areas with soil nail walls would be reclaimed to the foot of the wall; however, soil nail walls would remain. The Soils and Reclamation Cover Materials Specialist Report (Forest Service 2022m) provides additional information regarding soils and reclamation as presented in the Reclamation and Closure Plan (Perpetua 2021e).

During construction, approximately 2 miles of Meadow Creek would be diverted around the south side of the TSF and TSF Buttress. In the Meadow Creek and Horse Heaven IRAs, water temperature and chemistry in the 2-mile stream segment of Meadow Creek located in a channel could change and become less productive for fish and aquatic species. As described in the Surface Water and Groundwater Quality Specialist Report (Forest Service 2022b) and the Fisheries Specialist Report (Forest Service 2022i), changes to streamflow, groundwater-surface water interactions, and stream shading have the potential to affect stream temperatures.

Fugitive dust sources during construction would include haul roads, access roads, dust from vehicle travel, and transferring material which would be deposited in adjacent areas. Dust from vehicles using unpaved roads could become airborne and there could be a temporary impact on air quality in adjacent areas of IRAs. During construction, the predicted particulate matter 2.5 microns or less and 10 microns or less emissions would be below NAAQS thresholds (Forest Service 2022c) at the Operations Area Boundary. During operations, pollutants including ozone precursors (e.g., nitrogen oxides and volatile organic compounds) are predicted to be below NAAQS thresholds at Operations Area Boundary. The potential deposition of nitrogen, mercury, and sulfur also are predicted to be below analysis thresholds from the Operations Area Boundary outward. The lime kiln operation would increase emissions of sulfur dioxide but would remain below NAAQS thresholds (Forest Service 2022c).

Natural Appearing Landscapes with High Scenic Quality

Construction of the TSF, TSF Buttress, access roads, and the new transmission line segment would result in new disturbance within six IRAs. During the 15 years of operation, the flatter valley basins, terraces, and slopes from the TSF and TSF Buttress would contrast with the surrounding unmodified landscapes within Meadow Creek and Horse Heaven IRAs. During closure and reclamation, the TSF would be

graded/recontoured to blend into the surrounding topography and terrain; however, it would still be apparent in the environment. The change in elevation, flatter valley basins, terraces, and sloped landforms would continue to show evidence of human modification to natural landscapes within Meadow Creek drainage after closure and reclamation.

Areas cleared of vegetation, rock cuts, retaining walls, and human activity would be visible in Burnt Log, Black Lake, and Meadow Creek IRAs during the construction and operation of Burntlog Route. Areas cleared of vegetation, exposed soil color, and changes in terrain during the construction and operation of Burntlog Route would modify the natural landscape and reduce scenic quality. Locating a segment of the Burntlog Route within the Riordan Creek drainage would be visible in the Black Lake and Meadow Creek IRAs, depending upon the height of cut slopes. Maintaining vegetation in the new transmission line ROW and use of access roads would change plant succession within portions of the Horse Heaven and Meadow Creek IRAs for the long term. The 100-foot-wide ROW would contrast with the adjacent undisturbed vegetation, reducing the quality of scenic resources. The Scenic Resources Specialist Report (Forest Service 2022j) provides additional information about the potential effects on scenic resources under the 2021 MMP.

During closure and reclamation, the Burntlog Route would be decommissioned, structures removed, and slopes graded to blend with adjacent slopes where possible. After decommissioning, less than one mile of soil nail walls, some slopes, and rock cuts would remain. Soil nail walls and rock cuts would continue to be evidence of human alterations in localized areas. The Scenic Resources Specialist Report (Forest Service 2022j) provides additional details on where the mine facilities and the Burntlog Route could be visible.

Undeveloped Character

The wilderness attribute of undeveloped character (**Table 6-7**) informs impacts to the roadless area characteristics of *reference landscapes* and *natural appearing landscapes with high scenic quality*. The natural appearance in the 13 IRAs and lands contiguous to unroaded areas has generally been unaffected by human development. Past mining activities, roads, and utility infrastructure are evident in the landscape on the edges of the IRA boundaries. The location of the Burntlog Route would result in new surface disturbance within the Burnt Log, Black Lake and Meadow Creek IRAs. After mine closure and reclamation, the TSF and TSF Buttress would be reclaimed; however, the TSF and backfill liners, and retaining walls would remain as structures within the Meadow Creek, Horse Heaven, Black Lake, and Burnt Log IRAs. There are NFS roads and trails that allow motorized use in the roadless expanse. The SGP would result in human development, including new structures within IRAs.

Structures

The TSF and TSF Buttress would be permanent structures within the Meadow Creek and Horse Heaven IRAs. During mine operation, tailings deposition would change the elevation of lower Meadow Creek drainage several hundred feet above mean sea level.

New road segments, cut and fill slopes, and soil nail retaining walls would be present along the Burntlog Route that would be within the Burnt Log, Black Lake, and Meadow Creek IRAs during construction, operations, and closure and reclamation. Indirectly, improvements to Burnt Log Road (FR 447) and the newly constructed road could increase the number of user-created dispersed recreation sites in IRAs. The proliferation of dispersed recreation sites along Burntlog Route could decrease the undeveloped roadless characteristic IRAs.

Several miles of new transmission line would be present within the Meadow Creek and Horse Heaven IRAs. Existing transmission line structures would be replaced, and new access roads to transmission structures would be present within the Reeves Creek and Caton Lake IRAs.

As a result of facilities constructed within the IRAs, there would be a conversion of acres within IRAs managed for Backcountry Restoration meeting the semi-primitive non-motorized setting to the area meeting rural and semi-primitive motorized physical setting during both the summer and winter relative to existing conditions (AECOM 2020b).

During closure and reclamation, mining facilities on and off the SGP and associated utilities would be removed (e.g., transmission line from Johnson Creek substation to the SGP), and new mine access roads (i.e., portions of Burntlog Route) would be decommissioned and reclaimed. After mine closure, areas of mine related disturbance, access road retaining walls, geotextile fabric, and potentially foundations for the transmission poles, would remain within the Meadow Creek, Horse Heaven, Black Lake, and Burnt Log IRAs.

Natural Appearance

In the long term, the Burntlog Route, transmission line structures, access roads, and repeater sites within IRAs would reduce the undeveloped area and natural landscape in localized areas. Noise, lighting, and human activity from construction and operation of mining facilities and access road construction and maintenance would change the natural landscape within the Burnt Log, Black Lake, Meadow Creek, Horse Heaven, Secesh, and Sugar Mountain IRAs and would be evidence of modern human presence and modifications to the natural environment.

During closure and reclamation, the TSF and TSF Buttress within the Horse Heaven and Meadow Creek IRAs would be recontoured to blend with adjacent slopes. However, the elevation and change from a V-shaped valley topography to a level valley would remain noticeable and provide evidence of past human activity. The recontoured slopes, topography, and sparser vegetation would decrease the area within IRAs with a natural appearance. Recontouring slopes, reestablishing drainage, and seeding the constructed portion of the Burntlog Route within the Black Lake, Burnt Log, and Meadow Creek IRAs could help return these areas to a natural appearance over time.

Outstanding Opportunities for Solitude and Primitive Recreation

The 13 IRAs and lands contiguous to unroaded areas are large enough to provide outstanding opportunities for solitude and primitive recreation. Outstanding opportunities for solitude or primitive recreation vary throughout the roadless expanse depending on topography, vegetation, distance to roads and trails that allow motorized use, and other human structures. Forest visitors seeking outstanding opportunities for solitude could be displaced from IRAs and adjacent unroaded areas during construction, operation, and closure and reclamation of the SGP. The Operations Area Boundary encompasses approximately 15 percent of the total acres within the Sugar Mountain, Horse Heaven, and Meadow Creek IRAs combined and reduces the area available for outstanding opportunities for solitude or primitive recreation. The presence of workers, vehicles, and the sound of equipment would be high during the entire life of the SGP in adjacent areas. The presence of workers, vehicles, and the sound of equipment would decrease the areas within the Meadow Creek, Black Lake, Burnt Log, and Horse Heaven IRAs and adjacent unroaded areas with outstanding opportunities for solitude and primitive types of recreation.

There would be 135,827 acres within IRAs that would meet the semi-primitive non-motorized recreation setting during the summer (Forest Service 2022f). During the winter, there would be 104,717 acres

meeting the semi-primitive motorized recreation setting. Increasing areas within the roadless expanse meeting the semi-primitive motorized physical recreation setting could reduce opportunities for solitude and primitive recreation. Maintaining the new transmission line and use of access roads would reduce the area within the Horse Heaven and Meadow Creek IRAs with outstanding opportunities for solitude. The construction and use of the public access road through the SGP could increase recreation use and motorized access in the Meadow Creek IRA. The Recreation Specialist Report (Forest Service 2022f) provides additional information about the potential effects on recreation.

During operation, noise from daily road use or maintenance and blasting at the SGP could continue to reduce areas within these IRAs with outstanding opportunities for solitude. The Burntlog Route could lead to increased motorized public use and, thereby, indirectly increase recreation use in the Meadow Creek, Horse Heaven, Black Lake, and Burnt Log IRAs. Due to increased traffic, forest visitors also may avoid IRAs nearer to the SGP, indirectly increasing recreation use in the adjacent IRAs. After mine closure, the currently existing Burnt Log Road (FR 447) would remain and could lead to increased recreation use and decreased opportunities for primitive recreation and solitude within IRAs.

Special Features and Values

Special features in the 13 IRAs include areas valued for their scientific qualities, scenic qualities, or other notable distinct features. Special features that could be affected by the SGP under the 2021 MMP include habitat for Canada lynx, wolverine, and anadromous fish species; elk security areas (winter range) and migration paths; and vegetation communities where whitebark pine could be present. Construction of SGP facilities, access roads, and utilities could result in a loss or fragmentation of Threatened and Endangered Species and Forest Service Sensitive species habitat within the Meadow Creek, Horse Heaven, Black Lake, Burnt Log, Caton Lake, and Reeves Creek IRAs. Elk use and migration within the elk security area of the Horse Heaven IRA could be disturbed by noise from mine-related traffic and human activity during all SGP phases. Fish habitat would be improved if sediment loads are reduced and fish passage improves in streams within the Meadow Creek, Caton Lake, and Horse Heaven IRAs. Portions of the Chilcoot Peak RNA and eligible WSR segments of Burntlog Creek and Johnson Creek located within IRAs also could be indirectly affected by activities under the 2021 MMP from invasive species and sediment loading changes creating changes to water quality. Roadless area characteristics that correspond with this wilderness attribute are *traditional cultural properties and sacred sites* and *other locally identified unique characteristics*. A detailed evaluation of the impacts of SGP activities on traditional cultural properties and sacred sites is included in the Tribal Rights and Interests Specialist Report (Forest Service 2022).

Manageability

Manageability of IRAs is the ability of the Forest Service to manage these areas to maintain roadless characteristics. The new mining facilities, access routes, and the transmission line would create substantially noticeable human development and structures within IRAs and would create isolated parcels that may be difficult to manage during construction and operation of the SGP. The new transmission line segment and access roads would create an isolated parcel within the Horse Heaven IRA for the long term. The Burntlog Route within the Black Lake, Burnt Log, and Meadow Creek IRAs would create isolated parcels that would be difficult to manage to maintain roadless characteristics during mine construction and operation. The location of the Burntlog Route and the new transmission line segment in the Black Lake, Burnt Log, and Meadow Creek IRAs would create isolated parcels that would also be difficult to manage to maintain roadless characteristics.

7.2.3.3 Johnson Creek Route Alternative

Under the Johnson Creek Route Alternative, infrastructure and operations at the SGP would be the same as the 2021 MMP. Construction, operation, and closure and reclamation under the Johnson Creek Route Alternative could affect the wilderness attributes of naturalness; undeveloped character; outstanding opportunities for solitude and primitive types of recreation; special features and values; and manageability (**Table 6-7**) which inform impacts to roadless characteristics. A detailed evaluation of the impacts of SGP activities on roadless area characteristics by phase is included in the SGP Effects on Roadless Character (AECOM 2020b) report. **Figures 1-1** and **2-1** show the location of the SGP facilities. The differences between the 2021 MMP and the Johnson Creek Route Alternative where there is a measurable effect on IRAs and lands contiguous to unroaded areas include:

- **Johnson Creek Route** – Access to the SGP during construction, operation, closure and reclamation would be via Johnson Creek Road (CR 10-413) and the Stibnite portion of the McCall-Stibnite Road (CR 50-412). The construction phase of the SGP would increase to 5 years. During construction, public use of Stibnite Road from the village of Yellow Pine to the north mine gate would be limited to before 10:00 AM and after 4:00 PM. Also, the Johnson Creek Road would be periodically closed to public use for extended periods (up to 4 to 5 months) during construction. The Burntlog Route would not be constructed under this Alternative.
- **Radio repeater site construction** – Radio repeater sites within IRAs would be constructed via helicopter.

The upgrade to the transmission line would have the same effects on the roadless expanse as the 2021 MMP. A summary of the impacts under the Johnson Creek Route Alternative that would result in changes to roadless characteristics are described in the following sections.

7.2.3.3.1 *Naturalness*

As shown in **Table 7-3**, construction and operation of the SGP under the Johnson Creek Route Alternative would directly impact the Meadow Creek, Horse Heaven, Caton Lake, and Reeves Creek IRAs. Impacts to these IRAs from mine facilities and utilities would be similar in nature to the 2021 MMP. Under the Johnson Creek Route Alternative, improvements and use of only the Johnson Creek Route for mine access would eliminate impacts within the Black Lake and Burnt Log IRAs and within portions of the Meadow Creek IRA associated with the Burntlog Route.

Plants

Similar impacts to vegetation as described under the 2021 MMP would occur, but less acres within IRAs would be impacted. The Vegetation Specialist Report (Forest Service 2022g) provides additional information on vegetation communities and botanical resources.

Construction of the Johnson Creek Route along the boundary of the Meadow Creek, Horse Heaven, and Sugar Mountain IRAs could disperse non-native invasive plant species. Construction and operations traffic along Johnson Creek Route also would increase the spread of non-native plant species into these IRAs.

Using a helicopter to construct repeater sites located within IRAs would reduce the miles of temporary access roads needed and reduce the potential for non-native plant species to spread in the eastern part of the Meadow Creek IRA.

Fish and Wildlife

Fish and aquatic species habitat alterations at the SGP would be the same as those described under the 2021 MMP. The Burntlog Route would not be constructed; therefore, the impacts from that would not exist.

Using the Johnson Creek Route to access the SGP could disturb wildlife movement within the Caton Lake, Meadow Creek, Horse Heaven, and Sugar Mountain IRAs. Altering of wildlife habitat within IRAs described under the 2021 MMP would be the same under this alternative. Construction of the Johnson Creek Route along the boundary of the Caton Lake, Meadow Creek, Horse Heaven, and Sugar Mountain IRAs would extend SGP construction to 5 years. The additional 2 years of construction and 15 years of mine operation would increase the duration when sensitive wildlife species could be displaced from habitats in IRAs adjacent to the Johnson Creek Route. The Wildlife and Wildlife Habitat Specialist Report (Forest Service 2022l) provides additional information.

Soil, Water, and Air

Similar impacts to soils as described under the 2021 MMP would occur, but less acres within IRAs would be impacted. Sediment deposition during the construction of the Johnson Creek Route from replacing or clearing culverts would have a temporary impact on water quality. The Surface Water and Groundwater Quality Specialist Report (Forest Service 2022b) provides additional information on sediment and access roads. Construction to widen Johnson Creek Route would generate fugitive dust.

Natural Appearing Landscapes with High Scenic Quality

The effects on the natural appearing landscapes from constructing the TSF, TSF Buttress, and the new transmission line segment would be the same as the 2021 MMP. Widening Johnson Creek Route would change natural appearing landscapes in adjacent areas within the Secesh, Sugar Mountain, and Horse Heaven IRAs. The Scenic Resources Specialist (Forest Service 2022j) provides additional information about the potential effects on Scenic Resources.

Undeveloped Character

The wilderness attribute of undeveloped character (**Table 6-7**) informs impacts to the roadless area characteristics of reference landscapes and natural appearing landscapes with high scenic quality. Under the Johnson Creek Route Alternative, the TSF and TSF Buttress structures would have same effect on IRAs as those described under the 2021 MMP.

After mine closure, the impacts to IRAs described under the 2021 MMP would be the same. The access road retaining walls, geotextile fabric, and the foundations for the transmission poles, would remain as structures within the Meadow Creek, Horse Heaven, Black Lake, and Burnt Log IRAs.

Outstanding Opportunities for Solitude and Primitive Recreation

Using the Johnson Creek Route to access the SGP during construction, operation, and closure and reclamation, would decrease opportunities for solitude in adjacent areas of the Secesh, Sugar Mountain, Horse Heaven, and Meadow Creek IRAs.

Under the Johnson Creek Route Alternative, areas that meet the semi-primitive non-motorized recreation setting would be 136,077 acres during the summer (AECOM 2020b) report. During the winter 154,240 acres would meet the semi-primitive non-motorized recreation setting.

Indirectly, the number and size of mine vehicles using Johnson Creek Route could change dispersed recreation use within the 13 IRAs. Some forest visitors may choose to avoid areas where SGP components would be constructed or where the Johnson Creek Route would be used for access. This could increase recreation use in other areas of the 13 IRAs and lands contiguous to unroaded areas.

Special Features and Values

The construction of the Johnson Creek Route would have no direct effect on the eligible Burntlog Creek WSR or any of the two RNAs. The Johnson Creek Route Alternative would disturb less acres of special features and areas valued for their scientific qualities, scenic qualities, or other notable distinct features compared to the 2021 MMP as a result of the Burntlog Route not being constructed under this alternative. Roadless area characteristics that correspond with this wilderness attribute are 'traditional cultural properties and sacred sites' and 'other locally identified unique characteristics'. A detailed evaluation of the impacts of SGP activities on traditional cultural properties and sacred sites is included in the Tribal Rights and Interests Specialist Report (Forest Service 2022).

Manageability

Under the Johnson Creek Route Alternative, the difficulty to manage the Black Lake and Burnt Log IRAs to maintain roadless characteristics would be the same as existing conditions. The components under the 2021 MMP in the Horse Heaven and Meadow Creek IRAs would have the same effect on the ability for the Forest Service to manage these areas to maintain roadless characteristics.

7.2.4 Research Natural Areas

The following analysis of effects associated with RNAs is considered within the overall context of vegetation and hydrologic conditions within the RNA analysis area. Elements of this context include:

- By definition, RNA's unique ecological communities provide opportunities to study ecological processes and long- and short-term ecological change. Within the Intermountain Region, the RNAs provide a control area for comparing the results of manipulative research and monitor the effects of resource management techniques and practices applied to similar ecosystems.
- Ecological processes within the RNAs are related to overall ecosystem health and impacts that alter vegetation or affect hydrology could have effects that extend to the greater ecosystem of an area.
- Potential impacts to research values, ecological site conditions, and ecological processes are analyzed based on SGP phasing (e.g., construction, operations, closure and reclamation).
- Under the action alternatives, the applicant would be required to adhere to environmental design features, resource protection measures, Forest Service-required measures, and expected permit stipulations.

The purpose of the analysis is to disclose the potential effects on the research values, ecological site conditions, and processes in the RNAs within the analysis area. **Table 7-4** describes the distance and direction of the nearest SGP component to each RNA.

Table 7-4 Research Natural Area Location and Distance to Nearest SGP Component

RNA	Location and Distance to SGP Component
Belvidere Creek	The entire Belvidere Creek RNA is within the FCRNRW and is located about 7 miles northeast of the village of Yellow Pine and approximately 6 miles north of the SGP Operations Area Boundary. Cut and fill areas associated with upgrades to the Johnson Creek Road are within 5 miles of this RNA. No impacts to this RNA from the SGP are anticipated.
Chilcoot Peak	Portions of the Chilcoot Peak RNA are within the FCRNRW and Burnt Log IRA and are located near FR 447 (Burnt Log Road) and the Burntlog Route.

Source: AECOM 2020a

CR = County Road; FCRNRW = Frank Church-River of No Return Wilderness; FR = National Forest System Road; IRA = Inventoried Roadless Area; RNA = Research Natural Area

As discussed in **Section 6.1.4**, the analysis area includes RNAs that are within 5 miles of the SGP, access roads, off-site facilities, and new and upgraded transmission lines. Under the alternatives, there would be no structures or facilities located within the boundaries of the two RNAs. Under the action alternatives, the SGP activities would be located downgradient of streams that flow through RNAs or would be in watersheds that do not contain streams that flow through RNAs. There are no predicted changes to water chemistry, temperature, or quality in the stream segments that flow through the two RNAs.

7.2.4.1 No Action Alternative

Under the No Action Alternative, Perpetua would continue with exploration, monitoring, and reclamation commitments as described in the Golden Meadows Decision Memo and Environmental Assessment. Belvidere Creek, the RNA nearest to the SGP, is approximately 5 miles north. Fugitive dust generated from vehicles and reclamation activities would attenuate within 300 feet of unpaved roads (Watson 2000). The distance of approximately 6 miles between Belvidere Creek RNA and SGP reclamation and monitoring activities precludes the potential for fugitive dust and non-native invasive plant species establishment that could result in the loss of research values, ecological site conditions, and ecological processes within the two RNAs.

The spread of non-native invasive plant species varies based on each species characteristics. The distance from the mineral exploration and seeding of disturbed areas to any of the two RNAs listed in **Table 7-4** is more than 5 miles. The distance and the NFS and Valley County roads used for access reduce the potential for SGP activities to spread non-native invasive plant species into the two RNAs. Therefore, there would be negligible direct or indirect effects on the hydrologic conditions, vegetation communities, or the research values within the two RNAs from the No Action Alternative.

Warm Lake Road, Johnson Creek Road, and Stibnite Road would be used to access the SGP for exploration and monitoring activities in the summer. Motor vehicles and personnel using these roads or conducting maintenance activities could transport non-native invasive plant species seeds and propagules. Chilcoot Peak, the RNA nearest to Johnson Creek Road, is approximately 3 miles east of Johnson Creek Road, where aggregate and road maintenance activities would be conducted. The distance reduces the potential for fugitive dust and invasive plant species to spread within the Chilcoot Peak RNA from conducting road maintenance activities. Therefore, there would be negligible direct or indirect effects on research values or ecosystem conditions within the two RNAs listed in **Table 7-4** from the use of existing roads or their maintenance.

7.2.4.2 2021 MMP

Construction

As part of Burntlog Route, reconstruction of (i.e., widening, installing drainage features, etc.) approximately 3 miles of Burnt Log Road (FR 447) would remove vegetation and disturb soils located within 100 to 3,100 feet of the Chilcoot Peak RNA boundary. An approximately 2.4-mile section of Burnt Log Road that is currently within 700 to 800 feet of the Chilcoot Peak RNA boundary, would be reclaimed and decommissioned due to rerouting of the alignment. Removing existing vegetation and disturbing soils could disperse non-native invasive plant species that could become established within the Chilcoot Peak RNA (Forest Service 2019b; Jacobs et al. 2009). Non-native invasive plant species populations along Burnt Log Road, such as rush skeletonweed, spotted knapweed, and oxeye daisy, could become established in areas disturbed during Burntlog Route construction (Milan et al. 2016; Forest Service 2019b). Material from borrow sources used to reconstruct and widen Burnt Log Road also could contain non-native invasive plant species. The potential for non-native plant species and plant species used during interim reclamation to spread into the Chilcoot Peak RNA depends upon adjacent environmental conditions (e.g., soils, climatic influences, vegetation, etc.) and the non-native plant species characteristics. Surveying interim reclamation areas for non-native invasive plant species and implementing treatments for 3 years after the Burntlog Route construction is completed could reduce the potential for non-native invasive plant species to become established. Additionally, performing non-native plant species control measures (**Table 2-2**) as required in the Payette Forest Plan and Boise Forest Plan and under Forest Service Manual 2900 would reduce the potential for invasive plant species to become established. Implementing Forest Service standards NPST11, FRGU02, and TEST10 could reduce the spread of non-native invasive plant species from borrow sources. Surveys and implementing treatments would not completely remove the risk of non-native invasive plants or species that are not present within Chilcoot RNA from becoming established and spreading into the Chilcoot Peak RNA.

Interim reclamation and the use of certified weed-free mulch in disturbed areas would decrease the potential for non-native invasive plant species to spread and help stabilize soils (Gornish et al. 2016; Midas Gold 2016; Perpetua 2021). The Forest Service approved species used in the seed mix could spread into the Chilcoot Peak RNA (Morris and Schupp 2009). If the spread of plant species not currently present within the Chilcoot Peak RNA occurred, it would change research values, ecological site conditions, and ecological processes within the Chilcoot Peak RNA (Forest Service 1995). Impacts would be localized, negligible to moderate, and long term.

Once the Burntlog Route is complete, the AADT would increase from 27 to 65 vehicles, approximately 2.4 times the existing traffic volume. Increasing the number and size of vehicles using Burnt Log Road as part of Burntlog Route could increase the amount of dust deposited on adjacent vegetation. The distance dust travels depends on a variety of factors, including wind direction and speed, dust particle size, and vehicle travel speed (Cuscino et al. 1977). Dust deposition could change ecological conditions in a small portion of the Chilcoot Peak RNA that is closest to the Burntlog Route depending on the extent of the deposition (Lewis et al. 2017; Watson 2000). Dust abatement measures during construction would reduce the amount of fugitive dust generated and deposited on vegetation within the Chilcoot Peak RNA. During the 2 years of the Burntlog Route construction, the effects on vegetation health from dust deposition within the RNA would likely be negligible (Squires 2016; Trombulak and Frissell 2000; Ulrichs et al. 2008).

During construction, widening Burnt Log Road would increase human activity in areas near the Chilcoot Peak RNA and could increase the potential for human-ignited fires. While lightning is the primary source of fire in northwest forests, the human-ignited fire season is longer. Human-ignited fires occurring earlier

or later than lightning-ignited fires could change the natural fire regime, which would also be exacerbated by the introduction of certain non-native species and/or by a changing climate (Nagy et al. 2018). Fires occurring more frequently or during different seasons than lightning-ignited fires could change vegetation plant species succession and ecological processes within the Chilcoot Peak RNA. The presence of road construction crews in construction camps could have both positive and negative effects on fire conditions. Crews' observations could decrease the amount of time before a fire is detected; however, they could also increase the probability of a human-caused fire. In addition, design features would also limit the potential for human-caused fires during construction.

Timber harvested at the SGP could be transported on Burntlog Route. Timber from the SGP could have conifer pathogens such as pathogenic bark beetle species (e.g., mountain pine beetle [*Dendroctonus ponderosae*]), and white pine blister rust, which is caused by the introduced pathogen *Cronartium ribicola* (Hinke et al. 2016; Keane et al. 2017). At this time, the presence of conifer pathogens at the SGP is unknown; however, if present, pathogens could be transported on timber harvested at the SGP or other areas (Brockerhoff and Liebhold 2017; Jain and Graham 2005). Conifer pathogens could be distributed during the transport of timber on the Burntlog Route. The potential for conifer pathogens to be introduced into the Chilcoot Peak RNA depends upon site conditions during the transport of timber and specific characteristics of a conifer pathogen. Whitebark pine/subalpine fir habitat type is one of the distinguishing features of the Chilcoot Peak RNA, and conifer pathogens could cause mortality of whitebark pine and other conifers. If this occurs, changes in the composition and structure of existing vegetation communities and ecological succession would result in a localized, minor to major, long-term loss of the Chilcoot Peak RNA research value and ecological condition. The extent where insects and pathogens could be introduced into Chilcoot Peak RNA from the transport of timber harvested in other areas is unknown.

New culverts would be installed and existing culverts would be replaced on a segment of the Burntlog Route near but outside of the Chilcoot Peak RNA. The culverts could change the movement of sediment, woody debris, and other organic material (Forest Service 2008a). Culverts could change water quantity or hydrologic connection and indirectly effect ecological processes in areas adjacent to the Chilcoot Peak RNA, although all culvert installations or replacements would occur downstream and outside of the RNA, so potential impacts to water quantity or water quality impacts within the RNA are not anticipated. Potential impacts to water quantity and water quality from the SGP are described in those applicable specialist reports.

The removal of vegetation, soil disturbance, and access road improvements from the upgrade to the existing Idaho Power Company [Idaho Power] transmission line could disperse non-native invasive plant species into adjacent RNAs. Vehicles and equipment could transport non-native plant species seeds that could become established and spread (Trombulak and Frissell 2000). This increase in vehicles, human activity, and the disturbance of vegetation and soils would be over 3 miles from the two RNAs. As part of Idaho Power's construction activities, their Operation and Maintenance Plan (Idaho Power 2015) outlines measures for preventing and controlling noxious weed infestations. This plan does not specifically discuss non-native plants that are not noxious weeds; however, the applicable noxious weed and non-native species standards from the Payette Forest Plan (Forest Service 2003a) and Boise Forest Plan (Forest Service 2010) would apply to the transmission line upgrade. Constructing the upgraded transmission line would result in negligible direct or indirect effects on the research values, ecological site conditions, and ecological processes within the two RNAs.

Operation

During the 15 years of operation, AADT along the Burnt Log Road and newly constructed Burntlog Route would increase from 27 to 50 vehicles, approximately 1.9 times the existing number of vehicles on

Burnt Log Road. Daily road maintenance of Burntlog Route could disturb vegetation on road shoulders and distribute non-native invasive species seeds (Rew et al. 2018). As noted in **Table 2-2**, Perpetua's Weed Management Plan would include an identification process, methods and frequency for treating infestations, treatment procedures and restrictions, reporting requirements, and follow-up or monitoring requirements. However, surveys and treatments would not completely remove the risk of non-native invasive plants or species spreading into the Chilcoot Peak RNA. Traffic on Burntlog Route could continue to deposit dust on vegetation within portions of the Chilcoot Peak RNA. Dust abatement measures during operation would reduce the amount of fugitive dust generated and the amount of dust that could be deposited on vegetation within the Chilcoot Peak RNA (Lewis et al. 2017; Ulrichs et al. 2008). Changes in vegetation community composition and structure would result in a loss of research values, ecological site conditions, and ecological processes in the Chilcoot Peak RNA. Impacts would be localized, negligible to moderate, and long term if they occur.

Daily maintenance of the Burntlog Route, vehicles, and recreation use could increase the potential for non-native invasive plant species to spread and become established within Chilcoot Peak RNA. Widening Burnt Log Road as part of Burntlog Route could increase the recreation use of Summit Trail (NFST 088), which crosses the Chilcoot Peak RNA (Forest Service 1995; Marion et al. 2016). The Springfield Mine Road (FR 440A) which was mostly a rough ATV trail, has been rendered impassable in this area due to the Buck Fire. Vehicles, clothing, and recreation equipment could transport non-native plant and invasive plant species seeds (Ansong and Pickering 2016; Taylor et al. 2012; Trombulak and Frissell 2000). The potential for non-native plant species to spread into the Chilcoot Peak RNA depends upon adjacent environmental conditions (e.g., soils, climatic influences, vegetation, etc.) and the non-native plant species characteristics. The spread of non-native invasive plant species would change the composition and structure of vegetation communities within the Chilcoot Peak RNA. Changes to existing vegetation community composition and structure would result in the localized, negligible to major, long-term loss of research values, ecological site conditions, and ecological processes within the Chilcoot Peak RNAs (Forest Service 1995).

Forest visitors may choose to avoid Burntlog Route and the SGP due to the increased traffic, increased number of large vehicles, and potential delays during daily Burntlog Route maintenance activities. Recreation use could increase in other areas, such as the South Fork Salmon River and Big Creek drainages. During the summer, if recreation use on Warren-Profile Gap Road (FR 50340), Hamilton Bar (FR 50673), South Fork Road (FR 50674), and NFST 291 increases, the risk of non-native invasive plant species distribution and establishment would increase (Trombulak and Frissell 2000). Non-native plant species could become established within the Belvidere Creek RNA, although due to the design features that would be implemented, the anticipated overall impacts are expected to be negligible to minor and long-term. This spread could result in localized, minor to moderate, long-term impacts.

Increased recreation use due to additional access via the Burntlog Route could increase the risk of non-native invasive plant species distribution and establishment within the Belvidere Creek and the Chilcoot Peak RNAs (Marion et al. 2016; Rew et al. 2018; Trombulak and Frissell 2000). However, due to the distance between the SGP and associated components to the Belvidere Creek RNA and the design features that would be implemented, the anticipated overall impacts are expected to be negligible to minor and long-term.

The operation and maintenance of the upgraded transmission line could disperse non-native invasive plant species. Vehicles and equipment could transport non-native plant species seeds that could become established and spread (Trombulak and Frissell 2000). The increase in vehicles, human activity, and the vegetation management of the transmission line would be over 3 miles from the two RNAs listed in **Table**

7-4. At this distance, these activities would result in negligible direct or indirect effects on the research values, ecological site conditions, and ecological processes within the two RNAs.

Closure and Reclamation

During mine closure and reclamation, an estimated AADT of 57 vehicles, including 27 mine vehicles, would use the Burntlog Route an additional 5 to 7 years after the mine operation ceases. During mine closure, the AADT on Burntlog Route, including 27 mine vehicles, would increase from 27 to 57, approximately 1.9 times the existing traffic on Burnt Log Road. Vehicles and daily road maintenance activities could disperse non-native invasive plant species and continue to deposit dust on vegetation within portions of the Chilcoot Peak RNA. Dust abatement measures during closure and reclamation would reduce the amount of fugitive dust generated. The amount of dust that would be deposited on vegetation within the Chilcoot Peak RNA is unknown (Lewis et al. 2017; Ulrichs et al. 2008).

Recontouring slopes, reducing the width of the Burnt Log Road segment of Burntlog Route, and the use of the reclamation seed mix could spread non-native invasive plant species. Seeding disturbed areas with the approved seed mix and certified weed-free mulch would stabilize soils and decrease the potential for non-native invasive plant species to become established (Gornish et al. 2016; Midas Gold 2016; Perpetua 2021). The spread of native and non-native plant species into the Chilcoot Peak RNA would change vegetation community composition and structure (Forest Service 1995). Changes in vegetation community composition and structure would result in a loss of research values, ecological conditions, and ecological processes in the Chilcoot Peak RNA. Reclamation of disturbed areas, which involve revegetation on NFS lands, would be done according to Payette or Boise Forest Plan Standards and in coordination with a Forest Service botanist. After reclamation and closure, impacts from the spread of non-native invasive plant species or changes in vegetation composition and structure would be localized, negligible, and long term.

Implementing actions described in the SGP Reclamation Plan (Perpetua 2021), South Fork Salmon River Subbasin Noxious and Invasive Weed Management Plan (Forest Service 2007b), Forest Standards, the Payette and Boise National Forest Noxious Weed and Poisonous Plant Control Programs, and Valley County noxious weed control programs would reduce the potential for non-native plant species to become established within the RNAs. Implementing design features, surveys, and treatments would not altogether remove the risk of non-native invasive plants or species that are not already present in existing habitat types from becoming established and spreading into the Chilcoot Peak RNA, but it would limit the potential for this risk. Where non-native plant species become established within an RNA, there would be a localized, negligible to minor, permanent loss of RNA values.

7.2.4.3 Johnson Creek Route Alternative

Construction

Under the Johnson Creek Route Alternative, the Burntlog Route would not be constructed, and the 65 mine construction vehicles would use the Johnson Creek Route. During the 5 years of mine construction, the AADT would increase from 57 to 122 vehicles on Johnson Creek Road (CR 10-413), and from 39 to 104 on the Stibnite portion of the McCall-Stibnite Road (CR 50-412), approximately 2.1 to 2.6 times the existing traffic volumes. These activities would disperse non-native invasive plant species (Forest Service 2019b; Jacobs et al. 2009). The increase in vehicles, human activity, and the disturbance of vegetation and soils would occur over 3 miles from the two RNAs listed in **Table 7-4**. The Johnson Creek Route Alternative would occur farther away from the Chilcoot Peak RNA. Potential impacts to the Chilcoot Peak RNA would be fewer and of lesser intensity under this alternative. These activities would result in

negligible direct or indirect effects on the research values, ecological site conditions, and ecological processes within the two RNAs.

Construction of mine access roads under the Johnson Creek Route Alternative would be 1 year longer than under the 2021 MMP and increase the overall construction period to 5 years; which could increase the potential for recreation use in other areas. The increase in vehicles and delays during the 5 years of construction could indirectly increase recreation use in other areas such as the South Fork Salmon River. If recreation use on Phoebe Meadows trail (NFST 291) and South Fork Salmon River East trail (NFST 076) increases, the risk of non-native invasive plant species distribution and establishment would increase (Trombulak and Frissell 2000). Vehicles, clothing, and recreation equipment could transport non-native plant and invasive plant species seeds (Ansong and Pickering 2016; Taylor et al. 2012; Trombulak and Frissell 2000). The potential for non-native plant species to spread into the RNAs depends upon environmental conditions (e.g., soils, climatic influences, vegetation, etc.) and the non-native plant species characteristics, as well as the level of increase in recreation use. Changes in vegetation community composition and structure within the RNAs would occur where non-native invasive plant species become established, soils are compacted, or trails widened, or there is a change in fire frequency. Changes to vegetation composition and structure would result in the long-term loss of research values, ecological site conditions, and ecological processes within the Belvidere Creek RNA.

The application of Forest Plan standards and implementing treatments consistent with the PNF Noxious Weed Program and Idaho's Noxious Weed Management and Control Program would reduce the potential for non-native plant species to become established within the Belvidere Creek RNA. Non-native invasive plant species could become established within the RNAs. This would result in a localized, negligible to minor, long-term loss of research values, ecological conditions, and ecological processes.

Operations

During the 15 years of the mine operation, traffic volumes on Johnson Creek Route would increase. The AADT on Johnson Creek Road would increase from 57 to 125 vehicles, and on Stibnite Road from 39 to 107 vehicles, approximately 2.1 to 2.7 times the existing traffic volumes. Forest visitors may choose to avoid Johnson Creek Route due to the increased traffic, increased number of large vehicles, and potential delays during daily maintenance activities. Forest visitors could increase recreation use in the South Fork Salmon River and Big Creek drainages. Widening Stibnite Road could increase recreation use in the Big Creek drainage. During the summer, if recreation use on Warren-Profile Gap Road (FR 50340), Hamilton Bar (FR 50673), South Fork Road (FR 50674), and Phoebe Meadows Trail (NFST 291) increases, the risk of non-native invasive plant species distribution and establishment would increase (Trombulak and Frissell 2000). Vehicles and recreation equipment could disperse non-native invasive plant species (Forest Service 2013, 2015, 2019; Jacobs et al. 2009). Non-native plant species could become established within the Belvidere Creek RNA. Changes in vegetation community composition and structure within the RNA would occur where non-native invasive plant species become established, soils are compacted, or trails widened, or there is a change in fire frequency. Changes to vegetation community composition and structure would result in the long-term loss of research values, ecological site conditions, and ecological processes within this RNA.

Closure and Reclamation

During the 5 years of mine closure and reclamation, the AADT on Johnson Creek Road increases from existing 57 to 84 vehicles, and on Stibnite Road from 39 to 66 vehicles, approximately 1.5 to 1.6 times the existing traffic volumes. Human activity and the disturbance of vegetation and soils would be over 4 miles from any RNA. Belvidere Creek, the RNA nearest to the SGP Operations Area Boundary, is

approximately 6 miles north. These activities would result in negligible direct or indirect effects on the research values, ecological site conditions, and ecological processes within this RNA.

During the summer, if recreation use on Warren-Profile Gap Road increased, the risk of non-native invasive plant species distribution and establishment could increase (Trombulak and Frissell 2000). Vehicles and recreation equipment could disperse non-native invasive plant species (Forest Service 2013, 2015, 2019; Jacobs et al. 2009). Non-native plant species could become established within the Belvidere Creek RNA. Changes in vegetation community composition and structure within Belvidere Creek RNA would occur where non-native invasive plant species become established, soils are compacted, or trails widened, or there is a change in fire frequency. Changes to vegetation community composition and structure would result in the long-term loss of research values, ecological site conditions, and ecological processes within the Belvidere Creek RNA, but for the reasons described above these changes are unlikely.

7.3 Mitigation and Monitoring

Mitigation measures required by the Forest Service would represent reasonable and effective means to reduce the impacts identified in the previous section or to reduce uncertainty regarding the forecasting of impacts into the future. These mitigation measures are in addition to the Forest Service requirements and project design features (**Section 2.4**) accounted for in the preceding impact analysis.

Mitigation measures may be added, revised, or refined based on public comment, agency comment or continued discussions with Perpetua regarding this specialist report or subsequent analysis under NEPA. The adopted mitigation measures will be finalized in the Final EIS.

7.4 Cumulative Effects

7.4.1 Past and Present Actions

Past actions include activities that may have been initiated in the past but also could involve present operations such as mineral exploration, infrastructure development, and non-mining related actions. They may have lingering effects in degrading the environment or may influence trends in the physical, biological, or social environment.

Present actions include mining projects and their related activities (i.e., exploration, reclamation) that may have just commenced or are currently underway and are causing impacts. They also may include other non-mining related projects currently in progress, such as timber sales or vegetation treatment; recreation; other utility lines (e.g., powerlines) and roads; maintenance and use of the existing transportation network; urban development in Valley County; private land development and uses; and sand and gravel extraction.

Past and present actions that have an interactive, synergistic, and/or additive effect (per 40 CFR 1508.7) with a specific resource (such as lingering effects or influencing trends) in the SGP area are described below:

Mineral Exploration and Mining Activities – Past and present mineral exploration and mining have occurred in the vicinity of the SGP, including prospecting, exploration, underground mining, and open pit mining. To support past mining, other related activities occurred in the vicinity, including ore milling and processing, tailings disposal, smelting, heap leaching of ore, spent heap leach ore disposal, development rock disposal, hydropower generation, water retention dam construction, sawmill operations, electric

power transmission line construction, and occupancy by thousands of people in housing camps and later in the town of Stibnite.

Two major periods of mineral exploration, development, and operations have occurred in the past century, and have left behind substantial environmental impacts. Between the mid-1920s and the 1950s, the area was mined for gold, silver, antimony, and tungsten mineralized materials by both underground and, later, open pit mining methods. The second period of major activity started with exploration activities in 1974 and was followed by open pit mining and seasonal on-off heap leaching and one-time heap leaching from 1982 to 1997, with ore provided by multiple operators from several locations, and processed in adjacent heap leaching facilities (Forest Service 2015).

The mining, milling, and processing activities created numerous legacy impacts including underground mine workings, multiple open pits, development rock dumps, tailings deposits, heap leach pads, spent heap leach ore piles, a mill and smelter site, three town sites, camp sites, a ruptured water dam (with its associated erosion and downstream sedimentation), haul roads, an abandoned water diversion tunnel, and an airstrip.

Other past and/or present mining projects considered in the cumulative effects analysis include:

- **Fourth of July Mine** – Located in Government Creek on National Forest System (NFS) land, Fourth of July Mine has been inactive (Forest Service 2012).
- **Camp Bird Mine** – Located in Logan Creek on private land, Camp Bird Mine has been inactive for more than 30 years (Forest Service 2012).
- **Valley County Quarry Development** – Development and operation of an aggregate source to support the road maintenance activities on McCall-Stibnite Road (County Road [CR] 50-412), Johnson Creek Road (CR 10-413), and other backcountry roads as determined by Valley County (Forest Service 2017).
- **Walker Millsite** – Located in Logan Creek on private land, the plan of operations approved in 1990 included a 50 ton per day ball mill and gravity milling process with the following components: a 50-foot by 100-foot by 8-foot-deep tailings impoundment, 1,000 feet of access road, a water transmission line, and explosives magazine. The millsite on NFS land has been reclaimed (Forest Service 2012).
- **Golden Hand No. 1 and No. 2 Lode Mining Claims** – Located in the Big Creek drainage on 1,309 acres of NFS land, approximately 19 miles north of Yellow Pine, the plan of operations included drilling operations, trenching and sampling, and reopening the caved Ella Mine adit. The project also would include the collection of subsurface geological information to prepare for a new mineral examination. The claims encompass approximately 20 acres each and are adjacent to Coin Creek (Forest Service 2012).
- **Cinnabar Mine** – Located 15 miles east of Yellow Pine and approximately 50 acres in extent, most of the mining occurred during the 1950s. No reclamation has been performed at the site and contaminants of concern include mercury, methylmercury, and arsenic (EPA 2020).

Exploration activities for potential future mining development have been occurring for the last decade and are ongoing at or within the vicinity of the SGP. Affiliates of Midas Gold initiated mineral exploration activities in 2009 as part of the Golden Meadows Exploration Project to better define the mineral deposit potential for the area. Activities associated with the Golden Meadows Exploration Project included the

use of the existing road network, and construction of several temporary roads to access drill sites, drill pad construction, drilling on both NFS and private lands, and reclamation (Forest Service 2015). The following is a brief summary of the activities:

- **Midas Gold Exploratory Drilling (2009-2012)** – Exploratory drilling consisting of approximately 6 to 122 drill pads mostly occurred on private land. Crews were housed on private property in Yellow Pine. All equipment was staged on private property and drilling activities generally occurred 24 hours per day. Water withdrawal sites included existing sediment retention ponds and streams. Private and Forest Service temporary roads were used and/or authorized to access drill pads located on NFS lands. Road maintenance was needed to open the existing roads. For winter activities, chained rubber-tired vehicle, helicopter, snowcat, or snowmobile provided access. Where drill pads were located next to roads, some snow plowing occurred at select locations. During snow-free periods, access occurred by helicopter, and where there was authorized access on NFS land or on private land, rubber-tired vehicles also were used for access. Midas Gold also drilled 16 new groundwater alluvial and bedrock monitoring wells on 8 pads in 2012 (Forest Service 2015).

- **Monitoring Wells for the Golden Meadows Project (2013)** – Midas Gold drilled four new groundwater alluvial and bedrock monitoring wells on two pads in 2013. Exploration drilling was conducted in 26 drill areas within NFS land. Twenty-four of the drill areas were accessed by helicopter (i.e., for transport of equipment and crew) and contained temporary helicopter-supported drill pads. No temporary roads were needed for these 24 drill areas (Forest Service 2015).

- **Midas Gold Baseline Studies (2013-2017)** – Baseline data collection studies including water quality, fishery surveys, wildlife surveys, and vegetation mapping were conducted (Forest Service 2015).

- **Winter Geotechnical Study (2017)** – Exploration drilling was conducted in 26 drill areas within NFS land. Twenty-four of the drill areas were accessed by helicopter (i.e., for transport of equipment and crew) and contain temporary helicopter-supported drill pads. No temporary roads were needed for these 24 drill areas (Forest Service 2015).

- **Geotechnical Studies along Meadow Creek (2017)** – Geotechnical study field work program was conducted in support of feasibility level engineering work on the proposed tailings impoundment and impoundment dam foundation conditions. Midas Gold utilized a track mounted Cone-Penetrometer Test rig to access eight locations along Meadow Creek in September/October 2017 (Forest Service 2015).

- **Operations Exploratory Drilling (2016-2019)** – In addition to exploratory drilling for the winter geotechnical study in 2017, expansion of an existing borrow source on NFS land just east of the camp and shop area also occurred. The borrow material supplied approximately 7,000 cubic yards of crushed rock to support the exploration program, including road maintenance and site reclamation activities and also was used by previous operators and the Forest Service. Approximately 141,000 gallons of fuel (diesel, gasoline, and jet fuel) per calendar year was transported on existing Valley County roads to the fuel storage facility (located on private land) (Forest Service 2015).

- **Exploration and Geotechnical Drilling (2018)** – Midas Gold drilled 62 exploration and geotechnical drilling pads within the project area. Fifty-six of the pads are track-supported and

the remaining six are helicopter-supported. None of the pads are steep slope drill pads. The 62 proposed pads are located in the vicinities of the following water bodies: Upper East Fork South Fork Salmon River, Meadow Creek, Middle East Fork South Fork Salmon River, Lower East Fork South Fork Salmon River, Upper Meadow Creek, and West End Creek (HDR 2017).

- **On-going Monitoring for Golden Meadows Project** – Monitoring for weeds, water quality, minerals and geology, access and haul route water quality monitoring, monitoring of water quality best management practices and project standard operating procedures associated with haul and access road use, wildlife and rare plants continue to be conducted (Forest Service 2015).

- **Burntlog Route Geophysical Investigation Field Work (2020-2021)** – Midas Gold collected geophysical data at proposed rock quarries, bridge abutments, cut slopes, and soil nail/mechanically stabilized earth wall locations using four methods including a Dynamic Cone Penetrometer Test, a track mounted excavator, a truck/track mounted hollow stem auger/core rig, and a helicopter assisted casing advancer/core drill rig. Midas Gold has been investigating 24 locations by drilling or excavating 40 borings/test pits along the proposed Burntlog Route. The geophysical investigation field work was estimated to last approximately 40 days. Nearly half of the locations are situated along the existing Burnt Log Road and the remaining sites are located along the proposed new alignment of the Burntlog Route between Trapper Creek and Stibnite (Midas Gold 2019).

Transportation Projects – Road maintenance, improvement projects, airstrip operations and maintenance, and culvert and bridge replacements have occurred in the past and are expected to continue in the future. Installation or improvement of culverts and bridges may impact aquatic habitat due to construction-related effects and erosion. Maintenance of existing roadways, culverts, and bridges would likely be short-term, while new roadways, culverts, and bridges would have a larger effect. More information regarding current and future road maintenance and airstrip operations are provided below:

- **Road Maintenance of NFS Roads** – Thunder Mountain Road (FR 50375) and Meadow Creek Lookout Road (FR 51290) are both NFS maintenance level 2 roads that received maintenance in 2014 and are on a regular maintenance schedule. Road maintenance activities include blading, slough removal, and culvert cleaning. It is assumed that private landowners on private lands keep roads open and maintained to meet their needs.

- **Road Maintenance of County Roads** –Warren Profile Gap Road (CR 50-340) and the road to the Big Creek Trailhead are currently maintained by Valley 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 (Forest Service 2016).

  - McCall-Stibnite Road (CR 50-412) is currently maintained by Valley County under a cooperative agreement, on a regular maintenance schedule. There is an agreement between Valley County and Midas Gold to allow Perpetua to provide maintenance along the road from Yellow Pine to Perpetua 's property, “the road would be continuously maintained during the open period. Maintenance would, in all respect, be subject to review and approval by the Valley County Road Superintendent. The Owner/Contractor would abide by the Schedule 8: Payette National Forest; Road Maintenance Best Management Practices. During winter operations the Owner/Contractor would maintain a vehicle and trailer parking and turn around area at Profile Creek and Stibnite. The Owner/Contractor would place a temporary Valley County owned and signed gate above the Profile Creek Road during the Spring Breakup to prohibit any full-size

vehicles from entering the Yellow Pine-Stibnite Road, unless otherwise authorized. All-terrain vehicles (ATV), utility-terrain vehicles, and snow mobile access on the Yellow Pine-Stibnite Road would still be permitted for the public at large during this temporary travel restriction."

- **Road Maintenance of State Roads** – SH 55 is maintained by the Idaho Transportation Department (ITD). Recent upgrades and improvements included the Banks Beach parking study and the ongoing Smiths Ferry safety improvements. SH 55 was recently repaved between Donnelly and McCall (ITD 2021). The project addressed wear and tear to increase the service life of the roadway.

- The ITD, Division of Aeronautics maintains and operates the Johnson Creek, Warm Springs, and Bruce Meadows airstrips which are located on NFS land.

Mine Closure and Reclamation – Closure and reclamation of Hecla and SMI mining and processing facilities located in the headwaters of East Fork SFSR and Sugar Creek occurred between 1993 and 2000. Several Comprehensive Environmental Response, Compensation, and Liability Act Removal Actions also were conducted in the same area by the Forest Service, Environmental Protection Agency, and Exxon-Mobil Corporation to minimize risks to human health and the environment from legacy mining and processing activities during the 1930s, 40s, and 50s.

Recreation and Tourism – Past and present recreation and tourism activities include sport hunting, fishing, trapping, boating and river recreation, camping, hiking, backpacking, outfitter/guide operations, tourist services – Big Creek Lodge, Elk Springs Outfitters, and Juniper Mountain Outfitters. These activities take place primarily from late spring to late fall, and there may be small plane, helicopter, and vehicle traffic associated with access.

Infrastructure Development – Past and present community infrastructure projects include the transmission line upgrades in the West Central Mountain Electric Plan 2014, which follows the general location of the SGP upgraded transmission line route (Idaho Power 2014). In 2020, Idaho Power rerouted approximately 2.5 miles of the existing Warm Lake Feeder overhead 7.2kV distribution line with approximately 2.75 miles of single-phase underground line in the Yellow Pine area (Forest Service 2020d).

Water Diversions and Hydro Power Projects – There are eight water diversions on federal and private lands in vicinity of the SGP area. There also are three residential, small-scale hydroelectric operations (0.4 to 0.9 cubic feet per second permitted), and one hydroelectric operation at Big Creek Lodge.

Wildland Fire, Noxious Weed Control, and Firewood Harvest – There have been numerous wildland fires in vicinity of the SGP area and it is likely more would occur in the future. Past fires within the headwaters of the East Fork SFSR and Sugar Creek include Indian Creek Point (12,204 acres); Tamarack (2,348 acres); Bishop Creek (2,610 acres); Cascade Complex (299,930 acres); Thunder City (13,263 acres), and Buck Fire (19,474 acres). In fall of 2021, the Krassel Ranger District conducted prescribed burns to areas east of Yellow Pine (Bald Hill project area) and along the SFSR (Four Mile project areas). Removal of firewood for non-commercial use has occurred in the past and is expected to continue in the future on NFS land, in compliance with general permit requirements for the Payette National Forest. Several noxious weed species have been identified in the vicinity of the SGP including spotted knapweed, Canada thistle, yellow toadflax, and rush skeletonweed. Treatment of noxious weeds occurs regularly throughout the area. Treatments include chemical spraying and pulling. Main areas of treatment for noxious weeds include Chamberlain area, Beaver Creek, and Big Creek trails, and along road access areas. The Lost Horse vegetation management project was completed within the Clear Creek drainage along FRs 405, 406, 407, 409, and 433; the objective of this project was to restore species composition and stand

structure while reducing undesirable tree densities and favoring retention of larger diameter, more fire-resistant trees (Forest Service 2020b).

Authorized in May 2021, the Big Creek Hazardous Fuel Reduction was a community protection project for Edwardsburg/Big Creek area using commercial and noncommercial treatments and prescription fire to reduce hazardous fuels. Treatments were on Forest Service lands along public roads and adjacent to private property, outside of wilderness. The project implementation reduced wildfire risk and fire severity/intensity on NFS lands around Big Creek and Edwardsburg and private property using commercial timber harvest, understory treatment, and prescribed burning. Approximately 10,290 acres were treated including, approximately 631 acres of mastication and/or hand thin, no removal; 847 acres of commercial and pre-commercial thinning; 1,047 acres of hand-thinning, no removal; 7,765 acres of natural fuel prescribed fire burn blocks; and less than 1 mile of temporary road constructed to facilitate equipment access and product removal reclaimed after vegetation management treatments were completed.

Forest Management - These activities include easements and other management actions. There are several easements in the SGP area and vicinity that are granted and maintained by the Forest Service including: Road Right-of-Way, Forest Road and Trail Act (FRTA) on McCall-Stibnite Road (CR 50-412), Road Right-of-Way and Linear Utility easement to the Idaho Power. The Yellow Pine Blowdown Project near Yellow Pine was conducted to remove down material from camping and recreating areas, reduce the risk of insect outbreak, and to reduce the fuel loading to help to ensure the safety of the Yellow Pine community. In 2020, the BNF decommissioned approximately 18 miles of non-system routes in the Six-bit Creek and Curtis Creek subwatersheds, part of the SFSR subbasin (Forest Service 2020b).

The South Fork Restoration and Access Management Plan (RAMP) is in the implementation phase with the decision dated July 13, 2021. The project's objective is to determine the minimum road system, improve watershed condition, provide ATV and motorcycle trail opportunities, and provide dispersed camping and parking opportunities. The project includes numerous actions relating to watershed restoration, motorized and non-motorized access, and improvements of recreation facilities within the SFSR watershed within a 329,000-acre project area (http://www.fs.usda.gov/project/?project=51257). Target dates for implementation are 2022-2027 (Forest Service 2021a).

Commercial and Subsistence Harvest of Fish and Wildlife – Past and present harvest of fish and wildlife for recreational and subsistence purposes puts some degree of pressure on those resources. Legal hunting, fishing, and trapping has occurred and is currently occurring in the SGP area and vicinity. Fish and wildlife resources are managed by the Idaho Department of Fish and Game and federal agencies to maintain sustainable populations. Managers use management tools such as harvest limits and areas open and closed to sport and commercial harvest of fish and wildlife to maintain sustainable resources and allocate harvest.

7.4.2 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions are listed in the **Table 7-5**.

Table 7-5 Reasonably Foreseeable Future Actions in the Vicinity of the SGP Area

Project or Activity Name	Agency Document/ District	Brief Description	Approximate Implementation/ Construction/ Operation Dates
Stibnite Mine Site ASAOC	EPA and Forest Service ASAOC	Address legacy mining impacts, including time critical removal actions consisting of stream diversion ditches and removal of about 325,000 tons of development rock and tailings.	2022 - 2024
East Fork Salmon River RAMP	PNF	Scoping for the East Fork Salmon River (EFSR) RAMP estimated to start late 2021. The spatial extent of the EFSR RAMP could include Yellow Pine, Big Creek, and Thunder Mountain within the PNF. The purpose of the EFSR RAMP is travel management. The Forest Service would conduct travel planning to identify a Minimum Road System (MRS) (36 CFR 212 Subpart A) and the routes open for public use (36 CFR 212 Subpart B), including motorized trail opportunities, dispersed camping, and parking opportunities and update the Forest Motor Vehicle Use Map.	Expected Decision: 10/2022 Expected Implementation: 11/2022
Burntlog Route Geophysical Investigation	CE (BNF SOPA)	- Minerals and geology The purpose of the investigation is to collect crucial geophysical data along the existing Burnt Log Road and proposed new alignment between Trapper Creek and Stibnite.	Scoping Start: 02/10/2020 Expected Decision: 03/2022 Expected Implementation: 09/2022
Wildlife Conservation Strategy	EIS (Forest Plan Amendment) 101 (PNF SOPA)	- Land management planning - Wildlife, Fish, Rare plants Short- and long-term management strategies and priorities for maintaining and restoring habitats associated with terrestrial wildlife species. http://www.fs.usda.gov/project/?project=28633	On hold
Nez Perce Tribe Research Equipment	CE / PNF SOPA	Replacement of an existing propane tank servicing a fish detection system (PIT array) with a 1,000-gallon tank in an existing hardened area to ensure fuel supply through winter months.	Scoping initiation: 11/2021 Expected Decision: 04/2022 Expected Implementation: 07/2022
Stallion Gold – Horse Heaven Project		Surface exploration of gold and antimony deposits. The project consists of 695 unpatented federal mining claims and mineral rights on 13,950 acres. This project would share its eastern boundary with the SGP.	

Source: FHWA 2020; Forest Service 2018, 2020a, 2020b, 2020c, 2021a, and 2021b; ITD 2020

CE = Categorical Exemption; EA = Environmental Assessment; EIS = Environmental Impact Statement; FHWA-WFLHD = Federal Highway Administration, Western Federal Lands Highway Division; NOA = Notice of Availability; SOPA = Schedule of Proposed Actions

7.4.3 Wilderness

Past, present, and reasonably foreseeable future actions (RFFAs) include activities, developments, or events that have the potential to change the physical, social, economic, and/or biological nature of a specified area. For untrammeled, natural, undeveloped, and solitude, remoteness, and primitive recreation opportunities quality of wilderness character, the analysis area for cumulative effects includes NFS lands and projects in the Krassel and McCall Ranger Districts.

The following RFFAs have been identified that, in conjunction with the development of the SGP and the South Fork RAMP, could contribute to cumulative effects on the untrammeled, natural, and solitude, remoteness, and primitive recreation qualities of wilderness character.

- Horse Heaven Surface Exploration Program
- East Fork South Fork RAMP
- Big Creek Hazardous Fuels Reduction Project

7.4.3.1 No Action Alternative

Under the No Action Alternative, the SGP would not be implemented. Topography and the distance between the FCRNRW and human activity at the SGP and locations of the RFFAs would not measurably change the untrammeled, natural, undeveloped, or solitude, remoteness, and primitive recreation opportunities quality of wilderness character compared to existing conditions.

7.4.3.2 2021 MMP

Untrammeled

Under the 2021 MMP, the increase in human activity during the implementation of the RFFAs and construction and operation of the mine-related facilities could change the natural distribution of wildlife and plants. Increased human activity from project or recreation activities could change wildlife distribution into or from the FCRNRW or recommended wilderness areas. The extent where noise from these activities could change the natural distribution of wildlife would vary depending upon the season activities were implemented, duration, topography, and weather. The potential for non-native plant species establishment could increase. Surveys and treatments for non-native invasive species are ongoing in the cumulative impact analysis area. Each project is reviewed or surveyed for protected plant species and mitigation is developed where any of these species are found.

The RFFAs would be implemented during daylight hours on weekdays, limiting the extent and duration of potential changes to wildlife distribution. Surveys and implementing treatments as described in the Frank Church-River of No Return Noxious Weed Prevention Plan and the Integrated Weed Management program for the PNF and BNF would reduce the spread of non-native plant species. As such, the 2021 MMP, in combination with the RFFAs, could cumulatively impact the untrammeled quality of wilderness character.

Natural

Plants

The activities from the RFFAs and the 2021 MMP would result in additional land disturbance. The potential for non-native plant species establishment could increase either from project activities or from changes in recreation use. These effects have or would occur primarily along the western boundary of the FCRNRW near the Idaho-Valley County border and Logan Creek, or the recommended wilderness areas west of the South Fork Salmon River. The potential for an increase in non-native plant species to establish with FCRNRW or recommended wilderness would be influenced by existing vegetation, site conditions, and non- native plant species characteristics. The extent where non-native plant species could become established is unknown. Surveys and implementing treatments as described in the Frank Church-River of No Return Noxious Weed Prevention Plan and the Integrated Weed Management program for the PNF and BNF would reduce the spread of non-native plant species. Additionally, the South Fork RAMP proposes to improve trails within the Circle End Creek and Phoebe Meadows RNAs. The potential for introduction and spread of non-native plant species increases as visitors may transport vegetative matter on clothing and equipment along attractive, improved trails. As such, the 2021 MMP would cumulatively impact natural quality of wilderness character where non-native plant species become established.

Fish and Wildlife

Construction, operation, and reclamation/closure SGP facilities, including the Burntlog Route and the RFFAs, would disturb sensitive wildlife species within the FCRNRW and recommended wilderness areas. These actions could increase wildlife mortality from vehicles. The extent where the natural wildlife distribution and movement could change or increase in mortality is unknown. A cumulative impact to the natural quality of wilderness character would occur where there is a decrease in wildlife habitat quality, an impact on wildlife distribution, or mortality from vehicles.

The South Fork and East Fork RAMPs in combination with the 2021 MMP could reduce sediment in the South Fork Salmon River drainage and barriers to fish passage. Reducing sediment in the drainage would improve water quality and indirectly fish habitat quality.

Replacing culverts could reduce barriers to fish passage and improve aquatic species habitat connectivity within the South Fork Salmon River drainage. Long-term improvements to fish habitat quality could increase fish populations in the South Fork Salmon River drainage. The increase in fish populations in a specific stream is unknown. The natural quality of wilderness character could improve where sediment load in streams decline and barriers to fish passage are removed.

Solitude, Remoteness, and Primitive Recreation Opportunities

Under the 2021 MMP, the extent that wilderness visitors see or hear human activities could cumulatively increase. The extent where noise from human activity within the FCRNRW and recommended wilderness areas is influenced by topography and weather. The duration of increased noise from the RFFAs and project activities would be temporary as implementing the RFFAs would be completed in 10 days to several months in a specific area during weekdays. A temporary cumulative impact on solitude, remoteness, and primitive recreation opportunities quality of wilderness character would occur.

7.4.3.3 Johnson Creek Route Alternative

Under the Johnson Creek Route Alternative, the cumulative impacts described for the 2021 MMP would essentially be identical, although the impacts would be somewhat reduced as the Burntlog Route would not be constructed and the location of impacts would also be shifted to the Johnson Creek Route area.

7.4.4 WSR

The cumulative effects analysis area for WSRs includes all federally managed land and actions in the South Fork Salmon River watershed, and includes any action that could affect other eligible, suitable, or designated WSR waterways in the watershed. In addition to the three waterways previously discussed, the Secesh River is in the South Fork Salmon River watershed and is considered suitable for inclusion in the National WSR System. The upper and lower portions of the Secesh River are classified as Recreational, and the central portion, between NFS Trail (NFST) 080 and the Lick Creek Road portion of McCall-Stibnite Road (CR 50-412), is classified as Wild.

Cumulative effects associated with the SGP consider the range of existing activities and RFFAs and their potential effects with respect to WSR. Past and present actions that have, or are currently, affecting WSR and RFFAs that could cumulatively contribute to WSR impacts in the analysis area are described in **Sections 7.4.1** and **7.4.2** and have the following effects with respect to the WSR indicators:

- No cumulative impacts to the free-flowing characteristics of eligible and suitable WSRs.
- Improvements to the water quality of eligible, suitable, and designated WSRs would likely result from watershed management; Comprehensive Environmental Response, Compensation, and Liability Act actions; and bridge/culvert improvement projects.
- Improvements to fish ORVs would likely result from the RFFAs.
- No impacts to the preliminary Wild, Scenic, or Recreational classification for eligible and suitable WSRs from these projects combined with impacts from the SGP.

7.4.5 IRA

Effects on IRAs and the lands contiguous to unroaded areas could overlap in space and time with the direct and indirect effects and the following RFFAs:

- Horse Heaven Surface Exploration Program
- South Fork Salmon River RAMP
- East Fork Salmon River RAMP
- Big Creek Hazardous Fuels Reduction Project

Cumulative effects from the SGP and RFFAs could affect naturalness and outstanding opportunities for solitude and primitive types of recreation.

7.4.5.1 No Action Alternative

Naturalness

The No Action Alternative could affect the wilderness attributes of naturalness and undeveloped character (**Table 6-7**) which inform impacts to roadless characteristics. Under the No Action Alternative, surface exploration authorized as part of the RFFAs could increase the potential for non-native invasive plant species to spread. The surface exploration for the Horse Heaven project could disturb soils and remove vegetation in the Horse Heaven IRA while the Golden Meadow project and the RFFAs could disturb soils and remove vegetation adjacent to Sugar Mountain IRA. Surface disturbing activities could increase the spread of non-native invasive plant species into Horse Heaven IRA and the adjacent area of Sugar Mountain IRA. The extent where non-native invasive plant species could become established is unknown. Surveys and treatments implemented for the RFFAs would reduce the effects on the natural roadless character.

Outstanding Opportunities for Solitude and Primitive Recreation

The wilderness attribute of outstanding opportunities for solitude or primitive and unconfined recreation corresponds with the roadless area characteristic of primitive, semi-primitive non-motorized, semi-primitive motorized recreation opportunity spectrum classes of dispersed recreation (**Table 6-7**). Under the No Action Alternative, noise from surface exploration authorized for the Horse Heaven and Golden Meadow projects combined with the East Fork RAMP and the ASAOC activities, could decrease outstanding opportunities for solitude within the area of Sugar Mountain, Meadow Creek, and Horse Heaven IRAs. The noise extent from the Horse Heaven and Golden Meadows projects mineral exploration in combination with the RFFAs is unknown. Topography and distance between surface exploration activities and the RFFAs influence the area where noise could decrease outstanding opportunities for solitude and primitive recreation.

7.4.5.2 2021 MMP

Naturalness

The 2021 MMP could affect the wilderness attributes of naturalness and undeveloped character (**Table 6-7**) which inform impacts to roadless characteristics. Surface disturbance and vehicles from SGP and RFFA activities could spread non-native plant species. Depending on site conditions, and non-native plant species characteristics, non-native invasive plant species could spread into Sugar Mountain, Horse Heaven, and Meadow Creek IRAs. The extent where non-native invasive plant species could become established within these IRAs is unknown. Surveys and treatments implemented for the 2021 MMP and RFFAs would reduce the potential for non-native species to spread.

The 2021 MMP and the RFFAs could result in temporary to short term barriers to wildlife movement, disturbance, and increase vehicle-wildlife collisions. Wildlife mortality and distribution would be influenced by existing vegetation, site conditions, the wildlife species sensitivity to disturbance. The extent where wildlife distribution and movement could change or increase in vehicle-wildlife collisions is unknown. Changes in wildlife distribution from the activities associated with the 2021 MMP and the RFFAs could decrease natural roadless character in Meadow Creek, Horse Heaven, and Sugar Mountain IRAs.

Blowout Creek rock drain, hazardous fuel reduction, and potential changes to the miles of roads could reduce sediment in streams within the cumulative impact analysis area. Reducing sediment would improve water quality and long-term fish habitat quality. The extent and locations of streams where fish

habitat quality could improve is unknown; however, increases in fish habitat quality within IRAs would improve natural roadless character.

Outstanding Opportunities for Solitude and Primitive Recreation

The wilderness attribute of outstanding opportunities for solitude or primitive and unconfined recreation corresponds with the roadless area characteristic of primitive, semi-primitive non-motorized, semi-primitive motorized recreation opportunity spectrum classes of dispersed recreation (**Table 6-7**)**.** Noise from the 2021 MMP and the RFFAs would decrease outstanding opportunities for solitude within Sugar Mountain, Horse Heaven, and Meadow Creek IRAs and lands contiguous to unroaded areas. The intensity of the effect would vary depending upon the forest visitor's sensitivity. Human activity and noise during the 20+ years of mine construction, operation, and closure and reclamation and the RFFAs decrease the area with outstanding opportunities for solitude. The extent where these effects could decrease roadless character within IRAs and lands contiguous to unroaded areas is unknown and influenced by topography, vegetation, and when activities for the RFFAs would be implemented.

7.4.5.3 Johnson Creek Route Alternative

7.4.5.3.1 *Naturalness*

The 2021 MMP could affect the wilderness attributes of naturalness and undeveloped character (**Table 6-7**) which inform impacts to roadless characteristics. Surface disturbance and vehicles from the Johnson Creek Route Alternative and implementation of the RFFAs could increase the potential for non-native plant species to spread into IRAs and lands contiguous to unroaded areas. Using Johnson Creek Route for mine access, combined with the RFFAs, could increase the vehicle traffic and increase the potential for non-native invasive plant species to spread. The extent where non-native invasive plant species could become established is unknown. Existing vegetation and site conditions would influence the spread of non-native invasive plant species. Surveys and treatments implemented for the Johnson Creek Route Alternative and the RFFAs would cumulatively reduce the effects on the natural roadless character.

Traffic on Johnson Creek Route during mine construction and operation, combined with the RFFAs, would increase habitat fragmentation and barriers to movement, noise, and potential vehicle-wildlife collisions. These actions could increase wildlife mortality and change the distribution of wildlife within Sugar Mountain and Horse Heaven IRAs. The potential for an increase in wildlife mortality and habitat fragmentation would be influenced by existing vegetation, site conditions, and wildlife sensitivity to disturbance. The extent where wildlife distribution and movement could change is unknown; however, areas within the IRAs and lands contiguous to unroaded areas that are avoided by wildlife would have less natural roadless character.

Outstanding Opportunities for Solitude and Primitive Recreation

The wilderness attribute of outstanding opportunities for solitude or primitive and unconfined recreation corresponds with the roadless area characteristic of primitive, semi-primitive non-motorized, semi-primitive motorized recreation opportunity spectrum classes of dispersed recreation (**Table 6-7**). Forest visitors avoiding the SGP or areas of IRAs accessed from Johnson Creek Route and changes from access management plans could decrease outstanding opportunities for solitude within IRAs and lands contiguous to unroaded areas. The intensity of the effect would vary depending upon the forest visitor's sensitivity. Human activity and noise during the SGP's 25 years (5 years mine construction, 15 years operation, 5 years mine closure/reclamation) and the duration the RFFAs would be implemented would decrease outstanding opportunities for solitude. The extent where these effects could decrease roadless

character within IRAs and lands contiguous to unroaded areas is unknown and would be influenced by topography, vegetation, and timing of when RFFAs are implemented.

7.4.6 RNA

The RFFAs that could contribute to cumulative changes in research values, ecological site conditions, or change ecological processes within the RNAs listed in **Table 7-4** are:

- South Fork Salmon River RAMP
- Big Creek Hazardous Fuels Reduction Project

The SGP and these RFFAs include surface disturbing activities or changes in human activity that could indirectly affect research values and vegetation communities' conditions within an RNA.

7.4.6.1 No Action Alternative

Under the No Action Alternative, the exploration and reclamation activities at the SGP and the RFFAs are over 6 miles from the two RNAs. Belvidere Creek, the RNA nearest to the SGP Operations Area Boundary, is approximately 6 miles north, reducing the potential for cumulative effects from the RFFAs and SGP reclamation and monitoring activities.

7.4.6.2 2021 MMP

The RFFAs would not impact the RNAs; therefore, no cumulative effects would occur in the RNAs.

7.4.6.3 Johnson Creek Route Alternative

Under the Johnson Creek Route Alternative, during mine construction and operation, recreation use could increase in other areas, such as the South Fork Salmon River and Big Creek drainages.

Improvements and maintenance of Stibnite Road as part of the Johnson Creek Route could indirectly increase recreation use in the Big Creek drainage. Recreation use in the Big Creek drainage during the 20 years of mine construction and operation, combined with the implementation of the Big Creek Hazardous Fuels Reduction Project, could increase the potential for non-native invasive plant species to spread into Belvidere Creek RNA, although this potential is low.

Increased recreation use from forest visitors avoiding the SGP, areas with increased traffic volumes and human activity, combined with surface disturbance associated with implementing the RFFAs, could increase the potential non-native invasive plant species to spread into the Belvidere Creek RNA. The potential for non-native plant species to spread into the RNA depends upon vegetation conditions and the non-native plant species characteristics.

Changes in vegetation community composition and structure within the Belvidere Creek RNA would occur where non-native invasive plant species become established, soils compacted, or trails widen. Changes to vegetation community composition and structure would result in the long-term loss of research values, ecological site conditions, and ecological processes within the Belvidere Creek RNA.

7.5 Short-term Uses and Long-term Productivity

7.5.1 Wilderness

No short-term or long-term effects to Wilderness would occur under the No Action Alternative.

The untrammeled, natural, and solitude, remoteness, primitive recreation opportunities qualities of wilderness character would be impacted in both the short- and long-term under the action alternatives. The decrease in solitude where the duration is temporary would be considered a short-term impact. However, the establishment of non-native plant species within the FCRNRW or recommended wilderness would result in a long-term reduction in the natural quality of wilderness character.

7.5.2 WSR

No short-term or long-term effects to WSR would occur under the No Action Alternative.

Short-term indirect effects to the setting along WSR-eligible Johnson Creek could result from increased traffic related to mine construction on Johnson Creek Road (CR 10-413) (approximately 65 AADT during construction). These impacts would be temporary, as traffic would be diverted from Johnson Creek Road (CR 10-413) to the Burntlog Route during operations, reclamation, and closure. Construction traffic would not affect the Johnson Creek setting over the long term.

Under the Johnson Creek Route Alternative, Johnson Creek Road (CR 10-413) would be the main route to access the SGP over its entire construction, operation, and closure and reclamation timespan. The duration of effects described in the paragraph above would, therefore, be long-term.

7.5.3 IRA

Short-term uses of areas disturbed for the new transmission line segment and upgraded transmission line would have a long-term effect on solitude in the Horse Heaven, Meadow Creek, and Reeves Creek IRAs. The TSF, TSF Buttress, and retaining soil nail walls along the Burntlog Route would be a long-term loss of soil productivity within six IRAs. Under the 2021 MMP, there would be evidence of disturbance from the Burntlog Route and the transmission line in the Horse Heaven and Meadow Creek IRAs that would remain long-term. In the long term, areas that were cleared of vegetation for SGP components would be visible from several key viewpoints, resulting in a long-term impact on visual quality within the IRA.

The short-term uses of the Horse Heaven, Meadow Creek, and Reeves Creek IRAs for the new transmission line and upgraded transmission line would be the same as those described under the 2021 MMP. Under the Johnson Creek Route Alternative, the long-term loss of soil productivity within the Meadow Creek, Burnt Log, and Black Lake IRAs from the TSF and TSF Buttress would be the same as the 2021 MMP.

7.5.4 RNA

Under both the 2021 MMP and the Johnson Creek Route Alternative, the research values, ecological site conditions, and ecological processes within the two RNAs could be impacted in both the short and long term, although these changes are only likely in the Chilcoot Peak RNA. The increase in risk for non-native invasive plant species to establish within the RNAs where the duration of the surface disturbance is temporary would be considered a short-term impact. However, the establishment of non-native invasive plant species would be a long-term reduction in research values, ecological site conditions, and ecological processes within the RNAs listed in **Table 7-4**.

7.6 Irreversible and Irretrievable Commitments of Resources

7.6.1 Wilderness

Under the 2021 MMP, the Burntlog Route would be used by mine related traffic and open to public use for approximately 20 years. Motor vehicles on the Burntlog Route would increase the potential for non-native plant species to spread into the FCRNRW and disturb wildlife relative to existing conditions. Surveys conducted for 3 years after seeding or planting a disturbed area, and treatment of non-native plant species, could reduce the extent of spreading. If treatments of non-native plant species are successful, vegetation composition and structure could provide high-quality wildlife habitat over years or decades. The extent of and locations where non-native plant species could establish is unknown, but the most likely areas would be along ROWs and access roads. Irretrievable effects on the natural quality of wilderness character within the FCRNRW or recommended wilderness areas would occur where non-native plant species become established. The spread of non-native plant species would be an irretrievable effect on the natural quality of wilderness character.

Under the Johnson Creek Route Alternative, Stibnite Road from the village of Yellow Pine to the SGP would be plowed to support construction, operations, and reclamation and closure. Where and when audible, plowing Stibnite Road from Yellow Pine to the SGP would be an irreversible commitment of solitude.

The increase in human activity in the FCRNRW or recommended wilderness areas would decrease opportunities for solitude, remoteness, and primitive recreation under the action alternatives. The extent of the decrease in the solitude, remoteness, and primitive recreation opportunities quality of wilderness character is unknown; however, following mine closure, recreation use could return to pre-mining levels, and there would be no long-term irreversible commitment of resources.

7.6.2 WSR

If National Register-eligible heritage resources (i.e., historic properties) along Johnson Creek are impacted under the 2021 MMP or Johnson Creek Alternative, this would constitute an irreversible commitment of an eligible heritage resource, which would have an adverse effect on ORVs.

No irreversible and irretrievable commitments of public resources relating to WSRs would occur under the No Action Alternative.

7.6.3 IRA

Under the 2021 MMP, soil nail walls would remain within the Burnt Log, Black Lake, and Meadow Creek IRAs after decommissioning the Burntlog Route and this would be considered an irreversible commitment of natural roadless character. During the latter part of reclamation and closure, Perpetua would remove the Burntlog Route travel way and recontour slopes where practical (Perpetua 2021). The travelway would be removed to the toe of soil nail walls (Midas Gold 2018). Soil nail walls would not support vegetation communities or habitat for wildlife species that require large undisturbed areas. Soil nail walls would provide evidence of past human activity, resulting in an irreversible decrease in the undeveloped roadless character within the three IRAs.

Under the 2021 MMP, the new transmission line segment, access roads, and plowing Stibnite Road from the Yellow Pine to the SGP would support construction, operations, and reclamation and closure. Where

clearing of the transmission line corridor and access roads remains, there would be an irretrievable commitment of natural roadless character. Where and when audible, plowing Stibnite Road from Yellow Pine to the SGP would be an irretrievable commitment of solitude roadless character.

Under both the Burntlog Route and Johnson Creek Route Alternative, non-native plant species could spread into the IRAs, and disturbance of wildlife would increase relative to existing conditions. Under the action alternatives, surveys conducted by Perpetua for 3 years after seeding or planting a disturbed area, and treatment of non-native plant species, could reduce the extent where non-native plant species become established. Where treatments of non-native plant species are successful, vegetation composition and structure could provide high-quality wildlife habitat over years or decades. The extent of where non-native plant species could establish is unknown but would most likely be along ROWs and access roads. There could be an irretrievable loss of the natural quality of roadless character where non-native plant species become established.

The increase in human activity in the IRA and lands contiguous to unroaded areas would decrease outstanding opportunities for solitude and primitive types of recreation under the action alternatives. The extent of the decrease in associated roadless character is unknown; however, following mine closure, outstanding opportunities for solitude could return to pre-mining levels, and there would be no long-term irreversible commitment of roadless resources.

7.6.4 RNA

Under the No Action Alternative there would be no measurable irreversible commitment of research values, ecological conditions, or change in ecological processes within the two RNAs.

The establishment of non-native invasive plant species and human-ignited fire could indirectly change the composition and structure of vegetation communities, the ecological values, and the unique communities within the two RNAs. These potential changes would be an irretrievable loss of research values within an RNA and the Intermountain Region. The extent of non-native invasive species established or within the RNAs listed in **Table 7-4** or changes in fire frequency from human-ignited fires is unknown.

7.7 Summary

7.7.1 Wilderness

No structures or human facilities would be developed inside the FCRNRW for the SGP. SGP operations would affect soundscapes, natural dark skies, and natural wildlife distribution within the FCRNRW, impacting the untrammeled quality of wilderness. The SGP would result in emissions that could affect air quality in the FCRNRW. However, emissions would be below NAAQS thresholds. Under the 2021 MMP, construction and use of the Burntlog Route near the FCRNRW boundary could increase noise and lights in adjacent wilderness areas. Use of the Johnson Creek Route under the Johnson Creek Route Alternative would eliminate these impacts. However, the volume of traffic and potential delays along Johnson Creek Route could result in forest visitors avoiding FCRNRW trailheads accessed from Stibnite Road (CR 50-412). Indirectly, recreation use in recommended wilderness areas and other areas of the FCRNRW could increase. **Table 7-6** provides a summary comparison of impacts to the FCRNRW and recommended wilderness areas by issue and indicators for each alternative.

7.7.2 WSR

Impacts to WSR Free-Flowing Conditions

No impacts to WSR free-flowing conditions are anticipated under either action alternative.

Impacts to WSR Water Quality

The 2021 MMP may impact water quality in Burntlog Creek as a result of increased sedimentation from the Burntlog Route construction, winter maintenance, and increased traffic from heavy vehicles. Under the Johnson Creek Route Alternative, Burntlog Creek would not be adversely impacted as the Burntlog Route would not be built. However, increased heavy vehicle traffic could increase sedimentation rates and therefore decrease water quality in Johnson Creek due to use of Johnson Creek Road for all SGP-related traffic under the Johnson Creek Route Alternative.

Impacts to ORVs

Under either alternative, the Heritage ORV of Johnson Creek may be adversely affected by the upgrade of the existing transmission line or the upgrade of Johnson Creek Road, which could potentially impact historic properties located in the vicinity. Under the 2021 MMP, the fish ORV of Burntlog Creek may be adversely impacted by increased sedimentation into fish spawning habitat in the creek. With implementation of required BMPs, impacts would be temporary, negligible, and localized.

Impacts to Wild, Scenic, or Recreational Classification

Under the 2021 MMP, the Wild segment of Burntlog Creek would be adversely impacted by noise and visual effects from the extension, widening, and mine traffic usage of Burnt Log Road (FR 447). The Recreational segment of Burntlog Creek could be adversely impacted if a proposed borrow source (i.e., gravel quarry) is sited at the only road access to the Recreational segment of this creek.

Table 7-6 provides a summary comparison of impacts to WSRs by issues and indicators for the alternatives.

7.7.3 IRA

The analysis of effects on roadless character focuses on the wilderness attributes of naturalness; undeveloped character; outstanding opportunities for solitude and primitive types of recreation; special features and values; and manageability (**Table 6-7**) which inform impacts to roadless area characteristics.

Construction of SGP facilities, access roads, and utilities would remove vegetation, alter topography, and modify fish and wildlife habitat within IRAs. Construction and operation of the SGP under the 2021 MMP would directly impact the Meadow Creek, Horse Heaven, Black Lake, Burnt Log, Caton Lake, and Reeves Creek IRAs. The Johnson Creek Route Alternative would have a reduced least impact on IRAs. Under the Johnson Creek Route Alternative, improvements and use of only the Johnson Creek Route for mine access would eliminate impacts within the Black Lake and Burnt Log IRAs and within portions of the Meadow Creek IRA associated with the Burntlog Route. **Table 7-6** provides a summary comparison of IRA impacts by issue and indicators for the alternatives.

7.7.4 RNA

SGP activities would be located downgradient of streams that flow through RNAs or would be in watersheds that do not contain streams that flow through RNAs. There would be no changes to water chemistry, temperature, or quality in the stream segments that flow through the two RNAs.

Under the 2021 MMP, reconstructing approximately 3 miles of Burnt Log Road (FR 447) for the Burntlog Route would remove vegetation within 100 to 3,100 feet of the Chilcoot Peak RNA. Interim reclamation and vehicles could provide opportunities for non-native plant species to become established and spread into the RNA. There would be a localized, negligible to minor, long-term loss of the Chilcoot Peak RNA research and ecological process values if and where non-native plant species become established. Forest approved species used during interim reclamation, and increased traffic and recreation use could spread non-native plant species into the Chilcoot Peak RNA. Increased human activities could increase the risk of human ignited fires. Changes in the fire regime could result in a loss of research and ecological process values within the Chilcoot Peak RNA.

Under the 2021 MMP installation of culverts on the Burntlog Route could change the movement of sediment, woody debris, and other organic material (Forest Service 2008a). Culverts could change water quantity or hydrologic connection and indirectly ecological processes in areas adjacent to the Chilcoot Peak RNA. The extent and duration of where there could be changes to ecological processes within Chilcoot Peak RNA is unknown.

The Burntlog Route would not be constructed under the Johnson Creek Route Alternative and would retain the existing ecological process values of the Chilcoot Peak RNA.

Under the No Action Alternative, Perpetua would continue with exploration, monitoring, and reclamation commitments as described in the Golden Meadows Decision Memo and Environmental Assessment. The distance of approximately 6 miles between Belvidere Creek RNA, the nearest RNA, and reclamation and monitoring activities would reduce the potential for fugitive dust and non-native plant species to spread into the RNA. Therefore, there would not be measurable direct or indirect effects on research values or ecosystem conditions within the two RNAs under the No Action Alternative.

Table 7-6 provides a summary comparison of RNA impacts by issue and indicators for the alternatives.

Table 7-6 Comparison of SGP Impacts by Alternative

Issue	Indicator	Baseline (Existing) Conditions	No Action Alternative	2021 MMP	Johnson Creek Route Alternative
Wilderness					
The SGP could change the quality of wilderness character in designated or recommended wilderness areas.	Distance of SGP facilities from designated or recommended wilderness.	The FCRNRW and recommended wilderness areas contain diverse vegetation and wildlife species. Vegetation varies from ponderosa pine/bluebunch wheatgrass or Idaho fescue, and Douglas-fir/ninebark or snowberry at lower elevations, to near-alpine habitat in the highest elevation areas. Wildfires have continually altered the wilderness landscape, creating brush fields, large lodgepole pine stands, extensive snag patches, and variations in species and age classes of vegetation.	Same as Baseline Condition	Surface disturbance and vehicles used during the 2 years to construct Burntlog Route would increase the potential for non-native plant species to spread into the FCRNRW. Construction and maintenance of approximately 1.3 miles of the Burntlog Route between 170 and 300 feet of the FCRNRW boundary could result in sediment deposited in the headwater tributaries to Big Chief Creek. Disturbance from the cut and fill slopes on approximately 5.3 miles of Burntlog Route in the headwaters of Riordan Creek would increase the risk of non-native plant species spreading into the FCRNRW. The use of the Johnson Creek Route during construction and construction of the Burntlog Route could disturb wildlife and change the distribution of big game within the FCRNRW. During the 3 years of construction, the increase in human activity near the western FCRNRW boundary could change ecological processes in areas where non-native plant species establish. During the 15 years of operation, mine traffic and recreation use on the Burntlog Route could increase the potential for non-native plant species to spread into the FCRNRW. Where established, non-native plants could alter ecological processes. The 50 vehicles per day, the Burntlog Route road maintenance, and recreation use of access roads adjacent to the FCRNRW	Using the Johnson Creek Route would reduce the potential for non-native plant species to spread into the FCRNRW, reduce the miles of road near the FCRNRW, and help retain existing wildlife distribution. Using the Johnson Creek Route for mine access during the 15 years of mine operation would reduce the miles of road near the FCRNRW and reduce the potential for non-native plant species to spread into the FCRNRW. Mine vehicles and recreation use would be on existing roads. The use of existing roads for mine traffic would reduce the area adjacent to the FCRNRW where vehicle traffic could disturb big game species. Surface disturbance from mineral exploration, reseeding disturbed areas, and monitoring activities would be 3 miles from the FCRNRW boundary. The natural quality of wilderness character would be the same as existing conditions.

Issue	Indicator	Baseline (Existing) Conditions	No Action Alternative	2021 MMP	Johnson Creek Route Alternative
				western boundary could displace wildlife from areas within the FCRNRW. Mine and forest visitor traffic using the Burntlog Route during the 15 years of operations and 5 years of mine reclamation and closure could increase the potential for non-native plant species to spread into the FCRNRW. Recontouring slopes and seeding during the 2 years of decommissioning the Burntlog Route also would increase the potential for non-native plant species to spread into the FCRNRW.	
The SGP could change the quality of wilderness character in designated or recommended wilderness areas.	Distance of designated or recommended wilderness from sights and sounds of human activity from SGP activities.	The FCRNRW and recommended wilderness areas contain diverse vegetation and wildlife species. Vegetation varies from ponderosa pine/bluebunch wheatgrass or Idaho fescue, and Douglas-fir/ninebark or snowberry at lower elevations, to near-alpine habitat in the highest elevation areas. Wildfires have continually altered the wilderness landscape, creating brush fields, large lodgepole pine stands, extensive snag patches, and variations in species and age classes of vegetation.	Sights and sounds of human activity from mineral exploration and monitoring activities would be 3 miles from the FCRNRW boundary.	Noise from the construction of the Burntlog Route would be audible along the boundary of the FCRNRW. Decreasing the distance between the Burntlog Route and the FCRNRW boundary would increase the area where noise from construction activities would be audible. Noise from road maintenance activities and recontouring slopes during closure on the Burntlog Route could be heard along the boundary of the FCRNRW depending upon topography and weather conditions and would reduce opportunities for solitude within the FCRNRW. Decreasing the distance between Burntlog Route and the FCRNRW boundary would increase the area where noise from recontouring slopes and seeding activities would be audible.	Using the Johnson Creek Route during construction, operation, and closure and reclamation would eliminate impacts on the FCRNRW associated with the Burntlog Route.

Issue	Indicator	Baseline (Existing) Conditions	No Action Alternative	2021 MMP	Johnson Creek Route Alternative
	Reduced opportunities for self-reliant recreation within designated or recommended wilderness.	The FCRNRW and recommended wilderness areas provide opportunities for solitude and primitive recreation.	Opportunities for solitude would be the same as existing conditions.	The decreased distance between the Burntlog Route and the FCRNRW boundary would increase the area where noise from SGP activities is audible. The extent where noise is audible would reduce opportunities for solitude within the FCRNRW. If wilderness visitors avoid the FCRNRW areas accessed through the SGP or adjacent to the Burntlog Route, increased recreation in recommended wilderness areas could reduce opportunities for solitude within the FCRNRW. Where audible, during the 15 years of mine operation noise from road maintenance would reduce opportunities for solitude within the FCRNRW. The Burntlog Route could facilitate an increase in wilderness visits in the Big Chief Creek and Pistol Creek drainages of the FCRNRW. During the 20 years of mine operation and mine closure, if wilderness visitors avoid the FCRNRW areas accessed through the SGP or adjacent to the Burntlog Route, recreation use in recommended wilderness areas could increase. Increased recreation use in recommended wilderness areas could reduce opportunities for solitude.	Using the Johnson Creek Route during construction, operation, and closure and reclamation would eliminate impacts on the FCRNRW associated with the Burntlog Route. Using Johnson Creek Route during the 15 years of mine operation could increase wilderness visits to recommended wilderness areas or other areas of the FCRNRW. If recreation use increases, it could reduce opportunities for solitude within the recommended wilderness areas.

Issue	Indicator	Baseline (Existing) Conditions	No Action Alternative	2021 MMP	Johnson Creek Route Alternative
Wild and Scenic Rivers					
The SGP may affect the value of eligible or suitable WSRs.	Impacts to free-flowing characteristics of eligible and suitable WSRs.	Free-flowing conditions currently not impacted.	No impacts to free-flowing conditions anticipated.	No impacts to free-flowing conditions anticipated.	Same as the 2021 MMP.
	Impacts to water quality of eligible, suitable, and designated WSRs.	Water quality to improve as a result of improved management, site cleanups, and watershed restoration projects.	Water quality to improve as a result of improved management, site cleanups, and watershed restoration projects.	Area-wide water quality to improve, except for Burntlog Creek where water quality may be adversely impacted. Erosion and sediment control BMPs would reduce water quality impacts.	Area-wide water quality to improve, except for Johnson Creek where water quality may be adversely impacted. Erosion and sediment control BMPs would reduce water quality impacts.
	Impacts to ORVs for which eligible, suitable, and designated WSRs are recognized.	Heritage ORVs likely to decline over time. Fish ORVs anticipated to remain stable or improve.	Heritage ORVs likely to naturally decline over time. Fish ORVs anticipated to remain stable or improve.	Heritage ORVs likely to naturally decline over time and historic properties could be impacted. Fish ORVs anticipated to remain stable or improve, with possible exception of Burntlog Creek.	Heritage ORVs similar to the 2021 MMP. Fish ORVs anticipated to remain stable or improve, with possible exception of Johnson Creek.
	Impacts to the preliminary Wild, Scenic, or Recreational classification for eligible and suitable WSRs.	No impacts to preliminary Wild, Scenic or Recreational classifications anticipated.	No impacts to preliminary Wild, Scenic, or Recreational classifications anticipated.	Likely impacts to Wild classification of Burntlog Creek, possible impacts to recreation access to Burntlog Creek.	No impacts to preliminary Wild, Scenic, or Recreational classifications anticipated.

Issue	Indicator	Baseline (Existing) Conditions	No Action Alternative	2021 MMP	Johnson Creek Route Alternative
Inventoried Roadless Area					
The SGP may impact roadless character in IRAs and lands contiguous to unroaded areas.	Miles and acres of new roads in IRAs or contiguous unroaded lands.	Thirteen IRAs within the analysis area are managed for roadless character	No new roads within IRAs.	During construction and mine operation, new disturbance would occur within five IRAs (Meadow Creek, Horse Heaven, Black Lake, Burnt Log, and Reeves Creek). Within the Meadow Creek, Black Lake, and Burnt Log IRAs, soil nail walls would be constructed in association with the Burntlog Route and after mine closure, retaining walls would remain within the IRAs.	No access roads within IRAs.
	Number and acres of SGP facilities in IRAs or contiguous unroaded lands.	Thirteen IRAs within the analysis area are managed for roadless character	No new facilities within IRAs.	Total of 674 acres of SGP facilities within six IRAs (Meadow Creek, Horse Heaven, Black Lake, Burnt Log, Caton Lake, and Reeves Creek). After mine closure, the TSF and TSF Buttress would remain in the Meadow Creek and Horse Heaven IRAs.	A reduction of approximately 200 acres of SGP facilities within four IRAs (Meadow Creek, Horse Heaven, Caton Lake, and Reeves Creek) would occur. After mine closure, the TSF and TSF Buttress would remain in the Meadow Creek and Horse Heaven IRAs.

Issue	Indicator	Baseline (Existing) Conditions	No Action Alternative	2021 MMP	Johnson Creek Route Alternative
Research Natural Area					
The SGP could impact research values or ecosystem conditions within RNAs.	Change in vegetation community composition and structure within an RNA. Change in number of vehicles using roads and human activity within or immediately adjacent to an RNA. Changes to water quality (chemistry, temperature) or quantity within an RNA.	The two RNAs within the analysis area provide opportunities to conduct research and provide a control site to evaluate ecological conditions and processes within the Intermountain West.	Surface exploration and seeding of disturbed areas at the SGP would be over 5 miles from the two RNAs. The research values and ecological site conditions within the RNAs would be the same as existing conditions.	Areas where non-native plant species become established would reduce the Chilcoot Peak RNA values in the long term. Changes to the vegetation community composition would result in a loss of research values and ecological conditions within an RNA. Dust deposited on vegetation could change vegetation conditions and ecological processes within the Chilcoot Peak RNA. Human caused fire ignitions that spread into the Chilcoot Peak RNA could change the existing fire regime and reduce the RNA's research values related to ecological process. Indirectly, if forest visitors avoid areas near the Burntlog Route or the SGP there could be an increase in recreation use on trails and roads adjacent to an RNA. If recreation use increased, non- native plant species could spread into the Belvidere Creek RNA. Culverts along a segment of FR 447 of the Burntlog Route could change the movement of sediment, woody debris, and other organic material. Additional culverts installed along the Burntlog Route could indirectly change local hydrologic conditions within the Chilcoot Peak RNA and alter ecological process long term. Changes in ecological processes would reduce the Chilcoot Peak RNA values.	The use of the Johnson Creek Route for mine access could increase recreation use along the South Fork Salmon River and Big Creek drainages from forest visitors avoiding the SGP. Increased recreation use on trails could increase the potential for non-native invasive plant species to spread into the Belvidere Creek RNA. The potential loss of RNA values could be less than the 2021 MMP as the roads and trails open to public use are several miles from the closest RNA. The Johnson Creek Route Alternative would occur farther away from the Chilcoot Peak RNA. Potential impacts to the Chilcoot Peak RNA would be fewer and of lesser intensity under this alternative.

8.0 References

AECOM Technical Services, Inc. (AECOM). 2017. Technical Summary of Distance to Target Thresholds, AECOM, August 2017.

AECOM Technical Services, Inc. (AECOM). 2019. Technical Summary of Distance to Target Thresholds, AECOM, November 2019.

AECOM Technical Services, Inc. (AECOM). 2020a. Stibnite Gold Project. AECOM Geodatabase and Geodatabase Associated Calculations, Affected Acreage GIS data. [GIS Data].

AECOM Technical Services, Inc. (AECOM). 2020b. Stibnite Gold Project Effects on Roadless Character. Prepared for U.S. Forest Service, Payette National Forest, Megan Heider. July 2020.

Air Sciences, Inc. (Air Sciences). 2018. Stibnite Gold Project. Air Quality Analysis. Prepared for Midas Gold Idaho, Inc., Air Sciences, Inc. Project No. 335-1-2, October 10, 2018.

Ansong, M., and C. Pickering. 2016. The effects of seed traits and fabric type on the retention of seed on different types of clothing. Basic and applied ecology, 17(6), 516-526.

Arthur Carhart National Wilderness Training Center. 2014. Minimum requirements decision guide instructions. July 22, 2014 version.

Beschta, R. L. 1978. Long-term Patterns of Sediment Production Following Road Construction and Logging in the Oregon Coast Range. Water Resources Research. 14(6):1011-1016.

Brockerhoff, E. G., and A. M. Liebhold. 2017. Ecology of forest insect invasions. Biological Invasions, 19(11), 3141-3159.

Brooks, M., and Lusk, M. 2008. Fire Management and Invasive Plants: a Handbook. U.S. Fish and Wildlife Service. Arlington, VA.

Brown and Caldwell. 2019. Final Stibnite Gold Mitigation Plan. Prepared for Midas Gold Idaho, Inc. April 2019.

Brüel & Kjær Sound & Vibration Measurement (Brüel & Kjær). 2000. Sound & Vibration Measurement, Environmental Noise.

Cuscino, T. A., R. J. Heinsohn, and B. Clotworthy, Jr. 1977. Fugitive Dust from Vehicles Traveling on Unpaved Roads. In: Heisler, Gordon M.; Herrington, Lee P., eds. Proceedings of the conference on metropolitan physical environment; Gen. Tech. Rep. NE-25. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 295-302.

DJ&A, PC. 2017. Midas Gold Idaho, Inc. Stibnite Gold Project Access Road Motorized Mixed-Use Analysis of the Burntlog Alternative Report. Prepared by Matthew A. Ulberg, PE. September.

Eccleston, D. T., and R. E. Harness. 2018. Raptor Electrocutions and Power Line Collisions. In Birds of Prey (pp. 273-302). Foltz, R. B. 2012. A comparison of three erosion control mulches on decommissioned forest road corridors in the northern Rocky Mountains, United States. Journal of Soil and Water Conservation 67 (6): 536-544.

Gornish, E., E. Brusati, and D. Johnson. 2016. Practitioner perspectives on using nonnative plants for revegetation. California Agriculture, 70(4), 194-199.

HDR, Inc. (HDR). 2017. Plan of Operations, Geophysical Investigation. Prepared for Midas Gold Idaho, Inc. Stibnite Gold Project. Stibnite, Idaho. Revised June 2017.

Herron, T., and L. Freeman. 2008. Middle Fork Salmon River subbasin assessment and total maximum daily loads. Boise: Department of Environmental Quality.

Hinke, J. A., J. H. Meddens, and C. A. Kolden. 2016. Recent tree mortality in the Western United States from bark beetles and forest fires. Forest Science 62(2): 141-153.

Idaho Department of Environmental Quality (IDEQ). 2011. South Fork Salmon River Subbasin TMDL. Five Year Review, Idaho Department of Environmental Quality, McCall: McCall Satellite Office, 60. March 2011.

Idaho Department of Fish and Game (IDFG). 2019. Explore Idaho's Plants and Animals. Website database. Available at: https://idfg.idaho.gov/species/taxa/explore?category=4. Accessed 9/9/2019.

Idaho Department of Lands. 1992. Best Management Practices for Mining in Idaho.

Idaho Power Company (Idaho Power). 2014. West Central Mountains Electrical Plan Final Report. December 2014.

Idaho Power Company (Idaho Power). 2015. Operation and Maintenance Plan for Facilities Authorized by the Payette National Forest. April.

Idaho Transportation Department (ITD). 2020. ID-55, Smiths Ferry Improvements. Available at: https://itdprojects.org/projects/id55smithsferry/. Accessed July 2020.

Idaho Transportation Department (ITD). 2021. Idaho 55 – Donnelly to Deinhard Lane. ITD Construction Projects, available online https://itd.idaho.gov/d4/?target=construction. Access November 21.

Jacobs, J., K. Goodwin, and D. Ogle. 2009. Plant Guide for rush skeletonweed (*Chondrilla juncea* L.). Published October 2009. USDA-Natural Resources Conservation Service, Montana State Office, Bozeman, MT 59715.

Jain, T. B., and R. T. Graham. 2005. Restoring dry and moist forests of the inland northwestern US. In: Stranhauf, John A.; Madsen, Palle, eds. Restoration of boreal and temperate forests. New York: CRC Press. p. 463-480., 463-480.

Johnson, B. J., T. E. Hall, and D. N. Cole. 2005. Naturalness, Primitiveness, Remoteness and Wilderness: Wilderness Visitors Understanding and Experience of Wilderness Qualities. Unpublished, US Department of Agriculture, Forest Service, Rocky Mountain Research Station, Missoula: Aldo Leopold Wilderness Research Institute. Accessed March 3, 2015. http://leopold. wilderness. net/unpublished/UNP115.

Keane, R. E., L. M. Holsinger, M. F. Mahalovich, and D. F. Tomback. 2017. Restoring whitebark pine ecosystems in the face of climate change. Gen. Tech. Rep. RMRS-GTR-361. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 123 p.

Landres, P., C. Barns, S. Boutcher, T. Devine, P. Dratch, A. Lindholm, L. Merigliano, N. Roeper, and E. Simpson. 2015. Keeping It Wild 2: An Updated Inter-Agency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System. Gen. Tech. Rep. RMRS-GTR-340. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Landres, P., M. B. Hennessy, K. Schlenker, D. N. Cole, and S. Boutcher. 2008. Applying the concept of wilderness character to national forest planning, monitoring, and management. Gen. Tech. Rep. RMRS-GTR-217WWW. Fort Collins, CO: U.S.

Landres, P., W. N. Vagias, and S. Stutzman. 2012. Using wilderness character to improve wilderness stewardship. Park Science. Vol. 28 (Winter 2011-2012): 44-48. Available at: http://www.nature.nps.gov/ParkScience/index.cfm?ArticleID=540&Page=1.

Larkin R. P., L. L. Pater, and D. J. Tazik. 1996. Effects of military noise on wildlife: a literature review. No. USACERL-TR-96/21. Construction Engineering Research Lab (ARMY) Champaign IL.

Lewis, M. B., E. W. Schupp, and T. A. Monaco. 2017. Road Dust Correlated with Decreased Reproduction of the Endangered Utah Shrub *Hesperidanthus suffrutescens*. Western North American Naturalist, 77(4): 430-439.

Marion, J. L., Y. F. Leung, H. Eagleston, and K. Burroughs. 2016. A Review and Synthesis of Recreation Ecology Research Findings on Visitor Impacts to Wilderness and Protected Natural Areas. *Journal of Forestry* 114 (3): 352-362.

Midas Gold Idaho, Inc. (Midas Gold). 2016. Stibnite Gold Project, Valley County, Idaho. Plan of Restoration and Operations. September 2016.

Midas Gold Idaho, Inc. (Midas Gold). 2018. Request for Additional Information (RFAI) 83a Burntlog Route Reclamation Costs Submittal. September 24, 2018.

Midas Gold Idaho, Inc. (Midas Gold). 2019. Notice of Intent: Stibnite Gold Project – Burntlog Route Geophysical Investigation Field Work. May 28, 2019.

Midas Gold Idaho, Inc. (Midas Gold). 2020. Stibnite Gold Project, Valley County, Idaho. Refined Proposed Action ModPRO2. December 2020.

Milan, J., C. B. Randall, J. E. Andreas, and R. L. Winston. 2016. Biology and Control of Rush Skeleton Weed. U.S. Forest Service, Forest Health Enterprise Technology Enterprise Team, Morgantown, West Virginia. FHETET-2016-XX.

Montgomery, R. A., G. J. Roloff, and J. J. Millspaugh. 2012. Importance of visibility when evaluating animal response to roads. Wildlife Biology 18 (4): 393-405.

Morris, C., and E. W. Schupp. 2009. Comparison of emergence speed and sterility in two sterile annual hybrid cereal grasses developed for use in restoration. Restoration Ecology, 2009. 17:678-685.

Nagy, R., E. Fusco, B. Bradley, J. T. Abatzoglou, and J. Balch. 2018. Human-related ignitions increase the number of large wildfires across US ecoregions. Fire 1, no. 1 (2018): 4.

Parametrix. 2018a. Memorandum to Dale Kerner, Midas Gold. Stibnite Gold Project - Access Road Feasibility Design. July 18, 2018.

Parametrix. 2018b. Stibnite Gold Project – Access Road Feasibility Design. RFAI-83 Response (Revised). Memorandum to Dale Kerner, P.G. June 11, 2018. Boise, Idaho.

Pearson, D. E., Y. K. Ortega, J. B. Runyon, and J. L. Butler. 2016. Secondary invasion: the bane of weed management. Biological Conservation, 197, 8-17.

Perpetua Resources Idaho, Inc. (Perpetua) 2021a. Stibnite Gold Project, Valley County, Idaho, Refined Proposed Action ModPRO2. October 2021.

Perpetua Resources Idaho, Inc. (Perpetua) 2021b. Stibnite Gold Mitigation Plan.

Perpetua Resources Idaho, Inc. (Perpetua) 2021c. Stibnite Gold Fisheries and Aquatic Resources Mitigation Plan.

Perpetua Resources Idaho, Inc. (Perpetua) 2021d. Stibnite Gold Fishway Operations and Management Plan.

Perpetua Resources Idaho Inc. (Perpetua). 2021e. Reclamation and Closure Plan (RCP), Stibnite Gold Project – Errata. Valley County, Idaho. Prepared for Midas Gold Idaho, Inc. October.

Pickering, C. M., W. Hill, D. Newsome, and Y. Leung. 2010. Comparing hiking, mountain biking and horse riding impacts on vegetation and soils in Australia and the United States of America. Journal of Environmental Management 91 (3): 551-562.

Reid, L. M., and T. Dunne. 1984. Sediment production from forest road surfaces. Paper #G28 in DeWalle, D.R. (ed.): Forest Hydrology (IAHS Benchmark Papers in Hydrology Series). International Association of Hydrological Sciences. (1984 paper reprinted from Water Resources Research 20(11), 1753-1761). Available from https://www.fs.usda.gov/treesearch/pubs/38967.

Rew, L. J., T. J. Brummer, F. W. Pollnac, C. D. Larson, K. T. Taylor, M. L. Taper, J. D. Fleming, and H. E. Balbach. 2018. Hitching a ride: Seed accrual rates on different types of vehicles. Journal of Environmental Management, 206: 547-555.

Robinson, C., P. N. Duinker, and K. F. Beazley. 2010. A conceptual framework for understanding, assessing, and mitigating ecological effects of forest roads. Environmental Reviews (NRC Research Press) (18): 61-86.

Romme, W. H., C. M. Regan, M. R. Kaufmann, L. Huckaby, and T. T. Veblen. 2003. Ecological effects of the Hayman Fire-Part 4: Forest succession. General Technical Report, U.S. Department of Agriculture, Forest Service, Ogden, Utah: Rocky Mountain Research Station., 220-227.

Rust, S. K. 1998. A Research Natural Area Primer for Forest Plan Revision Idaho Department of Fish and Game, Natural Resource Policy Bureau. Boise, Idaho.

Squires, R. V. 2016. Dust particles and aerosols: impact on biota “a review” (part I). *Journal of Rangeland Science*, *6*(1), 82-91.

Taylor, Ki., T. Brummer, M. L. Taper, A. Wing, and L. J. Rew. 2012. Human-mediated long-distance dispersal: an empirical evaluation of seed dispersal by vehicles. Edited by Christoph Kueffer. Diversity and Distributions, A Journal of Conservation Biogeography (Blackwell Publishing Ltd) 10.

Taylor, A. R., and R. L. Knight. 2003. Wildlife responses to recreation and associated visitor perceptions. Ecological applications, 13(4), 951-963.

Tetra Tech, Inc. (Tetra Tech). 2019. Reclamation and Closure Plan (RCP), Stibnite Gold Project – Errata. Valley County, Idaho. Prepared for Midas Gold Idaho, Inc. July 26, 2019.

Trombulak, S. C., and C. A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology 14.1 (2000): 18-30.

U.S. Department of Transportation Federal Highway Administration (FHWA). 2020. SH-55 Banks Beach Parking Study. Available at: https://highways.dot.gov/federal-lands/projects/id/dot-55-2. Accessed July 2020.

U.S. Environmental Protection Agency (EPA). 2020. Cinnabar Mine Integrated Assessment. Yellow Pine, ID – Region X. Available at: https://response.epa.gov/site/site_profile.aspx?site_id=9801. Accessed July 2020.

U.S. Forest Service (Forest Service). 1974. National Forest Landscape Management Volume 2. The Visual Management System. Agriculture Handbook Number 462. April 1974.

U.S. Forest Service (Forest Service). 1982. Recreation Opportunity Spectrum User Guide. Available at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5277167.pdf.

U.S. Forest Service (Forest Service). 1987. Land and Resource Management Plan: Salmon National Forest, Region 4. Forest Service, Salmon: Forest Service. Accessed April 10, 2018.

U.S. Forest Service (Forest Service). 1995. Decision Notice/FONSI Designation Order, Chilcoot Peak, Trinity Mountain, North Fork Boise River, Back Creek, Roaring River, and Needles Research Natural Areas, Boise National Forest, Mountain Home, Cascade, and Idaho City Ranger Districts. Boise, Elmore, and Valley Counties.

U.S. Forest Service (Forest Service). 1996a. Establishment Record for Back Creek Research Natural Area within Boise National Forest, Valley County, Idaho.

U.S. Forest Service (Forest Service). 1996b. Establishment Record for Belvidere Creek Research Natural Area within Payette National Forest, Valley County, Idaho.

U.S. Forest Service (Forest Service). 1996c. Establishment Record for Chilcoot Peak Research Natural Area within Boise National Forest, Valley County, Idaho.

U.S. Forest Service (Forest Service). 1996d. Establishment Record for Circle End Creek Research Natural Area within Payette National Forest, Valley County, Idaho.

U.S. Forest Service (Forest Service). 1996e. Establishment Record for Needles Research Natural Area within Boise National Forest, Valley County, Idaho.

U.S. Forest Service (Forest Service). 1996f. Establishment Record for Phoebe Meadows Research Natural Area within Payette National Forest, Valley County, Idaho.

U.S. Forest Service (Forest Service). 2003a. Record of Decision for the Final Environmental Impact Statement and Revised Payette National Forest Land and Resource Management Plan. Revised July 2003.

U.S. Forest Service (Forest Service). 2003b. Frank Church–River of No Return Wilderness Management Plan. Salmon-Challis National Forest: U.S. Department of Agriculture.

U.S. Forest Service (Forest Service). 2007a. Frank Church–River of No Return Noxious Weed Treatments Final Supplemental Environmental Impact Statement. Salmon-Challis National Forest: U.S. Department of Agriculture.

U.S. Forest Service (Forest Service). 2007b. South Fork Salmon River Subbasin Noxious and Invasive Weed Management Program, Record of Decision. Krassel and McCall Ranger Districts, Payette National Forest. May 2007.

U.S. Forest Service (Forest Service). 2008a. Roadless Area Conservation – National Forest System Lands in Idaho. Final Environmental Impact Statement, August 2008. http://www.fs.usda.gov/roadmain/roadless/idahoroadlessrule.

U.S. Forest Service (Forest Service). 2008b. Final Rule and Record of Decision on Idaho Roadless Area Conservation. Federal Register October 16, 2008. 36 CFR Part 294.

U.S. Forest Service (Forest Service). 2009. Frank Church–River of No Return Wilderness Management Plan. Salmon-Challis National Forest: U.S. Department of Agriculture.

U.S. Forest Service (Forest Service). 2010. Boise National Forest Land and Resource Management Plan. 2003-2010 Integration.

U.S. Forest Service (Forest Service). 2012. Draft Environmental Impact Statement, Golden Hand No. 1 and No. Lode Mining Claims Project. Krassel Ranger District, Payette National Forest, Valley and Idaho County, Idaho. June 2012.

U.S. Forest Service (Forest Service). 2013. Idaho Power Company Line 328 Project Environmental Assessment. Environmental Assessment, US Department of Agriculture, Boise, Idaho: Boise National Forest, 189. Accessed October 9, 2017. https://www.fs.usda.gov/nfs/11558/www/nepa/74093_FSPLT3_1379137.pdf.

U.S. Forest Service (Forest Service). 2015. Keeping It Wild 2: An Updated Inter-Agency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System. Gen. Tech. Rep. RMRS-GTR-340. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

U.S. Forest Service (Forest Service). 2015. Final Environmental Assessment, Golden Meadows Exploration Project. Krassel Ranger District, Payette National Forest, Valley County, Idaho. September 2015.

U.S. Forest Service (Forest Service). 2016. Environmental Assessment, Big Creek Roads Plan of Operations. Krassel Ranger District, Payette National Forest, Valley County, Idaho. November 2016.

U.S. Forest Service (Forest Service). 2017. Valley County Quarry Development Project Proposed Action Report. Yellow Pine, Valley County, Idaho. August 2017.

U.S. Forest Service (Forest Service). 2018. Payette National Forest; Idaho; Granite Meadows Project: Notice of Intent to prepare and environmental impact statement. Federal Register. Vol. 83, No. 211. FR Docket. 2018-23826. October 31, 2018.

U.S. Forest Service (Forest Service). 2019a. Forest Service Noxious weed survey data. [GIS Data].

U.S. Forest Service (Forest Service). 2019b. GIS Data for 2018 Weed Control Survey, Payette National Forest.

U.S. Forest Service (Forest Service). 2020a. Schedule of Proposed Action (SOPA) 4/01/2020 to 6/30/2020 Boise National Forest. April 1.

U.S. Forest Service (Forest Service). 2020b. Schedule of Proposed Action (SOPA) 7/01/2020 to 9/30/2020 Boise National Forest. July 1.

U.S. Forest Service (Forest Service). 2020c. Schedule of Proposed Action (SOPA) 7/01/2020 to 9/30/2020 Payette National Forest. July 1.

U.S. Forest Service (Forest Service). 2021a. Schedule of Proposed Action (SOPA) 10/01/2020 to 12/31/2020 Payette National Forest. October 1.

U.S. Forest Service (Forest Service). 2021b. Schedule of Proposed Action (SOPA) 10/01/2020 to 12/31/2020 Boise National Forest. October 1.

U.S. Forest Service (Forest Service). 2022a. Stibnite Gold Project 2021 MMP Alternatives Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022b. Stibnite Gold Project Water Quality Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022c. Stibnite Gold Project Air Quality Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022d. Stibnite Gold Project Access and Transportation Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022e. Stibnite Gold Project Heritage Resources Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022f. Stibnite Gold Project Recreation Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022g. Stibnite Gold Project Vegetation Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022h. Stibnite Gold Project Noise Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022i. Stibnite Gold Project Fisheries Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022j. Stibnite Gold Project Scenic Resources Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022k. Stibnite Gold Project Wetlands Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022l. Stibnite Gold Project Wildlife Specialist Report. Payette National Forest.

U.S. Forest Service (Forest Service). 2022m. Stibnite Gold Project Soils and Reclamation Cover Materials Specialist Report. Payette National Forest.

Ulrichs, C., B. Welke, T. Mucha-Pelzer, A. Goswami, and I. Mewis. 2008. Effect of solid particulate matter deposits on vegetation: a review. Functional Plant Sci Biotechnology 2 (1): 56-62.

Valley County. 2019. Valley County Current and Historic Weed Data. http://valleycounty.maps.arcgis.com/apps/MapSeries/index.html?appid=5787d2abebfb45edbff6114f52ecb272&mobileBreakPoint=400. [Interactive web database, no PDF available].

Watson, A. E. 2000. Wilderness Use in the Year 2000: Societal Changes That Influence Human Relationships With Wilderness. In: Cole, David N.; McCool, Stephen F.; Borrie, William T.; O'Loughlin, Jennifer, comps. 2000. Wilderness science in a time of change conference— Volume 4: Wilderness visitors, experiences, and visitor management; 1999 May 23–27; Missoula, MT. Proceedings RMRS-P-15-VOL-4. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Wisdom, M. J., H. K. Preisler, A. G. Robert, B. K. Johnson, M. L. Naylor, and M. M. Rowland. 2018. Elk responses to trail-based recreation on public forests. Edited by Dan Binkley. Forest Ecology and Management 411: 223-233.

Zouhar, Kris. 2003. In: Fire Effects Information System, [Online]. U.S Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer).