

4.10 VEGETATION: GENERAL VEGETATION COMMUNITIES, BOTANICAL RESOURCES, AND NON-NATIVE PLANTS

4.10.1 Effects Analysis Indicators and Methodology of Analysis

Issue: The Stibnite Gold Project (SGP) would impact forested Potential Vegetation Groups (PVGs) within U.S. Forest Service (Forest Service)-administered land and could impact the ability of these areas to reach desired conditions.

Indicators:

- Acres of SGP disturbance to previously undisturbed forest PVGs within Forest Service-administered land.

Issue: The SGP would impact non-forested areas (i.e., those that are identified through PVG mapping as not being successional to forests) within Forest Service-administered land and could impact the ability of these areas to reach desired conditions.

Indicators:

- Acres of SGP disturbance to previously undisturbed non-forested areas within Forest Service-administered land.

Issue: The SGP would impact vegetation outside the boundaries of the Forests.

Indicators:

- Acres of SGP disturbance in previously undisturbed LANDFIRE existing vegetation types outside Forest Service boundaries.

Issue: The SGP would remove whitebark pine individuals, and habitat conversion associated with the SGP would impact seed production, dispersal, and establishment of this species.

Indicators:

- Number of acres of whitebark pine occupied habitat impacted by the SGP.
- Estimated number of mature whitebark pine trees to be cut during SGP construction.

Issue: The SGP would impact known occurrences of Regional and Forest-specific designated sensitive and forest watch plant species.

Indicators:

- Presence of known occurrences of sensitive or forest watch plant species or occupied habitat within 300 feet of the SGP disturbance area.

Issue: The SGP would result in a direct loss of modeled potential habitat for Regional and Forest-specific designated sensitive and forest watch plant species.

Indicators:

- Acres of modeled potential habitat for Regional and Forest-specific designated sensitive and forest watch plant species disturbed by the SGP.

Issue: SGP actions would result in increased potential for non-native plant establishment and spread.

Indicator:

- Total acres of land disturbed by the SGP.

4.10.1.1 Data Sources

4.10.1.1.1 AVAILABLE INFORMATION

Vegetation was analyzed using information referenced from a variety of sources.

The following sources provide the basis for analysis of impacts to vegetation communities in the analysis area:

- Forest Service Vegetation Classification Mapping and Quantitative Inventory (VCMQ) existing vegetation mapping for the Payette National Forest (PNF) and the Boise National Forest (BNF), last updated in 2016 (PNF) and 2017 (BNF);
- Forest Service potential vegetation mapping for the PNF and BNF, last updated in 2005 (PNF) and 2017 (BNF); and
- LANDFIRE existing vegetation type layer, which is based on NatureServe Ecological Systems, Version 1.13 (Data date: Oct. 23, 2009).

The following sources provided the basis for analysis of impacts to threatened, endangered, proposed, or candidate, sensitive, and forest watch plant species in the analysis area:

- U.S. Fish and Wildlife Service Information, Planning, and Conservation Online Database (2019);
- Forest Service Region 4 Plant List for sensitive and forest watch species for the PNF and BNF (2016);
- Idaho Natural Heritage Program tracked plant list (2014) and Idaho Fish and Game Conservation Data Center Website (2019);

- Forest Service Rare Plant Geographic Information System Data for the SGP Area (Idaho Fish and Wildlife Information System [IFWIS] 2017);
- Results of past plant species surveys and review (HDR, Inc. [HDR] 2017);
- Vegetation Baseline Study, which was prepared by HDR in November 2013 and revised in April 2017 to characterize existing vegetation in the SGP area (HDR 2017); and
- Addendum #1 to the Vegetation Baseline Study, which was prepared by HDR in December 2014 and revised April 2017 to characterize vegetation along the existing 71-mile-long transmission line corridor that runs from a substation south of the community of Lake Fork to approximately 10 miles west of the mine site (HDR 2017) (Note: no special status plants were located during this survey).
- PNF rare plant list and species habitat descriptions (Forest Service no date);
- BNF rare plant list and species habitat descriptions (Forest Service 2015);
- Reported voucher specimens in Consortium for Pacific Northwest Herbaria (Consortium for Pacific Northwest Herbaria 2018);
- Results of special status plant potential habitat modeling in the analysis area (AECOM 2020a); and
- Results of surveys for whitebark pine (Tetra Tech 2020).

The following sources provided the basis for analysis of impacts relating to non-native plants in the analysis area:

- Geographic Information System information for locations of noxious weeds and non-native plants in the PNF and BNF (Forest Service 2019a).

4.10.1.1.2 INCOMPLETE OR UNAVAILABLE INFORMATION

- PVG and existing vegetation mapping was not available for the portion of the Salmon-Challis National Forest that is overlapped by the SGP.

4.10.2 Direct and Indirect Effects

The following analysis of effects associated with vegetation is considered in the overall context of the affected environment presented in Section 3.10, Vegetation: General Vegetation Communities, Botanical Resources, and Non-Native Plants. Elements of this context include:

- Botanical resources are protected under various regulations, as described in Section 3.10.2, Relevant Laws, Regulations, Policies, and Plans.
- Removal of vegetation can have impacts on other resources such as wildlife, as vegetation is a key component of ecosystems.

Under all action alternatives, the SGP would be required to adhere to Forest Service-required measures (**Table D-1** in **Appendix D**, Mitigation Measures); SGP design features and resource protection measures (**Table D-2** in **Appendix D**, Mitigation Measures); and expected

requirements relating to vegetation (expected as part of Endangered Species Act (ESA) Section 7 consultation regarding potential impacts to whitebark pine). Procedures described in the Reclamation and Closure Plan (Tetra Tech 2019) also must be followed.

For organizational purposes, analysis of general effects is presented in this section by the issues outlined above.

4.10.2.1 Types of Impacts Common to All Action Alternatives

This section describes types of impacts that are common to all action alternatives and provides a general description of types of impacts by each phase of the SGP: construction, operations, and closure and reclamation as one discussion. Further discussion of acres impacted under each action alternative are presented in Sections 4.10.2.2 through 4.10.2.5, Alternative 1 through Alternative 4.

4.10.2.1.1 ISSUE: IMPACTS TO FORESTED PVGs WITHIN FOREST SERVICE-MANAGED LAND

Direct and indirect impacts of forested PVGs are described in this subsection. Direct impacts are the ground disturbance and removal of vegetation that would occur immediately at the time of construction. Indirect impacts are those that would occur in the surrounding ecosystem as a result of soil disturbance and vegetation removal.

4.10.2.1.1.1 Direct Impacts

For the purpose of this analysis, direct impacts are those that would occur immediately at the time of SGP construction and within the footprint of construction impacts. Construction would require removal of all vegetation to the ground level for construction of SGP features (i.e., mine site and associated facilities and infrastructure, new road construction and road widening, and transmission line infrastructure). Construction and operation also would require clearing of tall trees within a 50-foot-wide corridor centered on the new and upgraded transmission lines. Vegetation removal and tree clearing would not maintain or move towards desired conditions for vegetation (i.e., species composition, size class, canopy closure, snags and coarse woody debris) as described in the Payette National Forest Land and Resource Management Plan (Payette Forest Plan) (Forest Service 2003) and the Boise National Forest Land and Resource Management Plan (Boise Forest Plan) (Forest Service 2010a). The loss of potential of meeting desired conditions would be a result of impacts including vegetation removal, snags and coarse woody debris removal, and changes to soil structure and composition in areas where soil is disturbed, and a result of several changes to understory plant communities where tall trees are cleared for safe operation of the transmission line.

Clearing of tall trees for the new transmission line corridor would include removing tall tree species and leaving behind species of low growing vegetation such as grasses and shrubs. Other trees within the 100-foot right-of-way and hazard trees that are at risk of obstructing the safe operation of the transmission line would either be trimmed or removed as necessary. Vegetation removal and tall tree clearing would occur during the construction and operation

phases in the disturbance footprint of SGP activities. Clearing of tall trees for operation of the transmission line would continue during the operations phase as needed. Impacts of tall tree clearing associated with existing transmission lines would continue in perpetuity, as the existing transmission lines are likely to be maintained by Idaho Power Company after SGP closure and reclamation.

Tall tree clearing would increase availability of soil nutrients, water, and sunlight and likely result in changes of understory species composition and cover in these areas over time (Abella and Springer 2014). Changes to understory vegetation community composition would have cascading effects on the value of these areas as habitat for wildlife and for the distribution of fuels in these areas that are difficult to predict within the SGP area. Heavy vehicle use in disturbed areas and in the area where transmission line tree clearing would occur would result in soil compaction that would negatively impact the ability of these areas to support vegetation.

SGP disturbance to vegetation would begin during construction and continue until decommissioning, where all disturbed areas (with the exception of new, permanent pit lakes, or portions of pit highwalls that are too steep for re-vegetating) would be revegetated during the closure and reclamation phase (Tetra Tech 2019). Revegetation would be done according to Payette or Boise Forest Plan Standards and under the supervision of a Forest Service botanist. However, since it is not possible to precisely determine when or if disturbed or cleared areas would regain the potential for meeting desired conditions, it is assumed that all direct impacts of SGP disturbance or tree clearing on vegetation communities would continue into the foreseeable future.

4.10.2.1.1.2 Indirect Impacts

For the purpose of this analysis, indirect impacts are those that would occur outside construction footprints and possibly at a later time than direct impacts. Impacts from vegetation removal and tall tree clearing would occur in vegetation communities within and adjacent to the SGP. These effects would occur during construction and continue through closure and reclamation. It is likely that any or all these impacts may result in changes to the surrounding ecosystem that persist in perpetuity and would result in these areas not being able to meet desired conditions for the foreseeable future.

Increased Potential for Dust Impacts on Plants

Movement of machinery and vehicles in the SGP area could create dust that could impact the metabolic processes of plants in nearby areas (Farmer 1993). Dispersal distance of dust depends on particle size, wind velocities, and wind direction (Everett 1980) as well as terrain, climate conditions, and vegetation community characteristics in the surrounding area (Etyemezian et al. 2004). As these variables would be unknown throughout the life of the SGP, the distance to which dust deposition may travel is not analyzed. A study by Waser et al. (2017) found that flowering plants approximately 3 to 7 feet from roadsides received substantially more dust and less pollen than those 131 to 164 feet from roadsides, and that most dust was deposited within 98 feet from the road. For the SGP, the potential for dust deposition is likely to

be higher in the immediate area of roads and other surface-disturbing actions, but would diminish with distance from these actions.

The impacts of increased dust propagation from SGP activities would be minimized with implementation of best management practices in the Fugitive Dust Control Plan associated with access roads in the SGP analysis area and haul roads at the mine site (Air Sciences Inc. 2018), which are:

1. Allow natural conditions such as wet weather (rain and snow) or inherent material moisture content to maintain dust control until the use of conventional dust control methods is necessary.
2. Limit the speed of the haul trucks and light vehicles.
3. Apply water and chemical dust suppressants on road surfaces.

However, even with strict adherence to dust suppression measures, it is likely that dust propagation would increase due to SGP construction and operations and that vegetation species within and adjacent to the SGP analysis area may be negatively impacted (i.e., metabolic inhibition and inhibition of pollination) as a result of increased dust deposition.

Dust impacts on plants would start during construction and continue through closure and reclamation. Some dust deposition also may occur in the post-closure period where monitoring-related travel on dirt roads would occur; however, this would be negligible. Effects of dust on individual plants would occur immediately at the time of dust propagating activities and is likely to continue throughout the lifetime of affected plants.

Increased Soil Erosion Effects on Plants

Removal of vegetation and disturbance of soil also increases the susceptibility of an area to soil erosion, which results in a variety of effects that tend to limit vegetation reestablishment and growth in an area (Jiao et al. 2009). The exact location and extent of these potential impacts are difficult to predict in relation to SGP facilities but would likely be more pronounced in areas downslope or downstream of facilities and surface-disturbing actions.

Alterations of Hydrology in Habitat for Hydrophilic and Wetland Plants

Road building such as that which would occur for the SGP has been shown to alter wetland hydrology at distances greater than 328 feet through such mechanisms as alteration of hydrologic fluxes, increased nutrient inputs, increased sedimentation rates, and facilitation of the spread of invasive exotic species (Jones 2003). These sorts of impacts could impact wetlands and fens in ways that that could affect the ability of these areas to function as habitat for wetland plants. The effects of hydrological alteration would be greater for species that are highly sensitive to changes in environmental conditions.

Increased Habitat Fragmentation Effects on Plant Populations

Fragmentation is the separation or isolation of similar types of habitat, either by natural events or human activities (Forest Service 2003). Habitat fragmentation due to construction and operations in previously undisturbed areas could have implications for genetics of plant populations, including decreases in genetic variation and gene flow between populations (Aguilar et al. 2008; Young et al. 1996). These effects would be greater for species with low population numbers that already have limited genetic variability.

Loss of Biodiversity and Loss or Disruption of Ecological Functions and Ecosystem Services

Construction and operations could reduce overall biodiversity in the analysis area if species are removed or reduced in numbers as a result of direct or indirect effects of the SGP. Overall reductions in vegetation cover and associated loss of biodiversity and may result in loss or disruption of ecological functions and ecosystem services (Sodhi and Ehrlich 2010), such as:

- Climate regulation (i.e., carbon sequestration)
- Pollution control
- Soil protection and formation (i.e., erosion control)
- Nutrient cycling
- Biodiversity protection
- Water regulation, purification, and supply
- Natural hazard regulation (i.e., the buffering of natural hazards such as flooding, drought, and landslides on the human and natural environment [Millennium Ecosystem Assessment 2005]).

4.10.2.1.2 ISSUE: IMPACTS TO NON-FORESTED VEGETATION COMMUNITIES WITHIN FOREST SERVICE-MANAGED LAND

As is the case for forested vegetation communities, the SGP would impact non-forested areas (i.e., those that are identified through PVG mapping as not being successional to forests), such as grasslands and shrublands. Vegetation removal and soil disturbance in these areas would not maintain or move towards desired conditions as defined by the Forest Plans into the foreseeable future for the same reasons as described in Section 4.10.2.1.1.2, Indirect Impacts.

4.10.2.1.3 ISSUE: IMPACTS TO VEGETATION COMMUNITIES OUTSIDE FOREST SERVICE-MANAGED LAND

Upgrades to the transmission line, and construction of the Stibnite Gold Logistics Facility would occur in areas outside the boundaries of Forest Service-managed lands where PVG mapping is not performed. Tall tree clearing would occur in an area within a 50-foot-wide corridor centered on the upgraded transmission lines in this area. Vegetation removal and soil disturbance in

these areas also would result in the same types of direct and indirect impacts as described in Section 4.10.2.1.1, Issue: Impacts to Forested PVGs within Forest Service-Managed Land.

4.10.2.1.4 ISSUE: IMPACTS ON KNOWN LOCATIONS OF WHITEBARK PINE

Construction would require removal of known whitebark pine individuals. Direct impacts to whitebark pine individuals would occur during the construction and operation phases. Removal of whitebark pine individuals, particularly mature, cone-bearing individuals, would reduce the population size of this species in the Forests and potentially have long-term consequences for this species in the analysis area. Loss of whitebark pine individuals would result in reductions in seed production and dispersal, which would result in reduced establishment of this species in and adjacent to the analysis area.

Transport of whitebark pine individuals that are cut down for SGP construction outside the SGP area also has the potential to spread conifer pathogens such as pathogenic bark beetle species (e.g., mountain pine beetle [*Dendroctonus ponderosae*]), which are a main cause of tree mortality in the coniferous forests of the western U.S. in recent years (Hinke et al. 2016). White pine blister rust disease, which is caused by the introduced pathogen *Cronartium ribicola*, is another conifer pathogen (Keane et al. 2017) that has the potential to spread if infected trees are transported outside the SGP area. These pathogens are a threat to whitebark pine in the PNF and BNF, and their potential spread as a result of SGP actions could detrimentally impact whitebark pine and other conifers within and outside the analysis area.

4.10.2.1.5 ISSUE: IMPACTS ON KNOWN LOCATIONS OF SENSITIVE AND FOREST WATCH SPECIES

Direct and indirect impacts could occur where the SGP is planned within 300 feet of special status plant occurrences. The degree of impacts depends on species habitat requirements and the type of SGP activity. This buffer distance was selected based on the U.S. Fish and Wildlife Service Utah Ecological Services Field Office recommendation that a 300-foot buffer distance be in place between surface disturbing activities and plant occurrences to protect special status plants from indirect impacts of surface-disturbing activities (U.S. Fish and Wildlife Service 2014).

The most likely impacts on known occurrences of sensitive and forest watch species include dust impacts on plants and their pollinators due to construction, road use, and changes to hydrology for habitats that support wetland species due to construction of new roads. Species-specific impacts are presented in the analysis sections for each alternative.

4.10.2.1.6 ISSUE: IMPACTS ON MODELED POTENTIAL HABITAT FOR SENSITIVE AND FOREST WATCH SPECIES

SGP-related removal of vegetation and soil disturbance would result in direct impacts to modeled special status plant potential habitat overlain by SGP components. Additionally, clearing of tall trees within the 50-foot-wide corridor centered on the new and upgraded transmission lines would alter understory vegetation and cause soil compaction to the degree that there may no longer be suitable habitat for any associated special status plant species. Any

loss of special status plant potential habitat in areas of vegetation removal or tall tree clearing would occur during SGP construction and would continue into perpetuity, as it is unlikely that potential habitat for these species could be recovered in the same location as soil disturbance would likely preclude conditions necessary for their germination and reestablishment.

Types of indirect impacts to habitat for special status plants would be the same as described for forested PVGs (Section 4.10.2.1.1.2, Indirect Impacts).

4.10.2.1.7 ISSUE: INCREASED POTENTIAL FOR NON-NATIVE PLANT ESTABLISHMENT AND SPREAD

Increases in soil nutrient bioavailability and sunlight associated with vegetation removal and soil disturbance is a driver of non-native species colonization and spread (Hobbs and Huenneke 1992). Soil disturbance and removal of overstory canopies increases the susceptibility of disturbed areas to colonization by non-native plant species in mountain environments (Averett et al. 2016). Negative effects of noxious weed and non-native plant species establishment and spread into natural vegetation communities could result in losses of biodiversity and habitat degradation, leading to losses or disruptions of ecological functioning of invaded areas.

Additionally, vehicle use on roads in the SGP area by construction machinery and other vehicles throughout the life of the SGP is likely to inadvertently transport non-native plants, thereby increasing the potential for non-native plant establishment and spread in areas adjacent to the SGP.

Non-native plant and noxious weed control measures would be employed for the SGP as described in the Weed Management Plan (Midas Gold Idaho, Inc. [Midas Gold] 2015). Specifically, the Weed Management Plan outlines measures for preventing and controlling noxious weed infestations. This plan also includes protocols for noxious weed surveys and reporting. This plan does not specifically discuss non-native plants that are not noxious weeds; however, Midas Gold also would be required to commit to Forest Service-required mitigation measures (**Appendix D**) that meet the intent of all applicable noxious weed and non-native species standards from the Payette and Boise Forest Plans (Forest Service 2003, 2010a). Revegetation that employs certified noxious-weed-free seed and other materials (e.g., mulch) as required under the Forest Plans would reduce the extent of disturbed soil and minimize the potential for colonization and spread of non-native plants, including noxious weeds.

Measures in the Sawtooth and Boise National Forests Invasive Species Project Final Environmental Impact Statement (EIS) and Record of Decision (Forest Service 2019b,c) and the South Fork Salmon River Subbasin Noxious and Invasive Weed Management Program EIS and Records of Decision (Forest Service 2007, 2010b,c) also would be followed.

With the implementation of these measures, potential for colonization and spread of noxious weeds and invasive species in disturbed areas would be reduced. However, even with strict adherence to noxious weed and non-native plant species control measures, some colonization

and spread of noxious weeds and non-native species in and adjacent to the SGP area is possible.

Potential for colonization and spread of non-native plants is dependent on a variety of factors that are not able to be predicted for the SGP area. It is generally assumed that potential spread of non-native plants would be of a greater intensity closer to mine site disturbance areas, roadways, and other areas where soil would be disturbed and would dissipate at greater distances from SGP components. Total direct disturbance acres are used as the metric for relative potential colonization and spread of non-native plants under each alternative.

4.10.2.2 Alternative 1

Under Alternative 1, SGP activities would cause direct and indirect effects to vegetation communities, botanical resources, and non-native plants during the construction, operation and maintenance, and closure and reclamation periods.

4.10.2.2.1 ISSUE: IMPACTS TO FORESTED VEGETATION COMMUNITIES WITHIN FOREST SERVICE-MANAGED LAND

Anticipated acreages of direct impacts of vegetation clearing to previously undisturbed forested PVGs within Forest Service-managed lands under Alternative 1 are presented in **Table 4.10-1**. These areas would not maintain or move towards desired conditions into the foreseeable future. Most impacts to PVGs under this alternative would be related to disturbance activities at the mine site and would occur in the Warm, Dry Subalpine Fir (PVG 7) and Persistent Lodgepole Pine (PVG 10) types, which are the most extensive PVGs in the analysis area.

Table 4.10-1 Acres of Disturbance to Previously Undisturbed Forested PVGs Under Alternative 1

PVG	Mine Site	Access Roads	Utilities	Tall Tree Clearing¹	Total
PVG 1 – Dry Ponderosa Pine/ Xeric Douglas-fir	-	2.1	0.6	0.1	2.7
PVG 2 – Warm, Dry Douglas- fir/ Moist Ponderosa Pine	0.2	56.0	52.4	57.1	165.8
PVG 3 – Cool, Moist Douglas-fir	-	1.4	1.7	3.4	6.5
PVG 4 – Cool, Dry Douglas- fir	2.7	35.9	30.4	38.9	107.9
PVG 5 – Dry Grand Fir	-	2.4	21.0	24.6	48.1
PVG 6 – Moist Grand Fir	-	1.1	13.5	14.8	29.4
PVG 7 – Warm, Dry Subalpine Fir	624.7	143.6	26.6	31.8	826.6
PVG 8 – Cool Moist Subalpine Fir	-	-	-	-	-
PVG 9 – Hydric Subalpine Fir	3.7	14.6	2.2	4.5	25.0

4 ENVIRONMENTAL CONSEQUENCES
 4.10 VEGETATION

PVG	Mine Site	Access Roads	Utilities	Tall Tree Clearing¹	Total
PVG 10 – Persistent Lodgepole Pine	354.9	204.5	56.8	59.2	675.6
PVG 11 – High Elevation Subalpine Fir (with Whitebark Pine)	0.3	17.3	5.3	7.0	29.9
TOTALS²	986.6	478.9	210.6	241.4	1,917.5

Table Source: AECOM 2020a; Acres of direct impacts were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017), omitting areas of previous mine site disturbance (Midas Gold 2019)

Table Notes:

- 1 Tall tree clearing would only be performed in areas with tree species, and as such, tall tree clearing may not occur to the full extent of acreages reported in this column.
- 2 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.2.2 ISSUE: IMPACTS TO NON-FORESTED VEGETATION COMMUNITIES WITHIN FOREST SERVICE-MANAGED LAND

Anticipated acreages of direct impacts of vegetation clearing to previously undisturbed areas identified as not successional to forested PVGs within Forest Service-managed lands under Alternative 1 are presented in **Table 4.10-2**. These areas would not maintain or move towards desired conditions into the foreseeable future. Most impacts to these areas would be related to disturbance activities at the mine site and would occur in the Douglas-fir and Lodgepole Pine existing vegetation types.

Table 4.10-2 Acres of Disturbance to Areas Identified as not Successional to Forested PVGs Under Alternative 1

Existing Vegetation Type¹	Mine Site	Access Roads	Utilities	Tall Tree Clearing²	Offsite Facilities	Total
Aspen	-	0.1	-	-	-	0.1
Burned Forest Shrublands	-	1.8	0.8	1.9	-	4.5
Burned Herblands	3.4	3.3	1.8	3.3	-	11.8
Burned Sparse Vegetation	0.3	1.9	0.0	0.0	-	2.3
Developed	0.4	0.2	-	-	-	0.6
Douglas-fir	8.7	11.0	2.2	4.2	-	26.1
Douglas-fir/Lodgepole Pine	7.7	-	-	-	-	7.7
Douglas-fir/Ponderosa Pine	-	1.6	0.2	0.3	-	2.1
Engelmann's Spruce	-	-	-	0.3	-	0.3
Forblands	-	5.0	0.1	1.0	-	6.1

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Existing Vegetation Type¹	Mine Site	Access Roads	Utilities	Tall Tree Clearing²	Offsite Facilities	Total
Forest Shrublands	-	1.2	0.9	1.2	-	3.2
Grasslands	2.9	0.3	0.1	0.4	-	3.6
Lodgepole Pine	7.7	9.3	1.4	2.2	3.4	24.1
Mountain Big Sagebrush	-	0.2	-	-	-	0.2
Ponderosa Pine	-	0.3	4.1	1.2	-	5.6
Riparian Herblands	1.9	0.5	-	-	-	2.4
Riparian Shrublands/ Deciduous Forests	1.6	1.1	0.3	2.2	<0.1	5.2
Sparse Vegetation	1.9	0.5	-	0.0	-	2.4
Subalpine Fir	-	3.0	0.1	0.5	-	3.6
Water	-	0.4	-	0.1	-	0.5
Whitebark Pine	-	0.1	0.1	-	-	0.2
TOTALS³	36.6	41.7	12.0	18.9	3.5	112.6

Table Source: AECOM 2020a; Acres of direct impacts were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017) and VCMQ mapping (Forest Service 2016), omitting areas of previous mine site disturbance (Midas Gold 2019)

Table Notes:

- 1 PVG mapping and existing vegetation mapping are performed using different processes and different objectives. As such, forest existing vegetation types may occur within areas identified as not successional to forests in PVG mapping, and alternatively, non-forest existing vegetation types may occur in areas identified as successional to forests in PVG mapping.
- 2 Tall tree clearing would only be performed in areas with tree species, and as such, tall tree clearing may not occur to the full extent of acreages reported in this column.
- 3 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.2.3 ISSUE: IMPACTS TO VEGETATION COMMUNITIES OUTSIDE FOREST SERVICE-MANAGED LAND

Anticipated acreages of vegetation clearing in vegetation communities outside Forest Service-managed lands under Alternative 1 are presented in **Table 4.10-3**. In addition to the direct impact of vegetation clearing, these areas would experience the types of indirect impacts described in Section 4.10.2.1.1.2, Indirect Impacts.

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Table 4.10-3 Acres of Disturbance to Previously Undisturbed Vegetated Acres Outside Forests Under Alternative 1

PVG	Utilities	Tall Tree Clearing¹	Offsite Facilities	Total
<i>Artemisia tridentata</i> ssp. <i>vaseyana</i> Shrubland Alliance	14.7	15.5	0.4	30.7
Columbia Plateau Low Sagebrush Steppe	0.6	0.1	-	0.8
Dry-mesic Montane Douglas-fir Forest	2.5	3.3	-	5.8
Inter-Mountain Basins Big Sagebrush Shrubland	<0.1	<0.1	-	<0.1
Inter-Mountain Basins Big Sagebrush Steppe	1.0	1.3	-	2.3
Inter-Mountain Basins Montane Sagebrush Steppe	1.7	2.0	-	3.7
Inter-Mountain Basins Sparsely Vegetated Systems	0.8	0.7	-	1.5
Introduced Upland Vegetation-Perennial Grassland and Forbland	4.6	5.2	4.7	14.5
Mesic Montane Douglas-fir Forest	0.2	0.5	0.7	1.4
Middle Rocky Mountain Montane Douglas-fir Forest and Woodland	1.6	1.6	-	3.2
Northern Rocky Mountain Conifer Swamp	<0.1	-	-	<0.1
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest	11.3	9.2	2.0	22.5
Northern Rocky Mountain Lower Montane-Foothill-Valley Grassland	10.4	13.5	3.3	27.1
Northern Rocky Mountain Montane-Foothill Deciduous Shrubland	1.0	0.9	-	1.9
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	4.9	6.0	0.4	11.3
Northern Rocky Mountain Subalpine Deciduous Shrubland	2.9	2.5	-	5.4
Northern Rocky Mountain Subalpine-Upper Montane Grassland	0.7	0.8	-	1.5
Open Water	1.5	3.4	-	5.0
Rocky Mountain Alpine/Montane Sparsely Vegetated Systems	-	-	0.1	0.1
Rocky Mountain Lodgepole Pine Forest	1.8	2.5	2.0	6.3
Rocky Mountain Montane Riparian Forest and Woodland	4.9	5.7	-	10.6
Rocky Mountain Poor-Site Lodgepole Pine Forest	0.9	1.0	-	1.9
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0.4	0.6	0.4	1.4
Rocky Mountain Subalpine Mesic-Wet Spruce-Fir Forest and Woodland	0.1	0.1	-	0.1
Rocky Mountain Subalpine/Upper Montane Riparian Forest and Woodland	1.7	2.0	2.4	6.2

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

PVG	Utilities	Tall Tree Clearing¹	Offsite Facilities	Total
Rocky Mountain Subalpine-Montane Mesic Meadow	6.4	5.6	6.4	18.4
Rocky Mountain Wetland-Herbaceous	2.3	3.7	-	6.1
Subalpine Douglas-fir Forest	1.7	2.6	-	4.3
Xeric Montane Douglas-fir Forest	<0.1	<0.1	-	<0.1
TOTALS²	80.6	90.4	22.9	193.9

Table Source: AECOM 2020b; Acres of direct impacts were calculated by overlaying SGP components outside Forest Service boundaries with LANDFIRE data (LANDFIRE 2009)

Table Notes:

- 1 Tall tree clearing would only be performed in areas with tree species, and as such, tall tree clearing may not occur to the full extent of acreages reported in this column.
- 2 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.2.4 ISSUE: IMPACTS TO WHITEBARK PINE

Alternative 1 would impact approximately 257.8 acres of occupied whitebark pine habitat and would remove an estimated 1,027 individual trees, 50 of which would be mature, cone-bearing individuals.

Detailed calculations of impacts to whitebark pine occupied habitat and individual trees are reported in **Appendix H-6**, Whitebark Pine Impacts.

The Forest Service has preliminarily determined that Alternative 1 would impact whitebark pine, but will not jeopardize the continued existence of this species.

4.10.2.2.5 ISSUE: IMPACTS TO KNOWN LOCATIONS OF SENSITIVE AND FOREST WATCH SPECIES

Construction of Alternative 1 would impact several known occurrences of sensitive and forest watch plant species. Impacts to special status plants that would occur under this alternative are described in the following subsections.

4.10.2.2.5.1 Bent-flowered Milkvetch (*Astragalus vexilliflexus* var. *vexilliflexus*)

Several subpopulations of a single occurrence of bent-flowered milkvetch, a PNF forest watch species, occur to the east of the proposed mine site (IFWIS 2017; Mancuso 2016). One of the bent-flowered milkvetch subpopulations (the Cinnabar Peak subpopulation) extends from approximately one-quarter mile to approximately 300 feet upslope from the West End Development Rock Storage Facility (DRSF) and West End Creek diversion (Mancuso 2016).

Alternative 1 could impact the Cinnabar Peak subpopulation due to its proximity to the West End DRSF and West End Creek diversion. The most likely impact of the SGP on this subpopulation would be dust associated with construction of the West End DRSF and West End Creek diversion, which could travel upslope and impact this subpopulation or its pollinators. Impacts of dust on the Cinnabar Peak subpopulation could range from mild metabolic inhibition or inhibition of pollination to mortality of individuals; dust also could inhibit pollination success. These impacts may result in reduced ability of this subpopulation to serve as a seed source for future conservation efforts for this species.

The area of potential exploratory drilling (**Figure 2.3-9**) overlaps with subpopulations of this species. Exploratory drilling within this area has the potential to impact this species directly through removal or crushing and/or indirectly via dust deposition or impacts to pollinators.

Alternative 1 may indirectly impact bent-flowered milkvetch individuals and habitat but would not likely contribute to a loss of viability of the species within the planning area (i.e., PNF-administered lands).

4.10.2.2.5.2 Least Moonwort (*Botrychium simplex*)

Two subpopulations of a single occurrence of least moonwort, a Forest Service sensitive species on the PNF and a forest watch species on the BNF, are located in swales adjacent to Johnson Creek Road (County Road [CR] 10-413) (IFWIS 2017) in the BNF. Increased vehicle travel on this road associated with SGP activities would increase dust impacts that could impact these subpopulations and the swale habitat they occur in as compared to current conditions. Maintenance work on this road such as ditch and culvert repair and adding gravel to the road surface also could increase dust impacts on these subpopulations and swales. These subpopulations were not observed by Forest Service surveyors in the most recent survey year (2005; IFWIS 2017); however, if they still exist, increased dust deposition could result in impacts ranging from metabolic inhibition or mortality of individuals.

Alternative 1 may indirectly impact least moonwort individuals and habitat but would not likely contribute to a loss of viability of the species within the planning area (i.e., BNF-administered lands).

4.10.2.2.5.3 Blandow's Helodium (*Helodium blandowii*)

A single occurrence of Blandow's helodium, a forest watch species on both the PNF and BNF, is found in the analysis area near Trapper Creek within approximately 100 feet from where the proposed Burntlog Route would cross the Trapper Flat wetland in the BNF (IFWIS 2017). Construction of the road in this area could impact hydrology of the wetland that this species inhabits, which could result in conditions that would not support this occurrence.

The SGP also could impact this occurrence due to dust associated with construction of the road and vehicle travel in this area. Increased dust deposition could result in impacts ranging from metabolic inhibition or mortality of individuals.

Alternative 1 may indirectly impact Blandow's helodium individuals but would not likely contribute to loss of viability of the species within the planning area (i.e., BNF-administered lands).

4.10.2.2.5.4 Sweetgrass (*Hierochloe odorata*)

Two subpopulations of a single occurrence of sweetgrass, a forest watch species on the BNF, are located in wetlands near Trapper Creek, the closest being approximately 780 feet and the farthest being 1,000 feet from new construction for Burntlog Route in the BNF (IFWIS 2017). This species is in an area that is hydrologically connected to wetlands that would be impacted by construction of Burntlog Route, and therefore it is considered to be within the analysis area for botanical resources. Construction of Burntlog Route through the wetlands in this area could impact hydrology of the wetland that this species inhabits, which could result in conditions that would not support these subpopulations.

Alternative 1 may indirectly impact sweetgrass individuals and habitat but would not likely contribute to loss of viability of the species within the planning area (i.e., BNF-administered lands).

4.10.2.2.5.5 Sacajawea's Bitterroot (*Lewisia sacajawean*)

One occurrence of Sacajawea's bitterroot, a Forest Service sensitive species on both the PNF and BNF, occurs approximately 300 feet above Warm Lake Road (CR 10-579) and the existing transmission line corridor near the intersection of Warm Lake Road with Curtis Creek Road (IFWIS 2017) in the BNF. This occurrence is on a hillside above a portion of Warm Lake Road, and the polygon for this occurrence overlaps a transmission line access road that would be used by Idaho Power Company during transmission line reconstruction and SGP operation. Spur road construction and use of this dirt road during transmission line reconstruction and SGP operation would create dust that could negatively impact this occurrence of Sacajawea's bitterroot. Impacts of dust on this species could range from mild metabolic inhibition to mortality of individuals.

Alternative 1 may indirectly impact Sacajawea's bitterroot individuals and habitat but would not likely contribute to a trend towards ESA listing or loss of viability of the species within the planning area (i.e., BNF-administered lands).

4.10.2.2.5.6 Rannoch-rush (*Scheuchzeria palustris*)

One occurrence of Rannoch-rush, a forest watch species on the BNF, is located in a wetland in the Mud Lake area in the BNF (Idaho Department of Fish and Game 2004; IFWIS 2017). This occurrence is within 300 feet of an existing portion of Burnt Log Road (National Forest System Road [FR] 447). This occurrence is likely to be impacted by dust associated with road widening and vehicle travel on Burntlog Route in this location. This occurrence also could be subject to other potential indirect effects described in Section 4.10.2.1.1.2, Indirect Impacts. The most likely impact of the SGP on this occurrence is dust associated with construction of the road and

vehicle travel in this area. Increased dust deposition could result in impacts ranging from metabolic inhibition or mortality of individuals.

Alternative 1 may indirectly impact Rannoch-rush individuals and habitat but would not likely contribute to loss of viability to the species within the planning area (i.e., BNF-administered lands).

4.10.2.2.6 ISSUE: IMPACTS TO MODELED POTENTIAL HABITAT FOR SENSITIVE AND FOREST WATCH SPECIES

Table 4.10-4 presents acres of modeled potential habitat for special status plant species that would be directly impacted under Alternative 1 by SGP component. Direct removal of potential habitat would occur in these areas, as well as the types of impacts described in Section 4.10.2.1.1.2, Indirect Impacts.

As under all action alternatives, impacts to habitats for sensitive and forest watch species would predominantly occur at the mine site, with lesser extents of impacts occurring along access roads and transmission lines, including in areas of tall tree clearing.

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Table 4.10-4 Acres of Direct Impacts to Modeled Special Status Plant Potential Habitat under Alternative 1

Scientific Name	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Off-site Facilities	Total
<i>Allotropa virgata</i> Candystick	74.9	10.6	8.7	5.5	-	99.7
<i>Astragalus vexilliflexus</i> var. <i>vexilliflexus</i> Bent-flowered milkvetch	6.7	2.3	3.4	2.1	-	14.5
<i>Botrychium lineare</i> and <i>B. simplex</i> Slender moonwort and least moonwort	175.7	38.6	26.5	26.7	<0.1	267.5
<i>Botrychium crenulatum</i> Scalloped moonwort	1.1	3.4	3.2	2.7	-	10.4
<i>Bryum calobryoides</i> Beautiful bryum	-	10.2	6.0	5.0	-	21.1
<i>Buxbaumia viridis</i> Green bug moss	1.4	9.2	11.8	8.8	-	31.2
<i>Calamagrostis tweedyi</i> Cascade reedgrass	651.2	215.8	83.1	49.1	-	999.2
<i>Carex livida</i> Livid sedge	152.5	36.2	20.1	21.0	<0.1	229.8
<i>Carex stramineiformis</i> Shasta sedge	2.7	53.9	13.9	9.6	-	80.0
<i>Cicuta bulbifera</i> Bulblet-bearing water hemlock	7.3	1.1	2.3	1.9	-	12.5
<i>Douglasia idahoensis</i> Idaho douglasia	0.4	14.6	4.5	2.5	-	22.0
<i>Draba incerta</i> Yellowstone draba	9.2	23.3	12.2	7.8	-	52.5
<i>Drosera intermedia</i> Spoonleaf sundew	152.5	36.2	20.1	21.0	<0.1	229.8
<i>Epilobium palustre</i> Swamp willow weed	2.3	2.1	6.5	6.8	-	17.7
<i>Epipactis gigantea</i> Giant helleborine orchid	-	12.4	7.6	6.9	-	26.9

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Scientific Name	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Off-site Facilities	Total
<i>Helodium blandowii</i> Blandow's helodium	123.5	11.4	17.7	18.6	<0.1	171.3
<i>Hierochloe odorata</i> Sweetgrass	76.3	18.6	35.1	19.1	<0.1	149.1
<i>Lewisia sacajawea</i> Sacajawea's bitterroot	283.7	172.7	45.2	27.0	-	528.6
<i>Mimulus clivicola</i> Bank monkeyflower	-	9.9	20.8	19.0	-	49.7
<i>Penstemon latus</i> Tufted penstemon	21.9	5.8	15.7	12.1	-	55.6
<i>Polystichum kruckebergii</i> Kruckeberg's sword-fern	126.7	43.1	28.8	13.4	-	212.1
<i>Rhynchospora alba</i> White beaksedge	22.4	5.5	14.8	15.1	-	57.8
<i>Sanicula graveolens</i> Sierra sanicle	180.1	54.3	10.2	3.5	-	248.1
<i>Saxifraga tolmiei</i> var. <i>ledifolia</i> Tolmie's saxifrage	68.8	47.7	11.3	7.4	-	135.2
<i>Scheuchzeria palustris</i> Rannoch-rush	152.5	36.2	20.1	21.0	<0.1	229.8
<i>Sedum borschii</i> and <i>S. leibergii</i> Borch's stonecrop and Leiberg stonecrop	34.7	4.7	0.2	0.1	-	39.7
<i>Triantha occidentalis</i> ssp. <i>brevistyla</i> Short-style tofieldia	125.3	24.5	15.4	16.3	-	181.5

Table Source: Acres of direct impacts to modeled habitat were calculated by overlaying SGP components with modeled potential habitat reported in AECOM 2020a

Table Notes:

1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided. No total acreages for SGP features are presented in this table as modeled potential habitat for many species overlap that of other species.

4.10.2.2.7 ISSUE: INCREASED POTENTIAL FOR NON-NATIVE PLANT ESTABLISHMENT AND SPREAD

Anticipated acreages of vegetation clearing to previously undisturbed vegetation communities both inside and outside Forest Service boundaries under Alternative 1 are presented in **Table 4.10-5**. Increased establishment and spread of non-native plants is possible in these areas.

Table 4.10-5 Total Acres of Disturbance to Vegetation Communities due to SGP Components under Alternative 1

Vegetation	Mine Site	Access Roads	Utilities	Tall Tree Clearing¹	Offsite Facilities	Total²
Forest PVGs (1-11) within Forest Service boundaries	986.6	478.9	210.6	241.4	-	1,917.5
Non-forest Areas within Forest Service boundaries	36.6	41.7	12.0	18.9	3.5	112.6
LANDFIRE vegetation outside Forest Service boundaries	-	-	80.6	90.4	22.9	193.9
TOTALS²	1,023.2	520.6	303.2	350.7	26.4	2,224.0

Table Source: AECOM 2020b; Acres of direct impacts to forest PVGs and non-forest areas within Forest Service boundaries were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017) and VCMQ mapping (Forest Service 2016), omitting areas of previous mine site disturbance (Midas Gold 2019). Acres of direct impacts to LANDFIRE vegetation outside Forest Service boundaries were calculated by overlaying SGP components outside Forest Service boundaries with LANDFIRE data (LANDFIRE 2009)

Table Notes:

- 1 Tall tree clearing would only be performed in areas with tree species, and as such, tall tree clearing may not occur to the full extent of acreages reported in this column.
- 2 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.3 Alternative 2

Under Alternative 2, the 5.3-mile-long Riordan Creek segment of the Burntlog Route would route it to the southern side of the Riordan Creek drainage and cross Riordan Creek north of Black Lake; the Burntlog Maintenance Facility would be constructed in a borrow source site approximately 4.4 miles east of the junction of Johnson Creek Road (CR 10-413) and Warm Lake Road (CR 10-579); and two sections of the existing transmission line would be relocated. Additionally, the new transmission line would be permanently retained to provide power to the Centralized Water Treatment Plant at the mine site as part of the post-closure Water Quality Management Plan under Alternative 2, and as such, associated tall tree clearing would continue in perpetuity.

4.10.2.3.1 ISSUE: IMPACTS TO FORESTED PVGS WITHIN FOREST SERVICE-MANAGED LAND

Anticipated acreages of disturbance associated with all SGP features in mapped PVGs under Alternative 2 are presented in **Table 4.10-6**. These areas would not maintain or move towards desired conditions into the foreseeable future. As under all action alternatives, most impacts to PVGs under this alternative would be related to disturbance activities at the mine site and would occur in the Warm, Dry Subalpine Fir (PVG 7) and Persistent Lodgepole Pine (PVG 10) types.

Table 4.10-6 Acres of Disturbance to Previously Undisturbed Forested PVGs Under Alternative 2

PVG	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Offsite Facilities	Total¹
PVG 1 – Dry Ponderosa Pine/ Xeric Douglas-fir	-	2.1	0.6	0.1	-	2.7
PVG 2 – Warm, Dry Douglas-fir/ Moist Ponderosa Pine	0.2	56.0	53.9	60.3	-	170.5
PVG 3 – Cool, Moist Douglas-fir	-	1.4	1.7	3.4	-	6.5
PVG 4 – Cool, Dry Douglas-fir	5.9	35.9	31.5	41.0	-	114.3
PVG 5 – Dry Grand Fir	-	2.4	22.5	26.6	-	51.5
PVG 6 – Moist Grand Fir	-	1.1	14.6	16.5	-	32.2
PVG 7 – Warm, Dry Subalpine Fir	592.9	128.8	26.6	31.8	1.6	781.7
PVG 8 – Cool Moist Subalpine Fir	-	-	-	-	-	-
PVG 9 – Hydric Subalpine Fir	3.3	14.6	2.2	4.5	-	24.6
PVG 10 – Persistent Lodgepole Pine	322.7	197.5	56.8	59.2	3.0	639.3
PVG 11 – High Elevation Subalpine Fir (with Whitebark Pine)	-	17.1	5.3	7.0	-	29.4
TOTALS¹	925.0	456.9	215.7	250.5	4.6	1,852.7

Table Source: AECOM 2020b; Acres of direct impacts to modeled habitat were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017), omitting areas of previous mine site disturbance (Midas Gold 2019)

Table Notes:

1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.3.2 ISSUE: IMPACTS TO NON-FORESTED VEGETATION COMMUNITIES WITHIN FOREST SERVICE-MANAGED LAND

Anticipated acreages of direct impacts of vegetation clearing to previously undisturbed areas identified as not successional to forested PVGs within Forest Service-managed lands under Alternative 2 are presented in **Table 4.10-7**. These areas would not maintain or move towards desired conditions into the foreseeable future. As under all action alternatives, most impacts to these areas would be related to disturbance activities at the mine site and would occur in the Douglas-fir and Lodgepole Pine existing vegetation types.

Table 4.10-7 Acres of Disturbance to Previously Undisturbed Areas Identified as not Successional to Forested PVGs within Forest Service-managed lands Under Alternative 2

Existing Vegetation Type¹	Mine Site	Access Roads	Utilities	Tall Tree Clearing²	Total³
Aspen	-	0.1	-	-	0.1
Burned Forest Shrublands	-	1.8	0.8	1.9	4.5
Burned Herblands	3.4	3.1	1.8	3.3	11.6
Burned Sparse Vegetation	0.3	3.1	0.0	0.0	3.5
Developed	0.4	0.2	0.2	0.2	1.0
Douglas-fir	8.7	11.0	2.2	4.2	26.2
Douglas-fir/Lodgepole Pine	7.7	-	-	-	7.7
Douglas-fir/Ponderosa Pine	-	1.6	0.2	0.3	2.1
Engelmann's Spruce	-	-	-	0.3	0.3
Forblands	-	5.0	0.1	1.0	6.1
Forest Shrublands	-	1.2	0.9	1.2	3.2
Grasslands	2.9	0.3	0.4	0.7	4.3
Lodgepole Pine	7.7	12.7	1.4	2.2	24.1
Mountain Big Sagebrush	-	0.2	-	-	0.2
Ponderosa Pine	-	0.3	4.4	1.4	6.1
Riparian Herblands	1.9	0.5	0.2	0.7	3.2
Riparian Shrublands/ Deciduous Forests	1.6	1.1	0.3	2.2	5.2
Sparse Vegetation	1.9	0.5	-	0.0	2.4

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Existing Vegetation Type¹	Mine Site	Access Roads	Utilities	Tall Tree Clearing²	Total³
Subalpine Fir	-	2.9	0.1	0.5	3.6
Water	-	0.4	-	0.1	0.5
Whitebark Pine	-	0.2	0.1	-	0.3
TOTALS³	36.6	46.2	13.0	20.3	116.2

Table Source: AECOM 2020b; Acres of direct impacts were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017) and VCMQ mapping (Forest Service 2016), omitting areas of previous mine site disturbance (Midas Gold 2019)

Table Notes:

- 1 PVG mapping and existing vegetation mapping are performed using different processes and different objectives. As such, forest existing vegetation types commonly occur within areas identified as not successional to forests in PVG mapping, and alternatively, non-forest existing vegetation types commonly occur in areas identified as successional to forests in PVG mapping.
- 2 Tall tree clearing would only be performed in areas with tree species, and as such, the actual extent of impacts due to tall tree clearing may not occur to the full acres reported in this column.
- 3 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.3.3 ISSUE: IMPACTS TO VEGETATION COMMUNITIES OUTSIDE FOREST SERVICE-MANAGED LAND

Anticipated acreages of direct impacts of vegetation clearing in vegetation communities outside Forest Service-managed lands under Alternative 2 are presented in **Table 4.10-8**. These areas also would experience the types of impacts described in Section 4.10.2.1.1.2, Indirect Impacts.

Table 4.10-8 Acres of Disturbance to Previously Undisturbed Vegetated Acres Outside Forests Under Alternative 2

PVG	Utilities	Tall Tree Clearing¹	Offsite Facilities	Total²
<i>Artemisia tridentata</i> ssp. <i>vaseyana</i> Shrubland Alliance	11.0	9.4	0.4	20.9
Columbia Plateau Low Sagebrush Steppe	0.4	0.1	-	0.5
Dry-mesic Montane Douglas-fir Forest	2.5	2.6	-	5.0
Inter-Mountain Basins Big Sagebrush Shrubland	<0.1	<0.1	-	<0.1
Inter-Mountain Basins Big Sagebrush Steppe	0.7	1.3	-	2.0
Inter-Mountain Basins Montane Sagebrush Steppe	1.6	1.4	-	3.0
Inter-Mountain Basins Sparsely Vegetated Systems	0.7	0.4	-	1.2
Introduced Upland Vegetation-Perennial Grassland and Forbland	4.5	4.4	4.7	13.7
Mesic Montane Douglas-fir Forest	0.2	0.5	0.7	1.4
Middle Rocky Mountain Montane Douglas-fir Forest and Woodland	1.1	1.4	-	2.5
Northern Rocky Mountain Conifer Swamp	<0.1	-	-	<0.1

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

PVG	Utilities	Tall Tree Clearing¹	Offsite Facilities	Total²
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest	10.7	7.5	2.0	20.2
Northern Rocky Mountain Lower Montane-Foothill-Valley Grassland	8.9	10.7	3.3	22.9
Northern Rocky Mountain Montane-Foothill Deciduous Shrubland	0.9	0.9	-	1.9
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	4.8	5.8	0.4	11.0
Northern Rocky Mountain Subalpine Deciduous Shrubland	2.6	2.8	-	5.4
Northern Rocky Mountain Subalpine-Upper Montane Grassland	0.4	0.4	-	0.8
Open Water	1.5	3.3	-	4.8
Rocky Mountain Alpine/Montane Sparsely Vegetated Systems	-	-	0.1	0.1
Rocky Mountain Lodgepole Pine Forest	1.9	2.5	-	4.4
Rocky Mountain Montane Riparian Forest and Woodland	4.9	5.5	-	10.4
Rocky Mountain Poor-Site Lodgepole Pine Forest	-	0.3	2.0	2.4
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0.4	0.6	0.4	1.4
Rocky Mountain Subalpine Mesic-Wet Spruce-Fir Forest and Woodland	0.1	0.1	-	0.1
Rocky Mountain Subalpine/Upper Montane Riparian Forest and Woodland	1.7	2.0	2.4	6.2
Rocky Mountain Subalpine-Montane Mesic Meadow	5.1	5.4	6.4	16.9
Rocky Mountain Wetland-Herbaceous	2.9	4.7	-	7.7
Subalpine Douglas-fir Forest	1.6	2.5	-	4.1
Xeric Montane Douglas-fir Forest	<0.1	<0.1	-	<0.1
TOTALS²	71.3	76.7	22.9	170.8

Table Source: AECOM 2020b; Acres of direct impacts to modeled habitat were calculated by overlaying SGP components with LANDFIRE data (LANDFIRE 2009)

Table Notes:

- 1 Tall tree clearing would only be performed in areas with tree species, and as such, the actual extent of impacts due to tall tree clearing may not occur to the full acres reported in this column.
- 2 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.3.4 ISSUE: IMPACTS TO WHITEBARK PINE

Alternative 2 would impact approximately 243.2 acres of occupied whitebark pine habitat and would remove an estimated 997 individual trees, 15 of which would be mature, cone-bearing individuals (**Appendix H-6**).

The Forest Service has preliminarily determined that Alternative 2 would impact whitebark pine, but will not jeopardize the continued existence of this species.

4.10.2.3.5 ISSUE: IMPACTS ON KNOWN LOCATIONS OF SENSITIVE AND FOREST WATCH SPECIES

Alternative 2 would indirectly impact the same known occurrences of special status plants as Alternative 1 (Section 4.10.2.2.5, Issue: Impacts on Known Locations of Sensitive and Forest Watch Species under Alternative 1).

4.10.2.3.6 ISSUE- IMPACTS TO MODELED POTENTIAL HABITAT FOR SENSITIVE AND FOREST WATCH SPECIES

Tables 4.10-9 presents acres of modeled potential habitat for special status plant species that would be directly impacted under Alternative 2 by SGP component. Direct removal of potential habitat would occur in these areas, as well as the same types of impacts described for PVGs in Section 4.10.2.1.1.2, Indirect Impacts.

Impacts to habitats for sensitive and forest watch species would predominantly occur at the mine site, with lesser extents of impacts occurring along access roads and transmission lines, including in areas of tall tree clearing.

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Table 4.10-9 Acres of Direct Impacts to Modeled Special Status Plant Potential Habitat under Alternative 2

Scientific Name	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Off-site Facilities	Total
<i>Allotropa virgata</i> Candystick	77.1	10.6	8.7	5.5	-	101.9
<i>Astragalus vexilliflexus</i> var. <i>vexilliflexus</i> Bent-flowered milkvetch	6.7	2.3	3.4	2.1	-	14.5
<i>Botrychium lineare</i> and <i>B. simplex</i> Slender moonwort and least moonwort	177.0	29.9	27.9	28.1	-	262.9
<i>Botrychium crenulatum</i> Scalloped moonwort	1.1	3.2	3.2	2.7	-	10.2
<i>Bryum calobryoides</i> Beautiful bryum	-	10.2	6.0	5.0	-	21.1
<i>Buxbaumia viridis</i> Green bug moss	1.5	9.2	11.9	8.8	-	31.3
<i>Calamagrostis tweedyi</i> Cascade reedgrass	609.0	190.1	83.1	49.1	0.8	932.0
<i>Carex livida</i> Livid sedge	153.6	27.5	21.5	22.3	-	224.9
<i>Carex stramineiformis</i> Shasta sedge	-	69.4	13.9	9.6	-	92.8
<i>Cicuta bulbifera</i> Bulblet-bearing water hemlock	7.3	1.1	2.4	2.0	-	12.7
<i>Douglasia idahoensis</i> Idaho douglasia	0.4	13.1	4.5	2.5	-	20.5
<i>Draba incerta</i> Yellowstone draba	9.2	21.6	12.2	7.8	-	50.7
<i>Drosera intermedia</i> Spoonleaf sundew	153.6	27.5	21.5	22.3	-	224.9
<i>Epilobium palustre</i> Swamp willow weed	2.3	2.1	6.5	6.8	-	17.7

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Scientific Name	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Off-site Facilities	Total
<i>Epipactis gigantea</i> Giant helleborine orchid	-	12.4	7.6	6.9	-	26.9
<i>Helodium blandowii</i> Blandow's helodium	124.6	10.9	19.2	20.0	-	174.6
<i>Hierochloe odorata</i> Sweetgrass	76.3	18.7	35.8	19.9	-	150.6
<i>Lewisia sacajaweana</i> Sacajawea's bitterroot	287.7	168.1	45.2	27.0	-	528.1
<i>Mimulus clivicola</i> Bank monkeyflower	-	9.9	21.9	19.9	-	51.6
<i>Penstemon laxis</i> Tufted penstemon	22.9	5.8	15.7	12.1	-	56.6
<i>Polystichum kruckebergii</i> Kruckeberg's sword-fern	122.5	41.5	28.8	13.4	0.3	206.5
<i>Rhynchospora alba</i> White beaksedge	23.4	5.5	16.2	16.4	-	61.6
<i>Sanicula graveolens</i> Sierra sanicle	182.2	44.0	10.2	3.5	-	239.9
<i>Saxifraga tolmiei</i> var. <i>ledifolia</i> Tolmie's saxifrage	64.2	44.6	11.3	7.4	0.3	127.9
<i>Scheuchzeria palustris</i> Rannoch-rush	153.6	27.5	21.5	22.3	-	224.9
<i>Sedum borschii</i> and <i>S. leibergii</i> Borch's stonecrop and Leiberg stonecrop	30.9	4.7	0.2	0.1	-	35.9
<i>Triantha occidentalis</i> ssp. <i>Brevistyla</i> Short-style tofieldia	125.6	15.9	15.4	16.4	-	173.2

Table Source: Acres of direct impacts to modeled habitat were calculated by overlaying SGP components with modeled potential habitat reported in AECOM 2020a

Table Notes:

Due to rounding, numbers presented in this table may not sum precisely to the totals provided. No total acreages are presented for SGP components in this table as modeled potential habitat for many species overlaps that of other species.

4.10.2.3.7 ISSUE: INCREASED POTENTIAL FOR NON-NATIVE PLANT ESTABLISHMENT AND SPREAD

Anticipated acreages of vegetation clearing to previously undisturbed vegetation communities both inside and outside Forest Service boundaries under Alternative 2 are presented in **Table 4.10-10**. Increased establishment and spread of non-native plants is possible in these areas.

Table 4.10-10 Total acres of Disturbance to Vegetation Communities due to SGP Components under Alternative 2

Vegetation	Mine Site	Access Roads	Utilities	Tall Tree Clearing¹	Offsite Facilities	Total²
Forest PVGs (1-11) within Forest Service boundaries	925.0	456.9	215.7	250.5	4.6	1,852.7
Non-forest Areas within Forest Service boundaries	36.6	46.2	13.0	20.3	116.2	36.6
LANDFIRE vegetation outside Forest Service boundaries	-	-	71.3	76.7	22.9	170.8
TOTALS²	961.6	503.1	300.0	347.5	143.7	2,060.1

Table Source: AECOM 2020b; Acres of direct impacts to forest PVGs and non-forest areas within Forest Service boundaries were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017) and VCMQ mapping (Forest Service 2016), omitting areas of previous mine site disturbance (Midas Gold 2019). Acres of direct impacts to LANDFIRE vegetation outside Forest Service boundaries were calculated by overlaying SGP components outside Forest Service boundaries with LANDFIRE data (LANDFIRE 2009)

Table Notes:

- 1 Tall tree clearing would only be performed in areas with tree species, and as such, tall tree clearing may not occur to the full extent of acreages reported in this column.
- 2 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.4 Alternative 3

Under Alternative 3, the Tailings Storage Facility and buttressing DRSF would be located in the East Fork South Fork Salmon River drainage, requiring an approximately 3.2-mile-long segment of the Burntlog Route to be routed through the Blowout Creek Valley; approximately 2.5 miles of the new transmission line would be routed through the Meadow Creek valley within the mine site; the off-highway vehicle trail from Horse Heaven/Powerline to Meadow Creek Lookout Road (FR 51290) would not be constructed; and approximately 7.6 miles of Meadow Creek Lookout Road, from Burntlog Route at the upper portion of Blowout Creek drainage to Monumental Summit, would be improved for public access to connect with Thunder Mountain Road.

4.10.2.4.1 ISSUE: IMPACTS TO FORESTED PVGS WITHIN FOREST SERVICE-MANAGED LAND

Anticipated acreages of disturbance associated with all SGP features in mapped PVGs under Alternative 3 during the construction phase are presented in **Table 4.10-11**. These areas would not maintain or move towards desired conditions into the foreseeable future. As under all action alternatives, most impacts to PVGs would be related to disturbance activities at the mine site and would occur in the Warm, Dry Subalpine Fir (PVG 7) and Persistent Lodgepole Pine (PVG 10) types.

Table 4.10-11 Acres of Disturbance to Previously Undisturbed Forested PVGs Under Alternative 3

PVG	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Total¹
PVG 1 – Dry Ponderosa Pine/ Xeric Douglas-fir	-	2.1	455.9	0.1	458.1
PVG 2 – Warm, Dry Douglas-fir/ Moist Ponderosa Pine	0.2	56.0	52.4	57.1	165.8
PVG 3 – Cool, Moist Douglas-fir	-	1.4	1.7	3.4	6.5
PVG 4 – Cool, Dry Douglas-fir	5.8	36.5	30.4	38.9	111.6
PVG 5 – Dry Grand Fir	-	2.4	21.0	24.6	48.1
PVG 6 – Moist Grand Fir	-	1.1	13.5	14.8	29.4
PVG 7 – Warm, Dry Subalpine Fir	626.3	154.2	29.5	24.4	834.4
PVG 8 – Cool Moist Subalpine Fir	-	-	-	-	-
PVG 9 – Hydric Subalpine Fir	4.7	14.5	2.2	4.5	26.0
PVG 10 – Persistent Lodgepole Pine	516.2	159.6	56.9	56.6	789.4
PVG 11 – High Elevation Subalpine Fir (with Whitebark Pine)	0.3	16.2	5.3	5.0	26.7
TOTALS¹	1,153.6	443.9	668.9	229.4	2,495.8

Table Source: AECOM 2020b; Acres of direct impacts to modeled habitat were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017), omitting areas of previous mine site disturbance (Midas Gold 2019)

Table Notes:

1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.4.2 ISSUE: IMPACTS TO NON-FORESTED VEGETATION COMMUNITIES WITHIN FOREST SERVICE-MANAGED LAND

Anticipated acreages of direct impacts of vegetation clearing to previously undisturbed areas identified as not successional to forested PVGs within Forest Service-managed lands under Alternative 3 are presented in **Table 4.10-12**. These areas would not maintain or move towards desired conditions into the foreseeable future. As under all action alternatives, most impacts to these areas would be related to disturbance activities at the mine site and would occur in the Douglas-fir and Lodgepole Pine existing vegetation types.

Table 4.10-12 Acres of Disturbance to Previously Undisturbed Areas Identified as not Successional to Forested PVGs within Forest Service-managed lands Under Alternative 3

Existing Vegetation Type¹	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Offsite Facilities	Total²
Aspen	-	-	-	-	-	-
Burned Forest Shrublands	-	1.8	0.8	1.9	-	4.5
Burned Herblands	1.3	3.3	1.8	3.3	-	9.6
Burned Sparse Vegetation	0.2	1.9	0.0	0.0	-	2.2
Developed	0.4	0.2	-	-	-	0.6
Douglas-fir	13.3	11.0	2.2	4.2	-	30.7
Douglas-fir/Lodgepole Pine	0.6	0.1	-	-	-	0.7
Douglas-fir/Ponderosa Pine	-	1.6	0.2	0.3	-	2.1
Engelmann's Spruce	-	-	-	0.3	-	0.3
Forblands	-	5.0	0.1	1.0	-	6.1
Forest Shrublands	-	1.2	0.9	1.2	-	3.2
Grasslands	6.7	0.2	0.1	0.4	-	7.4
Lodgepole Pine	10.1	9.3	1.4	2.2	3.4	26.5
Mountain Big Sagebrush	-	0.2	-	-	-	0.2
Ponderosa Pine	-	0.3	4.1	1.2	-	5.6
Riparian Herblands	0.3	0.5	-	-	-	0.8
Riparian Shrublands/ Deciduous Forests	5.5	1.1	0.3	2.2	0.0	9.1
Sparse Vegetation	1.9	0.5	-	0.0	-	2.4

4 ENVIRONMENTAL CONSEQUENCES
 4.10 VEGETATION

Existing Vegetation Type¹	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Offsite Facilities	Total²
Subalpine Fir	-	3.0	0.1	0.5	-	3.6
Water	-	0.4	-	0.1	-	0.5
Whitebark Pine	-	-	0.1	-	-	0.1
TOTALS²	40.4	41.7	12.0	18.9	3.5	116.4

Table Source: AECOM 2020b; Acres of direct impacts were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017) and VCMQ mapping (Forest Service 2016), omitting areas of previous mine site disturbance (Midas Gold 2019)

Table Notes:

- 1 PVG mapping and existing vegetation mapping are performed using different processes and different objectives. As such, forest existing vegetation types commonly occur within areas identified as not successional to forests in PVG mapping, and alternatively, non-forest existing vegetation types commonly occur in areas identified as successional to forests in PVG mapping.
- 2 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.4.3 ISSUE: IMPACTS TO VEGETATION COMMUNITIES OUTSIDE FOREST SERVICE-MANAGED LAND

Acres of impacts to vegetation communities outside Forest Service-managed land would be the same under Alternative 3 as under Alternative 1 (**Table 4.10-3**), and as such, impacts to vegetation outside Forest Service-managed land would occur to the same degree as under Alternative 1 (Section 4.10.2.2.3, Issue: Impacts to Vegetation Communities outside Forest Service-managed Land).

4.10.2.4.4 ISSUE: IMPACTS TO WHITEBARK PINE

Alternative 3 would impact approximately 237.2 acres of occupied whitebark pine habitat and would remove an estimated 892 individual trees, 48 of which would be mature, cone-bearing individuals (**Appendix H-6**).

The Forest Service has preliminarily determined that Alternative 3 would impact whitebark pine, but will not jeopardize the continued existence of this species.

4.10.2.4.5 ISSUE: IMPACTS ON KNOWN LOCATIONS OF SENSITIVE AND FOREST WATCH SPECIES

Alternative 3 would indirectly impact the same known occurrences of special status plants as Alternative 1 (Section 4.10.2.2.5, Issue: Impacts to Known Locations of Sensitive and Forest Watch Species).

4.10.2.4.6 ISSUE- IMPACTS TO MODELED POTENTIAL HABITAT FOR SENSITIVE AND FOREST WATCH SPECIES

Tables 4.10-13 presents acres of modeled potential habitat for special status plant species that would be directly impacted under Alternative 3 by SGP component. Direct removal of potential habitat would occur in these areas, as well as the types of impacts described for PVGs in Section 4.10.2.1.1.2, Indirect Impacts.

As under all action alternatives, impacts to habitats for sensitive and forest watch species would predominantly occur at the mine site, with lesser extents of impacts occurring along access roads and transmission lines, including in areas of tall tree clearing.

Table 4.10-13 Acres of Direct Impacts to Modeled Special Status Plant Potential Habitat under Alternative 3

Scientific Name	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Off-site Facilities	Total¹
<i>Allotropa virgata</i> Candystick	84.0	8.5	3.2	5.5	-	101.2
<i>Astragalus vexilliflexus</i> var. <i>vexilliflexus</i> Bent-flowered milkvetch	6.7	1.9	1.7	2.1	-	12.4
<i>Botrychium lineare</i> and <i>B. simplex</i> Slender moonwort and least moonwort	202.7	36.5	5.5	26.7	0.0	271.5
<i>Botrychium crenulatum</i> Scalloped moonwort	1.1	3.3	0.8	2.7	-	7.9
<i>Bryum calobryoides</i> Beautiful bryum	-	10.2	1.6	5.0	-	16.8
<i>Buxbaumia viridis</i> Green bug moss	0.8	9.2	4.3	8.8	-	23.1
<i>Calamagrostis tweedyi</i> Cascade reedgrass	396.5	196.6	36.9	49.1	-	679.1
<i>Carex livida</i> Livid sedge	132.5	33.3	3.7	21.0	0.0	190.5
<i>Carex stramineiformis</i> Shasta sedge	2.7	48.2	2.5	9.6	-	63.0
<i>Cicuta bulbifera</i> Bulblet-bearing water hemlock	7.3	1.1	0.2	1.9	-	10.4
<i>Douglasia idahoensis</i> Idaho douglasia	0.4	5.7	1.7	2.5	-	10.3
<i>Draba incerta</i> Yellowstone draba	8.5	17.7	3.2	7.8	-	37.1

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Scientific Name	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Off-site Facilities	Total¹
<i>Drosera intermedia</i> Spoonleaf sundew	132.5	33.3	3.7	21.0	0.0	190.5
<i>Epilobium palustre</i> Swamp willow weed	2.3	2.1	1.0	6.8	-	12.2
<i>Epipactis gigantea</i> Giant helleborine orchid	-	12.4	1.9	6.9	-	21.1
<i>Helodium blandowii</i> Blandow's helodium	109.9	9.1	3.1	18.6	0.0	140.8
<i>Hierochloe odorata</i> Sweetgrass	73.2	19.0	18.6	19.1	0.0	130.0
<i>Lewisia sacajaweana</i> Sacajawea's bitterroot	437.8	129.1	14.7	27.0	-	608.7
<i>Mimulus clivicola</i> Bank monkeyflower	-	9.9	6.1	19.0	-	35.0
<i>Penstemon laxus</i> Tufted penstemon	23.2	5.8	6.6	12.1	-	47.7
<i>Polystichum kruckebergii</i> Kruckeberg's sword-fern	98.1	43.4	16.2	13.4	-	171.1
<i>Rhynchospora alba</i> White beaksedge	23.6	5.5	2.5	15.1	-	46.8
<i>Sanicula graveolens</i> Sierra sanicle	170.4	53.2	3.7	3.5	-	230.8
<i>Saxifraga tolmiei</i> var. <i>ledifolia</i> Tolmie's saxifrage	54.5	41.1	3.1	7.4	-	106.2
<i>Scheuchzeria palustris</i> Rannoch-rush	132.5	33.3	3.7	21.0	0.0	190.5
<i>Sedum borschii</i> and <i>S. leibergii</i> Borch's stonecrop and Leiberg stonecrop	50.1	2.3	0.0	0.1	-	52.5
<i>Triantha occidentalis</i> ssp. <i>brevistyla</i> Short-style tofieldia	151.3	22.9	3.5	16.3	-	194.1

Table Source: Acres of direct impacts to modeled habitat were calculated by overlaying SGP components with modeled potential habitat reported in AECOM 2020a

Table Notes:

- 1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided. No total acreages are presented for SGP components in this table as modeled potential habitat for many species overlaps.

4.10.2.4.7 ISSUE: INCREASED POTENTIAL FOR NON-NATIVE PLANT ESTABLISHMENT AND SPREAD

Anticipated acreages of vegetation clearing to previously undisturbed vegetation communities both inside and outside Forest Service boundaries under Alternative 3 are presented in **Table 4.10-14**. Increased establishment and spread of non-native plants is possible in these areas.

Table 4.10-14 Total Acres of Disturbance to Vegetation Communities due to SGP Components under Alternative 3

Vegetation	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Offsite Facilities	Total¹
Forest PVGs (1-11) within Forest Service boundaries	1,153.6	443.9	668.9	229.4	-	2,495.8
Non-forest Areas within Forest Service boundaries	40.4	41.7	12.0	18.9	3.5	116.4
LANDFIRE vegetation outside Forest Service boundaries	-	-	80.6	90.4	22.9	193.9
TOTALS¹	1,194.0	485.6	761.5	338.7	26.4	2,806.1

Table Source: AECOM 2020b; Acres of direct impacts to forest PVGs and non-forest areas within Forest Service boundaries were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017) and VCMQ mapping (Forest Service 2016), omitting areas of previous mine site disturbance (Midas Gold 2019). Acres of direct impacts to LANDFIRE vegetation outside Forest Service boundaries were calculated by overlaying SGP components outside Forest Service boundaries with LANDFIRE data (LANDFIRE 2009)

Table Notes:

1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.5 Alternative 4

Under Alternative 4, the mine site and utilities would operate similarly to Alternative 1. The Burntlog Route would not be constructed, and the Yellow Pine Route would be used for access during mine construction, operations, and closure and reclamation. The Landmark Maintenance Facility would be relocated to the southern side of Warm Lake Road (CR 10-579), approximately 0.1 mile south of Landmark.

4.10.2.5.1 ISSUE: IMPACTS TO FORESTED PVGS WITHIN FOREST SERVICE-MANAGED LAND

Anticipated acreages of disturbance associated with all SGP features in mapped PVGs under Alternative 4 during the construction phase are presented in **Table 4.10-15**. These areas would not maintain or move towards desired conditions into the foreseeable future. As under all other alternatives, most impacts to PVGs would be related to disturbance activities at the mine site and would occur in the Warm, Dry Subalpine Fir (PVG 7) and Persistent Lodgepole Pine (PVG 10) types.

Table 4.10-15 Acres of Disturbance to Previously Undisturbed Forested PVGs Under Alternative 4

PVG	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Offsite Facilities	Total¹
PVG 1 – Dry Ponderosa Pine/ Xeric Douglas-fir	-	2.1	0.6	0.1	-	2.7
PVG 2 – Warm, Dry Douglas-fir/ Moist Ponderosa Pine	0.2	69.2	52.3	57.1	-	178.8
PVG 3 – Cool, Moist Douglas-fir	-	1.4	1.7	3.4	-	6.5
PVG 4 – Cool, Dry Douglas-fir	5.0	28.5	30.4	38.9	0.1	102.9
PVG 5 – Dry Grand Fir	-	2.4	21.0	24.6	-	48.1
PVG 6 – Moist Grand Fir	-	1.1	13.5	14.8	-	29.4
PVG 7 – Warm, Dry Subalpine Fir	634.8	18.5	24.5	31.8	1.4	710.9
PVG 8 – Cool Moist Subalpine Fir	-	-	-	-	-	-
PVG 9 – Hydric Subalpine Fir	3.7	12.3	2.2	4.5	0.3	23.1
PVG 10 – Persistent Lodgepole Pine	355.2	44.9	54.1	59.2	2.3	515.7
PVG 11 – High Elevation Subalpine Fir (with Whitebark Pine)	0.3	-	4.3	7.0	-	11.6
TOTALS¹	999.2	180.2	204.7	241.4	4.0	1,629.6

Table Source: AECOM 2020b; Acres of direct impacts to modeled habitat were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017), omitting areas of previous mine site disturbance (Midas Gold 2019)

Table Notes:

1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.5.2 ISSUE: IMPACTS TO NON-FORESTED VEGETATION COMMUNITIES WITHIN FOREST SERVICE-MANAGED LAND

Anticipated acreages of direct impacts of vegetation clearing to previously undisturbed areas identified as not successional to forested PVGs within Forest Service-managed lands under Alternative 4 are presented in **Table 4.10-16**. These areas would not maintain or move towards desired conditions in the foreseeable future. As under all action alternatives, most impacts to these areas would be related to disturbance activities at the mine site and would occur in the Douglas-fir and Lodgepole Pine existing vegetation types.

Table 4.10-16 Acres of Disturbance to Previously Undisturbed Areas Identified as not Successional to Forested PVGs within Forest Service-managed Lands Under Alternative 4

Existing Vegetation Type¹	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Total²
Aspen	-	-	-	-	-
Burned Forest Shrublands	-	0.5	0.7	1.9	3.1
Burned Herblands	3.4	1.4	1.8	3.3	9.9
Burned Sparse Vegetation	0.3	-	0.0	0.0	0.4
Developed	0.5	0.2	-	-	0.6
Douglas-fir	8.7	4.7	2.2	4.2	19.9
Douglas-fir/Lodgepole Pine	7.7	-	-	-	7.7
Douglas-fir/Ponderosa Pine	-	1.8	0.2	0.3	2.3
Engelmann's Spruce	-	-	-	0.3	0.3
Forblands	-	0.2	0.1	1.0	1.2
Forest Shrublands	-	1.2	0.9	1.2	3.2
Grasslands	2.9	0.2	0.1	0.4	3.5
Lodgepole Pine	7.7	9.6	1.4	2.2	20.9
Mountain Big Sagebrush	-	-	-	-	-
Ponderosa Pine	-	0.3	4.1	1.2	5.6
Riparian Herblands	1.9	0.2	-	-	2.1
Riparian Shrublands/ Deciduous Forests	1.6	0.7	0.3	2.2	4.8
Sparse Vegetation	1.9	0.7	-	0.0	2.6
Subalpine Fir	-	0.1	0.1	0.5	0.7
Water	-	0.3	-	0.1	0.5
Whitebark Pine	-	-	0.1	-	0.1
TOTALS²	36.7	22.0	12.0	18.9	89.5

Table Source: AECOM 2020b; Acres of direct impacts were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017) and VCMQ mapping (Forest Service 2016), omitting areas of previous mine site disturbance (Midas Gold 2019)

Table Notes:

- 1 PVG mapping and existing vegetation mapping are performed using different processes and different objectives. As such, forest existing vegetation types commonly occur within areas identified as not successional to forests in PVG mapping, and alternatively, non-forest existing vegetation types commonly occur in areas identified as successional to forests in PVG mapping.
- 2 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.5.3 ISSUE: IMPACTS TO VEGETATION COMMUNITIES OUTSIDE FOREST SERVICE-MANAGED LAND

Acres of impacts to vegetation communities outside Forest Service-managed land would be the same under Alternative 4 as under Alternative 1 (**Table 4.10-3**), and as such, impacts to vegetation outside Forest Service-managed land would occur to the same degree as under Alternative 1.

4.10.2.5.4 ISSUE: IMPACTS TO WHITEBARK PINE

Alternative 4 would impact 123.6 acres of occupied whitebark pine habitat and would remove an estimated 613 individual trees, 48 of which would be mature, cone-bearing individuals (**Appendix H-6**).

The Forest Service has preliminarily determined that Alternative 4 would impact whitebark pine, but will not jeopardize the continued existence of this species.

4.10.2.5.5 ISSUE: IMPACTS ON KNOWN LOCATIONS OF SENSITIVE AND FOREST WATCH SPECIES

Construction of Alternative 4 would impact several known occurrences of sensitive and forest watch plant species. Impacts to occurrences of special status plants that would occur under this alternative are described in the following subsections.

4.10.2.5.5.1 Bent-flowered Milkvetch (*Astragalus vexilliflexus* var. *vexilliflexus*)

Alternative 4 could impact the Cinnabar Peak bent-flowered milkvetch subpopulation in the same manner as would occur under Alternative 1 (Section 4.10.2.2.5.1, Bent-flowered Milkvetch) due to its proximity to the West End DRSF and West End Creek diversion.

Alternative 4 may indirectly impact bent-flowered milkvetch individuals and habitat but would not likely contribute to a loss of viability of the species within the planning area (i.e., PNF-administered lands).

4.10.2.5.5.2 Least Moonwort (*Botrychium simplex*)

Alternative 4 could impact subpopulations of the occurrence of least moonwort in the same manner as would occur under Alternative 1 (Section 4.10.2.2.5.2, Least Moonwort).

Alternative 4 may indirectly impact least moonwort individuals and habitat but would not likely contribute to a loss of viability of the species within the planning area (i.e. BNF-administered lands).

4.10.2.5.5.3 Sacajawea's Bitterroot (*Lewisia sacajawea*)

Alternative 4 could impact the occurrence of Sacajawea's bitterroot in the same manner as would occur under Alternative 1 (Section 4.10.2.2.5.5, Sacajawea's Bitterroot).

Alternative 4 may indirectly impact Sacajawea's bitterroot individuals and habitat but would not likely contribute to a trend towards ESA listing or loss of viability of the species within the planning area (i.e. BNF-administered lands).

4.10.2.5.6 ISSUE: IMPACTS TO MODELED POTENTIAL HABITAT FOR SENSITIVE AND FOREST WATCH SPECIES

Tables 4.10-17 presents acreages of direct impacts to modeled potential habitat for special status plant species that would be directly impacted under Alternative 4 by SGP component. Direct removal of potential habitat would occur in these areas, as well as the types of impacts described in Section 4.10.2.1.1.2, Indirect Impacts.

As under all action alternatives, impacts to habitats for sensitive and forest watch species would predominantly occur at the mine site, with lesser extents of impacts occurring along access roads and transmission lines, including in areas of tall tree clearing.

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Table 4.10-17 Acres of Direct Impacts to Modeled Special Status Plant Potential Habitat under Alternative 4

Scientific Name	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Off-site Facilities	Total¹
<i>Allotropa virgata</i> Candystick	77.8	4.9	8.7	5.5	0.8	97.8
<i>Astragalus vexilliflexus</i> var. <i>vexilliflexus</i> Bent-flowered milkvetch	6.7	-	3.4	2.1	-	12.2
<i>Botrychium lineare</i> and <i>B. simplex</i> Slender moonwort and least moonwort	177.4	12.3	26.4	26.7	-	242.9
<i>Botrychium crenulatum</i> Scalloped moonwort	1.1	2.1	3.2	2.7	-	9.1
<i>Bryum calobryoides</i> Beautiful bryum	-	11.7	6.0	5.0	-	22.6
<i>Buxbaumia viridis</i> Green bug moss	1.4	9.7	11.8	8.8	0.3	32.0
<i>Calamagrostis tweedyi</i> Cascade reedgrass	654.3	19.2	80.4	49.1	-	802.9
<i>Carex livida</i> Livid sedge	154.0	9.7	20.1	21.0	-	204.7
<i>Carex stramineiformis</i> Shasta sedge	2.7	-	12.6	9.6	-	24.9
<i>Cicuta bulbifera</i> Bulblet-bearing water hemlock	7.3	0.8	2.3	1.9	-	12.3
<i>Douglasia idahoensis</i> Idaho douglasia	0.4	-	3.3	2.5	-	6.2
<i>Draba incerta</i> Yellowstone draba	9.2	-	10.8	7.8	-	27.8
<i>Drosera intermedia</i> Spoonleaf sundew	154.0	9.7	20.1	21.0	-	204.7
<i>Epilobium palustre</i> Swamp willow weed	2.3	1.8	6.5	6.8	-	17.4
<i>Epipactis gigantea</i> Giant helleborine orchid	-	14.8	7.6	6.9	-	29.3

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Scientific Name	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Off-site Facilities	Total¹
<i>Helodium blandowii</i> Blandow's helodium	124.9	9.6	17.7	18.6	-	170.9
<i>Hierochloe odorata</i> Sweetgrass	76.4	8.5	35.1	19.1	-	139.1
<i>Lewisia sacajaweana</i> Sacajaweas bitterroot	287.9	7.1	40.0	27.0	-	362.0
<i>Mimulus clivicola</i> Bank monkeyflower	-	10.5	20.7	19.0	-	50.2
<i>Penstemon latus</i> Tufted penstemon	23.3	6.4	15.7	12.1	-	57.6
<i>Polystichum kruckebergii</i> Kruckeberg's sword-fern	127.1	6.6	28.8	13.4	-	175.9
<i>Rhynchospora alba</i> White beaksedge	23.8	5.7	14.8	15.1	-	59.3
<i>Sanicula graveolens</i> Sierra sanicle	182.8	4.3	10.2	3.5	-	200.8
<i>Saxifraga tolmiei</i> var. <i>ledifolia</i> Tolmie's saxifrage	68.8	1.4	9.2	7.4	-	86.7
<i>Scheuchzeria palustris</i> Rannoch-rush	154.0	9.7	20.1	21.0	-	204.7
<i>Sedum borschii</i> and <i>S. leibergii</i> Borch's stonecrop and Leiberg stonecrop	35.0	2.8	0.2	0.1	-	38.1
<i>Triantha occidentalis</i> ssp. <i>brevistyla</i> Short-style tofieldia	125.7	4.9	15.4	16.3	-	162.3

Table Source: Acres of direct impacts to modeled habitat were calculated by overlaying SGP components with modeled potential habitat reported in AECOM 2020a

Table Notes:

1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided. No total acreages are presented for SGP components in this table as modeled potential habitat for many species overlaps that of other species.

4.10.2.5.7 ISSUE: INCREASED POTENTIAL FOR NON-NATIVE PLANT ESTABLISHMENT AND SPREAD

Anticipated acreages of vegetation clearing to previously undisturbed vegetation communities both inside and outside Forest Service boundaries under Alternative 4 are presented in **Table 4.10-18**. Increased establishment and spread of non-native plants is possible in these areas.

Table 4.10-18 Total acres of Disturbance to Vegetation Communities due to SGP Components under Alternative 4

Vegetation	Mine Site	Access Roads	Utilities	Tall Tree Clearing	Offsite Facilities	Total¹
Forest PVGs (1-11) within Forest Service boundaries	999.2	180.2	204.7	241.4	4.0	1,629.6
Non-forest Areas within Forest Service boundaries	36.7	22.0	12.0	18.9	-	89.5
LANDFIRE vegetation outside Forest Service boundaries	-	-	80.6	90.4	22.9	193.9
TOTALS¹	1,035.9	202.2	297.3	350.7	26.9	1,913.0

Table Source: AECOM 2020b; Acres of direct impacts to forest PVGs and non-forest areas within Forest Service boundaries were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017) and VCMQ mapping (Forest Service 2016), omitting areas of previous mine site disturbance (Midas Gold 2019). Acres of direct impacts to LANDFIRE vegetation outside Forest Service boundaries were calculated by overlaying SGP components outside Forest Service boundaries with LANDFIRE data (LANDFIRE 2009)

Table Notes:

1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.2.6 Alternative 5

Under Alternative 5, there would be no large-scale mining operations by Midas Gold and there would be no direct or indirect effects to vegetation and no changes to current conditions for vegetation in the analysis area from the SGP.

Midas Gold would continue to implement surface exploration and associated activities that have been previously approved on National Forest System (NFS) lands as part of the Golden Meadows Exploration Project, per the Golden Meadows Exploration Project Plan of Operations and the Golden Meadows Exploration Project Environmental Assessment (EA) (Forest Service 2015). These approved activities include construction of several temporary roads (approximately 0.32 mile of temporary roads) to access drill sites (total of 28 drill sites), drill pad construction (total of 182 drill pads), and drilling on both NFS and private lands at and in the vicinity of the mine site. These exploration and subsequent reclamation activities would have only a small direct effect on vegetation resources, as the disturbance footprint associated with

the Golden Meadows EA is limited to the temporary access roads to pads and the exploration drilling holes.

Midas Gold would be required to continue to comply with reclamation and monitoring commitments included in the applicable Golden Meadows Exploration Project Plan of Operations and EA, which include reclamation of the drill pads and temporary roads by backfilling, re-contouring, and seeding using standard reclamation practices, and monitoring to ensure that sediment and stormwater best management practices are in place and effective so that impacts to vegetation are avoided or minimized.

4.10.3 Mitigation Measures and Effectiveness

Mitigation measures required by the Forest Service and measures committed to by Midas Gold as part of design features of the SGP are described in **Appendix D**, Mitigation Measures and Environmental Commitments; see **Table D-1**, Preliminary Mitigation Measures Required by the Forest Service; and **Table D-2**, Mitigation Measures Proposed by Midas Gold as SGP Design Features, respectively. The preceding impact analysis has taken these mitigation measures into consideration, as well as measures routinely required through federal, state, or local laws, regulations or permitting, such that the identified potential impacts of the SGP are those that remain after their consideration.

Mitigation measures may be added, revised, or refined based on public comment, agency comment, or continued discussions with Midas Gold and will be finalized in the Final EIS.

4.10.4 Cumulative Effects

Effects of other past, present, and reasonably foreseeable future actions may cumulatively impact a resource if these actions overlap spatially with the potential direct and indirect effects of a proposed project. As such, the cumulative effects analysis area for vegetation resources is the same extent as the analysis area for direct and indirect impacts to vegetation, which is the 300-foot buffer around SGP and alternative components (**Figure 3.10-1**).

Past and present actions in the cumulative effects analysis area that have affected or are currently affecting vegetation are shown in **Table 4.10-19**. These actions are described in detail in Section 4.1.5, Cumulative Effects.

Table 4.10-19 Past and Present Actions in the Vegetation Analysis Area

Past or Present Action	Potential Effects on Vegetation
Past and present mineral exploration and mining in the vicinity of the mine site	Vegetation has been removed and soil conditions have been altered in areas with past and present mineral exploration and mining in the vicinity of the mine site. Increased dust and transportation of non-native plant propagules associated with these projects have likely indirectly impacted vegetation communities in the vicinity of these areas.
Wildland Fire	Wildland fires have occurred in the vegetation analysis area, which has resulted in changes to vegetation communities. Fires have been both characteristic and uncharacteristic.
Removal of Firewood	Removal of firewood by the public has likely occurred in the vegetation analysis area, resulting in loss of coarse woody debris and snags over time.
Recreation and tourism	Recreational activities (i.e., camping, hiking, hunting, trapping, trail riding, etc.) are likely to continue to affect vegetation communities. Increased road networks (e.g., new portions of Burntlog Route) open new NFS areas to additional human disturbance, which will likely result in increased non-native plant spread and establishment in the analysis area.
Mineral exploration and mining activities	Exploration activities for potential future mining development listed in Section 4.1.5 in the vegetation analysis area have likely impacted vegetation via removal and soil compaction at drill pad sites and temporary roads and will likely continue to do so as these activities continue.
Transportation projects	Road maintenance projects (McCall-Stibnite Road [CR 50-412], Profile Gap Road [CR 50340] and the road to the Big Creek Trailhead, and Yellow Pine Road) are ongoing in the analysis areas. Roadways impact vegetation communities through habitat fragmentation, noxious weed introduction, and possibly dust propagation during construction. Maintenance projects for existing roadways will likely impact vegetation indirectly and only during the time of construction.
Infrastructure Development projects	Transmission line upgrades in the West Central Mountain Electric Plan 2014, which follows the general location Stibnite Mine transmission line route, have required removal of tall trees in the right-of-way for safe operation of the transmission line. Removal of tall trees has altered understory vegetation community composition and likely removed potential habitat for special status plants.

Table Source: Section 4.1, Introduction

Reasonably foreseeable future actions in the cumulative effects analysis area that are anticipated to impact vegetation are shown in **Table 4.10-20**. These reasonably foreseeable future actions would result in loss of habitat, but all projects (private or federal actions) would have to meet the requirements of Section 7 of the ESA, which include consultation with federal agencies on listed plant species, completion of appropriate analysis documents, and compliance with agency-mandated reasonable and prudent measures to protect listed species.

Table 4.10-20 Reasonably Foreseeable Future Actions in the Vegetation Analysis Area

Project	Potential Effects on Vegetation
South Fork Restoration and Access Management Plan	The numerous actions relating to watershed restoration, motorized and non-motorized access, and improvements of recreation facilities within the South Fork Salmon River watershed within a 329,000-acre project area are likely to impact vegetation communities and special status plants in various ways. No specific acreages of potential impacts to vegetation are known for this project.
East Fork Salmon River Restoration and Access Management Plan	This travel management planning would likely impact vegetation communities and special status plants located within the spatial extent of the East Fork Salmon River Restoration and Access Management Plan which could include Yellow Pine, Big Creek, and Thunder Mountain within the Payette National Forest. No specific acreages of potential impacts to vegetation are known for this project.
Wildlife Conservation Strategy EIS	This EIS would present and analyze the impacts of short- and long-term management strategies and priorities for maintaining and restoring habitats associated with terrestrial wildlife species, some of which may impact vegetation communities and special status plants. No specific acreages of potential impacts to vegetation are known for this project.

Table Source: Section 4.1, Introduction

4.10.4.1 All Action Alternatives

Acres of previous disturbance from past mining actions within 300 feet of each action alternative are presented in **Table 4.10-21**. The total cumulative disturbance to vegetation in the analysis area under each action alternative is the sum of acres of previous disturbance within 300 feet of each alternative and the acres of previously undisturbed vegetation that would be impacted under each of the alternatives.

Table 4.10-21 Previous Disturbance to Vegetation Communities¹ within 300 Feet of Each Action Alternative

Vegetation	Alternative 1	Alternative 2	Alternative 3	Alternative 4
New Disturbance to Previously Undisturbed Areas	2,224.0	2,060.1	2,806.1	1,913.0
Previous Disturbance within 300 feet of an Alternative Footprint	853.3	830.1	787.2	856.9
Total Cumulative Disturbance to Vegetation within 300 feet of an Alternative Footprint²	3,077.3	2,890.2	3,593.3	2,769.9

Table Source: AECOM 2020b; Acres of new disturbance to previously undisturbed areas were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017), VCMQ data (Forest Service 2016), and LANDFIRE data (LANDFIRE 2009). Acres of previous disturbance within 300 feet of an alternative footprint were calculated by overlaying a 300-foot buffer of SGP components with previous mine site disturbance spatial data (Midas Gold 2019) and omitting areas of new disturbance

Table Notes:

1 Vegetation communities are defined for the purpose of these calculations as a combination of forest PVGs on NFS-administered lands, non-forest areas on NFS-administered lands identified through PVG mapping, and LANDFIRE vegetation classes outside NFS-administered lands.

2 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

PVG = Potential Vegetation Group.

SGP = Stibnite Gold Project.

VCMQ = Vegetation Classification, Mapping, and Quantitative Inventory.

Alternative 3 would result in the largest contribution to mining-related cumulative impacts to vegetation communities under the action alternatives, followed by Alternative 1 and Alternative 2. Alternative 4 would have the smallest contribution of mining-related cumulative impacts to vegetation communities under the action alternatives. Cumulative impacts of the SGP on botanical resources and non-native plants would follow the same ranking as for vegetation communities, with Alternative 3 having the highest potential and Alternative 4 having the lowest potential for negative impacts on botanical resources and non-native plants in conjunction with past mining actions.

Other past and present actions (**Table 4.10-19**) and reasonably foreseeable future actions (**Table 4.10-20**) have and will likely impact vegetation communities, occurrences of special status plants including whitebark pine, habitats for special status plants, and distribution of non-native plants throughout the analysis area. Specific impact acreages of most of these actions on these resources are not known. It is likely that the ranking of potential contribution of the SGP alternatives when combined with other reasonably foreseeable future actions on vegetation, most special status plants, and non-native plants would be the same as described in the preceding paragraph for mining-related impacts, with Alternative 3 having the highest potential for cumulative impacts, Alternative 4 having the lowest potential for cumulative impacts, and Alternatives 1 and 2 having intermediate degrees of potential for cumulative impacts on these

resources based on disturbance acreage. For whitebark pine, the potential for cumulative impacts would be lowest under Alternative 4, highest under Alternative 1, and intermediate under Alternatives 2 and 3 based on disturbance acreage and estimated number of trees removed.

Cumulative impacts of the SGP on known special status plant occurrences from the alternatives are likely to be the same as described in Section 4.10.2, Direct and Indirect Effects, and when considered with past, present, and reasonably foreseeable future actions (i.e., no loss of viability or trend towards ESA listing for all species known to occur in the analysis area).

4.10.4.2 Alternative 5

Forest management, motorized use of road systems, fire suppression, prescribed fire and wildfire, dispersed camping, fishing, and hunting activities would continue in the cumulative effects area and vicinity, which would alter vegetation resources through direct removal (trampling, cutting, harvest, etc.) and incidental damage. Under Alternative 5, Midas Gold would continue to comply with reclamation and monitoring commitments included in the applicable Golden Meadows Exploration Project Plan of Operations and EA, which include reclamation of the drill pads and temporary roads by backfilling, re-contouring, and seeding using standard reclamation practices. However, as described in the Golden Meadows EA, the exploration and subsequent reclamation activities would have only a small direct effect on vegetation resources, as the disturbance footprint associated with the Golden Meadows EA is primarily isolated to temporary access roads to pads and the exploration drilling holes. Therefore, implementation of Alternative 5 would present a minimal cumulative contribution to impacts to vegetation resources.

4.10.5 Irreversible and Irretrievable Commitments of Public Resources

4.10.5.1 Alternative 1

4.10.5.1.1 IRREVERSIBLE

Certain biological resources that would be affected by the SGP are renewable only over long-time spans, including mature vegetation, special status plants, seedbanks, and topsoil. Loss of these resources would be considered irreversible. Soils will be stockpiled and reused to the greatest degree possible, but there will still be some irreversible commitment of soil to the SGP.

4.10.5.1.2 IRRETRIEVABLE

Alternative 1 would remove the land from other uses while SGP is in operation, but the use would eventually be reversed through revegetation except for the approximately 357 acres of land where revegetation would not occur (i.e., in areas of new, permanent pit lakes or portions of pit highwalls that are too steep for re-vegetating). The temporal loss of the land for other uses would be irretrievable. This includes the loss of soil resources; even with reclamation, the

temporal loss of the resource is irretrievable. Whitebark pine individuals removed for construction of the SGP would be irretrievable.

4.10.5.2 Alternative 2

The irreversible and irretrievable commitment of vegetation under Alternative 2 would be the same as under Alternative 1 with the exception that the West End DRSF would not be constructed (resulting in less vegetation removal) and the Midnight pit would be fully backfilled instead of becoming a pit lake (representing a smaller area that would not be able to be revegetated compared to Alternative 1). However, tall tree clearing around new portions of the transmission line would continue in perpetuity.

4.10.5.3 Alternative 3

The irreversible and irretrievable commitment of vegetation under Alternative 3 would be similar to that described under Alternative 1, except the location of the Tailings Storage Facility in the East Fork South Fork Salmon River rather than in Meadow Creek would change the location of vegetation communities that would be removed and revegetated. Vegetation impacts also would be greater under Alternative 3 in the area of the Meadow Creek Lookout Road (FR 51290) from Burntlog Route at the upper portion of Blowout Creek drainage to Monumental Summit, which would be improved for public access to connect with Thunder Mountain Road under this alternative.

4.10.5.4 Alternative 4

The irreversible and irretrievable commitment of vegetation under Alternative 4 would be the same as under Alternative 1.

4.10.5.5 Alternative 5

Under the No Action Alternative, there would be no irreversible or irretrievable commitment of vegetation.

4.10.6 Short-term Uses versus Long-term Productivity

4.10.6.1 Alternative 1

This evaluation considers whether the proposed SGP alternatives reduce the ability of the land and water to be used for other purposes. Under any of the action alternatives, the land and water in the SGP area would be used for the 20-year life of the mine. Short-term uses of the mineral resources would represent a beneficial use of these resources, but once used, provide no long-term productivity opportunities. Some lands that will be impacted by SGP components (e.g. pits, Tailings Storage Facility, and DRSFs) will no longer be available for their original productivity.

Concurrent with mining, and after SGP closure and reclamation, many elements of lost productivity, such as salmon streams and wildlife habitat, would be restored.

4.10.6.2 Alternatives 2 through 4

Under Alternatives 2 through 4, the effects of short-term use and long-term productivity would be the same as described for Alternative 1, because all the action alternatives include the same type and intensity of impacts to vegetation.

4.10.6.3 Alternative 5

Under Alternative 5, SGP would not be undertaken. Consequently, there would be no change in the current status of vegetation conditions in the SGP area, and no impacts to productivity would occur.

4.10.7 Summary

4.10.7.1 Issue: Impacts to Forested PVGs within Forest Service-Managed Land

Table 4.10-22 presents acres of direct disturbance to previously undisturbed forested PVGs within Forest Service-managed lands under the action alternatives. These areas would not maintain or move towards desired conditions in the foreseeable future due to the types of impacts described in Section 4.10.2.1, Types of Impacts Common to All Action Alternatives. The greatest extent of impacts would occur under Alternative 3, with lesser extents occurring under Alternatives 1 and 2, and the smallest extent of impacts occurring under Alternative 4.

Table 4.10-22 Acres of Direct Disturbance to Previously Undisturbed Forested PVGs Under Each Action Alternative

PVG	Alternative 1	Alternative 2	Alternative 3	Alternative 4
PVG 1 – Dry Ponderosa Pine/ Xeric Douglas-fir	2.7	2.7	458.1	2.7
PVG 2 – Warm, Dry Douglas-fir/ Moist Ponderosa Pine	165.8	170.5	165.8	178.8
PVG 3 – Cool, Moist Douglas-fir	6.5	6.5	6.5	6.5
PVG 4 – Cool, Dry Douglas-fir	107.9	114.3	111.6	102.9
PVG 5 – Dry Grand Fir	48.1	51.5	48.1	48.1
PVG 6 – Moist Grand Fir	29.4	32.2	29.4	29.4
PVG 7 – Warm, Dry Subalpine Fir	826.6	781.7	834.4	710.9
PVG 8 – Cool Moist Subalpine Fir	-	-	-	-
PVG 9 – Hydric Subalpine Fir	25.0	24.6	26.0	23.1

4 ENVIRONMENTAL CONSEQUENCES
 4.10 VEGETATION

PVG	Alternative 1	Alternative 2	Alternative 3	Alternative 4
PVG 10 – Persistent Lodgepole Pine	675.6	639.3	789.4	515.7
PVG 11 – High Elevation Subalpine Fir (with Whitebark Pine)	29.9	29.4	26.7	11.6
TOTALS¹	1,917.5	1,852.7	2,495.8	1,629.6

Table Source: AECOM 2020b; Acres of direct impacts were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017)

Table Notes:

1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.7.2 Issue: Impacts to Non-Forested Vegetation Communities within Forest Service-Managed Land

Table 4.10-23 presents acres of direct disturbance to previously undisturbed non-forested PVGs within Forest Service-managed lands under the action alternatives. These areas would not maintain or move towards desired conditions into the foreseeable future due to the types of impacts described in Section 4.10.2.1.1.1, Direct Impacts. The greatest extent of impacts would occur under Alternatives 2 and 3, with lesser extents occurring under Alternative 1 and the smallest extent of impacts occurring under Alternative 4.

Table 4.10-23 Acres of Direct Disturbance to Previously Undisturbed Areas Identified as not Successional to Forested PVGs within Forest Service-managed Lands

Existing Vegetation Type in Non-Forested PVG (PVG 99)¹	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Aspen	0.1	0.1	-	-
Burned Forest Shrublands	4.5	4.5	4.5	3.1
Burned Herblands	11.8	11.6	9.6	9.9
Burned Sparse Vegetation	2.3	3.5	2.2	0.4
Developed	0.6	1.0	0.6	0.6
Douglas-fir	26.1	26.2	30.7	19.9
Douglas-fir/Lodgepole Pine	7.7	7.7	0.7	7.7
Douglas-fir/Ponderosa Pine	2.1	2.1	2.1	2.3
Engelmann's Spruce	0.3	0.3	0.3	0.3
Forblands	6.1	6.1	6.1	1.2
Forest Shrublands	3.2	3.2	3.2	3.2
Grasslands	3.6	4.3	7.4	3.5
Lodgepole Pine	24.1	24.1	26.5	20.9
Mountain Big Sagebrush	0.2	0.2	0.2	-
Ponderosa Pine	5.6	6.1	5.6	5.6
Riparian Herblands	2.4	3.2	0.8	2.1
Riparian Shrublands/ Deciduous Forests	5.2	5.2	9.1	4.8
Sparse Vegetation	2.4	2.4	2.4	2.6
Subalpine Fir	3.6	3.6	3.6	0.7
Water	0.5	0.5	0.5	0.5
Whitebark Pine	0.2	0.3	0.1	0.1
TOTALS²	112.6	116.2	116.4	89.5

Table Source: AECOM 2020b; Acres of direct impacts were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017) and VCMQ mapping (Forest Service 2016)

Table Notes:

- 1 PVG mapping and existing vegetation mapping are performed using different processes and different objectives. As such, forest existing vegetation types may occur within areas identified as not successional to forests in PVG mapping, and alternatively, non-forest existing vegetation types may occur in areas identified as successional to forests in PVG mapping.
- 2 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.7.3 Issue: Impacts to Vegetation Communities outside Forest Service-Managed Land

Table 4.10-24 presents acres of direct disturbance to previously undisturbed vegetation communities outside Forest Service-managed lands under the action alternatives. These areas would experience the types of impacts described in Section 4.10.2.1.1.1, Direct Impacts. The greatest extent of impacts would occur under Alternatives 2 and 3, with lesser extents occurring under Alternative 1 and the smallest extent of impacts occurring under Alternative 4.

Table 4.10-24 Acres of Direct Disturbance to Previously Undisturbed Vegetated Acres Outside Forests Under All Action Alternatives

PVG	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<i>Artemisia tridentata</i> ssp. <i>vaseyana</i> Shrubland Alliance	30.7	20.9	30.7	30.7
Columbia Plateau Low Sagebrush Steppe	0.8	0.5	0.8	0.8
Dry-mesic Montane Douglas-fir Forest	5.8	5.0	5.8	5.8
Inter-Mountain Basins Big Sagebrush Shrubland	<0.1	<0.1	<0.1	<0.1
Inter-Mountain Basins Big Sagebrush Steppe	2.3	2.0	2.3	2.3
Inter-Mountain Basins Montane Sagebrush Steppe	6.9	3.0	6.9	6.9
Inter-Mountain Basins Sparsely Vegetated Systems	1.5	1.2	1.5	1.5
Introduced Upland Vegetation-Perennial Grassland and Forbland	9.7	13.7	9.7	9.7
Mesic Montane Douglas-fir Forest	1.4	1.4	1.4	1.4
Middle Rocky Mountain Montane Douglas-fir Forest and Woodland	3.2	2.5	3.2	3.2
Northern Rocky Mountain Conifer Swamp	<0.1	<0.1	<0.1	<0.1
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest	22.5	20.2	22.5	22.5
Northern Rocky Mountain Lower Montane-Foothill-Valley Grassland	27.1	22.9	27.1	27.1
Northern Rocky Mountain Montane-Foothill Deciduous Shrubland	1.9	1.9	1.9	1.9
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	11.3	11.0	11.3	11.3
Northern Rocky Mountain Subalpine Deciduous Shrubland	5.4	5.4	5.4	5.4
Northern Rocky Mountain Subalpine-Upper Montane Grassland	1.5	0.8	1.5	1.5
Open Water	5.0	4.8	5.0	5.0
Rocky Mountain Alpine/Montane Sparsely Vegetated Systems	0.1	0.1	0.1	0.1
Rocky Mountain Lodgepole Pine Forest	6.3	4.4	6.3	6.3

4 ENVIRONMENTAL CONSEQUENCES
 4.10 VEGETATION

PVG	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Rocky Mountain Montane Riparian Forest and Woodland	10.6	10.4	10.6	10.6
Rocky Mountain Poor-Site Lodgepole Pine Forest	1.9	2.4	1.9	1.9
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	1.4	1.4	1.4	1.4
Rocky Mountain Subalpine Mesic-Wet Spruce-Fir Forest and Woodland	0.1	0.1	0.1	0.1
Rocky Mountain Subalpine/Upper Montane Riparian Forest and Woodland	6.2	6.2	6.2	6.2
Rocky Mountain Subalpine-Montane Mesic Meadow	18.4	16.9	18.4	18.4
Rocky Mountain Wetland-Herbaceous	6.1	7.7	6.1	6.1
Subalpine Douglas-fir Forest	4.3	4.1	4.3	4.3
Xeric Montane Douglas-fir Forest	<0.1	<0.1	<0.1	<0.1
TOTALS¹	193.9	170.8	193.9	193.9

Table Source: AECOM 2020b; Acres of direct impacts were calculated by overlaying SGP components outside Forest Service boundaries with LANDFIRE data (LANDFIRE 2009)

Table Notes:

1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.7.4 Issue: Impacts on Known Locations of Whitebark Pine

Table 4.10-25 presents acreage of whitebark pine occupied habitat and number of individuals that would be removed under each of the action alternatives. The greatest extent of impacts to whitebark pine occupied habitat would occur under Alternative 2. A slightly smaller acreage of impacts to occupied habitat would occur under Alternative 1, and the smallest acreage of impacts would occur under Alternative 4.

Alternatives 1 and 2 would remove the greatest estimated number of whitebark pine individuals of all age classes, followed by Alternative 3. Alternative 4 would result in the removal of the smallest estimated number of whitebark pine individuals.

Alternatives 1, 3, and 4 would remove approximately the same number of cone-bearing mature whitebark pine individuals, predominantly as a result of construction of the West End DRSF. As the West End DRSF would not be constructed under Alternative 2, this alternative would have the smallest overall impact on mature whitebark pine trees.

Table 4.10-25 Acres of Whitebark Pine Occupied Habitat and Number of Individual Trees Removed under All Action Alternatives

Scientific Name	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Acres of Occupied Habitat Removed	257.8	243.2	237.2	123.6
Estimated Number of Individual Trees Removed	1,027	997	892	613
Estimated Number of Reproducing Trees Removed	50	15	48	48

Table Source: AECOM 2020b; Acres of direct impacts to occupied habitat and whitebark pine individuals were calculated by overlaying SGP components with results of whitebark pine surveys (Tetra Tech 2020). Detailed calculations of impacts to whitebark pine occupied habitat and individual trees are reported in **Appendix H-6**, Whitebark Pine Impacts

4.10.7.5 Issue: Impacts to Known Locations of Sensitive and Forest Watch Species

All action alternatives would impact the same known occurrences of bent-flowered milkvetch, least moonwort and Sacajawea’s bitterroot as described in Section 4.10.2.2.5, Impacts to Known Locations of Sensitive and Forest Watch Species. Alternatives 1 through 3 also would impact known occurrences of Blandow’s helodium, sweetgrass, and Rannoch-rush due to construction of Burntlog Route as described in Section 4.10.2.2.5, Impacts to Known Locations of Sensitive and Forest Watch Species.

4.10.7.6 Issue: Impacts to Modeled Potential Habitat for Sensitive and Forest Watch Species

Table 4.10-26 presents acres of modeled potential habitat directly impacted for special status plant species within the disturbance footprint of SGP components under each of the action alternatives.

Overall, Alternative 1 would impact the largest extent of modeled potential habitat for sensitive and forest watch plant species, followed by Alternative 2 and then Alternative 3. Alternative 4 would have the smallest extent of impacts to modeled potential habitat for sensitive and forest watch plant species.

4 ENVIRONMENTAL CONSEQUENCES
 4.10 VEGETATION

Table 4.10-26 Acres of Modeled Potential Habitat for Special Status Plants Directly Impacted under All Action Alternatives

Scientific Name	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<i>Allotropa virgata</i> Candystick	99.7	101.9	101.2	97.8
<i>Astragalus vexilliflexus</i> var. <i>vexilliflexus</i> Bent-flowered milkvetch	14.5	14.5	12.4	12.2
<i>Botrychium lineare</i> and <i>B. simplex</i> Slender moonwort and least moonwort	267.5	262.9	271.5	242.9
<i>Botrychium crenulatum</i> Scalloped moonwort	10.4	10.2	7.9	9.1
<i>Bryum calobryoides</i> Beautiful bryum	21.1	21.1	16.8	22.6
<i>Buxbaumia viridis</i> Green bug moss	31.2	31.3	23.1	32.0
<i>Calamagrostis tweedyi</i> Cascade reedgrass	999.2	932.0	679.1	802.9
<i>Carex livida</i> Livid sedge	229.8	224.9	190.5	204.7
<i>Carex stramineiformis</i> Shasta sedge	80.0	92.8	63.0	24.9
<i>Cicuta bulbifera</i> Bulblet-bearing water hemlock	12.5	12.7	10.4	12.3
<i>Douglasia idahoensis</i> Idaho douglasia	22.0	20.5	10.3	6.2
<i>Draba incerta</i> Yellowstone draba	52.5	50.7	37.1	27.8
<i>Drosera intermedia</i> Spoonleaf sundew	229.8	224.9	190.5	204.7
<i>Epilobium palustre</i> Swamp willow weed	17.7	17.7	12.2	17.4
<i>Epipactis gigantea</i> Giant helleborine orchid	26.9	26.9	21.1	29.3
<i>Helodium blandowii</i> Blandow's helodium	171.3	174.6	140.8	170.9
<i>Hierochloe odorata</i> Sweetgrass	149.1	150.6	130.0	139.1
<i>Lewisia sacajaweana</i> Sacajaweana's bitterroot	528.6	528.1	608.7	362.0
<i>Mimulus clivicola</i> Bank monkeyflower	49.7	51.6	35.0	50.2
<i>Penstemon laxus</i> Tufted penstemon	55.6	56.6	47.7	57.6
<i>Polystichum kruckebergii</i> Kruckeberg's sword-fern	212.1	206.5	171.1	175.9

4 ENVIRONMENTAL CONSEQUENCES
 4.10 VEGETATION

Scientific Name	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<i>Rhynchospora alba</i> White beaksedge	57.8	61.6	46.8	59.3
<i>Sanicula graveolens</i> Sierra sanicle	248.1	239.9	230.8	200.8
<i>Saxifraga tolmiei</i> var. <i>ledifolia</i> Tolmie's saxifrage	135.2	127.9	106.2	86.7
<i>Scheuchzeria palustris</i> Rannoch-rush	229.8	224.9	190.5	204.7
<i>Sedum borschii</i> and <i>S. leibergii</i> Borch's stonecrop and Leiberg stonecrop	39.7	35.9	52.5	38.1
<i>Triantha occidentalis</i> ssp. <i>brevistyla</i> Short-style tofieldia	181.5	173.2	194.1	162.3

Table Source: Acres of direct impacts to modeled habitat were calculated by overlaying SGP components with modeled potential habitat (AECOM 2020a). No total acreages are presented in this table as modeled potential habitat for many species overlaps that of other species

4.10.7.7 Issue: Increased Potential for Non-native Plant Establishment and Spread

Acreages of vegetation clearing within previously undisturbed vegetation communities both inside and outside Forest Service boundaries under all action alternatives are presented in **Table 4.10-27**. Increased establishment and spread of non-native plants is possible in these areas.

Total extent of disturbance to previously undisturbed vegetation communities, and thus increased potential for non-native plant establishment and spread, would be highest under Alternative 3, followed by Alternative 1, Alternative 2, and lowest under Alternative 4.

Table 4.10-27 Total acres of Direct Disturbance to Vegetation Communities due to SGP Components under All Action Alternatives

Vegetation	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Forest PVGs (1-11) within Forest Service boundaries	1,917.5	1,852.7	2,495.8	1,629.6
Non-forest areas within Forest Service boundaries	112.6	36.6	116.4	89.5
LANDFIRE vegetation outside Forest Service boundaries	193.9	170.8	193.9	193.9
TOTALS¹	2,224.0	2,060.1	2,806.1	1,913.0

Table Source: AECOM 2020b; Acres of direct impacts to forest PVGs within Forest Service boundaries were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017). Acres of direct impacts to non-forest areas within Forest Service boundaries were calculated by overlaying SGP components with PVG data (Forest Service 2005, 2017) and VCMQ mapping (Forest Service 2016). Acres of direct impacts to LANDFIRE vegetation outside Forest Service boundaries were calculated by overlaying SGP components outside Forest Service boundaries with LANDFIRE data (LANDFIRE 2009)

Table Notes:

1 Due to rounding, numbers presented in this table may not sum precisely to the totals provided.

4.10.7.8 Summary Table

Table 4.10-28 provides a summary comparison of vegetation resource impacts by issues and indicators for each alternative.

Table 4.10-28 Comparison of Vegetation Impacts by Alternative

Issue	Indicator	Baseline Conditions	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
The SGP would impact forested PVGs within Forest Service-administered land and could impact the ability of these areas to reach desired conditions.	Acres of disturbance to previously undisturbed forest PVGs within Forest Service boundaries.	PVG data are available for the analysis area on Forest Service lands in the PNF and BNF. Maps of PVGs in the analysis area are included in Appendix H-1a .	Alternative 1 would remove an estimated 1,917.5 acres of previously undisturbed forest PVGs within the boundaries of the Forests. This is the second largest extent of impacts to forest PVGs under the action alternatives.	Alternative 2 would remove an estimated 1,852.7 acres of previously undisturbed forest PVGs within the boundaries of the Forests. This is the second smallest extent of impacts to forest PVGs under the action alternatives.	Alternative 3 would remove an estimated 2,495.8 acres of previously undisturbed forest PVGs within the boundaries of the Forests. This is the largest extent of impacts to forest PVGs under the action alternatives.	Alternative 4 would remove an estimated 1,629.6 acres of previously undisturbed forest PVGs within the boundaries of the Forests. This is the smallest extent of impacts to forest PVGs under the action alternatives.	None.
The SGP would impact non-forested areas (i.e., those that are identified through PVG mapping as not being successional to forests) within Forest Service-administered land and could impact the ability of these areas to reach desired conditions.	Acres of disturbance to previously undisturbed non-forested areas within Forest Service boundaries.	PVG and existing vegetation data are available for the analysis area on Forest Service lands in the PNF and BNF.	Alternative 1 would remove an estimated 112.6 acres of previously undisturbed non-forested areas within the boundaries of the Forests. This is the second smallest extent of impacts to non-forest areas under the action alternatives.	Alternative 2 would remove an estimated 116.2 acres of previously undisturbed non-forested areas within the boundaries of the Forests. This is the second largest extent of impacts to non-forest areas under the action alternatives.	Alternative 3 would remove an estimated 116.4 acres of previously undisturbed non-forested areas within the boundaries of the Forests. This is the largest extent of impacts to non-forest areas under the action alternatives.	Alternative 4 would remove an estimated 89.5 acres of previously undisturbed non-forested areas within the boundaries of the Forests. This is the smallest extent of impacts to non-forest areas under the action alternatives.	None.
The SGP would impact vegetation outside the boundaries of the Forests.	Acres of disturbance in previously undisturbed LANDFIRE existing vegetation types outside Forest Service boundaries.	LANDFIRE data are available for the analysis area outside Forest Service lands. Maps of LANDFIRE existing vegetation communities in the analysis area are included in Appendix H-1b .	Alternative 1 would remove an estimated 193.9 acres of previously undisturbed vegetation communities outside Forest Service-administered lands. Along with Alternatives 3 and 4, this would be the largest extent of vegetation removal outside Forest Service lands under the action alternatives.	Alternative 2 would remove an estimated 170.8 acres of previously undisturbed vegetation communities outside Forest Service-administered lands. This would be the smallest extent of vegetation removal outside Forest Service lands under the action alternatives.	Same as Alternative 1.	Same as Alternative 1.	None.
The SGP would remove whitebark pine individuals, and habitat conversion associated with the SGP would impact seed production, dispersal, and establishment of this species.	Number of acres of whitebark pine occupied habitat impacted by the SGP.	Results of whitebark pine surveys (Tetra Tech 2020) are available within suitable habitat in the analysis area. Approximately 2,310 acres of occupied whitebark pine habitat were identified within the analysis area.	Alternative 1 would remove an estimated 257.8 acres of occupied whitebark pine habitat (11.2% of occupied habitat in the analysis area). This would be the largest extent of removal under the action alternatives.	Alternative 2 would remove an estimated 243.2 acres of occupied whitebark pine habitat (10.5% of occupied habitat in the analysis area). This would be the second largest extent of removal under the action alternatives.	Alternative 3 would remove an estimated 237.2 acres of occupied whitebark pine habitat (10.2% of occupied habitat in the analysis area). This would be the second smallest extent of removal under the action alternatives.	Alternative 4 would remove an estimated 123.6 acres of occupied whitebark pine habitat (5.4% of occupied habitat in the analysis area). This would be the smallest extent of removal under the action alternatives.	None.
	Estimated number of mature whitebark pine trees to be cut during SGP construction.	Results of whitebark pine surveys (Tetra Tech 2020) are available within in the analysis area.	An estimated 1,027 individual trees, 50 of which would be cone-bearing trees, would be removed under Alternative 1. This would be the largest number of total whitebark pine individuals removed and cone-bearing individuals removed under the action alternatives.	An estimated 997 individual trees, 15 of which would be mature, cone-bearing trees, would be removed under Alternative 2. This would be the second largest number of total whitebark pine individuals removed and the lowest number of cone-bearing individuals removed under the action alternatives.	An estimated 892 individual trees, 48 of which would be mature, cone-bearing trees, would be removed under Alternative 3. This would be the second smallest number of total whitebark pine individuals removed and the second highest number of cone-bearing individuals removed under the action alternatives.	An estimated 613 individual trees, 48 of which would be mature, cone-bearing trees, would be removed under Alternative 4. This would be the smallest number of total whitebark pine individuals removed and the second highest number of cone-bearing individuals removed (the same as Alternative 3) under the action alternatives.	None.

4 ENVIRONMENTAL CONSEQUENCES
4.10 VEGETATION

Issue	Indicator	Baseline Conditions	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
The SGP would impact known occurrences of sensitive and forest watch plant species.	Presence of known occurrences of special status plants or occupied habitat within 300 feet of the SGP disturbance area.	Rare Plant Geographic Information System Data are available for the SGP area (IFWIS 2017).	Alternative 1 would impact known occurrences of bent-flowered milkvetch, least moonwort, Sacajawea's bitterroot, Blandow's helodium, sweetgrass, and Rannoch-rush.	Same as Alternative 1.	Same as Alternative 1.	Alternative 4 would impact known occurrences of bent-flowered milkvetch, least moonwort and Sacajawea's bitterroot.	None.
The SGP would result in a direct loss of modeled potential habitat for sensitive and forest watch plant species.	Acres of modeled potential habitat for sensitive and forest watch plant species disturbed by the SGP.	Modeled potential habitat for special status plant species is available for the SGP area. Maps are included in Appendix H-4 .	Alternative 1 would impact the largest extent of modeled potential habitat for scalloped moonwort, Cascade reedgrass, livid sedge, Idaho douglasia, Yellowstone draba, spoonleaf sundew, Kruckeberg's swordfern, Sierra sanicle, Tolmie's saxifrage, and Rannoch-rush. Alternative 1 would be equal to Alternative 2 in having the greatest extent of impacts to modeled potential habitat for bent-flowered milkvetch and swamp willow weed. Overall, Alternative 1 would impact the largest extent of modeled potential habitat for sensitive and forest watch species under the action alternatives.	Alternative 2 would impact the largest extent of modeled potential habitat for candystick, Shasta sedge, bulblet-bearing water hemlock, Blandow's helodium, sweetgrass, bank monkeyflower, and white beaksedge. Alternative 2 would be equal to Alternative 1 in impacting the largest extent of modeled potential habitat for bent-flowered milkvetch and swamp willow weed. Overall, Alternative 2 would impact the second largest extent of modeled potential habitat for sensitive and forest watch species under the action alternatives.	Alternative 3 would have the greatest extent of impacts to modeled potential habitat for slender moonwort and least moonwort, Sacajawea's bitterroot, Borch's stonecrop and Leiberg stonecrop, and short-style tofieldia. Overall, Alternative 3 would impact the second smallest extent of modeled potential habitat for sensitive and forest watch species under the action alternatives.	Alternative 4 would impact the largest extent of modeled potential habitat for beautiful bryum, green bug moss, giant helleborine orchid, and tufted penstemon. Overall, Alternative 4 would impact the smallest extent of modeled potential habitat for sensitive and forest watch species under the action alternatives.	None.
SGP actions would result in increased potential for non-native plant establishment and spread.	Total acres of land disturbed by the SGP.	PVG data are available for the analysis area on Forest Service lands in the PNF and BNF and LANDFIRE data are available for the analysis area outside Forest Service lands. Maps of non-native plants in the analysis area are included in Appendix H-2 .	Alternative 1 would impact the second largest total extent of vegetation clearing (2,224.0 acres) under the action alternatives. Therefore, the potential for non-native plant establishment and spread in and near the SGP area would be second highest under this alternative.	Alternative 2 would impact the second smallest total extent of vegetation clearing (2,060.1 acres) under the action alternatives. Therefore, the potential for non-native plant establishment and spread in and near the SGP area would be second lowest under this alternative.	Alternative 3 would impact the largest total extent vegetation clearing (2,806.1 acres) under the action alternatives. Therefore, the potential non-native plant establishment and spread in and near the SGP area would be highest under this alternative.	Alternative 4 would impact the smallest total extent vegetation clearing (1,913.0 acres) under the action alternatives. Therefore, the potential for non-native plant establishment and spread in and near the SGP area would be lowest under this alternative.	None.