4.13 WILDLIFE AND WILDLIFE HABITAT (INCLUDING THREATENED, ENDANGERED, PROPOSED, AND SENSITIVE SPECIES)

4.13.1 Effects Analysis Indicators and Methodology of Analysis

The analysis of effects on wildlife and wildlife habitat includes the following issues and indicators:

Issue: The Stibnite Gold Project (SGP) may cause changes in wildlife habitat in the analysis area that may affect wildlife species including special-status species (threatened, endangered, Management Indicator Species, and sensitive species).

Indicators:

- Acres of general wildlife habitat disturbed.
- Acres of special-status wildlife habitat disturbed.
- Acres of disturbance to other high-value habitats such as crucial and or high-value big game ranges, wetlands, and seep and spring areas.
- Change in noise levels (in decibels) in, or in proximity to, wildlife habitat.
- Miles of new roads proposed for the SGP.
- Acres of disturbance for new and upgraded transmission lines.

Issue: The SGP may affect wildlife by introducing barriers to movement, including the mine site, infrastructure, new/existing maintained roads, new transmission line.

Indicators:

- Length of potential movement barriers.

Issue: The SGP may affect wildlife by potentially increasing the risk of direct injury or mortality.

Indicators:

- Amount of increased traffic along the access routes, or acres of ground disturbance for less-mobile species.
- Miles of new roads and transmission lines.
- Miles of existing roads that are not currently plowed that would be plowed.

4.13.2 Direct and Indirect Effects

The following analysis of effects associated with wildlife and wildlife habitat is considered in the overall context of the affected environment presented in Section 3.13, Wildlife and Wildlife Habitat. The discussion for each of the alternatives is organized in terms of effects on species and/or habitats, by alternative and SGP phasing (e.g., construction, operations, closure and reclamation) wherever possible, to more clearly define the potential impacts to a given species from the SGP. Effects to wildlife and wildlife habitat were analyzed using species-specific models developed for the Payette National Forest (PNF) and Boise National Forest (BNF) and U.S. Forest Service (Forest Service) Region 4, geographic information system spatial analyses, scientific literature reviews, and information and analysis documented in reports prepared for the SGP. Survey reports and geographic information system data were obtained for vegetation groups and habitat types, forest stand information, listed species occurrences, and other wildlife species. Geographic information system analysis was used to quantify direct and indirect effects on species, where possible, by overlaying the action alternatives with the species-specific modeled habitat and other selected analysis areas.

Additional factors considered in this analysis:

- While there is significant historical mining activity in the Stibnite area, much of the analysis area is on remote National Forest System lands and in close proximity to the Frank Church-River of No Return Wilderness (FCRNRW), with little prior anthropogenic (i.e., human) influence.
- Human activity during the winter near the mine site and on many of the SGP area roadways is currently low. All phases of the SGP and all alternatives would increase miles of road plowed during the winter, including new routes in previously undisturbed areas.
- Noise levels are measured in decibels on the A-weighted scale (dBA), which is meant for human perception. Wildlife species are likely more sensitive to these noise levels. Continuous (ongoing) noises would attenuate to ambient levels in 1 to 2 miles of construction/operation activities, while temporary disturbances (e.g., blasting, winter maintenance) would be short-term, but potentially carry a farther distance from the source and be louder in nature.
- Based on known responses to varying levels of anthropogenic disturbance (i.e., displacement from primary and secondary habitat from noise, light and human presence) and based on professional judgement and existing literature, buffers were developed to more accurately address potential indirect and cumulative effects from the SGP components.

Effects on wildlife or habitat associated with Alternative 1 would likely be largest near the mine site and the access roads (specifically, the Burntlog Route during operations under Alternatives 1, 2, and 3 and the Yellow Pine Route during construction for Alternatives 1, 2, and 3, and construction and operations under Alternative 4). During construction, mine traffic under all action alternatives (Alternatives 1, 2, 3, and 4) would generate an estimated annual

average daily traffic (AADT) level of 65 vehicles (45 heavy vehicles and 20 light vehicles). During operations under Alternatives 1, 3, and 4, there would be an AADT level of 68 vehicles per day (vpd) (49 heavy vehicles and 19 light vehicles) resulting in approximately five mine-related vehicles traveling outside the mine site per hour between 5:00 am and 7:00 pm. Under all action alternatives, closure and reclamation would generate a total estimated AADT of 25 vehicles (13 heavy vehicles and 12 light vehicles).

Noise levels would vary among SGP phases and depending on distances to activities, but impacts would generally be higher during the construction phase and closer to activities, particularly because wildlife are more sensitive to noises than the measurements used for human perception. For example, during construction, noise levels 1 mile from the mine site and 0.5 mile from the access roads would be 50 dBA higher than ambient levels. However, noise levels 2 miles from the mine site and 2 miles from the access roads would drop to 34 dBA during construction.

The approximately 36-mile Yellow Pine Route consisting of Johnson Creek Road (County Road [CR] 10-413) and the Stibnite Road portion of McCall-Stibnite Road (CR 50-412) would be used for construction purposes while the primary mine access, the Burntlog Route is constructed. The Burntlog Route would include the 20-mile existing Burnt Log Road (National Forest System Road [FR] 447), two new road segments totaling approximately 15 miles and crossing a 1-mile portion of Meadow Creek Lookout Road (FR 51290). A 4.5-mile, 15-foot-wide off-highway vehicle (OHV) connector trail would be constructed between Horse Heaven/Powerline route and Meadow Creek Lookout Road (FR 51290) and would include 3 miles of new road. Additionally, the existing 11-mile groomed over-snow vehicle (OSV) trail from Warm Lake to Landmark would be closed under Alternative 1, and a new 10.4-mile groomed trail would be constructed using the existing Cabin Creek Road (FR 467). There would also be a 2-acre parking area west of FR 467 and a new 1.5-mile groomed access trail from the Forest Service Warm Lake Project Camp on Paradise Valley Road (FR 488). An approximately 7-mile temporary groomed OSV trail, on National Forest System lands adjacent to the west side of Johnson Creek Road (CR 10-413) from Landmark to Trout Creek, would also be maintained during construction of the Burntlog Route to replace the current OSV route that runs within the Johnson Creek Road travelway, but after Johnson Creek Road is no longer in use for construction traffic, the OSV route would return to the travelway.

Alternative 2 includes the following changes to the SGP that would affect wildlife differently than Alternative 1. Under Alternative 2, a 5.3-mile-long segment of the Burntlog Route would be located to the southern side of the Riordan Creek drainage, and cross Riordan Creek north of Black Lake. The Burntlog Route would be shortened by approximately 1.5 miles with inclusion of the Riordan Creek segment; however, the rerouted segment would be in closer proximity to the FCRNRW. This may affect listed or sensitive species that inhabit the FCRNRW, such as wolverine and Rocky Mountain big horn sheep. Under this alternative, there would be slightly less truck traffic (50 vehicles/day; 33 heavy vehicles and 17 light vehicles) due to the on-site lime generation plant, resulting in approximately four mine-related vehicles traveling outside the mine site per hour. This would likely reduce some traffic-related impacts to wildlife. Two sections of upgraded transmission line as described under Alternative 1 would be relocated under

Alternative 2, which would affect similar habitats and species. Noise levels would vary among SGP phases and depending on distances to activities but would be the same as Alternative 1.

Alternative 3 includes the following changes to the SGP that would affect wildlife differently than Alternative 1. Under Alternative 3, the Meadow Creek tailings storage facility (TSF) and Hangar Flats development rock storage facility (DRSF) would be relocated, which would require relocation of several on-site roads and trails, including the primary mine access which would be through a road construction along Blowout Creek. Additionally, approximately 2.5 miles of new transmission line would be rerouted through an existing corridor from the Johnson Creek substation to the mine site. The OHV connector from Horse Heaven/Powerline route to Meadow Creek Lookout Road (FR 51290) would not be constructed. Noise levels would vary among SGP phases and depending on distances to activities but would be similar to Alternative 1.

Alternative 4 includes the following changes to the SGP that would affect wildlife differently from noise impacts than Alternative 1. Under Alternative 4, the mine site and utilities would operate similarly to Alternative 1. However, very high frequency radio repeater and cell tower sites would be constructed and maintained using helicopters (instead of constructing access roads) in Inventoried Roadless Areas. This would reduce direct habitat impacts but would increase the disturbance of wildlife due to noise. For example, during construction, noise levels 1 mile from the mine site and 0.5 mile from the utilities constructed with a helicopter would be 58 dBA higher than ambient levels. Under this same scenario, noise levels would drop below ambient levels within 2 miles of the mine site and 2 miles of the utility construction activities, estimated to be 39 dBA. In addition, the Burntlog Route would not be constructed under Alternative 4, and the existing Yellow Pine Route would be used for access during mine construction, operations, and closure and reclamation. Traffic noise levels would be similar to those predicted for the other action alternatives; however, all the noise would be along Yellow Pine Route. The OHV connector from Horse Heaven/Powerline route to Meadow Creek Lookout Road (FR 51290), as well as the Cabin Creek OSV trail, would not be constructed under this alternative. Additionally, the temporary OSV trail along the west side of Johnson Creek Road would be maintained through operations under Alternative 4.

Impacts from SGP activities related to wildlife species, discussed in detail below, could include:

- Direct removal or disturbance of general or special-status species habitat;
- Disturbance and avoidance of habitat due to noise and light or increased human activity;
- Blockage or fragmentation of wildlife movement corridors;
- Mortality or injury from construction of new structures or vehicle traffic; or
- Loss of forage (e.g., vegetation) or prey species (e.g., insects, small mammals, etc.).

4.13.2.1 Threatened, Endangered, Proposed, and Candidate Species

The analysis of direct effects includes the potential take of Endangered Species Act (ESA) listed species. Pursuant to the ESA, take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." (16 United States Code 35.1531 et seq.). Take of an individual or population could occur for various reasons such as traffic collisions, change in an individual or population's habitat use due to noise, other disturbance, or contamination of food or water sources. Direct effects also would include loss of habitat or the encroachments into wildlife migration or travel areas, although no defined corridors have been identified. For all species, habitat loss could be temporary (0 to 3 years); short-term (3 to 15 years); long-term (>15 years); or permanent for land use changes (i.e., pit lakes, TSF, DRSFs, transmission line upgrades, or new transmission line remaining in perpetuity under Alternative 2).The analysis of potential indirect effects on threatened, endangered, proposed, and candidate species includes fragmentation of habitat; increased competition for resources or habitat due to displacement of individuals from the affected area into the territory of other animals; or other effects, such as increased human presence in the species-specific analysis areas (e.g., hunters, trappers, and recreationists) that can cause mortality or reduced breeding and recruitment in the future population.

All figures discussed below for threatened, endangered, candidate, and proposed species are included in **Appendix K-4**, Figures.

4.13.2.1.1 CANADA LYNX

4.13.2.1.1.1 Direct and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-1 displays the SGP components of Alternative 1 and 2 compared to modeled habitat within each Lynx Analysis Unit (LAU). **Figure 4.13-2** displays the project components of Alternative 3 compared to modeled habitat within each LAU. **Figure 4.13-3** shows the components of Alternative 4 within the Canada lynx analysis area compared to modeled habitat. Direct and indirect effects to Canada lynx are analyzed within a 5-mile buffer of all alternative components within the LAUs, to assess all potential impacts, including noise disturbance. However, most indirect impacts would occur within 1 to 2 miles from project components.

Mine Site

Although there is potentially suitable habitat for Canada lynx in the Canada lynx analysis area, there is no designated critical habitat on the PNF or BNF. The mine site and associated infrastructure may displace transient Canada lynx around the perimeter of these disturbances. This would be a large area, because the mine site area would measure approximately 6 miles long by 1 mile wide. Ruediger et al. (2000) found that Canada lynx often avoid large developments (e.g., ski resorts, facilities, etc.); therefore, it is likely that the mine site area would be a barrier to lynx movement, which would be a direct effect.

Direct mortality on lynx (e.g., vehicle collisions, destruction of dens, etc.) is not likely because lynx have not been documented in the Canada lynx analysis area; the analysis area does not contain prime denning habitat; and their movements are often nocturnal (Forest Service 2008) when limited vehicle traffic would occur. Although some denning habitat may exist, the PNF and BNF are considered secondary lynx habitat (Interagency Lynx Biology Team 2013). The lack of denning habitats and on-going activity in the vicinity of the mine site make it unlikely that there are resident individuals that would be displaced by Alternative 1.

Indirect disturbance impacts to Canada lynx due to an increase in noise and light (e.g., blasting, vehicle traffic, operations, etc.) would be long-term (i.e., through the life the SGP; approximately 20 years). Construction, operation, and closure and reclamation activities at the mine site are likely to disturb any transient Canada lynx in the vicinity. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc., see **Appendix D**, Mitigation Measures and Environmental Commitments, **Table D-2**, Mitigation Measures Proposed by Midas Gold Idaho, Inc. [Midas Gold] as SGP Design Features) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Additionally, light and noise impacts are reduced by vegetation, topography, and distance from the impact sources. The noise and light reduction strategies employed in the SGP area are expected to reduce impacts on transient Canada lynx by minimizing the intensity and duration; however, they would not prevent all indirect impacts.

The effects to Canada lynx at the mine site under Alternatives 2 or 4 would be the same as Alternative 1.

Although there would be some changes under Alternative 3 (e.g., moving the Meadow Creek TSF and Hangar Flats DRSF to the East Fork South Fork Salmon River (EFSFSR) drainage, and associated facilities and roads), lynx would likely still avoid the mine site area and the impacts would be similar to Alternative 1.

Access Roads

Direct mortality on lynx (e.g., vehicle collisions) is not likely because lynx have not been documented in the Canada lynx analysis area and their movements are often nocturnal (Forest Service 2008) when limited vehicle traffic would occur. However, Alternative 1 would include construction of 15 miles of new road between the existing Burnt Log Road (FR 447) to the Thunder Mountain Road (FR 50375) at the mine site, and several smaller segments of realignment and upgrades. Construction and the year-round operation (and plowing in winter), of the Burntlog Route could be a potential source of mortality for transient Canada lynx. During operations (when traffic levels would be highest), the AADT level would be 68 vpd. The slow speed limits on the Burntlog Route would likely limit potential mortality or injury for individual Canada lynx by giving drivers more time to react to wildlife occurrences.

Roadways under Alternative 1 may displace or alter the movement of transient Canada lynx. Linkage areas for Canada lynx have been estimated to occur north to south across Warm Lake Road (CR 10-579) and east to west across the South Fork of the Salmon River (Claar et al. 2004). Construction and use of the new 15-mile-long portion of the Burntlog Route would fragment habitat and could act as a barrier to movement (Interagency Lynx Biology Team 2013). Increased traffic on Warm Lake Road (CR 10-579), Johnson Creek Road (CR 10-413), and Stibnite Road portion of the McCall-Stibnite Road (CR 50-412) also would discourage lynx from crossing these roads. Ruediger et al. (2000) found that Canada lynx often avoid roadways more as they scale from gravel roads to highways; therefore, it is possible that the access roads could act as a barrier to transient lynx movement, which would be a direct effect.

Additionally, the existing 11-mile groomed OSV trail from Warm Lake to Landmark would be closed under Alternative 1, and an approximately 10.4-mile groomed trail would utilize the existing Cabin Creek Road (FR 467). There would also be a 2-acre parking area west of FR 467, and a new 1.5-mile groomed access trail from the Forest Service Warm Lake Project Camp on Paradise Valley Road (FR 488). This trail would cross modeled habitat for Canada lynx, which would cause additional indirect impacts during the winter due to noise from OSVs. During construction, the current OSV trail associated with Johnson Creek Road would be moved to the side of the road (see **Figure 2.3-1**), but there would be no expected changes as it is an existing route.

Disturbance impacts to Canada lynx along roadways due to noise and light would be long-term (i.e., through the life of the SGP; approximately 20 years). The noise and light reduction strategies employed along access roads during the SGP may be sufficient to reduce impacts on transient Canada lynx (see Mine Site section above for these measures). **Appendix D**, Mitigation Measures and Environmental Commitments contains mitigation measures required by the Forest Service and proposed by Midas Gold to reduce impacts on wildlife. For example, construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible; pumps, generators, and engines would be turned off when not in use; and light shields would be placed over outside lights, confining light to the immediate area in order to further limit visual impacts.

Indirect impacts could occur in the form of increased competition for resources, including the competition created by plowing the approximately 38-mile Burntlog Route which is currently not plowed for winter use. Currently, access in this area during the winter is limited to predators suited for over-snow travel (i.e., lynx and wolverine). Construction and operation of the Burntlog Route would open new corridors for predators and recreational activities. This could increase the predation on snowshoe hares by other predators (e.g., coyotes) or become a source of mortality for prey species (e.g., snowshoe hare, squirrels, etc.), which could affect food availability for transient Canada lynx. The increased human access and potential increase in hunting and trapping pressure for lynx and prey species in previously undisturbed areas also would be indirect effects.

Upon closure, the new segments of the Burntlog Route would be decommissioned, recontoured, and reclaimed, which would remove impacts associated with traffic or human access in the long-term.

Under Alternative 2, the Burntlog Route would be shortened by approximately 1.5 miles due to the Riordan Creek segment reroute, but the road would be closer to the FCRNRW. Direct mortality on lynx (e.g., vehicle collisions) is not likely because they have not been documented in the Canada lynx analysis area, but transient individuals that use the FCRNRW could be affected by noise, light, and traffic dangers. The rerouted segment would still be in a potential linkage area as well. Under Alternative 2, on-site lime production would reduce the AADT to 50 vpd during operations, which would reduce the risk of wildlife-vehicle collisions.

Alternative 3 would include construction of 19.6 miles of new road for the Burntlog Route, which is similar to Alternative 1. Transient Canada lynx would likely be affected similarly to Alternative 1. Alternative 3 would include an additional 5 miles of new roadway down the Blowout Creek valley to access mine facilities. This new route would pass the main gate and worker housing facility and would not overlap any suitable habitat; thus, impacts would be similar to those described for mine impacts under Alternative 1.

Under Alternative 4, the Yellow Pine Route would be used instead of the Burntlog Route, which would eliminate the disturbance of 15 miles of habitat adjacent to the FCRNRW. This would avoid the impacts of noise, light, and traffic on Canada lynx in the FCRNRW area where suitable current habitat is mapped. In addition, the 3 miles of new road for the OHV connector route would not be constructed under Alternative 4. However, it is expected that transient Canada lynx would still cross SGP area roadways, including the Yellow Pine Route. Traffic levels on Stibnite Road and Johnson Creek Road (both part of the Yellow Pine Route) would increase by about 174 percent and 119 percent, respectively, during operations. Therefore, there would still be a chance of wildlife mortality for Alternative 4.

Utilities

Direct impacts on Canada lynx due to construction and operation of the utility corridors, substations, and communication towers are not likely because lynx have not been documented in the Canada lynx analysis area and the construction activities would be temporary (e.g., 3 years). However, transient Canada lynx may occur sporadically. There would be an addition of 25 miles of new utility access roads, as well as a disturbance of approximately 115 acres due to new transmission lines and 158 acres due to upgraded transmission lines. Habitats along utility corridors would be maintained in low structure (e.g., low vegetation) condition, which would widen the right-of-way (ROW) effect for Canada lynx (Interagency Lynx Biology Team 2013). The new transmission line between the mine site and Johnson Creek substation would not intersect any modeled habitat. Upon closure, this new segment would be decommissioned and reclaimed, under all alternatives, except Alternative 2. Decommissioning of the transmission line under Alternatives 1, 3, and 4 would remove any potential effects in the long term.

Potential disturbance impacts due to noise and light near the substations would be long-term (approximately 20 years) and likely of low impact. However, the impacts from constructing the utility corridors, substations, and communication towers would be temporary (i.e., up to 3 years) but of higher intensity. The noise and light reduction strategies employed along utility corridors and near communication towers would reduce impacts on transient Canada lynx during construction (see Mine Site section above and **Appendix D,** Mitigation Measures and Environmental Commitments).

Under Alternative 2, there would be approximately 26 miles of new utility access roads, as well as a disturbance of approximately 141 acres due to new transmission lines, and 156 acres due to upgraded transmission lines. However, the new transmission line along Warm Lake Road would not intersect any modeled habitat. The new transmission line between the mine site and Johnson Creek substation would not be decommissioned in closure, which would continue the operational impacts (potential avoidance behavior) in the long-term.

Under Alternative 3, there would be approximately 22 miles of new utility access roads, as well as a disturbance of 121 acres due to new transmission lines and 158 acres due to upgraded transmission lines.

There would be no differences to the utilities under Alternative 4, so effects would be the same as Alternative 1.

Off-site Facilities

Direct impacts on Canada lynx from construction of the off-site facilities are unlikely because lynx have not been documented in the Canada lynx analysis area. However, the off-site facilities would impact approximately 4 acres of habitat in the Canada lynx analysis area. Transient Canada lynx individuals would likely avoid the off-site facility locations, but traffic associated with the off-site facilities may increase the potential for vehicle-wildlife collisions. The slow speed limits imposed would likely limit potential mortality or injury for individual Canada lynx.

Disturbance impacts to Canada lynx at the off-site facility locations due to noise and light would mostly occur during construction, but some effects would persist long-term (i.e., through the life of Alternative 1; approximately 20 years). The noise and light reduction strategies employed at the off-site facilities would likely be sufficient to reduce impacts on transient Canada lynx.

The Burntlog maintenance facility under Alternative 2 is in close proximity to roadways and would not likely disturb transient Canada lynx.

There would be no change to the off-site facilities under Alternative 3, so effects would be the same as Alternative 1.

Under Alternative 4, the Landmark Maintenance Facility would be relocated to the southern side of Warm Lake Road, which would shift the footprint slightly versus Alternative 1. However, effects to transient Canada lynx are expected to be the same.

Habitat Impacts

As discussed in Section 3.13.3.2.1.2, Baseline, not meeting Forest Service threatened, endangered, proposed, and candidate Standard 15 (TEST15) indicates the percentage of unsuitable habitat in the LAUs is higher than the 30 percent threshold.

In several LAUs that are currently not meeting the Forest Plan Standard TEST15 for suitable habitat (Stibnite, Yellowpine, Burntlog, Warm Lake, and Landmark; see **Table 3.13-3**), there would be an additional loss of suitable habitat, and these LAUs would continue to not meet the Standard. For the LAUs currently meeting the Standard (East Mountain and West Mountain), the direct impacts from the SGP would not cause the Standard to be exceeded.

Table 4.13-1 shows the acres of suitable habitat that would be directly impacted by each alternative in each LAU. Direct impacts to Canada lynx habitat across all LAUs would vary between 214 and 283 acres. Using a 5-mile buffer on the project components within each LAU, the area of indirect impacts on Canada lynx habitat could total approximately 58,852 to 59,357 acres.

Table 4.13-1 Direct and Indirect Impacts on Canada Lynx Habitat

LAU	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Stibnite	170	14,207
Yellowpine	36	8,168
Burntlog	65	15,443
Warm Lake	1	1,131
Landmark	2	5,712
East Mountain	9	14,531
West Mountain	0	0
Total	**283**	**59,192**
Alternative 2		
Stibnite	101	14,342
Yellowpine	36	8,168
Burntlog	65	15,443
Warm Lake	1	1,131
Landmark	2	5,712
East Mountain	9	14,561
West Mountain	0	0
Total	**214**	**59,357**

LAU	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 3		
Stibnite	168	14,209
Yellowpine	36	8,168
Burntlog	65	15,443
Warm Lake	1	1,131
Landmark	2	5,712
East Mountain	9	14,561
West Mountain	0	0
Total	**281**	**59,224**
Alternative 4		
Stibnite	172	14,275
Yellowpine	0	7,809
Burntlog	67	15,426
Warm Lake	1	1,131
Landmark	6	5,650
East Mountain	9	14,561
West Mountain	0	0
Total	**255**	**58,852**

Table Source: Forest Service 2020

4.13.2.1.1.2 Alternative 5

Mine Site

Transient Canada lynx would likely continue to use the mine site area much as they currently do, although there are no recent observations of lynx use in the area.

Access Roads

Because some of the existing roadways in the Canada lynx analysis area bisect potential linkage areas, they also would likely continue to affect transient Canada lynx through habitat fragmentation and vehicle-wildlife collisions.

Utilities

Transient Canada lynx would likely continue to use the Canada lynx analysis area much as they currently do.

Off-site Facilities

Depending on the future use of existing off-site facilities, Canada lynx would likely continue to avoid them as they currently do.

4.13.2.1.1.3 Determination

The Forest Service has preliminarily determined that the mine site, access roads, and utilities would affect, but not adversely affect, Canada lynx utilizing the area or their habitat. Direct impacts would be highest (and similar) for Alternatives 1 and 3, while Alternative 2 would have the lowest? direct impacts. The off-site facilities would likely not affect transient Canada lynx under any action alternative. Under all action alternatives, the Stibnite LAU and Burntlog LAU would have the highest direct impacts to lynx habitat. Informal Section 7 ESA consultation is ongoing with the U.S. Fish and Wildlife Service (USFWS).

4.13.2.1.2 NORTHERN IDAHO GROUND SQUIRREL

4.13.2.1.2.1 Direct and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-4 shows the components of Alternative 1 and 2 within the Northern Idaho ground squirrel (NIDGS) analysis area compared to modeled habitat. **Figure 4.13-5** shows the components of Alternative 3 within the NIDGS analysis area compared to modeled habitat. **Figure 4.13-6** shows the components of Alternative 4 within the NIDGS analysis area compared to modeled habitat. Direct and indirect effects to NIDGS are analyzed within a 1-mile buffer of alternative components. This buffer distance was developed using best professional judgment, in coordination with the USFWS, to encompass the area of potential indirect impacts from anthropogenic influences (e.g., noise, light, human presence) at the mine site and along access roads.

Mine Site

There are no known observations of NIDGS or modeled habitat in the mine site area. Therefore, mine site activities under all alternatives would not affect NIDGS.

Access Roads

Road maintenance and vehicle traffic could directly impact individual NIDGS, if sites become occupied in the future, where Alternative 1 components cross modeled habitat. The Burntlog Route would not cross modeled suitable habitat, and construction would therefore not impact squirrel habitat. However, Warm Lake Road (CR 10-579) does cross modeled habitat, and the increased traffic could pose a direct risk of mortality due to collisions. Additionally, the 10.4-mile groomed OSV trail along the existing Cabin Creek Road (FR 467) and the new 7-mile temporary groomed OSV trail along Johnson Creek Road would occur in close proximity to modeled habitat for NIDGS but would be unlikely to affect NIDGS due to their season of use.

The existing (23 miles of National Forest System roads and 75 miles of county roads) and new roads (43 miles of Burntlog Route, OHV Connector, and utility access roads) may act as a barrier to squirrel movement and dispersal, which would be an indirect effect. Increased habitat fragmentation between colonies could indirectly impact dispersal between populations, which could lead to genetic and demographic consequences. Yensen and Tarifa (2018) observed no evidence of NIDGS or their sign at the proposed logistics facility location or near Trout Creek. Additional suitable sites, associated with project components, have been identified and will be assessed in the future. Site buffers and monitoring would be used to avoid or mitigate direct impacts on squirrel populations. If sites are determined to be occupied in the future, additional mitigation measures, such as seasonal restrictions, site buffers, and monitoring would be used to avoid or mitigate direct impacts on squirrel populations.

Alternatives 2 and 3 would have similar effects on NIDGS and modeled habitat as Alternative 1.

Under Alternative 4, the Yellow Pine Route does not cross modeled suitable habitat, although it is in closer proximity to modeled suitable habitat than the Burntlog Route. Construction and operations would not likely impact NIDGS habitat.

Utilities

Construction of the utility corridors, substations, and communication towers, as well as maintenance activities in the ROWs, would likely impact individual NIDGS where Alternative 1 components overlap modeled habitat known to support populations. Yensen and Tarifa (2018) observed no evidence of NIDGS or their sign at the logistics facility; however, the correct modeled habitat areas were not surveyed, and the timing of the survey may have been too late in the season to observe aboveground NIDGS. Reclamation during closure would reclaim the new transmission line segment, but this area does not overlap modeled habitat and would not likely provide additional modeled habitat.

Under Alternative 2, the new transmission line segment from Warm Lake Road to the Cascade switching station crosses several modeled habitat areas. This corridor would not be reclaimed upon closure, so direct impacts would be permanent. Ongoing operation of this transmission line corridor would likely continue to indirectly impact any NIDGS individuals within 0.5 mile.

Alternatives 3 and 4 would have similar effects on NIDGS and modeled habitat as Alternative 1.

Off-site Facilities

Construction of new off-site facilities (i.e., Stibnite Gold Logistics Facility) is unlikely to impact individual NIDGS, because Alternative 1 components do not overlap modeled habitat known to support populations. Yensen and Tarifa (2018) observed no evidence of NIDGS or their sign at the logistics facility; however, there is a possibility that NIDGS may occur in the future at suitable sites. Site checks and formal surveys will be conducted, as needed, prior to ground-disturbing activities in suitable habitat.

Vehicle traffic associated with the proposed off-site facilities could impact individual NIDGS where Alternative 1 components cross modeled habitat known to support populations. Surveys of modeled habitat would be required before construction activities occur. All staff and contractors would be trained to reduce wildlife collisions.

Under Alternative 2, construction of off-site facilities (i.e., Burntlog Maintenance Facility, Stibnite Gold Logistics Facility, etc.) is unlikely to impact individual NIDGS, because these components would not occur in modeled habitat known to support populations.

There would be no changes to the off-site facilities under Alternative 3 or 4, so effects would be the same as Alternative 1.

Habitat Impacts

Direct impacts to NIDGS modeled habitat across the wildlife analysis area would be approximately 55 acres for Alternatives 1, 3, or 4, and would be approximately 63 acres for Alternative 2. Using a 1-mile buffer on project components, the indirect area of impacts on modeled NIDGS suitable habitat is approximately 5,417 acres (**Table 4.13-2**).

Table 4.13-2 Direct and Indirect Impacts on NIDGS Habitat

Alternative	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1 or 3	55	5,347
Alternative 2	63	5,347
Alternative 4	55	5,348

Table Source: Forest Service 2020

4.13.2.1.2.2 Alternative 5

Mine Site

No NIDGS are known or estimated to occur in the mine site area.

Access Roads

Existing roads would likely continue to be used in a similar manner with similar traffic levels. Habitat fragmentation and vehicle-wildlife collisions would still be present for NIDGS, if they occur in suitable habitats in the future, due to existing roadways under Alternative 5.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat or habitat fragmentation. There is a possibility that NIDGS may occur in the future at suitable sites.

Off-site Facilities

Because the existing off-site facilities occupy a small area and there would be no new facilities built, there would be no effects on NIDGS under Alternative 5.

4.13.2.1.2.3 Determination

The Forest Service has preliminarily determined that the access roads and utilities would affect, a small amount of NIDGS suitable habitat under all action alternatives. Direct impacts to habitat would be highest under Alternative 2 due to the new transmission line segment along Warm Lake Road, while direct and indirect impacts would be the same for the other action alternatives. The mine site and off-site facilities would not affect NIDGS habitat under any action alternative. Overall impacts from SGP would affect, but not adversely affect, NIDGS. Informal Section 7 ESA consultation is ongoing with the USFWS.

4.13.2.1.3 WOLVERINE

4.13.2.1.3.1 Direct and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-7 shows the components of Alternatives 1 and 2 within the wolverine analysis area compared to modeled habitat. **Figure 4.13-8** shows the components of Alternative 3 within the wolverine analysis area compared to modeled habitat. **Figure 4.13-9** shows the components of Alternative 4 within the wolverine analysis area compared to modeled habitat. Direct and indirect effects to wolverine are analyzed within a 5-mile buffer of alternative components, to assess all potential impacts, including noise disturbance. This buffer distance was developed using best professional judgment, in coordination with the USFWS, to address potential indirect impacts from anthropogenic influences (e.g., noise, light, human presence) and to account for potential impacts to wolverines moving through the general SGP area. However, impacts beyond 2 miles from alternative components would likely be negligible for wolverines, and the 5-mile buffer distance is large enough to include more than 2 home ranges.

Mine Site

Direct impacts on wolverines are likely in the mine site area due to habitat loss and associated habitat fragmentation; year-round vehicle traffic causing disturbance and potential avoidance behavior; and risk of vehicle collisions causing injury or mortality. However, the mine site also contains open water areas and disturbed ground, which would not provide habitat for wolverines. The mine site would measure approximately 6 miles long by 1 mile wide during operations. The mine site and associated infrastructure would reduce habitat quality or displace resident and transient wolverines around the perimeter of the mine site, because wolverines typically avoid crossing large openings, such as clear-cuts, roadways, and developed areas (Banci 1994; Luensmann 2008; Scrafford et al. 2018). The 3-mile-long and 15-foot-wide new road for the OHV connector trail would cross (and directly impact) this lower quality wolverine habitat and introduce additional indirect impacts to habitat due to vehicle noise. However, it would not likely be a barrier to wolverine movement. Because wolverines have been observed

in the wolverine analysis area, and several individual wolverines have been captured, collared, and tracked via global positioning systems in the PNF and BNF adjacent to the wolverine analysis area (Forest Service 2012, 2015; Heinemeyer et al. 2017), it is likely that wolverines would be directly affected through loss of quality habitat or displacement around the mine site.

Noise and light also could directly disturb potential wolverine foraging or denning behavior throughout the life of the SGP (i.e., 20 years). Sustained levels of human disturbances, especially noise due to operations and helicopter flights to assist with exploratory drilling, is expected to contribute to increased levels of displacement of individual wolverines in the wildlife analysis area. Noise levels would be above ambient levels within 1 to 2 miles of the mine site but would attenuate below ambient levels beyond 2 miles. The noise and light reduction strategies employed in the SGP area would reduce impacts on wolverines by minimizing the intensity and duration but would not completely eliminate them (see **Appendix D**, Mitigation Measures and Environmental Commitments).

Increased human presence in the wolverine analysis area also could lead to additional recreational (e.g., snowmobiling, skiing, etc.) and other human activity in the area, which could indirectly affect wolverine populations by displacing them. Heinemeyer et al. (2017) observed that both motorized and non-motorized recreation has a larger negative effect on wolverines the further away they occurred from roadways and trails. Heinemeyer et al. (2019) also noted that female wolverines showed a stronger avoidance of off-road motorized recreation than males, indicating that indirect impacts would be higher for denning females.

There would not be a measurable difference in habitat use at the mine site under Alternative 2, and wolverines would likely still avoid it due to noise and light impacts and additional human presence.

Although there would be some facility and road changes under Alternative 3, wolverines would likely still avoid the mine site due to noise and light impacts and additional human presence. Overall, Alternative 3 would directly and indirectly impact the most habitat based on changes at the mine site (e.g., TSF, DRSF, Burntlog Route).

Although there would be some differences under Alternative 4 and this alternative would directly and indirectly impact the least amount of habitat (persistent spring snow cover), effects would largely be the same as Alternative 1. In addition, the OHV connector trail from Horse Heaven/Powerline route to Meadow Creek Lookout Road (FR 51290) would not be constructed, which would reduce direct and indirect impacts to wolverine modeled habitat (persistent spring snow cover).

Access Roads

Several surveys have observed wolverine presence surrounding the mine site, along Old Thunder Mountain Road, Cabin Creek Road (FR 467), and near Warm Lake (see Section 3.13.3.2.3.2, Baseline).

Direct impacts on wolverines are likely along the access roads due to habitat loss by access road construction, year-round vehicle traffic causing disturbance and potential avoidance behavior, over-snow recreation in the winter and new construction and plowing of the Burntlog Route through potential suitable habitat. Wolverines typically use remote areas that are not fragmented by roadways or other linear disturbances (Scrafford et al. 2018), and they have shown an aversion to crossing roadways with ROWs over 328 feet (100 meters) in width (Luensmann 2008). The Burnt Log (FR 447) and Thunder Mountain (FR 50375) roads would be widened to 26 feet wide, including shoulders, which is significantly narrower than 328 feet. Austin (1998) found that wolverines avoided areas within 100 meters of the Trans-Canada Highway, and showed low use of areas within 1,000 meters (i.e., approximately 0.6 mile) of it. Scrafford and Boyce (2014) found that wolverines in northern Alberta tended to avoid areas within 300 meters (i.e., approximately 1,000 feet) of roadways, but regularly crossed paved roads with more than 100 vpd. Traffic levels on the Burntlog Route would be highest during operations at about 68 vpd. Midas Gold would limit their vehicle traffic outside the mine site to between 5:00 am and 7:00 pm resulting in approximately five mine-related vehicles traveling on Burntlog Route per hour during operations. Additionally, Squires et al. (2006) observed that wolverines in southwestern Montana crossed major roadways in areas with the narrowest distance between forest cover on each side. Construction of 15 miles of new road for the Burntlog Route would fragment habitat but may not act as a barrier to movement due to its width and adjacent tree cover. Upon closure, the new segment of Burntlog Route would be recontoured and reclaimed, which would reduce direct and indirect impacts in the long-term.

An increase in big or small game collision mortality along roadways would be likely as the Burntlog Route segment would be new to the area and would be plowed throughout the winter. Because wolverines are largely scavengers in the winter (particularly on ungulate carrion), this could attract wolverines to roadways. Vehicle-wildlife collisions and habitat fragmentation would likely be the largest impact on the wolverine related to Alternative 1. Appropriate speed limits (i.e., generally 30 miles per hour or less) would be established for the Burntlog Route, mine site haul roads, and light vehicle access roads for Alternative 1 to reduce the possibility of vehicle-wildlife collisions. All staff and contractors would be trained to reduce wildlife collisions. However, wildlife-vehicle collisions would still be possible. Removing wildlife collision mortality from roadways also could reduce some impacts.

Additionally, Heinemeyer et al. (2017) observed that wolverines responded negatively to increasing intensity of winter recreation in Idaho, Montana, and Wyoming; and that off-road or dispersed recreation triggered a stronger response than recreation concentrated on access roads. Female wolverines showed a stronger avoidance effect to motorized off-road recreation than males, and therefore experienced higher habitat loss (Heinemeyer et al. 2019). Kortello et al. (2019) also documented the negative association of forestry roads and winter recreation on wolverine distribution in the southern Columbia Mountains of Canada. During construction, the current OSV trail associated with Johnson Creek Road would be moved to the side of the road (see **Figure 2.3-1**), but there would be no increase in snowmobile use as it is an existing route for OSVs. The new 10.4-mile groomed OSV trail along the existing Cabin Creek Road (FR 467) would cross modeled habitat for wolverines, and associated increased recreational activity (e.g., snowmobiling, skiing, etc.) would likely cause indirect impacts to wolverines due to noise from

OSVs as this would be a new winter route. Wolverines affected physically (i.e., habitat disturbance due to construction of the Burntlog Route) or behaviorally (i.e., displacement) would likely avoid the areas by moving away from the activities, which could have an impact on denning females. Public use of some roadways would likely also encourage additional backcountry recreational activities and hunting, which could cause direct mortality or avoidance behavior.

Noise and increased lighting also could disturb potential wolverine foraging or denning habitat throughout the life of the SGP (i.e., 20 years), but the area disturbed would be small relative to equivalent habitat in the contiguous forest area, and relative to the extremely large home range of wolverines (from 49 to 833 square miles; Heinemeyer et al. 2017). However, construction of the access roads would likely produce noise effects at further distances. For example, noise levels 1 mile from the access road construction are estimated to be 34 dBA, which is at or below ambient noise levels. Estimated average hourly traffic noise levels would be approximately 49 dBA at 50 feet from the roadway and would attenuate to below ambient noise levels of 40 dBA within 500 feet from the roadway (Section 4.6, Noise). Therefore, traffic noise could affect wolverines in the FCRNRW within 500 feet of the roadway during operations. The noise and light reduction strategies (e.g., noise mufflers, light shields and type) employed along access roads would likely reduce impacts on wolverines by minimizing the intensity and duration but may not eliminate them entirely (see **Appendix D**, Mitigation Measures and Environmental Commitments).

The year-round maintenance and winter plowing of the Burntlog Route could potentially open new and more remote areas for other predators, such as wolves or coyotes, which could indirectly increase the competition for food resources with wolverines.

Under Alternative 2, construction of 13.5 miles of new road for the Burntlog Route may fragment wolverine habitat. Although the Burntlog Route would be shortened by 1.5 miles due to the Riordan Creek segment reroute, the road would be closer to the FCRNRW, and would cross through more areas of persistent spring snow cover (i.e., areas more likely used by wolverines). Traffic levels would be highest during construction at about 65 vpd and would drop to 50 vpd during operations. Direct mortality is possible due to collisions with vehicles, and wolverines would likely be affected by noise, light, and traffic disturbances.

Although the Burntlog Route would include 19.6 miles of new roadway under Alternative 3, effects of the access roads on wolverine habitat use would be the same as Alternative 1.

Under Alternative 4, the Yellow Pine Route would be used instead of the Burntlog Route, which would eliminate the disturbance of 15 miles of wolverine habitat adjacent to the FCRNRW. This would avoid the impacts of noise, light, and traffic impacts on wolverines in the FCRNRW area. Additionally, the Yellow Pine Route would mostly avoid areas mapped as persistent spring snow cover, which are areas expected to be used most by wolverines. However, it is expected that wolverines would still cross SGP area roadways, including the Yellow Pine Route. Traffic levels on Stibnite Road and Johnson Creek Road (both part of the Yellow Pine Route) would increase

by about 174 percent and 119 percent, respectively, during operations. Therefore, there would still be a chance of wildlife mortality for Alternative 4.

Utilities

Direct impacts on wolverines due to the utility corridors, substations, and communication towers are possible, and construction activities may cause wolverines to avoid these areas in the short-term. Some habitat would be removed for these areas along roadways, but they are not considered good habitat for wolverines due to their roadside location. The addition of 25 miles of new utility access roads, as well as a disturbance of approximately 115 acres due to new transmission lines and 158 acres due to upgraded transmission lines would likely be a threat to individual wolverines. Upon closure, the new transmission line between the mine site and Johnson Creek substation would be decommissioned, removed, and reclaimed, which would reduce long-term impacts under Alternative 1.

Noise and light due to construction of utility corridors, substations, and communication towers could temporarily (up to 3 years) disturb potential wolverine foraging habitat, but the area disturbed would be small relative to equivalent habitat in the contiguous forest area, and relative to the extremely large home range of wolverines (from 49 to 833 square miles; Heinemeyer et al. 2017). For example, noise levels 2 miles from the mine site and 1 mile from the utility construction are estimated to be 36 dBA, which is below the ambient noise levels. The noise and light reduction strategies employed along utility corridors and near communication towers would reduce impacts on wolverines but may not entirely eliminate them.

Under Alternative 2, direct impacts on wolverines due to construction and operation of the utility corridors, substations, and communication towers would be similar to Alternative 1, although some upgraded transmission line sections would be rerouted. There would be an addition of 26 miles of new utility access roads, as well as a disturbance of approximately 141 acres due to new transmission lines and 156 acres due to upgraded transmission lines under Alternative 2.

Under Alternative 3, direct impacts on wolverines would be the same as Alternative 1, although a segment of new transmission line would be rerouted through an existing corridor. The addition of 22 miles of new utility access roads, as well as a disturbance of approximately 121 acres due to new transmission lines and 158 acres due to upgraded transmission lines, could impact individual wolverines.

Under Alternative 4, utilities would be constructed and installed using helicopters in Inventoried Roadless Areas rather than by constructing access roads. This would introduce more noise impacts to wolverines in their vicinity during construction. For example, noise levels 2 miles from the mine site and 2 miles from the utility construction are estimated to be 39 dBA, which is below the ambient noise levels. During operations, the utilities would produce the same noise levels as Alternative 1.

Off-site Facilities

Direct impacts on wolverines due to off-site facilities are possible, as there are known breeding territories in the wolverine analysis area, and they would likely travel throughout the area. Because wolverines typically use remote areas that are not fragmented by roadways or buildings, it is likely that resident or transient wolverine individuals would naturally avoid the off-site facility areas. There could be some displacement and avoidance of more remote facilities (e.g., Landmark Maintenance Facility).

Noise and increased lighting near the off-site facilities may disturb potential wolverine foraging or denning habitat although the area disturbed would be small relative to equivalent habitat in the contiguous forest area, and relative to the extremely large home range of wolverines. It is likely that resident or transient wolverine individuals would avoid the off-site facilities.

Traffic associated with the facilities may increase the potential for vehicle-wildlife collisions. All employees and contractors would be trained to reduce wildlife collisions. Any adverse wildlife encounters would be reported to appropriate state and federal wildlife managers, and in accordance with state and federal laws.

Under Alternative 2, the Burntlog Maintenance Facility would affect a small amount of habitat in the wolverine analysis area. It is likely that resident or transient wolverine individuals would naturally avoid the off-site facility areas. However, because there are known breeding territories in the wolverine analysis area and they would likely travel throughout the area, it is possible that they would be affected.

Alternatives 3 and 4 would have similar effects on wolverines and modeled habitat as Alternative 1.

Habitat Impacts

Persistent snow cover is used to assess impacts to wolverine habitat (see Section 3.13.3.2.3.2, Baseline), particularly denning habitat. **Table 4.13-3** summarizes the areas (in acres) with persistent snow cover in numbers of years (from 1 through 7) impacted by action Alternatives 1, 2, 3, and 4. This model depicts the number of years, out of seven, in which snow cover was present in the spring in selected pixels (April 24 – May 15). This time frame generally corresponds to the period of wolverine den abandonment. Most dens were located in areas that were snow covered for 6 to 7 years out of the total seven years studied, indicating that wolverines select den sites in areas with the highest consistent snow coverage. Thus, the direct impacts on these areas would be a direct effect to wolverines and denning activities.

To be conservative, areas with persistent snow cover for years 5 through 7 indicate higher quality habitat (particularly denning habitat) than years 1 through 4. Indirect impacts were calculated by including all modeled habitat (years 1 through 7) within 5 miles of action alternative components. Alternative 4 would directly and indirectly impact the least amount of higher quality habitat and persistent spring snow cover overall, while Alternative 3 would impact

the most habitat overall based on direct and indirect impacts. This is largely due to changes at the mine site (e.g., TSF, DRSF, Burntlog Route) impacting different areas of wolverine habitat.

Table 4.13-3 Direct and Indirect Impacts on Wolverine Habitat

Persistent Spring Snow Cover Years	Directly Impacted Habitat (acres)	Indirectly Impacted Habitat (acres)
Alternative 1		
1-4	2,370	192,495
5-7	203	80,996
Alternative 2		
1-4	2,257	192,697
5-7	202	80,908
Alternative 3		
1-4	2,497	199,104
5-7	172	83,963
Alternative 4		
1-4	2,115	173,698
5-7	99	52,822

Table Source: Forest Service 2020

4.13.2.1.3.2 Alternative 5

Mine Site

Wolverines would likely continue to use the mine site area much as they currently do.

Access Roads

Existing roads also would continue to affect wolverines through habitat fragmentation and vehicle-wildlife collisions.

Utilities

There would be no new loss of habitat or source of noise and light for wolverines due to utility construction.

Off-site Facilities

Depending on the future use of current off-site facilities, wolverines would likely continue to avoid them as they currently do.

4.13.2.1.3.3 Determination

Wolverines have been well documented in the analysis area and several individual wolverines have been captured in and adjacent to the wolverine analysis area (Forest Service 2012, 2015; Heinemeyer et al. 2017). The Forest Service has preliminarily determined that the mine site, access roads, utilities, and off-site facilities would result in adverse effects to wolverine but

would not jeopardize the continued existence of this species. Alternative 4, which would not include the Burntlog route, would directly and indirectly impact the least amount of higher quality habitat (persistent snow cover years 5 through 7) overall, while Alternative 3 would impact the most habitat overall based on direct and indirect impacts. Alternatives 1 and 2 would be similar in direct and indirect impacts.

4.13.2.2 Focal Species, including Region 4 Sensitive Species and Management Indicator Species

Habitat impact figures discussed below for focal species, Region 4 sensitive species, and Management Indicator Species are included in **Appendix K-4**, Figures.

4.13.2.2.1 HABITAT FAMILY 1 – LOW ELEVATION, OLD FOREST

4.13.2.2.1.1 White-Headed Woodpecker

Direct (Habitat) and Indirect Effects Alternatives 1, 2, 3, and 4

Figure 4.13-10 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-11** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-12** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

The white-headed woodpecker is expected to be uncommon in the wildlife analysis area. Modeled habitat for white-headed woodpecker does not occur in the mine site area and direct impacts are unlikely.

Alternative 1 would cause an increase in noise and light in the vicinity of the mine site, which could cause indirect effects to white-headed woodpecker within 1 mile of the mine site. Wildlife behaviors that may change as a result of increased noise include nesting or foraging changes. Noise-reduction strategies would be used to lower potential indirect effects on woodpeckers. For example, buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2, 3, and 4 would have similar effects on white-headed woodpecker as Alternative 1.

Access Roads

There is very limited modeled habitat for white-headed woodpecker near the proposed Burntlog Route, so there would be only low direct impacts for the access roads (8 acres; see **Table 4.13-4**). Alternative 1 would cause an increase in noise and light in the wildlife analysis

area due to road construction, vehicle traffic, and maintenance. However, most modeled habitat is adjacent to existing roadways (e.g., Warm Lake Road). Wildlife behaviors that may change as a result of increased noise and light due to increased traffic include nesting or foraging changes. Noise-reduction strategies would be used to lower indirect effects on woodpeckers (see **Appendix D**, Mitigation Measures and Environmental Commitments).

Alternatives 2 and 3 would have similar effects on white-headed woodpecker as Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed. There is modeled habitat for white-headed woodpecker along the Yellow Pine Route. Because the Stibnite Road and Johnson Creek Road are existing roadways that would be upgraded, there would be approximately 9 acres of direct impacts on white-headed woodpecker habitat, and there would be more indirect impacts due to noise and light disturbance from increased traffic levels.

Utilities

There is very limited modeled habitat for white-headed woodpecker along the utilities, so there would be very little direct impacts (approximately 10 acres; see **Table 4.13-4**). Direct take of adult birds, nests, eggs, or young due to construction or operational activities is unlikely, because white-headed woodpeckers are expected to be uncommon.

Alternative 1 would cause an increase in noise and light in the wildlife analysis area, due to construction, operation, and maintenance of the utilities, particularly along the new transmission line between the mine site and Johnson Creek substation (where some modeled habitat occurs). Wildlife behaviors that may change as a result of increased noise include nesting or foraging changes. Noise-reduction strategies would be used to lower indirect effects on woodpeckers. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2, 3, and 4 would have similar effects on white-headed woodpecker as Alternative 1.

Off-site Facilities

Alternative 1 is unlikely to disturb individual white-headed woodpeckers due to clearing and construction activities for off-site facilities, because none are expected to impact modeled habitat. However, indirect effects on woodpeckers could include reduced use of foraging or nesting habitat.

Alternatives 2, 3, and 4 would have similar effects on white-headed woodpecker as Alternative 1.

Habitat Impacts

Table 4.13-4 White-headed Woodpecker Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	0	N/A
Access Roads	8	N/A
Utilities	10	N/A
Off-site Facilities	0	N/A
Total	**18**	**1,498**
Alternative 2		
Mine Site	0	N/A
Access Roads	8	N/A
Utilities	12	N/A
Off-site Facilities	0	N/A
Total	**20**	**1,498**
Alternative 3		
Mine Site	0	N/A
Access Roads	8	N/A
Utilities	10	N/A
Off-site Facilities	0	N/A
Total	**18**	**1,498**
Alternative 4		
Mine Site	0	N/A
Access Roads	9	N/A
Utilities	10	N/A
Off-site Facilities	0	N/A
Total	**19**	**1,505**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (0.5 mile for woodpeckers) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

Mine Site

There is no modeled habitat near the mine site for white-headed woodpeckers, and they are not expected to occur.

Access Roads

Existing roads (e.g., Stibnite Road, Johnson Creek Road, Warm Lake Road) in close proximity to modeled habitat would continue to affect white-headed woodpeckers through habitat fragmentation.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat, source of noise and light, or increased risk of collision for woodpeckers.

Off-site Facilities

There would be no loss of habitat or new sources of noise and light due to off-site facilities.

Determination

The action alternatives would have no impact to white-headed woodpecker individuals and habitat and would not contribute to a trend towards ESA listing or loss of viability of the species within the planning area.

4.13.2.2.1.2 Lewis's Woodpecker

Direct and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-13 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-14** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-15** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Effects to the Lewis's woodpecker at the mine site under all action alternatives would be similar to the white-headed woodpecker analysis (Section 4.13.2.2.1.1). No modeled habitat would be impacted in the mine site area under all action alternatives (see **Table 4.13-5**).

Access Roads

Effects to the Lewis's woodpecker along the access roads under all action alternatives would be similar to the white-headed woodpecker analysis (Section 4.13.2.2.1.1). Approximately 11 acres of modeled habitat would be impacted along the access roads for each of the action alternatives.

Utilities

Effects to the Lewis's woodpecker associated with the utilities under all action alternatives would be similar to the white-headed woodpecker analysis (Section 4.13.2.2.1.1). Approximately 6 acres of modeled habitat would be impacted along the access roads for each of the action alternatives.

Off-site Facilities

There would be no effects to the Lewis's woodpecker due the off-site facilities under all action alternatives.

Habitat Impacts

Table 4.13-5 Lewis's Woodpecker Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	0	N/A
Access Roads	11	N/A
Utilities	6	N/A
Off-site Facilities	0	N/A
Total	**17**	**1,360**
Alternative 2		
Mine Site	0	N/A
Access Roads	11	N/A
Utilities	6	N/A
Off-site Facilities	0	N/A
Total	**17**	**1,360**
Alternative 3		
Mine Site	0	N/A
Access Roads	11	N/A
Utilities	6	N/A
Off-site Facilities	0	N/A
Total	**17**	**1,360**

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 4		
Mine Site	0	N/A
Access Roads	11	N/A
Utilities	6	N/A
Off-site Facilities	0	N/A
Total	**17**	**1,366**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (0.5 mile for woodpeckers) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

See the white-headed woodpecker analysis (Section 4.13.2.2.1.1) for effects under Alternative 5 that also would apply to the Lewis's woodpecker.

Determination

The action alternatives would have no impact to Lewis's woodpecker individuals and habitat and would not contribute to a trend towards ESA listing or loss of viability of the species within the planning area.

4.13.2.2.2 HABITAT FAMILY 2 – BROAD ELEVATION, OLD FOREST

4.13.2.2.2.1 American Three-Toed Woodpecker

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-16 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-17** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-18** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

While there is modeled habitat for American three-toed woodpeckers in the mine site area, there are no documented occurrences and they are expected to be rare. However, there would be a direct impact of 39 acres of modeled habitat in the mine site area for American three-toed woodpeckers under Alternative 1 (see **Table 4.13-6**). Removal of snag trees would cause a loss of suitable habitat for this species, which would likely displace resident birds. Adjacent areas contain similar habitat types, but individual birds may face more competition for these areas,

which would be an indirect effect. Direct take of adult birds due to construction or operational activities is possible, but unlikely, because most individuals are expected to avoid areas of activity and they are rare in the mine site area. However, it is possible that nests, eggs, and young could be directly disturbed by vegetation removal (including cutting of trees) during construction if it occurs during the nesting season. To the extent practicable, trees found to contain nests would not be disturbed or cut. A Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Although these mitigation measures would reduce impacts, there would still be a decrease in modeled habitat.

Alternative 1 would cause an increase in noise and light in the woodpecker analysis area, mostly in the vicinity of the mine site. Construction and operations, vehicle traffic, and helicopter use are likely to directly disturb or displace individuals. Wildlife behaviors that may change as a result of increased noise include nesting or foraging changes. Noise-reduction strategies would be used to reduce indirect effects on woodpeckers (see **Appendix D**, Mitigation Measures and Environmental Commitments). For example, buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2 and 4 would have similar effects on American three-toed woodpecker as Alternative 1.

Alternative 3 would impact 47 acres of modeled habitat at the mine site, primarily due to the TSF and DRSF.

Access Roads

There would be a direct impact of 10 acres to modeled habitat along the Burntlog Route for American three-toed woodpeckers under Alternative 1 (see **Table 4.13-6**). Removal of snag trees along this roadway would cause a loss of suitable habitat for this species. Direct take of adult birds due to construction or operational activities is unlikely because they are expected to be uncommon. However, it is possible that nests, eggs, and young could be directly disturbed by vegetation removal (including cutting of trees) during construction if it occurs during the nesting season. To the extent practicable, trees found to contain nests would not be disturbed or cut. A Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Although these mitigation measures would reduce impacts, there would still be a decrease in habitat.

Alternative 1 would cause an increase in noise and light in the woodpecker analysis area, due to road construction, vehicle traffic, and maintenance. Wildlife behaviors that may change as a result of increased noise include nesting or foraging changes. Noise-reduction strategies would be used to lower indirect effects on woodpeckers. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Additionally,

the 10.4-mile groomed OSV trail along the existing Cabin Creek Road (FR 467) would cross modeled habitat, which may disrupt American three-toed woodpeckers due to OSV noise.

Alternatives 2 and 3 would have similar effects on American three-toed woodpecker as Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed. However, there would be a direct impact of 2 acres of modeled habitat associated with upgrades to the Yellow Pine Route. Additionally, the increased traffic along Stibnite Road, Johnson Creek Road, and Warm Lake Road would cause indirect impacts to woodpeckers using the modeled habitat within 1 mile of the roadways due to noise and light.

Utilities

There would be a direct impact of 16 acres of modeled habitat along the utilities for American three-toed woodpeckers under Alternative 1 (see **Table 4.13-6**). Removal of snag trees near utility corridors, substations, and communication towers would cause a loss of suitable habitat for this species, which would likely displace any resident birds. Adjacent areas contain similar habitat types, but individual birds may face more competition for these areas, which would be an indirect effect. Direct take of adult birds due to construction or operational activities is unlikely because they are expected to be uncommon. However, it is possible that nests, eggs, and young could be directly disturbed by vegetation removal (including cutting of trees) during construction if it occurs during the nesting season. This could occur along the new transmission line segment between the mine site and Johnson Creek substation or along the upgraded transmission line segments along Johnson Creek Road and Warm Lake Road. To the extent practicable, trees found to contain nests would not be disturbed or cut. A Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Although these mitigation measures would reduce impacts, there would still be a decrease in habitat.

Alternative 1 would cause an increase in noise and light in the woodpecker analysis area, due to construction, operation, and maintenance of the utilities. Wildlife behaviors that may change as a result of increased noise include nesting or foraging changes. Noise-reduction strategies would be used to reduce indirect effects on woodpeckers. Buildings and equipment would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2, 3, and 4 would have similar effects on American three-toed woodpecker as Alternative 1.

Off-site Facilities

Alternative 1 is unlikely to disturb individual American three-toed woodpeckers due to clearing and construction activities for off-site facilities, because none of the facilities are expected to

overlap modeled habitat. However, indirect effects on woodpeckers could include reduced use of foraging or nesting habitat within 1 mile of the off-site facilities due to noise and light.

Alternatives 2 and 3 would have similar effects on American three-toed woodpecker as Alternative 1.

Under Alternative 4, the Landmark Maintenance Facility would be relocated to the southern side of Warm Lake Road, which would shift the footprint slightly versus Alternative 1 and cause a direct impact of about 1 acre. It is not expected that this change would cause effects different from Alternative 1.

Habitat Impacts

Table 4.13-6 American Three-toed Woodpecker Direct and Indirect impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	39	N/A
Access Roads	10	N/A
Utilities	16	N/A
Off-site Facilities	0	N/A
Total	**65**	**2,930**
Alternative 2		
Mine Site	36	N/A
Access Roads	10	N/A
Utilities	16	N/A
Off-site Facilities	0	N/A
Total	**62**	**2,930**
Alternative 3		
Mine Site	47	N/A
Access Roads	6	N/A
Utilities	17	N/A
Off-site Facilities	0	N/A
Total	**70**	**2,882**

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 4		
Mine Site	39	N/A
Access Roads	2	N/A
Utilities	16	N/A
Off-site Facilities	1	N/A
Total	**58**	**2,347**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (0.5 mile for woodpeckers) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

See the white-headed woodpecker analysis (Section 4.13.2.2.1.1) for effects under Alternative 5 that also would apply to the American three-toed woodpecker.

Determination

The action alternatives may directly and indirectly impact American three-toed woodpecker 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. The action alternatives would all have similar direct and indirect impacts, but Alternative 3 would marginally have the most direct impacts to mature forest stands or stands impacted by wildfires or beetle infestations, and Alternative 4 would directly impact the least habitat.

4.13.2.2.2.2 Black-Backed Woodpecker

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-19 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-20** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-21** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Effects to the black-backed woodpecker at the mine site would be similar to the American three-toed woodpecker analysis (Section 4.13.2.2.2.1). However, there would be a direct impact of 98 acres of modeled habitat under Alternative 1 and 92 acres under Alternative 2 (see **Table 4.13-7**).

Alternatives 3 and 4 would have similar effects on black-backed woodpecker, with direct impacts of 109 and 104 acres, respectively. Alternative 3 would impact more habitat due to the TSF and DRSF.

Access Roads

Effects to the black-backed woodpecker along the access roads would be similar to the American three-toed woodpecker analysis (Section 4.13.2.2.2.1). Alternatives 1, 2, and 3 would have similar direct impacts of 22, 19, and 17 acres, respectively (see **Table 4.13-7**). This would primarily occur due to construction of the Burntlog Route through modeled habitat. Indirect impacts (due to noise and light from construction and increased traffic) would occur within 1 mile of the Burntlog Route as well.

Alternative 4 would directly impact 3 acres of modeled habitat, due to shifting the primary access route to the Yellow Pine Route. There would also be indirect impacts along this route due to an abundance of modeled habitat along Stibnite Road, Johnson Creek Road, and Warm Lake Road.

Utilities

Effects to the black-backed woodpecker associated with the utilities would be similar to the American three-toed woodpecker analysis (Section 4.13.2.2.2.1). Direct impacts on modeled habitat for black-backed woodpecker would be similar across all action alternatives.

Off-site Facilities

Effects to the black-backed woodpecker at the off-site facilities under all action alternatives would be similar to the American three-toed woodpecker analysis (Section 4.13.2.2.2.1).

Habitat Impacts

Table 4.13-7 Black-backed Woodpecker Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	98	N/A
Access Roads	22	N/A
Utilities	19	N/A
Off-site Facilities	0	N/A
Total	**139**	**7,994**

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 2		
Mine Site	92	N/A
Access Roads	19	N/A
Utilities	19	N/A
Off-site Facilities	0	N/A
Total	**130**	**7,994**
Alternative 3		
Mine Site	109	N/A
Access Roads	17	N/A
Utilities	21	N/A
Off-site Facilities	0	N/A
Total	**147**	**7,962**
Alternative 4		
Mine Site	104	N/A
Access Roads	3	N/A
Utilities	19	N/A
Off-site Facilities	1	N/A
Total	**127**	**6,535**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (0.5 mile for woodpeckers) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

See the white-headed woodpecker analysis (Section 4.13.2.2.1.1) for effects under Alternative 5 that also would apply to the black-backed woodpecker.

Determination

The action alternatives may directly and indirectly impact black-backed woodpecker 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. The action alternatives would all have similar direct and indirect impacts, but Alternative 3 would marginally have the most direct impacts to mature forest stands or stands impacted by wildfires or beetle infestations, and Alternative 4 would directly impact the least habitat.

4.13.2.2.2.3 Dusky Grouse (Summer)

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-22 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-23** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-24** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Modeled summer habitat for dusky grouse is limited and occurs only in the northern portion of the mine site area. However, no modeled habitat would be directly impacted by any of the action alternatives in the mine site.

Alternative 1 would cause an increase in noise and light in the wildlife analysis area, mostly in the vicinity of the mine site. Dusky grouse behaviors that may change as a result of increased noise and light include changes in nesting and foraging patterns that could lead to fragmentation of habitat. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Additionally, light and noise impacts are reduced by vegetation, topography, and distance from the impact sources. Therefore, indirect impacts on dusky grouse would differ depending on the specific conditions at each individual Alternative 1 component location based on the density of vegetation and proximity to adjoining hillsides and valleys.

Direct and i indirect effects for dusky grouse would likely be exposure to emissions and a reduction in insects due to emissions, which could affect dusky grouse during the brood-rearing season (summer).

Insects and insectivorous birds may be exposed to metals (e.g., mercury) and other elements from atmospheric emissions and tailings piles associated with gold and silver mining activities (Custer et al. 2009; Eagles-Smith et al. 2018; Jones and Miller 2005). Emissions of metals from mining operations and ore processing, in the form of particulate matter and dust, may be deposited directly on local soils and waterways. In addition, rainwater and snow melt may provide a pathway for these elements to leach from tailings piles or be physically transported as solid particles into adjacent waterbodies. These elements may enter the food web through plants and insects and then be consumed by insectivorous wildlife, potentially causing injury if exposure is sufficient. The Forest Service would require an adaptive management plan to address dust and emissions (see **Appendix D**, Mitigation Measures and Environmental Commitments). Although this mitigation measure would reduce impacts, there would still likely be direct and indirect impacts to insectivorous birds like the dusky grouse.

Alternatives 2, 3, and 4 would have similar effects on dusky grouse as Alternative 1.

Access Roads

Alternative 1 could directly disturb dusky grouse in the wildlife analysis area through habitat removal and disturbance. The new segment of the Burntlog Route would be decommissioned and reclaimed during mine closure, but the effects would still be considered permanent due to the long time period. The Burntlog Route does not cross much modeled suitable habitat, but there would still be approximately 36 acres of direct impacts (see **Table 4.13-8**). The operational traffic (AADT of 68 vpd) associated with the workforce, supplies, haulage, and other miscellaneous traffic, including road maintenance on the access roads, could expose individual dusky grouse to vehicle-wildlife collisions.

Also, noise and light disturbance from road construction, road maintenance, and routine vehicle traffic may disturb or displace individual grouse where they occur. Dusky grouse behaviors that may change as a result of increased noise and light include changes in nesting and foraging patterns that could lead to fragmentation of habitat.

Another indirect impact to dusky grouse along access roads could include fugitive dust. Dust associated with construction of facilities and roads, road maintenance, and vehicle travel may have indirect impacts on wildlife forage (e.g., plants and insects) (see Section 4.10.2.1.1.2 Indirect Impacts, in Section 4.10, Vegetation: General Vegetation Communities, Botanical Resources, and Non-Native Plants). Increased dust deposition could result in negative impacts on wildlife foods ranging from plant metabolic process inhibition, plant mortality, inhibition of pollination, or injury to pollinating insects. For 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. Dust impacts on wildlife forage plants and insects 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 plants and insects would occur immediately at the time of dust propagating activities and is likely to continue throughout the lifetime of SGP.

Alternatives 2 and 3 would have similar effects on dusky grouse as Alternative 1.

Under Alternative 4, the Burntlog Route would not be built. Most of the modeled dusky grouse habitat is located in proximity to the Yellow Pine Route. As such, dusky grouse could be impacted by Alternative 4 along the access roads due to direct impacts of 43 acres. There would also be more indirect impacts along the Yellow Pine Route due to more modeled habitat occurring along Stibnite Road, Johnson Creek Road, and Warm Lake Road.

Utilities

Alternative 1 would directly disturb dusky grouse in the wildlife analysis area through habitat loss due to clearing and construction activities for utility corridors, substations, and communication towers. Direct impacts would include 139 acres of modeled habitat along the

utility features (see **Table 4.13-8**). During operations, the utility ROWs would be maintained in a low vegetation growth stage, which could provide summer nesting or brood-rearing habitat for dusky grouse.

Noise and light disturbance from construction of the utility corridors, substations, and communication towers may temporarily disturb or displace individuals. These indirect effects would be considered temporary during construction (up to 3 years). Once the construction is complete, it is expected that dusky grouse would resume use of the area.

Existing substations, structures, and upgraded transmission lines would exist in perpetuity. The new transmission line segment between the mine site and Johnson Creek substation (as well as the substation itself) would be removed and the area recontoured and reclaimed upon closure, which would reduce impacts after the life of the mine.

Alternative 2 would directly impact 149 acres of modeled summer habitat, primarily from the Cascade switching station to Warm Lake Road. The effects would be similar to those described for Alternative 1.

Alternatives 3 and 4 would have similar effects on dusky grouse as Alternative 1.

Off-site Facilities

There would be no direct impacts to modeled habitat due to the off-site facilities under all action alternatives. Construction and operation of the off-site facilities is also unlikely to have indirect effects on dusky grouse, as modeled habitat is limited within 1 mile of the off-site facilities.

Habitat Impacts

Table 4.13-8 Dusky Grouse (Summer) Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	0	N/A
Access Roads	36	N/A
Utilities	139	N/A
Off-site Facilities	0	N/A
Total	**175**	**6,346**
Alternative 2		
Mine Site	0	N/A
Access Roads	36	N/A
Utilities	149	N/A
Off-site Facilities	0	N/A
Total	**185**	**6,346**

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 3		
Mine Site	0	N/A
Access Roads	36	N/A
Utilities	139	N/A
Off-site Facilities	0	N/A
Total	**175**	**6,346**
Alternative 4		
Mine Site	0	N/A
Access Roads	43	N/A
Utilities	139	N/A
Off-site Facilities	0	N/A
Total	**182**	**6,358**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (0.5 mile for dusky grouse) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

Mine Site

Modeled habitat is limited for dusky grouse in the mine site area, and they are assumed to occur sporadically. Individuals would likely continue to use the mine site as they currently do.

Access Roads

Existing roads (e.g., Stibnite Road, Johnson Creek Road, and Warm Lake Road) would continue to affect dusky grouse through habitat fragmentation, direct mortality through vehicle strikes, and noise or light impacts from traffic.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no loss of habitat, sources of noise and light impacts, or increased risk of collision for grouse.

Off-site Facilities

There would be no loss of habitat or sources of noise and light impacts due to off-site facilities.

Summary of Impacts

The action alternatives may directly and indirectly impact dusky grouse individuals and habitat. All action alternatives would all have similar impacts, but Alternative 2 would marginally have the most direct impacts and Alternatives 1 and 3 would directly impact the least (and same amount of) habitat (e.g., herblands, grasslands, and shrublands adjacent to ponderosa pine, lodgepole pine, aspen, and fir forests).

4.13.2.2.2.4 Boreal Owl

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-25 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-26** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-27** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Boreal owls are known to occur and breed in the mine site area, and modeled habitat occurs as well. Alternative 1 could directly disturb boreal owls in the wildlife analysis area through habitat loss, disturbance from increased human activity, and helicopter use associated with some exploratory drilling support.

Approximately 60 acres of modeled habitat would be directly impacted or removed at the mine site under Alternative 1 (see **Table 4.13-9**). Direct take of adult birds due to construction or operational activities is possible, but unlikely, because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young could be directly disturbed by vegetation removal (including cutting of trees) during construction if it occurs during the nesting season. To the extent practicable, trees found to contain nests or cavities (often used by boreal owls) would not be disturbed or cut. A Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Timing restrictions would restrict some activities within a certain radius of active nest trees for raptor species, which would help reduce habitat impacts. For example, the Forest Service would require restricting activities between March 1 and July 15 which occur up to 1,500 feet from active boreal owl nest sites, and a 350-foot ground disturbance buffer would be maintained around active nests, with some exceptions (see **Appendix D**, Mitigation Measures and Environment Commitments). Although these mitigation measures would reduce impacts, there would still be a decrease in modeled habitat.

The boreal owl also could be impacted by direct collision risks with structures at the mine site. Electric transmission line structures to serve Alternative 1 facilities would be designed and constructed to avoid raptor perching (to minimize the risk of being electrocuted).

Alternative 1 would cause an increase in noise, light, and emissions in the wildlife analysis area, mostly in the vicinity of the mine site. Construction and operations, vehicle traffic, and helicopter

use are likely to directly disturb or displace individuals. Wildlife behaviors that may change as a result of increased noise include nesting or foraging changes. Bright lighting can disrupt feeding activities for many owl species. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Additionally, light and noise impacts are reduced by vegetation, topography, and distance from the impact sources. Therefore, indirect impacts on wildlife would differ depending on the specific conditions at each individual Alternative 1 component location based on the density of vegetation and proximity to adjoining hillsides and valleys.

A possible indirect effect is that there could be a reduction in insects as prey species near the mine site activities. Any actions resulting in a decrease to insects could impact the boreal owl, including direct removal of foraging habitat (e.g., understory vegetation) or effects from fugitive dust and emissions.

Insects and insectivorous birds may be exposed to metals (e.g., mercury) and other elements from atmospheric emissions and tailings piles associated with gold and silver mining activities (Custer et al. 2009; Eagles-Smith et al. 2018; Jones and Miller 2005). Emissions of metals from mining operations and ore processing, in the form of particulate matter and dust, may be deposited directly on local soils and waterways. In addition, rainwater and snow melt may provide a pathway for these elements to leach from tailings piles or be physically transported as solid particles into adjacent waterbodies. These elements may enter the food web through plants and insects and then be consumed by insectivorous wildlife, potentially causing injury if exposure is sufficient. The Forest Service would require an adaptive management plan to address dust and emissions (see **Appendix D**, Mitigation Measures and Environmental Commitments). Although this mitigation measure would reduce impacts, there would still likely be indirect impacts to insectivorous birds like the boreal owl.

Alternatives 2, 3, and 4 would have similar effects on boreal owl as Alternative 1.

Access Roads

Alternative 1 could disturb individual boreal owls in the wildlife analysis area through direct habitat loss (12 acres) due to tree clearing, road construction, and increased human activity along the access roads (see **Table 4.13-9**). Direct take of adult birds due to these activities is possible, but unlikely, because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young could be directly disturbed by vegetation removal, including cutting of trees if it occurs during the nesting season. Timing restrictions described for the mine site would be used to reduce impacts.

Additionally, increased vehicle traffic is likely to disturb or displace individuals from roadside habitats. Plowing of the Burntlog Route over the winter would introduce additional noise and

disturbance, which could affect wintertime use by boreal owls. Noise-reduction strategies would be used to reduce indirect effects on owls. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Additionally, the 10.4-mile groomed OSV trail along the existing Cabin Creek Road (FR 467) would cross modeled habitat, which may disrupt boreal owls due to OSV noise.

Alternatives 2 and 3 would have similar effects on boreal owl as Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed or used. While 2 acres of modeled habitat would be directly impacted under this alternative, there is modeled suitable habitat located along the Yellow Pine Route that could be indirectly affected by noise and light from increased traffic levels.

Utilities

Alternative 1 could disturb individual boreal owls in the wildlife analysis area through direct habitat loss (8 acres) due to clearing and construction activities for utility corridors, substations, and communication towers. Direct take of adult birds due to these activities is unlikely because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young could be disturbed by vegetation removal, including cutting of trees if it occurs during the nesting season. Timing restrictions described for the mine site would be used to reduce impacts.

The communication towers and new or upgraded 138-kilovolt (kV) transmission line would be a potential source of mortality for boreal owls (Avian Power Line Interaction Committee [APLIC] 2012). In the long term, the transmission line design would meet APLIC raptor-protection criteria and include insulating or covered apparatus for perch accommodation to reduce risks to raptor species. Transmission line structures to serve Alternative 1 facilities would be designed and constructed to avoid raptor perching (to minimize the risk of being electrocuted). However, the long-term presence of structures and communication towers would pose a risk of collision and direct mortality. Upon closure, the new segment of transmission line between the mine site and Johnson Creek substation would be reclaimed.

Noise and light from construction of the utility corridors, substations, and communication towers is likely to disturb or displace individuals. However, construction of these areas would be temporary (approximately 3 years), and it is not expected to become a barrier to long-term movement or to fragment habitat. Once the construction is complete, it is expected that owls would resume use of the area.

Alternatives 2, 3, and 4 would have similar effects on boreal owl as Alternative 1, except that under Alternative 2 the transmission line between the mine site and Johnson Creek substation would not be reclaimed.

Off-site Facilities

Alternative 1 would not have any direct impacts on modeled habitat due to clearing and construction activities for off-site facilities. Modeled habitat within 1 mile of the off-site facilities is limited, but Alternative 1 could disturb individual boreal owls in the wildlife analysis area through noise increases due to construction or operation of the off-site facilities. Noise-reduction strategies would be used to lower indirect effects on the boreal owl. Lighting best management practices (e.g., downturned/shielded lights, reduced number used, directional lighting, etc.) would be used to reduce indirect effects on sensitive wildlife species (see **Appendix D**, Mitigation Measures and Environmental Commitments). Buildings would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2 and 3 would have similar effects on boreal owl as Alternative 1.

Under Alternative 4, the Landmark Maintenance Facility would be relocated to the southern side of Warm Lake Road, which would shift the footprint slightly versus Alternative 1. While the facility would be closer to modeled habitat, it is not expected that this change would cause effects different from Alternative 1.

Habitat Impacts

Table 4.13-9 Boreal Owl Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	60	N/A
Access Roads	12	N/A
Utilities	8	N/A
Off-site Facilities	0	N/A
Total	**80**	**9,590**
Alternative 2		
Mine Site	56	N/A
Access Roads	9	N/A
Utilities	8	N/A
Off-site Facilities	0	N/A
Total	**73**	**9,590**

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 3		
Mine Site	62	N/A
Access Roads	12	N/A
Utilities	9	N/A
Off-site Facilities	0	N/A
Total	**84**	**9,538**
Alternative 4		
Mine Site	65	N/A
Access Roads	2	N/A
Utilities	8	N/A
Off-site Facilities	0	N/A
Total	**75**	**8,004**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (1.0 mile for owls) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

Mine Site

Overall, boreal owls would likely continue to use the mine site as they currently do.

Access Roads

Existing roads also would continue to affect wildlife through habitat fragmentation and the risk of vehicle-wildlife collisions.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no loss of habitat, sources of noise and light, or increased risk of collision for boreal owls.

Off-site Facilities

There would be no loss of habitat or sources of noise and light impacts due to off-site facilities.

Determination

The action alternatives may directly and indirectly impact boreal owl 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. The action alternatives would all have similar direct and indirect impacts, but Alternative 3 would marginally have the most direct impacts to high elevation, mature conifer forests with standing snags (particularly near the mine site), and Alternative 2 would directly impact the least habitat.

4.13.2.2.2.5 Fisher

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-28 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-29** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-30** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Approximately 39 acres of direct impacts to modeled habitat would occur in the mine site under Alternative 1 (see **Table 4.13-10**). Olson et al. (2014) observed that although fishers are capable of long-distance dispersal movements (e.g., 6.2 miles), large expanses of non-favorable habitat may prevent them from doing so and become a barrier to movement. As the mine site would be approximately 6 miles long by 1 mile wide, it could fragment habitat.

These same effects also could reduce prey availability or redistribute their populations in the wildlife analysis area, causing them to travel further for foraging opportunities, which would indirectly affect the fisher. Noise and light at the mine site could also indirectly impact fishers.

Alternatives 2 and 4 would have similar effects on fisher as Alternative 1.

Alternative 3 would directly impact 47 acres of modeled habitat, primarily due to the TSF and DRSF. However, effects would be similar to those described for Alternative 1.

Access Roads

Approximately 10 acres of direct impacts to modeled habitat would occur along the access roads under Alternative 1 (see **Table 4.13-10**). The new 15-mile-long section of Burntlog Route would be used and plowed year-round; and along with all other access roads and other roads used for the SGP, would likely represent an increased potential for vehicle collisions. All employees and contractors would be trained to reduce wildlife collisions. The AADT for Alternative 1 would be approximately 68 vpd during operations. There also is the potential for an increase in trapping, resulting from increased access in remote areas. Restricting public access on the Burntlog Route and removing roadkill from roadways would likely reduce the chance of mortality (see **Appendix D**, Mitigation Measures and Environmental Commitments). These same effects also could reduce prey availability in the SGP area, which would indirectly affect

the fisher. Upon reclamation, the new section of the Burntlog Route would be decommissioned, re-contoured, and seeded to resemble pre-mining conditions, although the vegetation would likely continue to be dominated by grasses and forbs for many years. Additionally, the 10.4-mile groomed OSV trail along the existing Cabin Creek Road (FR 467) would cross modeled habitat, which may disrupt fishers due to OSV noise.

Under Alternative 2, there would also be 10 acres of direct impacts on modeled habitat. However, the on-site lime production would reduce traffic to the mine site by 2,032 trips per year. As such, the AADT for Alternative 2 would be approximately 50 vpd. Other effects would be similar to Alternative 1.

Alternative 3 would have similar effects on fisher as Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed and there would be approximately 2 acres of direct impacts on modeled habitat associated with the Yellow Pine Route. Indirect effects would also be likely within 1 mile of the Yellow Pine Route, as modeled habitat occurs along Stibnite Road, Johnson Creek Road, and Warm Lake Road.

Utilities

Approximately 13 acres of direct impacts to modeled habitat would occur along the utilities under Alternative 1 (see **Table 4.13-10**). Direct impacts on the fisher would include disturbance or fragmentation of habitat along utility corridors, substations, and communication towers due to land clearing activities and land use changes. Direct impacts would occur along new transmission lines (between the mine site and Johnson Creek substation) and along upgraded transmission lines (between Johnson Creek Road and the Thunderbolt Tap substation, and along Warm Lake Road). Construction impacts would likely displace fisher individuals further distances but would be temporary (up to 3 years). Vegetation would be cleared only in those areas necessary for Alternative 1 activities to preserve natural habitat to the greatest extent practicable. During operations, vegetation would be maintained in a low vegetation growth stage, and fishers would likely use the area again.

After mine closure is complete, the 8.5-mile new transmission line between the mine site and Johnson Creek substation would be removed, and fishers could continue to use modeled habitat in the area.

Alternatives 2, 3, and 4 would have similar effects on fisher as Alternative 1, except that under Alternative 2 the transmission line between Johnson Creek substation and the mine site would remain as a permanent feature.

Off-site Facilities

Construction and operation of the off-site facilities for Alternative 1 are unlikely to disturb the fisher, because construction activities are not planned to occur in modeled habitat. However, noise and light reduction strategies would be used to reduce indirect effects on them, as modeled habitat does occur adjacent to the Landmark Maintenance Facility. Buildings would

have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2 and 3 would have similar effects on fisher as Alternative 1.

Under Alternative 4, the Landmark Maintenance Facility would be relocated to the southern side of Warm Lake Road, which would shift the footprint slightly versus Alternative 1. This would cause approximately 1 acre of direct impacts to fisher; however, it is not expected that this change would cause effects different from Alternative 1.

Habitat Impacts

Table 4.13-10 Fisher Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	39	N/A
Access Roads	10	N/A
Utilities	13	N/A
Off-site Facilities	0	N/A
Total	**62**	**6,068**
Alternative 2		
Mine Site	36	N/A
Access Roads	10	N/A
Utilities	13	N/A
Off-site Facilities	0	N/A
Total	**59**	**6,068**
Alternative 3		
Mine Site	47	N/A
Access Roads	6	N/A
Utilities	14	N/A
Off-site Facilities	0	N/A
Total	**67**	**6,052**

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 4		
Mine Site	39	N/A
Access Roads	2	N/A
Utilities	13	N/A
Off-site Facilities	1	N/A
Total	**55**	**4,956**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (0.5 mile for fisher) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

Mine Site

Fishers may use the mine site area as they have in limited areas in the past.

Access Roads

Existing roads also would continue to affect wildlife through habitat fragmentation and vehicle-wildlife collisions.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat or source of noise and light impacts.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Determination

The action alternatives may directly and indirectly impact fisher 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. The action alternatives would all have similar effects, but Alternative 3 would marginally have the most direct impacts on suitable habitat (particularly near the mine site), and Alternative 4 would directly and indirectly impact the least habitat.

4.13.2.2.2.6 Flammulated Owl

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-31 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-32** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-33** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Alternative 1 could directly disturb 1 acre of modeled habitat in the mine site area (see **Table 4.13-11**), as modeled habitat is limited in this area. However, flammulated owls are known to occur in the wildlife analysis area. Direct take of adult birds due to construction or operational activities is unlikely because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young could be directly disturbed by vegetation removal (including cutting of trees) during construction if it occurs during the nesting season. To the extent practicable, trees found to contain nests or cavities (often used by flammulated owls) would not be disturbed or cut. A Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Although these mitigation measures would reduce impacts, there would still be a decrease in habitat.

Alternative 1 would cause an increase in noise and light in the wildlife analysis area, mostly in the vicinity of the mine site. Construction and operations, vehicle traffic, and helicopter use are likely to directly disturb or displace individuals. Wildlife behaviors that may change as a result of increased noise include nesting or foraging changes. Bright lighting can disrupt feeding activities for many owl species. Because flammulated owls are primarily nocturnal, they also could be impacted by direct collision risks with structures at the mine site due to lighting. Transmission line structures to serve facilities under Alternative 1 would be designed and constructed to avoid raptor perching (to minimize the risk of being electrocuted).

A likely indirect effect is that there could be a reduction in prey species near the mine site activities. Any actions resulting in a decrease to insects could impact the flammulated owl, including direct removal of foraging habitat (e.g., understory vegetation) or effects from fugitive dust and emissions. Flammulated owls are highly migratory and would primarily be impacted during the breeding season (mid-May to mid-August).

Insects and insectivorous birds, such as the flammulated owl, may be exposed to metals (e.g., mercury) and other elements from atmospheric emissions and tailings piles associated with gold and silver mining activities (Custer et al. 2009; Eagles-Smith et al. 2018; Jones and Miller 2005). Emissions of metals from mining operations and ore processing, in the form of particulate matter and dust, may be deposited directly on local soils and waterways. In addition, rainwater and snow melt may provide a pathway for these elements to leach from tailings piles or be physically transported as solid particles into adjacent waterbodies. These elements may enter the food web through plants and insects and then be consumed by insectivorous wildlife, potentially causing injury if exposure is sufficient. The Forest Service would require an adaptive

management plan to address dust and emissions (see **Appendix D**, Mitigation Measures and Environmental Commitments). Although this mitigation measure would reduce impacts, there would still likely be indirect impacts to insectivorous birds like the flammulated owl.

Alternatives 2, 3, and 4 would have similar effects on flammulated owl as Alternative 1.

Access Roads

Alternative 1 could disturb individual flammulated owls in the wildlife analysis area through direct habitat loss (4 acres; see **Table 4.13-11**) due to tree clearing, road construction, and increased human activity in the access roads. Direct take of adult birds due to these activities is possible, but unlikely, because most individuals are expected to avoid areas of activity. However, it is likely that nests, eggs, and young would be directly disturbed by vegetation removal, including cutting of trees if it occurs during the nesting season. Additionally, increased vehicle traffic is likely to directly disturb or displace individuals from roadside habitats.

Noise-reduction strategies would be used to reduce indirect effects on owls. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Cutting of trees for Alternative 1 activities would avoid avian tree nests, where feasible; and a Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Although these mitigation measures would reduce direct impacts, there would still be a decrease in habitat due to construction of the Burntlog Route.

Another indirect impact to flammulated owls along access roads could include fugitive dust. Dust associated with construction of facilities and roads, road maintenance, and vehicle travel may have indirect impacts on owl prey (e.g., insects, small mammals due to plant forage changes, etc.) (see Section 4.10.3.1.1.2, Indirect Impacts, in Section 4.10, Vegetation: General Vegetation Communities, Botanical Resources, and Non-Native Plants). Increased dust deposition could result in negative impacts on wildlife foods ranging from plant metabolic process inhibition, plant mortality, inhibition of pollination, or injury to pollinating insects. For 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. Dust impacts on wildlife forage plants and insects 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 plants and insects would occur immediately at the time of dust propagating activities and is likely to continue throughout the lifetime of SGP.

Alternatives 2 and 3 would have similar effects on flammulated owl as Alternative 1.

Under Alternative 4, the Burntlog Route would not be built. Most of the modeled suitable boreal owl habitat is located in proximity to the Yellow Pine Route. As such, there would be 5 acres of direct impacts to modeled habitat associated with the Yellow Pine Route. Indirect effects (e.g., noise, light, emissions) would also be likely due to modeled habitat occurring along the Stibnite Road, Johnson Creek Road, and Warm Lake Road.

Utilities

Alternative 1 could disturb individual flammulated owls in the wildlife analysis area through direct impacts of 39 acres to modeled habitat due to clearing and construction activities for utility corridors, substations, and communication towers. Direct take of adult birds due to these activities is unlikely because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young would be disturbed by vegetation removal, including cutting of trees if it occurs during the nesting season. To the extent practicable, trees found to contain nesting cavities would not be disturbed or cut. No trees with active nests would be cut.

The communication towers and new 138-kV transmission line would be a potential source of mortality for flammulated owls (APLIC 2012). The utility line design would meet APLIC raptor-protection criteria and include insulating or covered apparatus for perch accommodation to reduce risks to raptor species. Electric transmission line structures to serve facilities under Alternative 1 would be designed and constructed to avoid raptor perching (to minimize the risk of being electrocuted). However, the long-term (i.e., 20 years) presence of structures and communication towers would pose a risk of collision and direct mortality. Upon closure and reclamation, the new transmission line between the mine site and Johnson Creek substation would be removed, which would eliminate these impacts.

Noise and light from construction of the utility corridors, substations, and communication towers is likely to disturb or displace individuals. However, construction of these areas would be temporary (up to 3 years) and is not expected to become a barrier to long-term movement or to fragment habitat. Once the construction is complete, it is expected that owls would resume use of the area. The noise-reduction strategies described for the mine site and access roads would be employed along utility corridors and near communication towers, which would reduce noise impacts on flammulated owls.

Alternatives 2, 3, and 4 would have similar effects on flammulated owl as Alternative 1 except that under Alternative 2 the transmission line between the Johnson Creek substation and the mine site would remain.

Off-site Facilities

All action alternatives are unlikely to impact flammulated owls as there would be no direct impacts to modeled habitat. Additionally, indirect impacts would be unlikely as modeled habitat is very limited within 1 mile of the off-site facilities.

Habitat Impacts

Table 4.13-11 Flammulated Owl Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	1	N/A
Access Roads	4	N/A
Utilities	39	N/A
Off-site Facilities	0	N/A
Total	**44**	**6,590**
Alternative 2		
Mine Site	1	N/A
Access Roads	4	N/A
Utilities	42	N/A
Off-site Facilities	0	N/A
Total	**47**	**6,590**
Alternative 3		
Mine Site	1	N/A
Access Roads	4	N/A
Utilities	39	N/A
Off-site Facilities	0	N/A
Total	**44**	**6,590**
Alternative 4		
Mine Site	1	N/A
Access Roads	5	N/A
Utilities	39	N/A
Off-site Facilities	0	N/A
Total	**45**	**6,591**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (1.0 mile for owls) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

See the boreal owl analysis (Section 4.13.2.2.2.4) for effects under Alternative 5 that also would apply to the flammulated owl.

Determination

The action alternatives may directly and indirectly impact flammulated owl 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. The action alternatives would all have very similar direct and indirect impacts on modeled habitat (e.g., medium to large ponderosa pine, Douglas-fir, and aspen stands).

4.13.2.2.2.7 Great Gray Owl

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-34 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-35** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-36** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Great gray owls are documented in the area and modeled habitat occurs throughout the wildlife analysis area. Alternative 1 would result in 277 acres of direct impacts to modeled habitat for great gray owl in the mine site area (see **Table 4.13-12**). Direct take of adult birds due to construction or operational activities is possible, but unlikely, because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young could be directly disturbed by vegetation removal (including cutting of trees) during construction if it occurs during the nesting season. This resident species occasionally nests early in the season (in the snow). To the extent practicable, trees found to contain nests would not be disturbed or cut. A Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Timing restrictions would restrict some activities within a certain radius of active nest trees for raptor species, which would help reduce habitat impacts. For example, the Forest Service would require restricting activities between March 1 and August 1 which occur up to 1,500 feet from active great gray owl nest sites, and a 150-foot ground disturbance buffer would be maintained around active nests, with some exceptions (see **Appendix D**, Mitigation Measures and Environmental Commitments). Although these mitigation measures would reduce impacts, there would still be a decrease in modeled habitat.

The great gray owl also could be impacted by direct collision risks with structures at the mine site. Electric transmission line structures to serve Alternative 1 facilities would be designed and constructed to avoid raptor perching (to minimize the risk of being electrocuted). Additionally, the OHV connector trail would directly impact modeled habitat and cause further indirect impacts due to vehicle noise.

Alternative 1 would cause an increase in noise and light in the wildlife analysis area, mostly in the vicinity of the mine site. Construction and operations, vehicle traffic, and helicopter use are likely to directly disturb or displace individuals. Wildlife behaviors that may change as a result of increased noise include nesting or foraging changes. Bright lighting can disrupt feeding activities

for many owl species. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Additionally, light and noise impacts are reduced by vegetation, topography, and distance from the impact sources. Therefore, indirect impacts on wildlife would differ depending on the specific conditions at each individual Alternative 1 component location based on the density of vegetation and proximity to adjoining hillsides and valleys.

Alternative 2 would directly impact 239 acres and Alternative 4 would impact 281 acres of modeled habitat, but effects would be similar to those described for Alternative 1.

Under Alternative 3, approximately 365 acres of direct impacts would occur to modeled habitat. Under Alternative 4, the 3 miles of new road for the OHV connector trail from Horse Heaven/Powerline route to Meadow Creek Lookout Road (FR 51290) would not be constructed, which would reduce indirect impacts to great gray owl modeled habitat.

Access Roads

Alternative 1 would result in 64 acres of direct impacts to modeled habitat for great gray owl associated with the Burntlog Route (see **Table 4.13-12**). Direct take of adult birds due to these activities is possible, but unlikely, because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young could be directly disturbed by vegetation removal, including cutting of trees if it occurs during the nesting season. Timing restrictions described for the mine site would be used to reduce impacts.

Additionally, increased vehicle traffic is likely to disturb or displace individuals from roadside habitats. Noise-reduction strategies would be used to reduce indirect effects on owls. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Also, the 10.4-mile groomed OSV trail along the existing Cabin Creek Road (FR 467) would cross modeled habitat, which may disrupt great gray owls due to OSV noise.

Alternatives 2 and 3 would have similar direct impacts (57 acres and 54 acres, respectively), and the effects on great gray owl would be similar to those described for Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed or used. Direct impacts on modeled habitat would total approximately 13 acres and would be associated with upgrades along the Yellow Pine Route. Additionally, there is modeled suitable habitat located along the Yellow Pine Route that could be indirectly affected by noise and light from increased traffic levels.

Utilities

There would be 48 acres of direct impacts to modeled habitat due to construction of the new substations and new transmission line between the mine site and Johnson Creek substation, in addition to the upgrades to transmission lines and substations between Johnson Creek Road and the Warm Lake substation, and along Warm Lake Road and Johnson Creek Road.

Direct take of adult birds due to these activities is unlikely because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young could be disturbed by vegetation removal, including cutting of trees if it occurs during the nesting season. Timing restrictions described for the mine site would be used to reduce impacts.

The communication towers and new or upgraded transmission lines would be a potential source of mortality for great gray owls (APLIC 2012). In the long-term, the transmission line design would meet APLIC raptor-protection criteria and include insulating or covered apparatus for perch accommodation to reduce risks to raptor species. Transmission line structures to serve Alternative 1 facilities would be designed and constructed to avoid raptor perching (to minimize the risk of being electrocuted). However, the long-term (e.g., 20 years) presence of structures and communication towers would pose a risk of collision and direct mortality. Upon closure and reclamation, the new transmission line between the mine site and Johnson Creek substation would be removed, which would eliminate some of these impacts.

Noise and light from construction of the utility corridors, substations, and communication towers is likely to disturb or displace individuals within 1 mile of the project components. However, construction of these areas would be temporary (approximately 3 years), and it is not expected to become a barrier to long-term movement or to fragment habitat. Once the construction is complete, it is expected that owls would resume use of the area.

Alternatives 2, 3, and 4 would have similar effects on great gray owl as Alternative 1, except that under Alternative 2 the transmission line between the Johnson Creek substation and the mine site would remain.

Off-site Facilities

Alternative 1 would not have any direct impacts on modeled habitat due to clearing and construction activities for off-site facilities. However, Alternative 1 could disturb individual great gray owls in the wildlife analysis area through noise pollution due to construction or operation of the off-site facilities. Noise-reduction strategies would be used to reduce indirect effects on the owls. Lighting best management practices (e.g., downturned/shielded lights, reduced number used, directional lighting, etc.) would be used to reduce indirect effects on sensitive wildlife species (see **Appendix D**, Mitigation Measures and Environmental Commitments). Buildings would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2 and 3 would also have no direct impacts on great gray owl.

Under Alternative 4, the Landmark Maintenance Facility would be relocated to the southern side of Warm Lake Road, which would shift the footprint slightly versus Alternative 1. While this would result in 2 acres of direct impacts to modeled habitat, it is not expected that this change would cause effects different from Alternative 1.

Habitat Impacts

Table 4.13-12 Great Gray Owl Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	277	N/A
Access Roads	64	N/A
Utilities	48	N/A
Off-site Facilities	0	N/A
Total	**389**	**22,652**
Alternative 2		
Mine Site	239	N/A
Access Roads	57	N/A
Utilities	48	N/A
Off-site Facilities	0	N/A
Total	**344**	**22,652**
Alternative 3		
Mine Site	365	N/A
Access Roads	54	N/A
Utilities	49	N/A
Off-site Facilities	0	N/A
Total	**468**	**22,379**
Alternative 4		
Mine Site	281	N/A
Access Roads	13	N/A
Utilities	48	N/A
Off-site Facilities	2	N/A
Total	**344**	**17,101**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (1.0 mile for owls) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

See the boreal owl analysis (Section 4.13.2.2.2.4) for effects under Alternative 5 that also would apply to the great gray owl.

Determination

The action alternatives may directly and indirectly impact great gray owl 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. Alternative 3 would have the most direct impacts to great gray owl habitat (e.g., Engelmann spruce, spruce-subalpine fir, and riparian woodlands) due to the mine site. Alternatives 2 and 4 would directly impact the least (and same amount of) habitat, and Alternative 4 would indirectly impact the least amount of habitat due to the elimination of the Burntlog Route (where much modeled habitat occurs).

4.13.2.2.2.8 Northern Goshawk

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-37 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-38** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-39** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Northern goshawks have been documented but are expected to be uncommon and there are no known nests in the wildlife analysis area. There would be 98 acres of direct impacts to modeled habitat in the mine site area under Alternative 1. Direct take of adult birds or nests, eggs, or young due to construction or operational activities is unlikely, as they are thought to be uncommon. However, to the extent practicable, trees found to contain nests would not be disturbed or cut. A Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Timing restrictions would restrict some activities within a certain radius of active nest trees for raptor species, which would help reduce habitat impacts. For example, the Forest Service would restrict activities within a 30-acre (650-foot radius) area surrounding active nests, with some exceptions (see **Appendix D**, Mitigation Measures and Environmental Commitments). Additionally, drilling operations, roadwork, and helicopter flights would be restricted within a 1,500-foot buffer of active goshawk nests from April 1 to August 15. Although these mitigation measures would reduce impacts, there would still be a decrease in modeled habitat.

The northern goshawk could also be impacted by direct collision risks with structures at the mine site. Electric transmission line structures to serve Alternative 1 facilities would be designed and constructed to avoid raptor perching (to minimize the risk of being electrocuted).

Alternative 1 would cause an increase in noise and light in the wildlife analysis area, mostly in the vicinity of the mine site. Construction and operations, vehicle traffic, and helicopter use are

likely to directly disturb or displace individuals. Wildlife behaviors that may change as a result of increased noise include foraging changes.

Alternatives 2, 3, and 4 would have similar effects on northern goshawk as Alternative 1.

Access Roads

Alternative 1 would result in 22 acres of direct impacts to modeled habitat for northern goshawk associated with the Burntlog Route (see **Table 4.13-12**). Direct take of adult birds or nests, eggs, or young due to these activities is unlikely, because most individuals are expected to avoid areas of activity and there are no known nests in the area. However, timing restrictions described for the mine site would be used to reduce potential impacts.

Additionally, increased vehicle traffic is likely to disturb or displace individuals from roadside habitats and would cause indirect impacts on northern goshawk. Noise-reduction strategies would be used to reduce indirect effects on raptor species. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. The 10.4-mile groomed OSV trail along the existing Cabin Creek Road (FR 467) would cross modeled habitat, which may disrupt northern goshawks due to OSV noise.

Alternatives 2 and 3 would have similar direct impacts (19 acres and 18 acres, respectively), and the effects on northern goshawk would be similar to those described for Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed or used. Direct impacts on modeled habitat would total approximately 4 acres and would be associated with upgrades along the Yellow Pine Route. Additionally, there is modeled habitat located along the Yellow Pine Route that could be indirectly affected by noise and light from increased traffic levels.

Utilities

There would be 19 acres of direct impacts to modeled habitat due to construction of the new substations and new transmission line between the mine site and Johnson Creek substation, in addition to the upgrades to transmission lines and substations between Johnson Creek Road and the Warm Lake substation, and along Warm Lake Road and Johnson Creek Road. Direct take of adult birds or nests, eggs, or young due to these activities is unlikely because most individuals are expected to avoid areas of activity and they are not known to nest in the area.

The communication towers and new or upgraded transmission lines would be a potential source of mortality for northern goshawk. However, the transmission line design would meet APLIC raptor-protection criteria and include insulating or covered apparatus for perch accommodation to reduce risks to raptor species. Upon closure and reclamation, the new transmission line between the mine site and Johnson Creek substation would be removed, which would eliminate some of these collision impacts.

Noise and light from construction of the utility corridors, substations, and communication towers could disturb or displace individuals within 1 mile of the project components. However, construction of these areas would be temporary (approximately 3 years), and it is not expected to become a barrier to long-term movement or to fragment habitat. Once the construction is complete, it is expected that northern goshawks would resume use of the area.

Alternatives 2, 3, and 4 would have similar effects on northern goshawk as Alternative 1, except that under Alternative 2 the transmission line between the Johnson Creek substation and the mine site would remain.

Off-site Facilities

Alternative 1 would not have any direct impacts on modeled habitat due to clearing and construction activities for off-site facilities. Indirect impacts would also be unlikely as modeled habitat is limited within 1 mile of the off-site facilities.

Alternatives 2 and 3 also would have no direct impacts on northern goshawk.

Under Alternative 4, the Landmark Maintenance Facility would be relocated to the southern side of Warm Lake Road, which would shift the footprint slightly versus Alternative 1. While this would result in 1 acre of direct impacts to modeled habitat, it is not expected that this change would cause effects different from Alternative 1.

Habitat Impacts

Table 4.13-13 shows the direct and indirect impacts modeled habitat acres.

Table 4.13-13 Northern Goshawk Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	98	N/A
Access Roads	22	N/A
Utilities	19	N/A
Off-site Facilities	0	N/A
Total	**139**	**15,724**
Alternative 2		
Mine Site	92	N/A
Access Roads	19	N/A
Utilities	19	N/A
Off-site Facilities	0	N/A
Total	**130**	**15,724**

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 3		
Mine Site	109	N/A
Access Roads	18	N/A
Utilities	21	N/A
Off-site Facilities	0	N/A
Total	**148**	**15,657**
Alternative 4		
Mine Site	104	N/A
Access Roads	4	N/A
Utilities	19	N/A
Off-site Facilities	1	N/A
Total	**128**	**13,133**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (1.0 mile for raptors) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

Mine Site

Overall, northern goshawks would likely continue to use the mine site as they currently do.

Access Roads

Existing roads also would continue to affect wildlife through habitat fragmentation and vehicle-wildlife collisions.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat, source of noise and light impacts, or increased risk of collision for northern goshawks.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Determination

The action alternatives may directly and indirectly impact northern goshawk 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. Alternative 3 would have the most direct impacts to northern goshawk habitat (e.g., medium and large tree size classes in most forested habitat types), while Alternative 4 would directly and indirectly impact the least amount of habitat.

4.13.2.2.2.9 Pileated Woodpecker

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-40 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-41** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-42** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Effects to the pileated woodpecker at the mine site under all action alternatives would be similar to the white-headed woodpecker analysis (Section 4.13.2.2.1.1), as pileated woodpeckers and modeled habitat are uncommon in the mine site area. There are some documented occurrences in the Big Creek and Chamberlain areas, and it is possible they may utilize the wildlife analysis area.

There would be no direct impacts to pileated woodpecker modeled habitat on the mine site under any of the action alternatives. Indirect impacts could include displacement due to noise or light, and mitigation measures described for the white-headed woodpecker would likely reduce those impacts.

Access Roads

Effects to the pileated woodpecker along the access roads under all action alternatives would be similar to the white-headed woodpecker analysis (Section 4.13.2.2.1.1), as pileated woodpeckers and modeled habitat are rare along the access roads.

There would be 1 acre of direct impacts to modeled habitat along the access roads for each of the action alternatives. Indirect impacts could include displacement due to noise or light, and mitigation measures described for the white-headed woodpecker would likely reduce those impacts.

Utilities

Effects to the pileated woodpecker associated with the utilities under all action alternatives would be similar to the white-headed woodpecker analysis (Section 4.13.2.2.1.1), as pileated woodpeckers and modeled habitat are rare in the utility areas.

There would be no direct impacts to pileated woodpecker modeled habitat along the utilities under any of the action alternatives. Indirect impacts could include displacement due to noise or light, and mitigation measures described for the white-headed woodpecker would likely reduce those impacts.

Off-site Facilities

Effects to the pileated woodpecker at the off-site facilities under all action alternatives would be similar to the white-headed woodpecker analysis (Section 4.13.2.2.1.1), as pileated woodpeckers and habitat are rare near the off-site facilities.

There would be no direct impacts to pileated woodpecker modeled habitat for the off-site facilities under any of the action alternatives. Indirect impacts could include displacement due to noise or light, and mitigation measures described for the white-headed woodpecker would likely reduce those impacts.

Habitat Impacts

Table 4.13-14 shows the direct and indirect impacts modeled habitat acres.

Table 4.13-14 Pileated Woodpecker Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	0	N/A
Access Roads	1	N/A
Utilities	0	N/A
Off-site Facilities	0	N/A
Total	**1**	**391**
Alternative 2		
Mine Site	0	N/A
Access Roads	1	N/A
Utilities	0	N/A
Off-site Facilities	0	N/A
Total	**1**	**391**
Alternative 3		
Mine Site	0	N/A
Access Roads	1	N/A
Utilities	0	N/A
Off-site Facilities	0	N/A
Total	**1**	**391**

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 4		
Mine Site	0	N/A
Access Roads	1	N/A
Utilities	0	N/A
Off-site Facilities	0	N/A
Total	**1**	**392**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (0.5 mile for woodpeckers) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

Mine Site

Pileated woodpeckers would likely continue to use the mine site as they currently do, which is believed to be rarely.

Access Roads

Existing roads would continue to affect wildlife through habitat fragmentation and vehicle-wildlife collisions.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat, source of noise and light impacts, or increased risk of collision for woodpeckers.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Summary of Impacts

Although modeled habitat is limited in the wildlife analysis area, individuals are present during the breeding season. The action alternatives would likely have no direct impacts on pileated woodpecker modeled habitat (e.g., large and very large tree size classes in several different forest stands) but may affect individuals. There would be similar indirect impacts across all the action alternatives.

4.13.2.2.2.10 Silver-Haired Bat

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-43 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-44** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-45** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Silver-haired bats are documented in the wildlife analysis area and FCRNRW. There would be approximately 48 acres of direct impacts to modeled habitat at the mine site under Alternative 1 (see **Table 4.13-15**). Removal of large trees could reduce roosting habitat, while removal of open riparian habitats or small natural openings could reduce foraging habitat.

Alternative 1 would cause an increase in noise and light in the wildlife analysis area, mostly in the vicinity of the mine site. Silver-haired bat behaviors that may change as a result of increased noise and light include changes in roosting and foraging patterns that could lead to fragmentation of habitat. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Additionally, light and noise impacts are reduced by vegetation, topography, and distance from the impact sources. Therefore, indirect impacts on silver-haired bats would differ depending on the specific conditions at each individual Alternative 1 component location based on the density of vegetation and proximity to adjoining hillsides and valleys.

Direct and indirect impacts for bat species would likely be emission exposure and a reduction in insects due to emissions.

Insects and insectivorous wildlife including bats may be exposed to metals (e.g., mercury) and other elements from atmospheric emissions and tailings piles associated with gold and silver mining activities (Custer et al. 2009; Eagles-Smith et al. 2018; Jones and Miller 2005). Emissions of metals from mining operations and ore processing, in the form of particulate matter and dust, may be deposited directly on local soils and waterways. In addition, rainwater and snow melt may provide a pathway for these elements to leach from tailings piles or be physically transported as solid particles into adjacent waterbodies. These elements may enter the food web through plants and insects and then be consumed by insectivorous wildlife, potentially causing injury if exposure is sufficient. The Forest Service would require an adaptive management plan to address dust and emissions (see **Appendix D**, Mitigation Measures and Environmental Commitments). Although this mitigation measure would reduce impacts, there would still likely be indirect impacts to the silver-haired bat.

Alternatives 2 and 4 would have effects similar to Alternative 1.

Alternative 3 would have approximately 74 acres of direct impacts to modeled habitat at the mine site, primarily due to the TSF and DRSF. Indirect impacts would be likely within 1 mile of the mine site components due to noise, light, and emissions, similar to those described for Alternative 1.

Access Roads

There would be approximately 46 acres of direct impacts to modeled habitat along the access roads under Alternative 1, due to construction of the Burntlog Route (see **Table 4.13-15**). Removal of large trees in this area could reduce roosting habitat. The new segment of the Burntlog Route would be decommissioned and reclaimed during mine closure, which would reduce impacts to silver-haired bats and potentially create foraging habitat in the long-term (e.g., 20 years).

The operational traffic associated with the workforce, supplies, haulage, and other miscellaneous traffic, including road maintenance on the access roads, could expose individual bats to indirect impacts due to noise and light. Bat behaviors that may change as a result of increased noise and light include changes in roosting and foraging patterns that could lead to fragmentation of habitat.

Alternatives 2 and 3 would have effects similar to Alternative 1.

Under Alternative 4, the Burntlog Route would not be built. While more of the modeled silver-haired bat habitat is located in proximity to the Yellow Pine Route, direct impacts for Alternative 4 would total approximately 33 acres. Due to the modeled habitat along the Yellow Pine Route, there would be indirect impacts due to increased traffic levels (e.g., noise and light) and emissions.

Utilities

There would be approximately 137 acres of direct impacts to modeled habitat along the utilities under Alternative 1, due to clearing and construction activities for utility corridors, substations, and communication towers (see **Table 4.13-15**). Removal of large trees during construction could reduce roosting habitat. The Forest Service would require that known roost sites and hibernacula be avoided during the roosting period whenever possible (see **Appendix D**, Mitigation Measures and Environmental Commitments). During operations, the utility ROWs would be maintained in a low vegetation growth stage, which could provide summer foraging habitat for silver-haired bats. Upon closure and reclamation, the new transmission line between the mine site and Johnson Creek substation would be removed and reclaimed, which would reduce habitat impacts.

Noise and light disturbance from construction of the utility corridors, substations, and communication towers may temporarily (up to 3 years) disturb or displace individual bats. Once the construction is complete, it is expected that silver-haired bats would resume use of the area.

Alternative 2 would directly impact 146 acres of modeled habitat, primarily from the new transmission line between the Cascade switching station and Warm Lake Road. The effects would be similar to those described for Alternative 1.

Alternatives 3 and 4 would have similar effects on silver-haired bats as Alternative 1, except that under Alternative 2 the transmission line between the Johnson Creek substation and the mine site would remain.

Off-site Facilities

There would be no direct impacts to modeled habitat for silver-haired bat at any of the off-site facilities under all action alternatives. Indirect impacts would be unlikely as well, due to modeled habitat being limited around these facilities.

Habitat Impacts

Table 4.13-15 shows the direct and indirect impacts modeled habitat acres.

Table 4.13-15 Silver-haired Bat Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	48	N/A
Access Roads	46	N/A
Utilities	137	N/A
Off-site Facilities	0	N/A
Total	**231**	**12,348**
Alternative 2		
Mine Site	44	N/A
Access Roads	41	N/A
Utilities	146	N/A
Off-site Facilities	0	N/A
Total	**231**	**12,348**
Alternative 3		
Mine Site	74	N/A
Access Roads	45	N/A
Utilities	137	N/A
Off-site Facilities	0	N/A
Total	**256**	**12,306**

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 4		
Mine Site	49	N/A
Access Roads	33	N/A
Utilities	136	N/A
Off-site Facilities	0	N/A
Total	**218**	**11,619**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (1.0 mile from mine site and 0.5 mile from other components for bats) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

Mine Site

Because there is suitable habitat nearby for silver-haired bat and they are assumed to occur in the mine site area (especially the northern portion), individuals would likely continue to use the mine site as they currently do.

Access Roads

Existing roads (e.g., Johnson Creek Road, Stibnite Road, and Warm Lake Road) would continue to affect silver-haired bats through habitat fragmentation and disturbance from noise or light impacts due to traffic.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat, source of noise and light impacts, or increased risk of collision for bats. Individual bats would likely continue to use existing utility corridors for foraging.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Summary of Impacts

The action alternatives may directly and indirectly impact silver-haired bat individuals and habitat. Alternative 3 would have the most direct impacts on habitat (e.g., forest stands adjacent

to streams and riparian areas, and forested wetlands) and Alternative 4 would have the fewest direct and indirect impacts.

4.13.2.2.3 HABITAT FAMILY 3 – FOREST MOSAIC

4.13.2.2.3.1 Mountain Quail

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-46 shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-47** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figure 4.13-48** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

Mountain quail are believed to be rare in the wildlife analysis area, although modeled habitat is abundant and would be impacted. Alternative 1 could directly disturb 104 acres of modeled habitat in the mine site area. Mountain quail are ground nesters in shrub-dominated riparian areas and could be at risk of direct nest damage associated with the vegetation clearing and ground disturbance. However, the likelihood of mountain quail nesting in the wildlife analysis area is low, because suitable shrub-dominated riparian habitat is sparse in the Alternative 1 disturbance footprint, and the nearest observation of the species is approximately 8 miles west of the mine site (Strobilus Environmental 2017).

Implementation of Alternative 1 would require removal of vegetation from several habitat types during the life of the mine, some of which would be reclaimed during closure and reclamation. Alternative 1 would permanently impact approximately 116 acres of wetlands in the mine site, which could directly reduce habitat for mountain quail depending on specific riparian areas. Although riparian habitats would be directly disturbed in the short term, portions of the area would be reclaimed in the long term, including 51,350 linear feet of reclaimed stream channel and riparian habitat (Midas Gold 2016). The OHV connector trail would directly impact modeled habitat and cause further indirect impacts due to vehicle noise.

Alternative 1 would cause an increase in noise and light in the wildlife analysis area, mostly in the vicinity of the mine site. Mountain quail behaviors that may change as a result of increased noise and light include modifications in nesting and foraging patterns that could lead to fragmentation of habitat. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Indirect impacts during the brood-rearing season due to loss of insects from emissions and fugitive dust is discussed in Section 4.13.2.2.2.3 (Dusky Grouse).

Alternative 2 would have similar effects on mountain quail as Alternative 1.

Alternative 3 would directly impact 177 acres of modeled habitat at the mine site, primarily due to the TSF and DRSF changes, but the effects would be similar to those described for Alternative 1. Under Alternative 4, the 3 miles of new road for the OHV connector trail from Horse Heaven/Powerline route to Meadow Creek Lookout Road (FR 51290) would not be constructed, which would reduce direct and indirect impacts to mountain quail modeled habitat.

Access Roads

Alternative 1 could directly disturb 99 acres of modeled habitat along the access roads. Alternative 1 would impact up to 18 acres of wetlands along access roads, which could directly reduce habitat for mountain quail depending on riparian areas. The operational traffic associated with the workforce, supplies, haulage, and other miscellaneous traffic, including road maintenance on the access roads, could expose individual mountain quail to vehicle-wildlife collisions. The new segment of the Burntlog Route would be decommissioned and reclaimed during mine closure, but the effects would be considered long-term (e.g., 20 years).

Noise and light disturbance from road construction, road maintenance, and routine vehicle traffic could potentially disturb or displace individual quail. Mountain quail behaviors that may change as a result of increased noise and light include modifications in nesting and foraging patterns that could lead to fragmentation of habitat. Additionally, the 10.4-mile groomed OSV trail along the existing Cabin Creek Road (FR 467) would cross modeled habitat, which may disrupt mountain quail due to OSV noise. See Section 4.13.2.2.2.3 (Dusky Grouse) for indirect impacts related to fugitive dust along access roads that could also impact mountain quail.

Under Alternative 2, the on-site lime production would reduce traffic to the mine site, and the AADT level would be 50 vpd, which could reduce the risk of wildlife-vehicle collisions. Other effects would be the same as Alternative 1.

Although the Burntlog Route would include an additional 5 miles of new road that would impact more mountain quail habitat, Alternative 3 would have similar effects on mountain quail as Alternative 1.

Under Alternative 4, the Burntlog Route would not be built. There would be 81 acres of direct impacts to modeled habitat, which would be associated with upgrades to the existing Yellow Pine Route roadways. Indirect effects due to traffic noise and light would be expected within 1 mile of the Yellow Pine Route.

Utilities

Alternative 1 could directly disturb 228 acres of modeled habitat due to clearing and construction activities for utility corridors, substations, and communication towers. Utilities under Alternative 1 would impact up to 46 acres of wetlands. Direct impacts to forested wetlands would likely be permanent as ROW management practices generally do not allow the establishment of woody vegetation. Utility corridors would be maintained in a low vegetation stage during operations, which could disturb modeled habitat as well.

Noise and light disturbance from construction of the utility corridors, substations, and communication towers may temporarily disturb or displace individuals. These indirect impacts would be considered temporary during construction (up to 3 years). Once the construction is complete, it is expected that mountain quail would resume use of the area.

Alternatives 2, 3, and 4 would have similar effects on mountain quail as Alternative 1.

Off-site Facilities

Alternative 1 would not directly disturb any modeled habitat for the off-site facilities, but up to 1 acre of wetlands would be impacted. However, it is expected that most individuals would avoid these areas, and any habitat effects would be minor.

Indirect impacts would be unlikely as modeled habitat is limited near these facilities. However, noise-reduction strategies would be used to reduce any potential indirect impacts on mountain quail. Buildings would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternative 2 would directly impact up to 1 acre of modeled habitat at the Burntlog Maintenance Facility, but indirect impacts would be limited. Alternatives 3 and 4 would have no direct impacts on mountain quail.

Habitat Impacts

Table 4.13-16 shows the direct and indirect impacts modeled habitat acres.

Table 4.13-16 Mountain Quail Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	104	N/A
Access Roads	99	N/A
Utilities	228	N/A
Off-site Facilities	0	N/A
Total	**431**	**14,065**
Alternative 2		
Mine Site	96	N/A
Access Roads	93	N/A
Utilities	237	N/A
Off-site Facilities	1	N/A
Total	**427**	**14,065**

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 3		
Mine Site	177	N/A
Access Roads	103	N/A
Utilities	226	N/A
Off-site Facilities	0	N/A
Total	**506**	**14,015**
Alternative 4		
Mine Site	106	N/A
Access Roads	81	N/A
Utilities	225	N/A
Off-site Facilities	0	N/A
Total	**412**	**12,588**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (0.5 mile for mountain quail) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

Mine Site

Because there is potentially suitable habitat for mountain quail, any individuals would likely continue to use the mine site as they currently do in limited areas.

Access Roads

Existing roads would continue to affect wildlife through habitat fragmentation, vehicle-wildlife collisions, and noise impacts.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat or source of noise and light impacts.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Determination

The action alternatives may directly and indirectly impact mountain quail 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. Alternative 3 would have the most direct impacts to mountain quail habitat (e.g., Douglas-fir, ponderosa pine, Western larch, and riparian habitats), particularly due to the mine site, while Alternative 4 would directly and indirectly impact the least amount of habitat.

4.13.2.2.4 HABITAT FAMILY 5 – FOREST AND RANGE MOSAIC

4.13.2.2.4.1 Gray Wolf

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Mine Site

Direct impacts on gray wolves would include habitat loss in the wildlife analysis area. Additional indirect impacts on gray wolves would include displacement due to noise and light or increased human activity. These same effects also could reduce prey availability or redistribute their populations in the wildlife analysis area, causing wolves to travel further for foraging opportunities. This could expose them to increased competition with other wolf packs as they seek new territory and would be a potential indirect effect.

Alternatives 2, 3, and 4 would have similar effects on gray wolves as Alternative 1.

Access Roads

Several wolf packs occur in the FCRNRW area, which is near the Burntlog Route. Direct impacts on gray wolves would include habitat loss and an increased potential of vehicle-wildlife collisions along the Burntlog Route. Vehicle traffic associated with the access roads could increase the risk of wildlife-vehicle collisions. All employees and contractors would be trained to reduce wildlife collisions. Midas Gold would develop a wildlife mortality-reporting procedure and form to be used for reporting accidental Alternative 1-related wildlife mortality. Any adverse wildlife encounters would be reported to appropriate state and federal wildlife managers, and in accordance with state and federal laws. Restricting public access on the Burntlog Route would likely reduce impacts due to mortality.

Indirect impacts would include displacement due to noise and light or increased human activity. The new road systems and groomed OSV trails could serve as hunting corridors for wolves, changing their movement patterns and indirectly increasing predation of big game species, including elk (Forest Service 2017). Although additional roadways could expose gray wolves to hunting pressure from humans in the wildlife analysis area, hunting or discharge of firearms during construction and operations in the SGP area would be prohibited. Signs would be posted throughout the mine site and off-site facilities and training would be provided to notify employees that hunting is prohibited, and employees would be prohibited from carrying firearms

on any SGP site. Although these mitigation measures would reduce impacts, there would still be a direct decrease in habitat, and increase in risk of disturbance and injury or mortality. These same effects also could reduce prey availability in the SGP area, causing wolves to range further. This indirect effect also could expose them to increased competition with other wolf packs as they seek new territory.

Under Alternative 2, the on-site lime production would reduce traffic to the mine site, and the AADT level would be 50 vpd, which could reduce the risk of wildlife-vehicle collisions. Other effects would be the same as Alternative 1.

Alternative 3 would include 19.6 miles of new road that would disturb additional habitat, but it would have similar effects on gray wolves as Alternative 1.

Under Alternative 4, the Burntlog Route would not be built, and the Yellow Pine Route would be used instead. This would shift disturbance away from the FCRNRW area, where gray wolf packs are known to occur.

Utilities

Direct impacts on gray wolves would include loss or fragmentation of habitat along utility corridors, substations, and communication towers due to land clearing activities and land use changes. Construction impacts would likely displace wolves further distances, but would be temporary (e.g., up to 3 years). Vegetation would be cleared only in those areas necessary for Alternative 1 activities to preserve natural habitat to the greatest extent practicable.

Alternatives 2, 3, and 4 would have similar effects on gray wolves as Alternative 1.

Off-site Facilities

Direct impacts on gray wolves would include habitat loss in the wildlife analysis area and could include displacement due to noise and light or increased human activity. These same effects also could reduce prey availability in the SGP area, which would indirectly affect the gray wolf.

Alternatives 2, 3, and 4 would have similar effects on gray wolves as Alternative 1.

Habitat Impacts

The focal species selected for the Wildlife Conservation Strategy (WCS) for the BNF and PNF represent the appropriate habitat types and are surrogates for many other species, including gray wolf. Thus, there are no specific habitat models available for this species.

Alternative 5

Mine Site

Gray wolves would likely continue to use the mine site area as they currently do.

Access Roads

Existing roads also would continue to affect wildlife through habitat fragmentation and vehicle-wildlife collisions.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat or source of noise and light impacts.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Determination

The action alternatives may directly and indirectly impact gray wolf individuals and habitat (i.e., general habitat types), but would not likely contribute to a trend towards ESA listing or loss of viability of the species within the planning area.

4.13.2.2.4.2 Peregrine Falcon

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Mine Site

Direct impacts on peregrine falcon would include potential habitat loss in the wildlife analysis area. Indirect impacts would include displacement due to noise and light and increased human activity. These same effects also could reduce avian prey availability or redistribute their populations in the wildlife analysis area, which could indirectly impact falcons.

Alternatives 2, 3, and 4 would have similar effects on peregrine falcons as Alternative 1.

Access Roads

Direct impacts on peregrine falcon would include habitat loss within and adjacent to breeding territories that are known to occur in the FCRNRW area. Indirect impacts would include displacement due to noise and light from increased human activity and traffic.

Alternatives 2 and 3 would have similar effects on peregrine falcons as Alternative 1.

Under Alternative 4, the Burntlog Route would not be built. There are known breeding territories within the FCRNRW area that would not be impacted under Alternative 4. However, traffic would be higher along the Yellow Pine Route (Johnson Creek and the EFSFSR), where nesting also has been documented, and this would be an indirect impact.

Utilities

Direct impacts on peregrine falcons would include loss or fragmentation of habitat along utility corridors, substations, and communication towers due to land clearing activities and land use changes. Construction impacts would likely displace falcons further distances, but would be temporary (e.g., 3 years). Vegetation would be cleared only in those areas necessary for Alternative 1 activities to preserve natural habitat to the greatest extent practicable.

Alternatives 2, 3, and 4 would have similar effects on peregrine falcons as Alternative 1.

Off-site Facilities

Direct impacts on peregrine falcons would include habitat loss in the wildlife analysis area and could include displacement due to noise and light or increased human activity.

Alternatives 2, 3, and 4 would have similar effects on peregrine falcons as Alternative 1.

Habitat Impacts

The focal species selected for the WCS for the BNF and PNF represent the appropriate habitat types and are surrogates for many other species, including peregrine falcon. Thus, there are no specific habitat models available for this species.

Alternative 5

Mine Site

Peregrine falcons would likely continue to use the mine site area as they currently do.

Access Roads

Existing roads, especially Johnson Creek Road, would continue to affect falcons through habitat fragmentation and disturbance due to noise and light impacts.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat or source of noise and light impacts.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Determination

The action alternatives may directly and indirectly impact peregrine falcon individuals and habitat (e.g., forest and non-forest vegetation types within 10 miles of suitable nesting cliffs) but

would not likely contribute to a trend towards ESA listing or loss of viability of the species within the planning area.

4.13.2.2.4.3 Rocky Mountain Bighorn Sheep

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figures 4.13-49 and **52** shows the components of Alternatives 1 and 2 within the wildlife analysis area compared to modeled habitat. **Figures 4.13-50** and **53** shows the components of Alternative 3 within the wildlife analysis area compared to modeled habitat. **Figures 4.13-51** and **54** shows the components of Alternative 4 within the wildlife analysis area compared to modeled habitat.

Mine Site

There is more Rocky Mountain bighorn sheep summer habitat in the vicinity of the mine site than winter habitat. As such, there would be approximately 560 acres of direct impacts to summer modeled habitat and 128 acres of winter modeled habitat under Alternative 1 at the mine site. This direct loss of habitat would displace any individuals that occur in the wildlife analysis area, which appears to be limited. The mine site and associated infrastructure may displace sheep around the perimeter of the disturbances. Rocky Mountain bighorn sheep are very mobile and able to avoid localized direct threat of injury or mortality. Although additional roadways near the mine site could expose individuals to direct vehicle collisions and mortality. Personnel and contractors traveling in vehicles would be required to observe posted speed limits or state secondary road speed limits, and to drive at speeds appropriate to reduce the possibility of vehicle-wildlife accidents.

Light and noise impacts are reduced by vegetation, topography, and distance from the impact sources. Therefore, indirect impacts on sheep would differ depending on the specific conditions at each Alternative 1 component location, based on the density of vegetation and proximity to adjoining hillsides and valleys. As part of SGP standard operating procedures (SOPs), buildings, equipment, and drill rigs would have limited external lighting and use noise-reduction strategies when feasible (see **Appendix D**, Mitigation Measures and Environmental Commitments). The result would generally be a reduction in the area of habitat disturbed at most sites.

There would be no hunting or discharge of firearms during construction and operations in the mine site area. Signs would be posted at the SGP area and training would be provided to notify employees that hunting is prohibited, and employees would be prohibited from carrying firearms on the SGP site. However, illegal harvest of big game species is a potential risk and would be an indirect impact.

Alternatives 2, 3, and 4 would generally have the same effects on summer and winter modeled habitat as Alternative 1.

Access Roads

Because bighorn sheep are known to occur in the FCRNRW area, they could potentially be affected by loss of potential habitat along the access roads, and direct impacts would include approximately 74 acres of modeled summer habitat and 21 acres of modeled winter habitat. The new 15-mile-long section of Burntlog Route would be constructed and plowed year-round and have an AADT level of 68 vehicles during operations, which would likely directly disrupt or alter Rocky Mountain bighorn sheep movements. The intensity of this impact could range from minor injury to mortality. The duration ranges from temporary road construction (e.g., 3 years) to short-term (during 12 to 15 years of mining and ore processing operations). It is not expected that the increased risk of injury or mortality would become permanent, because the new segment of the Burntlog Route would be reclaimed upon closure, and traffic levels on the existing roads would return to current levels. The geographic extent of these impacts would be limited to the vicinity of the access road. Additionally, the 10.4-mile groomed OSV trail along the existing Cabin Creek Road (FR 467) would cross bighorn sheep winter habitat, which may disrupt them due to OSV noise.

Although additional roadways could expose Rocky Mountain bighorn sheep to increased hunting pressure from humans in the wildlife analysis area, hunting or discharge of firearms during construction and operations in the SGP area would be prohibited. Signs would be posted throughout the SGP area and training would be provided to notify employees that hunting is prohibited, and employees would be prohibited from carrying firearms on the SGP site. Roadways also are used as corridors by predators such as wolves or mountain lions, which could indirectly increase predation of sheep.

The reroute of the Burntlog Route under Alternative 2 could disrupt or alter Rocky Mountain bighorn sheep movements as it would be in closer proximity to modeled habitat and the FCRNRW area, but effects would be generally the same as Alternative 1. Additionally, the on-site lime production would reduce traffic to the mine site, and have an AADT level of 50 vpd, which would slightly reduce the risk of wildlife-vehicle collisions.

Although Alternative 3 would include 19.6 miles of new roadway due to the Burntlog Route adjacent to bighorn sheep habitat, Alternative 3 would have similar effects on Rocky Mountain bighorn sheep as Alternative 1.

Under Alternative 4, the Burntlog Route would not be built. However, there is a comparable amount of modeled suitable habitat adjacent to the Yellow Pine Route as well. There would be 48 acres of direct impacts to modeled summer habitat and 23 acres of direct impacts to modeled winter habitat under Alternative 4.

Utilities

Direct impacts on Rocky Mountain bighorn sheep could include loss or fragmentation of habitat along utility corridors, substations, and communication towers due to land clearing activities and land use changes. There would be 68 acres of direct impacts to modeled summer habitat and 22 acres of direct impacts to modeled winter habitat under Alternative 1 for the utility corridors.

Construction impacts would likely displace wildlife further distances, but this would be temporary (e.g., 3 years). Vegetation would be cleared only in those areas necessary for Alternative 1 activities to preserve natural habitat to the greatest extent practicable.

Noise-reduction strategies would be used to reduce indirect effects on sheep. Equipment would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2, 3, and 4 would have similar effects on Rocky Mountain bighorn sheep and modeled habitat as Alternative 1.

Off-site Facilities

There would be no direct impacts to modeled summer or winter habitat due to construction and operation of the off-site facilities under any of the action alternatives. Indirect impacts would also be unlikely, as modeled habitat is limited within 1 mile of these facilities.

Habitat Impacts

Table 4.13-17 shows the direct and indirect impacts modeled habitat acres.

Table 4.13-17 Rocky Mountain Bighorn Sheep Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres) - Summer	Indirectly Impacted Modeled Habitat (acres) - Summer	Directly Impacted Modeled Habitat (acres) - Winter	Indirectly Impacted Modeled Habitat (acres) - Winter
Alternative 1				
Mine Site	560	N/A	128	N/A
Access Roads	74	N/A	21	N/A
Utilities	68	N/A	22	N/A
Off-site Facilities	0	N/A	0	N/A
Total	**702**	**6,565**	**171**	**1,869**
Alternative 2				
Mine Site	511	N/A	128	N/A
Access Roads	79	N/A	21	N/A
Utilities	68	N/A	22	N/A
Off-site Facilities	0	N/A	0	N/A
Total	**658**	**6,565**	**171**	**1,869**
Alternative 3				
Mine Site	540	N/A	108	N/A
Access Roads	72	N/A	20	N/A
Utilities	62	N/A	24	N/A
Off-site Facilities	0	N/A	0	N/A
Total	**674**	**6,394**	**152**	**1,867**

Project Component	Directly Impacted Modeled Habitat (acres) - Summer	Indirectly Impacted Modeled Habitat (acres) - Summer	Directly Impacted Modeled Habitat (acres) - Winter	Indirectly Impacted Modeled Habitat (acres) - Winter
Alternative 4				
Mine Site	563	N/A	128	N/A
Access Roads	48	N/A	23	N/A
Utilities	67	N/A	22	N/A
Off-site Facilities	0	N/A	0	N/A
Total	**678**	**5,647**	**173**	**1,819**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (0.5 mile for bighorn sheep) from the action alternatives and occur outside of the project components.

0 acres indicates that project components would not cross or overlap modeled habitat.

Alternative 5

Mine Site

Rocky Mountain bighorn sheep may use the mine site area as they have in limited areas in the past.

Access Roads

Existing roads also would continue to affect wildlife through habitat fragmentation and vehicle-wildlife collisions.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat or source of noise and light impacts.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Determination

The action alternatives may directly and indirectly impact Rocky Mountain bighorn sheep 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. Across all action alternatives, more summer habitat (e.g., most forest types and tree size classes within 2 miles of a steep rock, cliff, or talus slope) would be directly and indirectly impacted than winter habitat (e.g., sagebrush-dominated cover types within 2 miles of a steep rock, cliff, or talus slope). For summer habitat types, Alternative 1 would directly impact the most habitat, Alternative 2 would directly impact the least habitat, and Alternative 4 would indirectly impact the least habitat (due to the Burntlog Route not being constructed). For winter habitat, Alternative 3 would have the fewest direct impacts, while the other action alternatives would have very similar direct and indirect impacts.

4.13.2.2.5 HABITAT FAMILY 7 – FORESTS, WOODLANDS, AND SAGEBRUSH

4.13.2.2.5.1 Townsend's Big-Eared Bat

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Mine Site

Direct disturbance to the Townsend's big-eared bat would be possible through habitat loss at the mine site. Although some historic mine workings that may serve as winter hibernacula habitat are present in the wildlife analysis area, there are no known occurrences of the Townsend's big-eared bat. After closure and reclamation, the pit walls of the Hangar Flats and

West End pits would be exposed for a long time period, which could potentially create roost sites for them. The Forest Service would require that any potential drill pad sites adjacent to any open mine workings or natural caves should be observed for the presence of bats. If necessary, to maintain key features of habitat or to avoid disruption, activities would be modified in coordination with the Forest Service (see **Appendix D**, Mitigation Measures and Environmental Commitments).

Alternative 1 also would cause an increase in noise and light in the wildlife analysis area, mostly in the vicinity of the mine site. Bat behaviors that may change as a result of increased noise or light include changes in roosting or foraging patterns that could lead to fragmentation of habitat. The potential effects on wildlife habitat are dependent on geographical conditions, because sound propagation is reduced by distance, vegetation, and intervening topography. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Refer to Section 4.13.2.2.2.10 (Silver-haired bat), which discusses additional indirect impacts that could likely also impact the Townsend's big-eared bat, including emissions exposure and loss of insects due to air emissions and fugitive dust.

Alternatives 2, 3, and 4 would have similar effects on Townsend's big-eared bat as Alternative 1.

Access Roads

Disturbance to the Townsend's big-eared bat would be possible due to habitat loss along the access roads, but unlikely because of their limited occurrence in the area. Because they can occupy forested habitats within 15 miles of cave/rock crevices, they could potentially be displaced by the removal of summer roosting habitat.

Disturbance to the Townsend's big-eared bat due to road construction and vehicle traffic along the Burntlog Route also would be possible. Potential effects could include direct disturbance and displacement, although signal masking due to traffic noise is unlikely, because traffic noise does not overlap much with bat echolocation calls (Caltrans 2016). The noise-reduction strategies mentioned above employed along access roads would likely be sufficient to reduce noise impacts on the Townsend's big-eared bat. Refer to Section 4.13.2.2.2.10 (Silver-haired bat), which contains additional indirect impacts that would likely also impact the Townsend's big-eared bat.

Alternatives 2 and 3 would have similar effects on Townsend's big-eared bat as Alternative 1.

Under Alternative 4, the Burntlog Route would not be built and habitat along that corridor would not be impacted. However, bats along the Yellow Pine Route may be impacted in a similar manner.

Utilities

Direct impacts on the Townsend's big-eared bat could include loss or fragmentation of habitat along utility corridors, substations, and communication towers due to land clearing activities and land use changes. Construction impacts would likely displace wildlife further distances, but would be temporary (e.g., 3 years). Vegetation would be cleared only in those areas necessary for Alternative 1 activities to preserve natural habitat to the greatest extent practicable.

Noise and light reduction strategies would be used to reduce indirect effects on the Townsend's big-eared bat. Equipment would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Lighting impacts could alter the Townsend's big-eared bat's natural activities, but construction of these areas would be temporary (e.g., 3 years). Refer to Section 4.13.2.2.2.10 (Silver-haired bat), which contains additional indirect impacts that would likely also impact the Townsend's big-eared bat.

Alternatives 2, 3, and 4 would have similar effects on Townsend's big-eared bat as Alternative 1.

Off-site Facilities

Direct impacts on the Townsend's big-eared bat are unlikely near the off-site facilities, because no construction or infrastructure would impact the habitats used by the Townsend's big-eared bat in the wildlife analysis area. Noise and light reduction strategies would be used to reduce indirect effects on the Townsend's big-eared bat within 1 mile of these facilities. Equipment would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Lighting impacts could alter the Townsend's big-eared bat's natural activities, but construction of these areas would be temporary (e.g., 3 years). Refer to Section 4.13.2.2.2.10 (Silver-haired bat), which contains additional indirect impacts that would likely also impact the Townsend's big-eared bat.

Alternatives 2, 3, and 4 would have similar effects on Townsend's big-eared bat as Alternative 1.

Habitat Impacts

The focal species selected for the WCS for the BNF and PNF represent the appropriate habitat types and are surrogates for many other species, including Townsend's big-eared bat. Thus, there are no specific habitat models available for this species.

Alternative 5

Mine Site

Townsend's big-eared bats have not been observed, but are assumed to occur in the mine site, and individuals would likely use the mine site much as they currently do.

Access Roads

Existing roads also would continue to affect wildlife through habitat fragmentation and noise and light impacts.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat, source of noise and light impacts, or increased risk of collision for the Townsend's big-eared bat.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Determination

The action alternatives may directly and indirectly impact Townsend's big-eared bat individuals and habitat (e.g., ponderosa pine, Douglas fir, and grand fir stands), but would not likely contribute to a trend towards ESA listing or loss of viability of the species within the planning area.

4.13.2.2.6 HABITAT FAMILY 13 – RIVERINE RIPARIAN AND WETLAND

4.13.2.2.6.1 Bald Eagle

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Mine Site

Alternative 1 could directly disturb bald eagles in the analysis area through habitat loss, disturbance from increased human activity, and helicopter flights. Direct take of adult birds due to construction or operational activities is possible, but unlikely, because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young could be directly disturbed by vegetation removal (including cutting of trees) during construction if it occurs during the nesting season. Trees found to contain nests would not be disturbed or cut. A Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Although these mitigation measures would reduce impacts, there would still be a decrease in habitat.

Alternative 1 would cause an increase in noise and light in the wildlife analysis area, mostly in the vicinity of the mine site. Construction and operations, vehicle traffic, and helicopter use are likely to directly disturb or displace individuals. Wildlife behaviors that may change as a result of increased noise include nesting or foraging changes. A likely indirect effect is that there would be a reduction in prey species (i.e., fish) within the mine site.

The bald eagle also could be impacted by direct collision risks with structures at the mine site. Transmission line structures to serve Alternative 1 facilities and the new 138-kV transmission line in the mine site would be a potential source of mortality for raptors (APLIC 2012). However, the utility line design would meet APLIC raptor-protection criteria and include insulating or covered apparatus for perch accommodation to reduce risks to raptor species.

Alternatives 2, 3, and 4 would have similar effects on bald eagle as Alternative 1.

Access Roads

Alternative 1 could directly disturb bald eagles in the wildlife analysis area through habitat loss due to tree clearing, road construction, and increased human activity along access roads. Direct take of adult birds due to these activities is unlikely, because most individuals are expected to avoid areas of activity. However, there are known eagle nests along Johnson Creek Road and Warm Lake, and it is possible that eagles would be displaced from these territories due to the increased traffic.

Bald eagles are opportunistic scavengers of carrion. Roadkill from Alternative 1 traffic could attract them to roadsides where they also would be exposed to vehicle-wildlife collisions. The operational traffic associated with the workforce, supplies, haulage, and other miscellaneous traffic, including road maintenance on the access roads, is expected to produce an annual average daily traffic level of 68 vehicles. Midas Gold would establish appropriate speed limits (i.e., generally 30 miles per hour or less) for the Burntlog Route, site haul roads, and light vehicle access roads on Alternative 1 site to reduce the possibility of vehicle-wildlife collisions. All staff and contractors would be trained to observe posted speed limits and reduce wildlife collisions. However, wildlife-vehicle collisions are still a possibility. Any adverse wildlife encounters would be reported to appropriate state and federal wildlife managers. Restricting public access on the Burntlog Route and removing roadkill from roadways would likely reduce impacts due to mortality.

Noise-reduction strategies would be used to reduce indirect effects on bald eagles. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Although timing restrictions would restrict some activities within a certain radius of active nest trees for raptor species, which would help reduce habitat impacts, some displacement and nest failure could occur. Cutting of trees for Alternative 1 activities would avoid avian tree nests, where feasible, and a Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Although these mitigation measures would reduce direct impacts, there would still be a decrease in habitat.

Alternatives 2 and 3 would have similar effects on bald eagle as Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed and thus the area associated with the Burntlog Route would not be impacted. However, since there are known nest sites along the Yellow Pine Route, the increased traffic under Alternative 4 may displace eagles from these territories.

Utilities

Alternative 1 could directly disturb bald eagles in the analysis area through habitat loss due to clearing and construction activities for utility corridors, substations, and communication towers. Direct take of adult birds due to these activities is unlikely because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young would be disturbed by vegetation removal, including cutting of trees if it occurs during the nesting season. To the extent practicable, trees found to contain nests would not be disturbed or cut. No trees with active nests would be cut.

The communication towers and new 138-kV transmission line would be a potential source of mortality for bald eagles (APLIC 2012). The utility line design would meet APLIC raptor-protection criteria and include insulating or covered apparatus for perch accommodation to reduce risks to raptor species. Electric transmission line structures to serve Alternative 1 facilities would be designed and constructed to avoid raptor perching (to minimize the risk of being electrocuted). However, the long-term presence of structures and communication towers would pose a risk of collision and direct mortality.

Noise and light from construction of the utility corridors, substations, and communication towers is likely to disturb or displace individuals. However, construction of these areas would be temporary (e.g., 3 years), and is not expected to fragment habitat. Once the construction is complete, it is expected that bald eagles would resume use of the area. The noise-reduction strategies employed along utility corridors and near communication towers would reduce noise impacts on individual bald eagles.

Alternatives 2, 3, and 4 would have similar effects on bald eagle as Alternative 1.

Off-site Facilities

Alternative 1 is unlikely to directly disturb bald eagles in the analysis area through habitat loss due to clearing and construction activities for off-site facilities.

Alternative 1 could disturb individual bald eagles in the wildlife analysis area through noise and light due to construction of the off-site facilities. Noise-reduction strategies would be used to reduce indirect effects on bald eagles. Lighting best management practices (e.g., downturned/shielded lights, reduced number used, directional lighting, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would

be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2, 3, and 4 would have similar effects on bald eagle as Alternative 1.

Habitat Impacts

The focal species selected for the WCS for the BNF and PNF represent the appropriate habitat types and are surrogates for many other species, including bald eagle. Thus, there are no specific habitat models available for this species.

Alternative 5

Mine Site

Because there is potentially suitable habitat for bald eagles and they are assumed to occur in the mine site, individuals would likely continue to use the mine site as they currently do in limited areas.

Access Roads

Existing roads also would continue to affect wildlife through habitat fragmentation, particularly along Johnson Creek Road and near Warm Lake where there are known nest sites.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of habitat, source of noise and light impacts, or increased risk of collision for bald eagles.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Determination

The action alternatives may directly and indirectly impact bald eagle individuals and habitat (e.g., mature forest types within 1.25 miles of major waterbodies) but would not likely contribute to a trend towards ESA listing or loss of viability of the species within the planning area.

4.13.2.2.6.2 Columbia Spotted Frog

Direct (Habitat) and Indirect Effects from Alternatives 1, 2, 3, and 4

Figure 4.13-55 shows the components of Alternatives 1 and 2 within the analysis area compared to the riparian analysis area. **Figure 4.13-56** shows the components of Alternative 3 within the wildlife analysis area compared to the riparian analysis area. **Figure 4.13-57** shows

the components of Alternative 4 within the wildlife analysis area compared to the riparian analysis area.

Mine Site

Amphibians are considered reliable indicators of environmental quality (Boyer and Grue 1995). Water quality criteria for frogs and other amphibians do not currently exist. Rather, the following discussion summarizes impacts on fish resources from chemical contaminants associated with SGP (see Section 4.12.2.3.3.1, Changes to WCIs at the Mine Site), as fish have historically been used as surrogates for amphibians in evaluating chemical impacts in aquatic environments (Glaberman et al. 2019).

Despite analysis area improvements to water quality as a result of the removal and reclamation of legacy mine wastes, exceedances of the most stringent water quality standards (including both human health and aquatic life) for water column antimony, arsenic, copper, and mercury are anticipated to extend indefinitely throughout SGP post-closure. In considering only the aquatic life criteria, which are more relevant for the protection of fish species, impacts due to antimony and arsenic are not anticipated. For copper and mercury, impacts may be minimal but substantial uncertainties exist. For copper, the Biotic Ligand Model-based criteria are preliminary and do not encompass the range of monitoring nodes and the range of variability required for Biotic Ligand Model implementation (Brown and Caldwell 2020a). For mercury, while the predicted concentrations do not exceed the aquatic life criterion based on water column, it is uncertain whether incremental change in water column concentrations beyond baseline would cause fish tissue concentrations to exceed the tissue-based criterion.

A Water Quality Management Plan was developed and presented in 2020 (Brown and Caldwell 2020b). Section 4.9.2.2.2, Surface Water Quality provides more details regarding changes to water quality; Section 4.12.2.4.9 Alternative 2 Water Quality Management Plan provides a summary of effects on fish. Section 4.12.2.3.3.1, Changes to WCIs Analyzed in Detail at the Mine Site, Chemical Contaminants, provides an analysis of changes and the impacts on fish resources under Alternative 1.

Alternative 1 could directly disturb Columbia spotted frog in the riparian analysis area through permanent impacts to wetlands in the mine site area. Up to 726 acres of direct impacts to this habitat would occur in the mine site (see **Table 4.13-18**). Columbia spotted frogs have been observed in the riparian analysis area near the operational areas and open pits along the EFSFSR, and their presence is also likely based on habitat (i.e., streams and wetlands). Disturbance of water sources would occur in areas occupied by spotted frogs, placing them at risk of direct mortality or displacement. The presence of traffic in the mine site could expose them to direct mortality from vehicles as well. The OHV connector trail would impact forested wetlands and riparian areas, which would be a direct impact to habitat for Columbia spotted frog, while noise from vehicles using this trail would be an indirect impact for frogs.

The Forest Service would require that potential water sources be surveyed for Columbia spotted frog egg masses and other amphibians after ice melt, and Alternative 1 would avoid disturbing

any water sources with identified egg masses or other species, with some exceptions (see **Appendix D**, Mitigation Measures and Environmental Commitments). Construction of a natural stream channel for the EFSFSR and 51,350 linear feet of reclaimed stream channel and riparian habitat (Midas Gold 2016) on closure could reclaim some riparian habitat for Columbia spotted frogs in the future, although this would not represent suitable breeding habitat (i.e., wetlands and ponds).

Alternative 1 would cause an increase in noise and light in the riparian analysis area, mostly in the vicinity of the mine site. Columbia spotted frogs could be impacted by an interference in communication during breeding activities. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Additionally, light and noise impacts could be reduced by vegetation, topography, and distance from the impact sources. Therefore, indirect impacts on wildlife would differ depending on the specific conditions at each individual Alternative 1 component location based on the density of vegetation and proximity to adjoining hillsides and valleys.

Another indirect effect for Columbia spotted frog could occur in wetlands affected by fugitive dust and emissions.

Amphibians and insects may be exposed to metals (e.g., mercury) and other elements from atmospheric emissions and tailings piles associated with gold and silver mining activities (Custer et al. 2009; Eagles-Smith et al. 2018; Jones and Miller 2005). Emissions of metals from mining operations and ore processing, in the form of particulate matter and dust, may be deposited directly on local soils and waterways. In addition, rainwater and snow melt may provide a pathway for these elements to leach from tailings piles or be physically transported as solid particles into adjacent waterbodies. These elements may enter the food web through plants and insects and then be consumed by insectivorous wildlife, potentially causing injury if exposure is sufficient. The Forest Service would require an adaptive management plan to address dust and emissions (see **Appendix D**, Mitigation Measures and Environmental Commitments). Although this mitigation measure would reduce impacts, there would still likely be indirect impacts to amphibians like the Columbia spotted frog.

Under Alternatives 2, 3, and 4, effects would generally be the same as Alternative 1. However, up to 877 acres of riparian and forested wetland habitat would be impacted under Alternative 3, which would be the highest direct impact among the action alternatives. Under Alternative 4, the 3 miles of new road for the OHV connector trail from Horse Heaven/Powerline route to Meadow Creek Lookout Road (FR 51290) would not be constructed, which would reduce direct and indirect impacts to forested wetlands and riparian areas, used as habitat for this species.

Access Roads

Alternative 1 could directly disturb Columbia spotted frog in the riparian analysis area through impacts to wetlands along the access roads, and up to 175 acres of modeled habitat could be impacted along the Burntlog Route. Road construction, culvert installation, disturbance of roadside ditches that contain enough water for egg laying, and increased traffic levels may cause direct mortality. Restricting public access on the Burntlog Route would likely reduce impacts due to mortality. Anurans (including Columbia spotted frogs) are very susceptible to mortality from roadways (Jochimsen et al. 2004) when they cross them or emerge from their eggs in the spring. The new segment of the Burntlog Route would be decommissioned and reclaimed during mine closure, but the effects would mostly still be considered permanent due to the long time-period. As described for the mine site, potential water sources would be surveyed for Columbia spotted frog egg masses and other amphibians after ice melt, and Alternative 1 would avoid disturbing any water sources with identified egg masses or other species.

Alternative 1 would cause an increase in noise and light in the riparian analysis area, which could directly affect frogs along the access roads. These indirect impacts are described in the mine site section. Another indirect impact to amphibians along access roads could include fugitive dust. Dust associated with construction of facilities and roads, road maintenance, and vehicle travel may have indirect impacts on insects. Increased dust deposition could result in negative impacts to pollinating insects. For 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. Dust impacts on insects 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 insects would occur immediately at the time of dust propagating activities and is likely to continue throughout the lifetime of SGP.

Under Alternative 2, the on-site lime production would reduce traffic to the mine site, and the AADT would be 50 vpd during operations, which would slightly reduce the risk of wildlife-vehicle collisions. Other effects would be the same as Alternative 1.

Alternative 3 would have similar effects on Columbia spotted frog as Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed and there would be no impacts along the proposed Burntlog Route corridor. There would be 142 acres of direct impacts to modeled habitat under Alternative 4. Increased traffic along the existing Yellow Pine Route would likely increase direct mortality and indirect impacts (due to noise and light) along these roadways.

Utilities

Alternative 1 could directly disturb Columbia spotted frogs in the riparian analysis area through impacts to wetlands due to clearing and construction activities for utility corridors, substations, and communication towers. Direct impacts to modeled habitat are estimated to be 291 acres

under Alternative 1. The effects on wetlands would be considered temporary during construction (up to 3 years). However, impacts to forested wetlands would likely be permanent as ROW management practices generally do not allow the establishment of woody vegetation. Construction activities associated with the utilities may cause direct mortality for some frogs.

As described for the mine site, potential water sources would be surveyed for Columbia spotted frog egg masses and other amphibians after ice melt, and Alternative 1 would avoid disturbing any water sources with identified egg masses or other species.

Alternative 1 would cause an increase in noise and light in the riparian analysis area, which could directly affect frogs in the utilities. These indirect impacts are described in the mine site section.

Alternatives 2, 3, and 4 would have similar effects on Columbia spotted frog as Alternative 1. However, up to 314 acres of riparian and forested wetland habitat would be impacted under Alternative 3, which would be the highest direct impact among the action alternatives.

Off-site Facilities

Alternative 1 would impact 6 acres of wetlands for construction of the off-site facilities (see **Table 4.13-18**). It is possible that individual frogs could be directly or indirectly impacted from these activities. The operating procedures and mitigation measures described above would be used to reduce impacts where possible.

Alternatives 2 and 3 would have similar effects on Columbia spotted frog as Alternative 1.

Under Alternative 4, the Landmark Maintenance Facility would be relocated to the southern side of Warm Lake Road, which would shift the footprint slightly versus Alternative 1 and create 8 acres of direct impacts. However, it is not expected that this change would cause effects different from Alternative 1.

Habitat Impacts

The focal species selected for the WCS for the BNF and PNF represent the appropriate habitat types and are surrogates for many other species, including Columbia spotted frog. Thus, there are no specific habitat models available for this species. However, the riparian analysis area has been used for estimating impacts to this amphibian. Indirect impacts are assessed by including any forested wetlands or riparian areas within 0.5 mile of project components. For each alternative, indirect impacts would be higher for riparian areas than for forested wetlands. For example, Alternative 1 would include 18,645 acres of riparian indirect impacts and 209 acres of forested wetland indirect impacts.

Table 4.13-18 Columbia Spotted Frog Direct and Indirect Impacts

Project Component	Directly Impacted Modeled Habitat (acres)	Indirectly Impacted Modeled Habitat (acres)
Alternative 1		
Mine Site	726	N/A
Access Roads	175	N/A
Utilities	291	N/A
Off-site Facilities	6	N/A
Total	**1,198**	**18,853**
Alternative 2		
Mine Site	681	N/A
Access Roads	169	N/A
Utilities	288	N/A
Off-site Facilities	6	N/A
Total	**1,144**	**18,853**
Alternative 3		
Mine Site	877	N/A
Access Roads	165	N/A
Utilities	314	N/A
Off-site Facilities	6	N/A
Total	**1,362**	**18,886**
Alternative 4		
Mine Site	734	N/A
Access Roads	142	N/A
Utilities	289	N/A
Off-site Facilities	8	N/A
Total	**1,173**	**15,202**

Table Source: Forest Service 2020

Table Notes:

N/A = indirect impacts are calculated by buffer distances (0.5 mile for Columbia spotted frog) from the action alternatives and occur outside of the project components.

Alternative 5

Mine Site

Columbia spotted frogs would likely continue to use the mine site as they currently do.

Access Roads

Existing roads also would continue to affect frogs through habitat fragmentation, direct mortality risks due to vehicle-wildlife collisions, and noise and light impacts from vehicles.

Utilities

No new transmission lines or communication towers would be constructed, so there would be no new loss of riparian habitat.

Off-site Facilities

There would be no new loss of habitat or source of noise and light impacts due to off-site facilities.

Determination

The action alternatives may directly and indirectly impact Columbia spotted frog 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. Alternative 3 would directly impact the most habitat (e.g., forested wetlands and riparian areas) due to the mine site and utilities, Alternative 2 would have the fewest direct impacts, and Alternative 4 would have the fewest indirect impacts.

4.13.2.3 Species of Greatest Conservation Need

Direct impacts on Species of Greatest Conservation Need (SGCN) could include direct mortality (i.e., wildlife-vehicle collisions, removal of nest or roost trees, etc.) or loss of habitat due to land clearing activities and land use changes. Indirect impacts could include reduced use of foraging or breeding habitat or reduced prey resources in the analysis areas.

4.13.2.3.1 GENERAL HABITAT SPECIES

Mine Site

Direct effects on general habitat SGCN would primarily be due to loss and fragmentation of habitat, and disturbance from light, noise, and increased human activity. There would be a direct loss of habitat in the wildlife analysis area at the mine site under Alternative 1. Displaced individuals would likely only be lost to the population if the adjacent environment were at maximum carrying capacity, to the extent that there were not enough available habitats to support them. In such a case, individuals would have to travel further, exposing them to predation risks and energetic loss.

Light and noise impacts associated with mine site activities are likely to disturb or displace these SGCN. Bird and bat behaviors that may change as a result of increased noise or light including changes in roosting or foraging patterns that could lead to fragmentation of habitat. The estimated total average hourly noise levels from the mine site during the operations phase would be 102 dBA with blasting. Under the blasting scenario, SGP-related noise levels from the mine site during operations would attenuate to well below average ambient sound levels, because the impacts are reduced by vegetation, topography, and distance from the impact sources. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used and could reduce indirect effects on wildlife. Equipment would have limited external lighting and would employ noise-

minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. The result would generally be a reduction in the area of habitat disturbed at most sites, but there would be indirect effects regardless. Timing restrictions would restrict some activities (e.g., blasting, drilling, etc.) within 1 mile of active winter hibernacula and summary maternity sites, which would help reduce habitat impacts.

Alternatives 2, 3, and 4 would have similar effects on general habitat SGCN as Alternative 1.

Access Roads

Direct effects on general habitat SGCN would primarily be due to loss and fragmentation of habitat, and disturbance from light, noise, and increased human activity under Alternative 1. Construction of 15 miles of new road for the Burntlog Route would likely fragment habitat for SGCN and may act as a barrier to movement for some species. The new 15-mile-long section of Burntlog Route would be constructed and plowed year-round, and have an AADT level of 68 vpd, which could disturb the bird and bat SGCN. The intensity of this impact could range from minor displacement to mortality. The duration ranges from temporary road construction to short-term (during 12 to 15 years of mining and ore processing operations). It is not expected that the increased risk of injury or mortality would become permanent, because the new segment of the Burntlog Route would be reclaimed upon closure, and traffic levels on the existing roads would return to current levels. The geographic extent of these impacts would be limited to the vicinity of the access road. Restricting public access on the Burntlog Route would likely reduce impacts due to mortality.

Light and noise impacts associated with road construction, maintenance, and vehicle traffic are likely to disturb or displace these birds and bats. Mitigation measures and SGP SOPs would help reduce these impacts, but not eliminate them. The estimated noise levels from SGP-related traffic on the Burntlog Route during the operations phase would be 49 dBA. The estimated SGP-related noise level from road maintenance activity on the mine access road would range from 88 dBA during the summer months to 90 dBA during the winter months, when snow removal is required.

Under Alternative 2, the on-site lime production would reduce traffic to the mine site, and the AADT level would be 50 vpd, which would slightly reduce the risk of wildlife-vehicle collisions. Other effects would be the same as Alternative 1.

Alternative 3 would have similar effects on general habitat SGCN as Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed. All traffic would access the SGP area via the Yellow Pine Route. General habitat SGCN with occurrence along these existing roadways may be impacted from increased traffic levels.

Utilities

Direct impacts on general habitat SGCN could include loss or fragmentation of habitat along utility corridors, or at substations and communication towers due to land clearing activities and land use changes under Alternative 1. The addition of 25 miles of new utility access roads, as well as a disturbance of approximately 115 acres due to new transmission lines and 158 acres due to upgraded transmission lines, could impact individual SGCN. Construction impacts would likely displace wildlife, but effects would be temporary (up to 3 years). Vegetation would be cleared only in those areas necessary for Alternative 1 activities to preserve natural habitat to the greatest extent practicable. During operations, it's likely that wildlife would use the utility corridors again.

Noise and light reduction strategies would be used to reduce indirect effects on bird and bat SGCN. Equipment would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2, 3, and 4 would have similar effects on general habitat SGCN as Alternative 1.

Off-site Facilities

Direct impacts on general habitat SGCN due to the off-site facilities would include loss or fragmentation of habitat. Construction and operation of the off-site facilities of Alternative 1 are unlikely to disturb most species, because construction activities are not planned to occur in suitable habitat used by them. Noise and lighting reduction strategies would be used to reduce indirect effects on them. Buildings would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2, 3, and 4 would have similar effects on general habitat SGCN as Alternative 1.

4.13.2.3.2 RIPARIAN SPECIES

Mine Site

Direct effects on riparian SGCN would primarily be due to permanent impacts to wetlands in the mine site area under Alternative 1, and approximately 726 acres of direct impacts would occur (see **Table 4.13-18**). Construction of a natural stream channel for the EFSFSR and 51,350 linear feet of stream channel and riparian habitat (Midas Gold 2016) on closure could restore some habitat for these species in the future, but the effects would be long-term (e.g., 20 years) in these cases.

Implementation of Alternative 1 would cause an increase in noise and light in the riparian wildlife analysis area, mostly in the vicinity of the mine site. Bird behaviors that may change as a result

of increased noise and light include changes in nesting and foraging patterns that could lead to fragmentation of habitat. The noise and light increase may affect western toad breeding activities in the mine site. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. Additionally, light and noise impacts are reduced by vegetation, topography, and distance from the impact sources. Therefore, indirect impacts on wildlife would differ depending on the specific conditions at each individual Alternative 1 component location, based on the density of vegetation and proximity to adjoining hillsides and valleys.

Under Alternative 2, effects would generally be the same as Alternative 1 (681 acres of direct impacts), with the exception of the Midnight pit being backfilled in closure.

Alternatives 3 and 4 would have similar effects on riparian SGCN as Alternative 1. Alternative 3 would directly impact 877 acres and Alternative 4 would directly impact 734 acres.

Access Roads

Alternative 1 could directly disturb these riparian SGCN in the riparian analysis area through impacts to wetlands (175 acres of direct impacts). Road construction, culvert installation, disturbance of roadside ditches that contain enough water for egg laying, and increased traffic levels may cause direct mortality to the western toad. Anurans (including western toads) are very susceptible to mortality from roadways (Jochimsen et al. 2004) when they cross them or emerge from their eggs in the spring. The Forest Service would require that potential water sources be surveyed for amphibian egg masses after ice melt, and Alternative 1 would avoid disturbing any water sources with identified egg masses or other species (see **Appendix D**, Mitigation Measures and Environmental Commitments). The grebes and sandhill crane would likely be impacted from loss of riparian habitat throughout the life of the mine.

Noise and light disturbance from road construction, road maintenance, and routine vehicle traffic are likely to disturb or displace individual birds or toads that do occur in the access road vicinity. Western toads could be impacted by an interference in communication during breeding activities. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2 and 3 would have similar effects on riparian SGCN as Alternative 1.

Under Alternative 4, there would be no impacts associated with the Burntlog Route as it would not be constructed. However, riparian SGCN along the Yellow Pine Route may be impacted from the increased traffic.

Utilities

Alternative 1 could directly disturb riparian SGCN in the riparian analysis area through direct impacts to wetlands (291 acres) due to clearing and construction activities for utility corridors, substations, and communication towers. Some effects would be considered temporary during construction (up to 3 years). However, impacts to forested wetlands would likely be permanent as ROW management practices generally do not allow the establishment of woody vegetation. Construction activities associated with the utilities may cause direct mortality for some western toads, but likely not for the bird species. Potential water sources would be surveyed for amphibian egg masses, as described for the access roads. During operations, it's likely that wildlife would use the utility corridors again.

Noise and light disturbance from construction of the utility corridors, substations, and communication towers may temporarily disturb or displace grebes or cranes that use the area. Western toads could be impacted by an interference in communication during breeding activities. Noise-reduction strategies (e.g., enclosure of ore processing facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on sensitive wildlife species. Buildings, equipment, and drill rigs would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2, 3, and 4 would have similar effects on riparian SGCN as Alternative 1. Alternative 3 would impact the most riparian habitat, with direct impacts to 314 acres (see **Table 4.13-18**).

Off-site Facilities

Alternative 1 would impact 6 acres of wetlands for the off-site facilities. It is unlikely to directly disturb riparian SGCN in the riparian analysis area, with the possible exception of western toads that may use the affected wetland area.

Alternatives 2, 3, and 4 would have similar effects on riparian SGCN as Alternative 1.

4.13.2.3.3 ALPINE SPECIES

Mine Site

Direct impacts on the hoary marmot are possible in the mine site due to habitat loss and associated habitat fragmentation, year-round vehicle traffic causing disturbance and potential avoidance behavior, and a potential risk of vehicle collisions causing injury or mortality under Alternative 1. Impacts to persistent snow cover (i.e., wolverine analysis) are used as a surrogate

for marmot habitat. Direct take of these species due to construction or operational activities is possible, but unlikely, because hoary marmots prefer higher elevation meadows or rocky talus slopes where construction activities are unlikely to occur.

Alternative 1 would cause an increase in noise and light in the wolverine analysis area, mostly in the vicinity of the mine site. Construction and operations, vehicle traffic, and helicopter use are likely to directly disturb or displace individuals. Wildlife behaviors that may change as a result of increased noise include foraging or denning changes. Noise-reduction strategies would be used to reduce indirect effects on this species. Buildings, equipment, and drill rigs would have limited external lighting, and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2, 3, and 4 would have similar effects on hoary marmot as Alternative 1.

Access Roads

There would be a direct habitat loss along the access roads for the hoary marmot under Alternative 1. Direct mortality due to construction or operational activities is possible, but unlikely, because hoary marmots are expected to avoid areas of activity.

Alternative 1 would cause an increase in noise and light in the wolverine analysis area, due to road construction, vehicle traffic, and maintenance. Noise and light mitigation measures described for the mine site would likely reduce impacts.

Alternatives 2 and 3 would have similar effects on hoary marmot as Alternative 1.

Under Alternative 4, there would be a reduction of impacts due to the Burntlog Route not being built. However, any habitats adjacent to the Yellow Pine Route would be impacted from upgrades and increased traffic levels.

Utilities

There would be a direct habitat loss within the utilities for the hoary marmot under Alternative 1. Direct mortality due to construction or operational activities is possible, but unlikely, because the hoary marmot is expected to avoid areas of activity.

Alternative 1 would cause an increase in noise and light in the wolverine analysis area, due to construction, operation, and maintenance of the utilities. Noise and light mitigation measures described for the mine site would likely reduce impacts.

Alternatives 2, 3, and 4 would have similar effects on hoary marmot as Alternative 1.

Off-site Facilities

Alternative 1 is unlikely to disturb hoary marmots due to clearing and construction activities for off-site facilities, because a small amount of persistent snow cover years 1 through 7 are expected to be impacted for these facilities. However, indirect effects on them could include reduced use of nearby foraging or denning habitat.

Alternatives 2, 3, and 4 would have similar effects on hoary marmot as Alternative 1.

4.13.2.3.4 SUMMARY OF IMPACTS

The action alternatives may directly and indirectly impact SGCN (including general habitat, riparian, and alpine species) individuals and habitat.

4.13.2.4 General Wildlife Species

Direct impacts on general wildlife species could include direct mortality (i.e., wildlife-vehicle collisions, removal of nest or roost trees, etc.) or loss of habitat due to land clearing activities and land use changes. Indirect impacts could include reduced use of foraging or breeding habitat or reduced prey resources in the analysis area.

Mine Site

Direct effects on general wildlife species would primarily be due to loss and fragmentation of habitat; direct mortality through vehicle-wildlife collisions; and disturbance from light, noise, and increased human activity under Alternative 1. Displaced individuals would likely only be lost to the population if the adjacent environment were at maximum carrying capacity, to the extent that there were not enough available habitats to support them. In such a case, individuals would have to travel further, exposing them to predation, vehicle-wildlife collisions, and energetic loss.

General wildlife would likely be displaced around the perimeter of the mine site. Additional roadways in the mine site would expose individuals to direct vehicle collisions or increased hunting pressure from humans in the wildlife analysis area. There would be no hunting or discharge of firearms during construction and operations in the mine site area. Signs would be posted at the SGP area and training would be provided to notify employees that hunting is prohibited, and employees would be prohibited from carrying firearms on the SGP site. However, illegal harvest of some species is a potential risk. Employees and contractors traveling in vehicles would be encouraged to observe posted speed limits or state secondary road speed limits, and to drive at speeds appropriate to reduce the possibility of vehicle-wildlife accidents.

Light and noise impacts associated with mine site activities are likely to disturb or displace common wildlife species. The estimated total average hourly noise levels from the mine site during the operations phase would be 102 dBA with blasting. Under the blasting scenario, SGP-related noise levels from the mine site during operations would attenuate to well below average ambient sound levels, because the impacts are reduced by vegetation, topography, and distance from the impact sources. Noise-reduction strategies (e.g., enclosure of ore processing

facility, use of electricity instead of diesel generators, muffling equipment, etc.) would be used to reduce indirect effects on wildlife. Several terrestrial wildlife species have shown responses to anthropogenic noise levels beginning at 40 dBA (Shannon et al. 2016). However, because the existing (ambient) sound levels vary between 20 and 40 dBA, it is likely that SGP area wildlife would have a higher tolerance for noise. Equipment would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use. As part of SGP SOPs, buildings, equipment, and drill rigs would have limited external lighting when feasible. The result would generally be a reduction in the area of habitat disturbed at most sites.

Hazardous materials and chemicals would be transported to the mine site in U.S. Department of Transportation-certified containers by trained personnel and would be stored in designated areas employing secondary containment measures. A Hazardous Materials Handling and Emergency Response Plan would address procedures for responding to accidental spills or releases of hazardous materials to minimize environmental effects. Used products would be stored on site in approved containers that would be separate from other trash and garbage products. Therefore, there is little chance of wildlife being exposed to hazardous materials.

Alternatives 2, 3, and 4 would have similar effects on general wildlife species as Alternative 1.

Access Roads

Direct effects on general wildlife species would primarily be due to loss and fragmentation of habitat; direct mortality through vehicle-wildlife collisions; and disturbance from light, noise, and increased human activity under Alternative 1. Construction of 15 miles of new road for the Burntlog Route would likely fragment habitat for general wildlife species and may act as a barrier to movement for some species. The new 15-mile-long section of Burntlog Route would be constructed and plowed year-round and have an annual average daily traffic level of 68 vehicles, which would likely directly disrupt wildlife movements. The intensity of this impact could range from minor displacement to mortality. The duration ranges from temporary road construction (up to 3 years) to short-term (during 12 to 15 years of mining and ore processing operations). It is not expected that the increased risk of injury or mortality would become permanent, because the new segment of the Burntlog Route would be reclaimed, and traffic levels on the existing roads would return to current levels. The geographic extent of these impacts would be limited to the vicinity of the access road.

Although additional roadways could expose general wildlife species to increased hunting pressure from humans in the wildlife analysis area, hunting or discharge of firearms during construction and operations within the SGP area would be prohibited. Signs would be posted throughout the SGP area and training would be provided to notify employees that hunting is prohibited, and employees would be prohibited from carrying firearms on the SGP site. All staff and contractors would be trained to reduce wildlife collisions. Midas Gold would develop a wildlife mortality-reporting procedure and form to be used for reporting accidental Alternative 1-related wildlife mortality. Any adverse wildlife encounters would be reported to appropriate state

and federal wildlife managers, and in accordance with state and federal laws. Roadways also are used as corridors by predators such as wolves, which could indirectly increase predation of some general mammal species.

Light and noise impacts associated with road construction, maintenance, and vehicle traffic are likely to disturb or displace common wildlife species. Mitigation measures and SGP SOPs would help reduce these impacts, but not eliminate them. The estimated noise levels from SGP-related traffic on the Burntlog Route during the operations phase would be 49 dBA. The estimated SGP-related noise level from road maintenance activity on the mine access road would range from 88 dBA during the summer months to 90 dBA during the winter months, when snow removal is required.

Under Alternative 2, the on-site lime production would reduce traffic to the mine site, and the AADT would be 50 vpd, which would slightly reduce the risk of wildlife-vehicle collisions. Other effects would be the same as Alternative 1.

Although there would be 19.6 miles of new roadway due to the Burntlog Route, Alternative 3 would have similar effects on general wildlife species as Alternative 1.

Under Alternative 4, the Burntlog Route would not be built. This would avoid effects of noise disturbance, habitat loss, and habitat fragment on wildlife in the vicinity of Burnt Log Road (FR 447). However, general wildlife species that currently utilize habitats along the Yellow Pine Route would likely be more impacted due to increased traffic and noise disturbance.

Utilities

Direct impacts on general wildlife species could include loss or fragmentation of habitat along utility corridors, substations, and communication towers due to land clearing activities and land use changes under Alternative 1. The addition of 25 miles of new utility access roads, as well as a disturbance of 115 acres due to new transmission lines and 158 acres due to upgraded transmission lines, could impact individual general wildlife species. Construction impacts would likely displace wildlife but would be temporary (up to 3 years). Vegetation would be cleared only in those areas necessary for Alternative 1 activities to preserve natural habitat to the greatest extent practicable. However, impacts to forested wetlands would likely be permanent as ROW management practices generally do not allow the establishment of woody vegetation.

Noise-reduction strategies would be used to reduce indirect effects. Equipment would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Alternatives 2, 3, and 4 would have similar effects on general wildlife species as Alternative 1.

Off-site Facilities

Construction and operation of the off-site facilities under Alternative 1 are unlikely to disturb most general wildlife species, because construction activities are not planned to occur in suitable habitat used by them. Noise and lighting reduction strategies would be used to reduce indirect effects on species in the vicinity. Buildings would have limited external lighting and would employ noise-minimizing practices. Construction equipment engines would be equipped with adequate mufflers, intake silencers, and engine enclosures when feasible. When practicable, pumps, generators, and engines would be turned off when not in use.

Although construction and operation of the off-site facilities themselves would likely not cause direct mortality to general wildlife species, vehicle traffic associated with the facilities could result in vehicle-wildlife collisions. All staff and contractors would be trained to reduce wildlife collisions.

Alternatives 2, 3, and 4 would have similar effects on general wildlife species as Alternative 1.

Summary of Impacts

The action alternatives may directly and indirectly impact general wildlife species individuals and habitat.

4.13.2.5 Big Game Species

Potential effects on big game species would be similar to those discussed for general wildlife species. The discussion below focuses on issues specific to big game species while Section 4.13.2.4 contains additional impacts to general wildlife.

Mine Site

Big game wildlife species are very mobile and generally able to avoid localized direct threat of injury or mortality due to construction. However, big game species would likely be displaced around the perimeter of the mine site disturbances. Additional roadways in the mine site would expose individuals to direct vehicle collisions or increased hunting pressure from humans in the wildlife analysis area.

Although there are no identified wildlife migration corridors between winter and spring ranges, elk are predicted to use the area for calving in the summer, and big game animals likely use the wildlife analysis area to migrate. Elk and deer may be displaced around the perimeter of the mine site and associated infrastructure, which would directly affect high-value seasonal habitat for elk and mule deer. Blum et al. (2015) observed that mule deer tended to avoid disturbed mining areas in Nevada, and rerouting around disturbances would increase their energy expenditures during migration, potentially decreasing survival or productivity. However, given the relatively small size of the mine site in context of the region and available habitat, any direct effect on survival or productivity would likely be small.

Alternatives 2, 3, and 4 would have similar effects on big game species as Alternative 1.

Access Roads

Roadways also are used as corridors by predators such as wolves, which could indirectly increase predation of elk and mule deer. Plowing the Burntlog Route would increase the access into a previously less accessible area for wolves and coyotes. Likewise, the 10.4-mile groomed OSV trail along the existing Cabin Creek Road (FR 467) may increase access for predators during the winter.

Although there are no officially designated wildlife migration corridors between winter and spring ranges, big game animals likely use the wildlife analysis area to migrate. Roadways under Alternative 1 may displace elk and mule deer or increase the possibility of vehicle-wildlife collisions. Under Alternative 1, the AADT level during operations would be 68 vpd. The following are linear components of Alternative 1 that may present a barrier to the movement of wildlife. Warm Lake Road (CR 10-579) is not specifically a part of either access route; however, it is used by both access routes. The existing and proposed road segments are as follows:

- Yellow Pine Route (Johnson Creek Road [CR 10-413], and Stibnite Road [CR 50-412])
- Burntlog Route (Existing Burnt Log Road [FR 447] to be upgraded and extended 15 miles to Thunder Mountain Road [FR 50375], which also would be upgraded)

If fawning/calving activity is encountered during Alternative 1 activities, the activity would cease and/or be modified in coordination with the Forest Service. Although this and other mitigation measures would reduce impacts, there would still be a direct decrease in habitat, and increase in risk of disturbance and injury or mortality.

Under Alternative 2, the on-site lime production would reduce traffic to the mine site, and the AADT level would be 50 vpd, which would slightly reduce the risk of wildlife-vehicle collisions. Other effects would be the same as Alternative 1.

Although there would be 19.6 miles of new roadway due to the Burntlog Route, Alternative 3 would have similar effects on big game species as Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed. Impacts to big game species in the vicinity of Burnt Log Road (FR 447) would likely be avoided. However, big game species that currently utilize habitats along the Yellow Pine Route would be impacted due to increased traffic and noise disturbance associated with only using Yellow Pine Route for the SGP.

Utilities

There are no officially designated wildlife migration corridors between winter and spring ranges, or any elk winter range in the wildlife analysis area. The following are linear Alternative 1 components that may present a barrier to the movement of wildlife, although big game species would likely still use these corridors. The existing and proposed transmission line segments are as follows:

- Existing transmission line segment to be upgraded from East Fork to the Johnson Creek substation – 42 miles
- New transmission line segment from the Johnson Creek substation to the mine site – 8.5 miles

Alternatives 2, 3, and 4 would have similar effects on big game species as Alternative 1.

Off-site Facilities

Although there are no officially designated wildlife migration corridors between winter and spring ranges, big game animals likely use the wildlife analysis area to migrate. The off-site facilities would be unlikely to disrupt or alter big game herd movements, except for displacing them a short distance, which would have a negligible impact.

Alternatives 2, 3, and 4 would have similar effects on big game species as Alternative 1.

Summary of Impacts

The action alternatives may directly and indirectly impact big game species individuals and habitat.

4.13.2.6 Migratory Bird Species and Bald or Golden Eagles

Direct impacts on migratory bird species and bald and golden eagles could include direct mortality (i.e., collisions with vehicles, structures, removal of nest trees, etc.) or loss of habitat due to land clearing activities and land use changes. Indirect impacts on these species could include reduced use of foraging or nesting habitat; reduced prey resources (insects and pollinators) in the analysis areas; or disturbance from noise, light, and emissions. Bald eagles are assessed above in Section 4.13.2.2.6.1, Habitat Family 13 – Riverine Riparian and Wetland – Bald Eagle, and golden eagles would likely face similar impacts. Effects on migratory birds under the action alternatives are similar in nature to the effects discussed in Section 4.13.2.4, General Wildlife Species. Therefore, this section focuses only on the differences for migratory bird species.

Mine Site

Under Alternative 1, direct take of adult birds due to construction or operational activities is possible, but unlikely, because most individuals are expected to avoid areas of activity. However, it is possible that nests, eggs, and young could be directly disturbed by vegetation removal (including cutting of trees) during construction if it occurs during the nesting season. Impacts to the priority habitats mentioned in **Table 3.13-21** also may directly affect the migratory bird species found in the analysis areas. The Partners in Flight Idaho Bird Conservation Plan (Ritter 2000) contains several goals for the various habitats to reduce impacts on migratory bird species. Implementation of the SGP would require removal of vegetation from several habitat types during the life of the mine but would reclaim several habitats during closure. Although both habitats listed in **Table 3.13-21** (i.e., dry ponderosa pine and riparian habitats) would be directly disturbed in the short term, portions of the area would be reclaimed in the long term, including

51,350 linear feet of stream channel and riparian habitat (Midas Gold 2016). These activities would accomplish some of the Partners in Flight Idaho Bird Conservation Plan goals. Cutting of trees for Alternative 1 activities and removal of snags would avoid avian tree nests, where feasible; and a Forest Service wildlife biologist would be notified of any occupied sensitive species nests or dens encountered. Although these mitigation measures would reduce impacts, there would still be a decrease in habitat.

Migratory bird species also could be impacted by direct collision risks with structures at the mine site. Electric transmission line structures to serve Alternative 1 facilities and the new 138-kV transmission line in the mine site area would be a potential source of mortality for migratory bird species and raptors (APLIC 2012). However, the utility line design would meet APLIC raptor-protection criteria and include insulating or covered apparatus for perch accommodation to reduce risks to these species.

Alternative 1 would cause an increase in noise and light in the wildlife analysis area, mostly in the vicinity of the mine site. Construction and operations, vehicle traffic, and helicopter use are likely to directly disturb or displace individuals. Wildlife behaviors that may change as a result of increased noise include nesting or foraging changes. Chronic noise can interfere with an animal's ability to detect important sounds, while intermittent noise is often perceived as a threat, which can lead to a reduction in fitness (Francis and Barber 2013). Increased noise levels can mask some lower-frequency bird calls, interrupting mating processes. Additionally, Kleist et al. (2018) observed that anthropogenic noise could disrupt stress hormone signaling and lead to lower survival rates across several bird species (i.e., ash-throated flycatcher, western bluebird, mountain bluebird), which may be similar to migratory bird species in the SGP area. Over time, noise can change the composition of avian communities in favor of more noise-tolerant species, which reduces the number of species. Birds migrating through may avoid the area during noisy periods instead of stopping over during migration. Permanent physical damage to a bird's ability to hear can occur from short-duration, loud sounds (exceeding 140 dBA for single blasts or 125 dBA for multiple blasts), or from continuous (greater than 72 hours) noise at levels above 110 dBA (Dooling and Popper 2007). The average hourly noise level during construction at the mine site would be 94 dBA (at 50 feet) and 102 dBA (at 50 feet) with blasting during operations. As such, the SGP would not be expected to result in permanent hearing loss for birds. Additionally, light and noise impacts are reduced by vegetation, topography, and distance from the impact sources. Therefore, indirect impacts on wildlife would differ depending on the specific conditions at each Alternative 1 component location, based on the density of vegetation and proximity to adjoining hillsides and valleys. Bright lighting can confuse birds into becoming active earlier in the day and staying alert throughout the night. It also can attract night-flying or migrating birds, causing them to alter their natural activities or expose them to accidental collisions with structures.

Possible direct and indirect effects are that there could be emission exposure and a reduction in prey species near the mine site activities, due to insects being affected by emissions or fugitive dust.

Insects and insectivorous birds may be exposed to metals (e.g., mercury) and other elements from atmospheric emissions and tailings piles associated with gold and silver mining activities (Custer et al. 2009; Eagles-Smith et al. 2018; Jones and Miller 2005). Emissions of metals from mining operations and ore processing, in the form of particulate matter and dust, may be deposited directly on local soils and waterways. In addition, rainwater and snow melt may provide a pathway for these elements to leach from tailings piles or be physically transported as solid particles into adjacent waterbodies. These elements may enter the food web through plants and insects and then be consumed by insectivorous wildlife, potentially causing injury if exposure is sufficient. The mitigation measure FS-146 would require an adaptive management plan to address dust and emissions (see **Appendix D**, Mitigation Measures and Environmental Commitments). Although this mitigation measure would reduce impacts, there would still likely be indirect impacts to insectivorous migratory birds.

As part of SGP SOPs, buildings, equipment, and drill rigs would employ noise-minimizing practices and would have limited external lighting when feasible. The result would generally be a reduction in the area of habitat disturbed at most sites. The noise and light reduction strategies employed in the SGP area would reduce noise impacts on migratory birds, but not eliminate them. Timing restrictions would restrict some activities within a certain radius of active nest trees for avian species, which would help reduce habitat impacts.

Alternatives 2, 3, and 4 would have similar effects on migratory bird species as Alternative 1.

Access Roads

Migratory bird species, including focal species that are migratory, could be directly impacted and disturbed in the wildlife analysis area through vehicle mortality, habitat loss due to tree clearing, road construction, traffic noise and dust, and increased human activity along access roads. Direct take of adult birds due to these activities is possible, but unlikely, because most individuals are expected to avoid areas of activity. However, it is likely that nests, eggs, and young would be directly disturbed by vegetation removal, including cutting of trees, if it occurs during the nesting season. Ground disturbance associated with road construction and upgrades could cause injury or mortality of ground-nesting birds if conducted during the breeding season. Cutting of trees for Alternative 1 activities would avoid avian tree nests, where feasible, and a Forest Service wildlife biologist would be notified of any occupied sensitive species nests encountered. Although these mitigation measures would reduce direct impacts, there would still be a decrease in habitat. The Burntlog Route may present a barrier to movement for sensitive migratory bird species.

Additionally, noise and light from road construction, road maintenance, and routine vehicle traffic is likely to disturb or displace individual migratory bird species or bald and golden eagles from roadside habitats. Increased ambient noise levels can mask some lower-frequency bird calls, interrupting mating processes. Additionally, Kleist et al. (2018) observed that anthropogenic noise could disrupt stress hormone signaling and lead to lower survival rates across several bird species (i.e., ash-throated flycatcher, western bluebird, mountain bluebird), which may be similar to migratory bird species in the SGP area. McClure et al. (2013) observed

that simulated traffic noise led to a decline in bird abundance at sites in southern Idaho by about one quarter, and that many migratory bird species may avoid sites with such noise levels. The average hourly noise level during construction for the access roads would be 91 dBA (at 50 feet) and 86 (winter) to 88 (summer) dBA (at 50 feet) during operations. As such, the SGP would not be expected to result in permanent hearing loss for birds. Bright lighting can attract night-flying or migrating birds, causing them to alter their natural activities or expose them to accidental collisions with structures.

Noise- and light-reduction strategies described for the mine site and for other general wildlife species would be used to reduce indirect effects on migratory bird species.

Alternatives 2 and 3 would have similar effects on migratory bird species as Alternative 1.

Under Alternative 4, the Burntlog Route would not be constructed. However, the existing roadways included in the Yellow Pine Route would be upgraded and would likely cause direct and indirect impacts to migratory birds. Due to the increased traffic and noise, the Yellow Pine Route may present a barrier to movement of sensitive migratory bird species.

Utilities

Alternative 1 could directly disturb migratory bird species in the wildlife analysis area through habitat loss due to clearing and construction activities for utility corridors, substations, and communication towers. Direct take of adult birds due to these activities is unlikely because most individuals are expected to avoid areas of activity. However, it is likely that nests, eggs, and young would be disturbed by vegetation removal, including cutting of trees if it occurs during the nesting season. To the extent practicable, trees found to contain nests would not be disturbed or cut. No trees with active nests would be cut.

The communication towers and new or upgraded 138-kV transmission line would be a potential source of mortality for migratory bird species and raptors through accidental collisions with structures, cell towers, or transmission lines (APLIC 2012). In the long-term, the utility line design would meet APLIC raptor-protection criteria and include insulating or covered apparatus for perch accommodation to reduce risks to raptor species. Electric transmission line structures to serve Alternative 1 facilities would be designed and constructed to avoid raptor perching (for predation purposes and to minimize the risk of being electrocuted). However, the long-term presence of structures and communication towers would pose a risk of collision and direct mortality.

The average hourly noise level during construction for the utilities would be 84 dBA (at 50 feet) without helicopter use and 100 dBA (at 50 feet) with helicopter use and attenuate to 55 dBA approximately 53 feet from the substation during operations. As such, the SGP would not be expected to result in permanent hearing loss for birds. Noise- and light-reduction strategies described for the mine site and for other general wildlife species would be used to reduce indirect effects on migratory bird species.

Construction effects (i.e., displacement) to these areas would be temporary (up to 3 years), but long-term (e.g., 20 years) effects could include habitat fragmentation due to the utility corridors. The following are linear Alternative 1 components that may present a barrier to the movement of sensitive migratory bird species (i.e., smaller birds or those that use mature interior forest). The existing and proposed transmission line segments are as follows:

- Existing transmission line segment to be upgraded from East Fork to the new Johnson Creek substation – 42 miles
- New transmission line segment from Johnson Creek substation to the mine site – 8.5 miles

Alternatives 2, 3, and 4 would have similar effects on migratory bird species as Alternative 1.

Off-site Facilities

Alternative 1 is unlikely to directly disturb migratory bird species in the wildlife analysis area, because only approximately 4 acres of habitat would be affected due to clearing and construction activities for off-site facilities. Direct take of adult birds due to these activities is unlikely, because most individuals are expected to avoid areas of activity. It also is unlikely that nests, eggs, and young would be disturbed by vegetation removal because nest sites are most likely not adjacent to roadways where the facilities would be built.

The average hourly noise level during construction for the off-site facilities would be 92 dBA (at 50 feet) and 84 dBA (at 50 feet) due to the borrow area activity during operations. As such, the SGP would not be expected to result in permanent hearing loss for birds. Noise- and light-reduction strategies described for the mine site and for other general wildlife species would be used to reduce indirect effects on migratory bird species.

Alternatives 2, 3, and 4 would have similar effects on migratory bird species as Alternative 1.

Summary of Impacts

The action alternatives may directly and indirectly impact migratory bird species individuals and habitat.

4.13.3 Mitigation Measures

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 Environmental Impact Statement.

4.13.4 Cumulative Effects

The cumulative effects analysis area for wildlife and wildlife habitats that could be directly or indirectly affected by the SGP consists of the analysis areas described in Section 3.13.

Cumulative effects associated with the SGP consider the range of existing and foreseeable activities and their potential effects with respect to wildlife and wildlife habitats. Past and present actions that have, or are currently, affecting wildlife and wildlife habitats, as well as reasonably foreseeable future actions (RFFAs) that could cumulatively contribute to wildlife and wildlife habitat impacts in the analysis area include mineral exploration and mining activities, closure and reclamation projects, transportation projects, recreation and tourism effects, wildfire and noxious weed control projects, and development projects (see **Table 4.13-19**).

Table 4.13-19 Cumulative Effects on Wildlife Species in the Analysis Areas

Cumulative Project Type	Potential Effects on Wildlife
Mineral exploration and mining activities	Several historic mines in the analysis areas have changed the habitat over time through removal of vegetation and displacement of wildlife species. Currently planned or future mine development will modify additional habitat types during development; these habitats will likely also be reclaimed in part on closure of the mine projects. During exploratory drilling, development, and operations, the increased noise and light impacts and road networks will be a source of disturbance and mortality for wildlife and will likely also displace several species.
Closure and reclamation projects	Projects that are currently undergoing reclamation, or will in the future, will likely improve habitat for wildlife. These projects will likely be closed, which involves the removal of some of the infrastructure involved and reclamation of native habitats. Additional habitat would generally become available to wildlife use within different time frames, depending on the type of reclamation. Early seral and grassland habitats would be available for wildlife within a short time, while mature forest types would not be available for decades.
Transportation projects	Road maintenance, improvement projects, and bridge replacements are likely in the analysis areas. As roadways represent a threat to wildlife due to vehicle-wildlife collisions, habitat fragmentation, and noxious weed introduction, these types of projects are likely to also cause an impact on wildlife. Maintenance of existing roadways will likely only be short-term, while new roadways would have a larger effect.
Recreation and tourism	Recreational activities (i.e., camping, hiking, hunting, trapping, trail riding, firewood harvest, etc.) are likely to continue to affect wildlife in the future. Increased road and trail networks open new areas to additional human disturbance, which will likely displace wildlife. Hunting activities also could decrease localized wildlife populations, although these are regulated closely by Idaho Department of Fish and Game.
Wildfire and noxious weed control projects	Wildfires and noxious weeds have affected wildlife throughout the analysis areas. Additional wildfires are likely to affect wildlife in the future by reducing mature forest structure and transitioning to early seral communities. Small-scale harvesting of timber on private lands in the area also is likely to reduce the amount of forested habitat available. Control of invasive and noxious plant species also is likely to affect wildlife positively, because spraying or hand-pulling will reduce the invasive species present.
Development projects	Private residential developments are likely to impact wildlife in the future. Native habitats would be disturbed for wildlife, and additional human presence would likely displace individuals.

Table Source: Section 4.1, Introduction

These RFFAs 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 (e.g., USFWS, National Oceanic and Atmospheric Administration, etc.) on listed species, completion of appropriate analysis documents, and compliance with agency-mandated reasonable and prudent measures to protect listed species. In addition, actions on PNF and BNF must meet the standards of the Forest Plans, which specifically addresses threatened, endangered, proposed, or candidate species, as well as sensitive species and species of special interest, such as elk, and related habitat.

4.13.4.1 Alternative 1

Alternative 1 would impact approximately 3,533 acres from the combined mine site, access roads, utilities, and off-site facilities, which would be a large increase of disturbed habitat compared to other past, present, and RFFAs in the area. Various components of this larger area would be considered habitat for different species, depending on the potential vegetation groups, tree size classes, and canopy cover classes present. However, these impacts would be mitigated through restoration of vegetation communities native to the area during the closure and reclamation process. The result is that long-term, net impacts (e.g., functional habitat losses and disturbed habitat in the analysis areas) would be minimized, although it would be decades before habitats would be reclaimed to similar functionalities. The effects of road upgrades and traffic-related incidents with wildlife are likely under Alternative 1, which would contribute to the other past, present, and RFFAs.

Following closure and reclamation of the mine site, existing and ongoing mineral exploration for the SGP would cease in the wildlife analysis areas. Activities that would continue in the future, and may contribute to cumulative effects on wildlife and habitats in the analysis areas would include mineral exploration activities outside the mine site; other closure and reclamation projects; continued road use, transportation infrastructure improvements and maintenance; recreational and tourism activities; wildfire and vegetation management actions (e.g., mechanical vegetation treatment, salvage harvest, and prescribed fire); and private development projects. Potential cumulative effects from these types of actions would include further ground disturbance and habitat alteration. These reasonably foreseeable future actions would have the potential to disturb wildlife habitats because of vegetation removal and ground disturbance. RFFAs would be governed by applicable laws and regulations and would be required to conform to applicable forest plan standards on PNF and BNF.

Cumulative impacts from past and present projects have resulted in temporary and permanent losses of habitats and ecological functions in the region, and future projects also would likely impact terrestrial wildlife species. However, the region is still somewhat remote and relatively wild, and the types of projects listed above are unlikely to significantly change this wilderness character in the near term, with the exception of additional wildfires reducing mature forest structure.

Alternative 1 includes a variety of reclamation projects over the course of mine construction, operation, and closure and reclamation. However, Alternative 1 would likely result in impacts

that would be considered to permanently contribute to an adverse cumulative impact on these resources when combined with past, present, or RFFAs.

4.13.4.2 Alternative 2

Alternative 2 would impact approximately 3,423 acres from the combined mine site, access roads, utilities, and off-site facilities footprints. Although 110 acres less than Alternative 1, this would still be a large increase in the amount of disturbed habitat compared to other past, present, and RFFAs in the area. Because the size of disturbance footprint is very similar to that of Alternative 1, Alternative 2 would have the same cumulative impacts as Alternative 1.

4.13.4.3 Alternative 3

Alternative 3 would impact approximately 3,610 acres from the combined mine site, access roads, utilities, and off-site facilities footprints, which would be a large increase in the amount of disturbed habitat compared to other past, present, and RFFAs in the area. Although the disturbance footprint is larger than Alternative 1, Alternative 3 would have the same cumulative impacts as Alternative 1.

4.13.4.4 Alternative 4

Alternative 4 would impact approximately 3,219 acres from the combined mine site, access roads, utilities, and off-site facilities footprints, and would be a large increase in the amount of disturbed habitat compared to other past, present, and RFFAs in the area. Because the size of the disturbance footprint is smaller than that of Alternative 1 due to the absence of the Burntlog Route, the cumulative impacts of Alternative 4 would be less than under Alternative 1.

4.13.4.5 Alternative 5

Under Alternative 5, the analysis area would still be impacted by the types of projects discussed in Alternative 1. However, Alternative 5 itself would not contribute additional impacts to wildlife.

4.13.5 Irreversible and Irretrievable Commitments of Public Resources

The Council on Environmental Quality guidelines require an evaluation of “any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented” (40 Code of Federal Regulations 1502.16). Resources that would be irreversibly or irretrievably used during implementation of the alternatives would include a range of natural, physical, human, and financial resources.

Irreversible – A commitment of resources is irreversible when the impacts of the alternatives would limit the future options for use of the resource. This applies primarily to non-renewable resources or to processes or resources that are renewable over long periods of time.

Certain biological resources that would be affected by the alternatives are renewable only over long-time spans, including mature vegetation, seedbanks, and topsoil. Loss of these resources

would be considered irreversible. Reclamation of high-value habitats for wildlife species such as wolverine, lynx, and tree-nesting bird species may require long periods of time (decades).

Irretrievable – A commitment of resources is irretrievable when the impacts of an action would result in a loss of production, harvest, or use of renewable resources; it describes the temporal loss of renewable resources. These opportunities are foregone for the period of the alternatives, during which the resource cannot be used.

An irretrievable commitment of resources occurs when a resource that is renewable over a relatively short period of time is consumed during the life of a project and is therefore unavailable for other uses until the use ceases, and it is renewed and once again available. It is the temporal loss of resources that is considered irretrievable.

The SGP would remove the land from other uses while it is ongoing, but the use would eventually be reversed through reclamation. The temporal loss of the land for other uses would be irretrievable. This includes biological resources that are renewable over a short time, such as vegetation, wetlands, and streams. Although the loss of the resource is reversible, the temporal loss of the use of the resource is irretrievable. The temporal loss of biological resources that are renewable only over long-time spans would be considered irretrievable.

Any incidental or induced mortality of wildlife resulting from the SGP would result in an irretrievable commitment of these resources. Although most animals displaced from the affected areas are expected to survive relocation, some displaced animals may not survive the stresses of relocation; their loss would be irretrievable.

Any reduction in habitat functions also would be irretrievable. Once the habitat is reclaimed to its full function, the irretrievable loss would be limited to the temporal loss of habitat during the period before it was reclaimed.

4.13.5.1 Alternative 1

Irreversible – Although most wildlife species are considered renewable, certain biological resources that would be affected by Alternative 1 are renewable only over long-time spans, including mature vegetation, including snags, seedbanks, and topsoil. Loss of these resources would be considered irreversible. Reclamation of high-value habitats for wildlife species such as Canada lynx, wolverines and migratory bird species may require long periods of time (decades). Impacts to populations of threatened or endangered species, or species with low populations, such as Canada lynx or wolverine, would be considered irreversible, because recovery may take a long period of time or not occur at all. The direct mortality of wildlife also would be an irreversible impact.

Irretrievable – Irretrievable commitments include biological resources that are renewable over a short time, such as vegetation, wetlands, and streams. Although the loss of the resource itself is reversible, the temporal loss of the use of the resource is irretrievable. Alternative 1 activities would cause a temporal loss of habitat for a number of species; both from direct removal of vegetation, and indirectly through avoidance due to human presence. Some species sensitive to

human presence, such as Canada lynx and wolverine, may not return to the area for years after the mine is closed.

Injury or mortality of individuals, such as burrow-dwelling species and slow-moving species that are unable to relocate when ground-disturbance activities begin, or through vehicle or transmission line collisions, would result in an irretrievable commitment of these resources. Although most animals displaced from the affected areas are expected to survive relocation, some displaced animals may not survive due to the associated dangers of migration and competition for resources; their loss also would be irretrievable.

Any reduction in habitat functions also would be irretrievable. Once the habitat is reclaimed to its full function, the irretrievable loss would only be the temporal loss of habitat during the period before it was reclaimed. Some vegetation and soil habitats would be lost for future use by wildlife until reclamation could be successfully implemented. Wildlife displaced from the affected habitat may relocate throughout the region, changing the availability of game for hunters and predators. The change could increase or decrease hunting success, but any reduction in game availability would represent an irretrievable loss of opportunity.

4.13.5.2 Alternative 2

Irreversible – There would be irreversible effects similar to Alternative 1.

Irretrievable – There would be irretrievable effects similar to Alternative 1. However, the Riordan Creek segment of the Burntlog Route would affect different habitats than Alternative 1 and will likely take many years to reclaim. Similarly, there would be some transmission line reroutes and substation changes in Alternative 2 that could affect different habitats.

4.13.5.3 Alternative 3

Irreversible – There would be irreversible effects similar to Alternative 1.

Irretrievable – There would be irretrievable effects similar to Alternative 1. However, the TSF would be relocated to the EFSFSR drainage, which also would include relocation of the worker housing facility and changes to the Burntlog Route, haul routes, service roads, and trails; this could affect different habitats. There would be some transmission line reroutes in Alternative 3 that could affect different habitats as well.

4.13.5.4 Alternative 4

Irreversible – There would be irreversible effects similar to Alternative 1.

Irretrievable – Under Alternative 4, there would not be improvements or construction of new segments for Burntlog Route, which would be a significant reduction of irretrievable commitments compared to Alternative 1. Relocation of the maintenance facility could affect different habitats.

4.13.5.5 Alternative 5

There would be no irreversible and/or irretrievable commitment of resources under Alternative 5.

4.13.6 Short-term Uses versus Long-term Productivity

National Environmental Policy Act recognizes that short-term uses and long-term productivity of the environment are linked. The uses of environmental resources—or impacts on those resources—have corollary opportunity costs. These costs relate to lost opportunities and productivity that could continue into the future. This section discusses whether the short-term uses of environmental resources by the SGP would affect (either positively or negatively) the long-term productivity of the environment.

This section provides a brief overview of the short-term effects of the alternatives versus the maintenance and enhancement of potential long-term productivity of the environmental resources in the SGP area. Short-term refers to the timeframe for the proposed SGP (the 20-year life of the mine). Long-term refers to an indefinite period after the SGP ends.

4.13.6.1 Alternative 1

Wildlife resources contribute to biological productivity, and the long-term productivity of these resources provides economic, ecological, and recreational benefits. Construction and operation of the mine and associated off-site facilities would result in some temporary, short-, mid-, and long-term impacts on wildlife. During construction, wildlife habitat would be removed from the footprint of the proposed mine site and from land associated with off-site facilities, access roads, and utilities. Habitat loss would be short-term in some areas, and long-term in others, depending on the type of vegetative cover. Timbered areas to be cleared would take decades to re-generate, during which a loss of primary and secondary habitat for many species would occur. Natural recovery and reclamation of habitat would take place outside the footprint of the proposed mine site after construction activities cease. Additional habitat would be lost for the duration of the SGP, because the increase in human activity would cause avoidance of the area by certain sensitive wildlife species. The risk of wildlife injury or mortality also would be increased as a result of the increase in human activity.

These short-term impacts would persist long enough to potentially affect the long-term productivity for some sensitive wildlife species or those with limited habitat. It is possible that some species would not return to the area after being displaced, which would be a long-term impact.

4.13.6.2 Alternative 2

Although there would be construction or operational differences, Alternative 2 would have similar short-term effects as Alternative 1. As a result, the long-term productivity effects also would be similar.

4.13.6.3 Alternative 3

Although there would be construction or operational differences, Alternative 3 would pose short-term effects similar to Alternative 1. As a result, the long-term productivity effects also would be similar.

4.13.6.4 Alternative 4

Although there would be construction or operational differences, Alternative 4 would have short-term effects similar to Alternative 1. The exception is that upgrading the Yellow Pine Route would have fewer long-term impacts to many sensitive species and habitats than developing the Burntlog Route under the other action alternatives.

4.13.6.5 Alternative 5

Alternative 5 is not expected to affect the long-term productivity of the environment.

4.13.7 Summary

For wildlife and wildlife habitat, the important differences among the alternatives lie in the acres of habitat loss, the amount and location of the disturbance from noise and human activity, and the location of the facilities. Alternative 3 would have the most habitat loss (3,610 acres). Alternative 4 would have the smallest amount of habitat loss (3,219 acres), with 391 fewer acres than Alternative 3 due to the elimination of the Burntlog Route, which also would substantially reduce the magnitude and extent of impacts on most wildlife, especially wolverine, big game and migratory birds.

Table 4.13-20 provides a summary comparison of SGP impacts by issues and indicators for each alternative.

This page intentionally left blank

Table 4.13-20 Comparison of SGP Impacts by Alternative

Issue	Indicator	Baseline Conditions	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
The SGP may cause changes in wildlife habitat in the analysis area that may affect wildlife species including special-status species (endangered, threatened, Management Indicator Species, and sensitive species)	Acres of general wildlife habitat disturbed.	Hydrologic Unit Code 12 Wildlife Analysis Area: 400,417 acres	Direct Habitat Impacts: 3,476 acres	Direct Habitat Impacts: 3,368 acres	Direct Habitat Impacts: 3,573 acres	Direct Habitat Impacts: 3,153 acres	No additional general wildlife habitats would be disturbed.
	Acres of special-status wildlife habitat disturbed.	Canada Lynx Analysis Area: 656,493 acres NIDGS Analysis Area: 17,917 acres Wolverine Analysis Area: 316,035 acres	Canada Lynx Direct Impacts: 283 acres NIDGS Direct Impacts: 55 acres Wolverine Direct Impacts: 2,572.3 acres	Canada Lynx Direct Impacts: 214 acres NIDGS Direct Impacts: 63 acres Wolverine Direct Impacts: 2,459 acres	Canada Lynx Direct Impacts: 281 acres NIDGS Direct Impacts: 55 acres Wolverine Direct Impacts: 2,669 acres	Canada Lynx Direct Impacts: 255 acres NIDGS Direct Impacts: 55 acres Wolverine Direct Impacts: 2,214 acres	No additional special-status wildlife habitats would be disturbed.
	Acres of disturbance and the proximity of the proposed mining operations to high-value habitats such as crucial and or high-value big game ranges, wetlands, and seep and spring areas.	Not applicable.	Direct Habitat Impacts: 3,476 acres Canada Lynx Direct Impacts: 283 acres NIDGS Direct Impacts: 55 acres Wolverine Direct Impacts: 2,572.3 acres	Direct Habitat Impacts: 3,368 acres Canada Lynx Direct Impacts: 214 acres NIDGS Direct Impacts: 63 acres Wolverine Direct Impacts: 2,459 acres	Direct Habitat Impacts: 3,573 acres Canada Lynx Direct Impacts: 281 acres NIDGS Direct Impacts: 55 acres Wolverine Direct Impacts: 2,669 acres	Direct Habitat Impacts: 3,153 acres Canada Lynx Direct Impacts: 255 acres NIDGS Direct Impacts: 55 acres Wolverine Direct Impacts: 2,214 acres Routing Meadow/Blowout Creek in a pipeline avoids impacts on forested wetlands, which could reduce impacts for amphibians.	No additional wildlife habitats would be disturbed.
	Change in noise levels (in decibels) in—or in proximity to—wildlife habitat	Existing ambient sound levels were measured at various noise-sensitive receptor sites and varied between 34 and 64 dBA.	Ongoing noise levels would attenuate to ambient levels within 1 to 2 miles of the disturbances. Temporary disturbances (e.g., blasting, winter road maintenance) would be audible further away. Construction: 2 miles from mine site and 2 miles from access road = 34 dBA Operations: 2 miles from mine site and 0.125 mile from access road traffic (Yellow Pine Route or Burntlog Route) = 38-39 dBA Operations: 2 miles from mine site and 2 miles from access road maintenance (summer and winter) = 38 dBA Operations: 2 miles from mine site (blasting) and 0.25 mile from utilities = 40 dBA Closure: 1 mile from mine site and 0.5 mile from access road = 50 dBA	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1, with the exception of the Burntlog Route – noise from traffic on Yellow Pine Route would be similar. Helicopter installation of utility structures would reduce habitat impacts but would introduce noise that could affect sensitive species. Construction: 1 mile from mine site or access road and 0.5 mile from helicopter utility construction = 58 dBA, which is an increase of 7 decibels over other construction methods.	There would still be some equipment noise under Alternative 5, because certain exploration and reclamation activities would continue.

Issue	Indicator	Baseline Conditions	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	Miles of new roads proposed for the SGP.	Access Roads – existing roads – 89 miles Utilities – existing roads – 30 miles	Access Roads – 15 miles new road on Burntlog Route Cabin Creek OSV route – 10.4 miles groomed OSV route OHV Connector – 3 miles new road Utilities – new utility access roads – 25 miles	Access Roads – 13.5 miles new road on Burntlog Route Cabin Creek OSV route – Same as Alternative 1 OHV Connector – same as Alternative 1 Utilities – new utility access roads – 26 miles	Access Roads – 19.6 miles new road on Burntlog Route Cabin Creek OSV route – Same as Alternative 1 OHV Connector – same as Alternative 1 Utilities – same as Alternative 1	Access Roads – No new access road miles No Cabin Creek OSV route No OHV Connector Utilities – same as Alternative 1	No new roads would be constructed.
	Acres of disturbance for new and upgraded transmission lines.	Existing transmission lines – 459 acres	New transmission lines – 115 acres Upgraded transmission lines – 158 acres	New transmission lines – 141 acres Upgraded transmission lines – 156 acres	New transmission lines – 121 acres Upgraded transmission lines – same as Alternative 1	Same as Alternative 1	No new transmission lines would be constructed, and transmission lines would not be upgraded.
The SGP may affect wildlife by introducing barriers to movement, including the mine site, infrastructure, new/existing maintained roads, new transmission line.	Length of potential movement barriers.	There are no known or designated wildlife corridors for big game species or listed species. Linkage areas for Canada lynx have been estimated to occur north to south across Warm Lake Road, and east to west across the South Fork of the Salmon River.	Potential barriers: Mine Site – 6 miles long x 1 mile wide Access Roads – new roads – 38 miles Utilities – new utility access roads: 25 miles and new transmission corridors: 115 acres Off-site Facilities – no barrier effects	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1, with the exception of the Burntlog Route, which would reduce new access road mileage as a barrier.	Existing activities at the different components may as a barrier to wildlife.
The SGP may affect wildlife by potentially increasing the risk of direct injury or mortality.	Amount of increased traffic along the access routes, or acres of ground disturbance for less-mobile species.	Baseline AADT: Warm Lake Road – 1,174 Johnson Creek Road – 57 Stibnite Road – 39 Burnt Log Road – 27 East Fork Road – 84	AADT – Construction through Post Closure: Warm Lake Road – 1,215 Johnson Creek Road – 73 Stibnite Road – 55 Burnt Log Road – 52 East Fork Road – 84	AADT – Construction through Post Closure: Warm Lake Road – 1,211 Johnson Creek Road – 73 Stibnite Road – 55 Burnt Log Road – 47 East Fork Road – 84	Same as Alternative 1.	AADT – Construction through Post Closure: Warm Lake Road – 1,215 Johnson Creek Road – 98 Stibnite Road – 80 Burnt Log Road – 27 East Fork Road – 84	Existing roads would likely continue to have AADT levels similar to those that currently exist.
	Miles of new roads and new transmission lines.	Access Roads – existing roads – 135 miles Utilities – existing roads – 30 miles	Access Roads – new roads – 28 miles Utilities – new utility access roads – 25 miles	Access Roads – new roads – 27 miles Utilities – new utility access roads – 26 miles	Access Roads – new roads – 33 miles Utilities – new utility access roads – 22 miles	Access Roads – new roads – 0 miles Utilities – same as Alternative 1	No new roads would be constructed.
	Miles of existing roads that are not currently plowed that would be plowed.	Currently plowed: Warm Lake Road – 26 miles Stibnite Road – 14 miles	Proposed (new) to be plowed: Burnt Log Road – 21 miles (currently groomed) Burnt Log Road Extension – 15 miles (proposed new)	Same as Alternative 1.	Same as Alternative 1.	Proposed (new) to be plowed: Johnson Creek Road – 17 miles (conversion of existing OSV portion of Johnson Creek Road)	Existing roads would likely continue to be maintained as they currently are in winter.